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Candia Land Conservation and Well Survey Project

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CANDIA LAND CONSERVATION AND WELL SURVEY PROJECT

A Final Report to
The New Hampshire Estuaries Project

Submitted by

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September 30, 2005

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Candia Well Survey	

Candia Land Conservation Outreach Program and Community Well Survey
Summary of Activities
September 30, 2005
NH Estuaries Project Grant

Executive Summary

Candia's concern over local development, its rapid growth and encroaching sprawl, and the resulting negative impacts on the natural environment led them to consider taking more serious steps towards environmental protection. This resulted in a two-pronged initiative: a land conservation program, and a survey to collect baseline data about their groundwater resources. With many of the lands overlying identified aquifers not permanently protected, conservation of these lands is critical for preserving the integrity of Candia's current and future water supplies.

The Candia Open Space Committee was a direct outgrowth of the NROC program. With NROC staff assistance, the group formulated its structure and goals, and established its relationship with the Candia Conservation Commission. During the NROC process, the group developed a public outreach strategy to build support for land protection, and to reach landowners interested in conserving their land.

As part of their land conservation efforts, the Open Space Committee and Conservation Commission wrote a warrant article for the 2005 Town meeting for \$200,000 to replenish their conservation fund. To build support for this initiative, the group developed a brochure describing the Open Space Committee and their goals, and four newsletters. The warrant article was passed successfully. The intent is that the Conservation Commission will come back to town meeting every year, report on its activities/spending, and request replenishment of the funds spent.

To reach out to landowners, the Open Space Committee and other town boards hosted the *Dollars and Sense of Saving Special Places* presentation, and held three informal "coffee evening" workshops at private homes for interested landowners.

The Candia-NROC group's concern about drinking water resources (both quality and quantity) led to the development and implementation of a well survey to collect baseline data about Candia's ground water resources. The survey, which was sent to 1500 households, yielded an 18% response.

Candia Land Conservation Outreach Program and Community Well Survey
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September 30, 2005
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Introduction

The Town of Candia, located on the western edge of Rockingham County, has witnessed increased growth in the last several years, like other towns to its east and south. With the planned expansion of I-93 in the next several years, estimates from state and local authorities and from private groups have shown that Candia can expect an increase of 40% in its population (currently around 4,000 people) in the next 15 years. As population growth and development increase, water resources and open space will be dramatically impacted.

Candia established its Open Space Committee in 2003, shortly after the start of the NROC program. This group involves representatives from the Planning Board, Conservation Commission, and interested residents. The Town's concern over local development, its rapid growth and encroaching sprawl, and the resulting negative impacts on the natural environment led them to consider taking more serious steps towards environmental protection. This resulted in a two-pronged initiative: a program to educate Candia residents about the value of maintaining open spaces and reach out to landowners interested in conserving their land; and a survey to collect baseline data about their groundwater resources, and increase public awareness of the vulnerability of this resource to unplanned development. With many of the lands overlying identified aquifers not permanently protected, conservation of these lands will be critical for preserving the integrity of Candia's current and future water supplies.

Project Goal and Objectives

Project Goals

- To collect information about Candia's current water usage, and plan for future water needs, and
- To preserve Candia's water resources and open spaces by educating landowners about the benefits of, and mechanisms for, permanently protecting their land.

Project Objectives

Well Survey:

- Develop and implement a well survey to establish baseline data regarding current water usage in various parts of town.

Open Space Protection:

- Develop outreach strategies to increase residents and municipal decision makers' understanding of open space issues, and build support for land conservation and associated funding.

Methods

1. Assign Project Leader and Establish Project Team:

Peter Bond (later replaced by Bob Berendsen) and Betsy Kruse (Conservation Commission and Open Space Committee) served as project liaisons. The Open Space Committee members included Judi Lindsey as chairperson, Joe Miele, Debbie Levesque, Betsy Kruse, Joe Collette and Bob Berendsen.

2. Developing the Well Survey

At the same time that Candia was beginning work on the well survey, the Nottingham-NROC group was also planning a similar survey, and it made good sense for the two communities to pool resources and develop the survey together. Members of the Candia-NROC group attended the NROC educational workshop, *Ground Water Protection Strategies*, held jointly with the Nottingham-NROC group, to address priority issues of ground water supply in both communities. The Candia group worked with NROC staff and Nottingham-NROC participants through several joint meetings to develop a survey of well owners in each community.

3. Planning Land Conservation Education and Outreach

In October 2003, Candia formed its Open Space Committee (COSC). The committee began work on developing an outreach program focused on the value of natural resources protection through land conservation. To help focus their efforts, eight members of the COSC and Conservation Commission attended the NROC training session on *Developing an Effective Public Outreach and Education Campaign*. This workshop helped the COSC develop appropriate messages for their target audiences. Their strategies included educational workshops geared to three audiences: the general public, land owners, and municipal officials; a series of four newsletters; and development of a brochure describing the COSC and their mission to protect open space. The Open Space Committee met regularly throughout the duration of the project to plan and implement their strategy to build strong public support for land conservation.

Results and Discussion

OBJECTIVE 1: Develop and implement a well survey to establish baseline data regarding current water usage in various parts of town.

The Candia-NROC participants attended the educational workshop session, *Ground Water Protection Strategies*, organized by NROC staff and held jointly with the Nottingham-NROC group. The workshop provided scientific information to help both communities address priority issues of ground water supply. Presenters included representatives from the NH Geological Survey, and the NH Coastal Program.

Following this program, the group worked with NROC staff and Nottingham-NROC participants to develop a survey of well owners in each community. The purpose of the survey was to determine water supply and quality issues that may exist, and to educate residents about ground water issues. The survey was sent to 1,500 households in Candia.

275 surveys were returned, an 18% response rate. Volunteers developed a computer program to input the survey responses, and entered the data.

OBJECTIVE 2: To develop outreach strategies to increase residents' and municipal decision makers' understanding of open space issues, and build support for land conservation and associated funding.

The facilitated training session *Developing an Effective Education and Outreach Campaign* by NROC staff members from UNH Cooperative Extension and NH Dept of Environmental Services helped the Open Space Committee and Conservation Commission focus the messages for different target audiences (the voting public, landowners and municipal board members). Using the results of the training session, the group developed and implemented an education and outreach program for land conservation in Candia.

The group sponsored the following workshops:

- Hosted three neighborhood Coffee Evening workshops on *Land Conservation Options* for landowners interested in learning more about conserving their land. The informal workshop sessions were presented by NROC staff.
- Hosted and attended the community-wide workshop: *The Dollars and Sense of Saving Special Places*, presented by the Forest Society's Center for Land Conservation Assistance.
- Hosted and attended the NROC workshop *Land Conservation Nuts and Bolts*, presented by NROC staff, for the Open Space Committee, Conservation Commission, members of other municipal boards and interested residents. The workshop participants also included some representatives from the Chester and East Kingston NROC programs

The Candia Open Space Committee and Conservation Commission put together a warrant article, to be voted on at the 2005 Town meeting, for \$200,000 to replenish their conservation fund. The vote was passed successfully. The intent is that the Conservation Commission will come back to town meeting every year, report on its activities/spending, and request replenishment of the funds spent.

To build support for the warrant article, the following publicity materials were developed:

- An Open Space Committee brochure for Candia residents, describing committee activities and purpose, and the value of protecting open space. Around 600 copies of the brochure were produced.
- Four newsletters to publicize the importance of open space protection.
 - Candia Open Space Committee Observes First Anniversary – Reports on Activities
 - Protecting land from development: The Conservation Warrant Article
 - Protecting Open Space, Conservation Warrant Article No. 32: Questions and Answers
 - Questions and answers regarding use of town-owned land under Conservation Commission management, prioritizing properties for protection, and a calendar of events.

Recommendations (for future work or management strategies)

- Incorporate the results of the well survey into town documents, such as the Master Plan (Open Space Committee, Conservation Commission, Planning Board)
- Continue to work proactively on open space protection in Candia (Open Space Committee, in conjunction with the Conservation Commission).
- Communicate with landowners about voluntary land conservation options (Open Space Committee)
- Continue to educate and inform the public about the importance of open space protection (Open Space Committee and Conservation Commission).

APPENDIX I:
Open Space Committee Brochure

How the Open Space Committee was Formed

Like much of southern New Hampshire, Candia has already experienced rapid growth for several decades. Now, due to the planned widening of I-93, growth is projected to increase even more over the next 15 years. If not managed carefully, this growth will inevitably threaten Candia's rural character.

Accordingly, in 2001, the Candia Conservation Commission and the Candia Planning Board worked with the Southern New Hampshire Planning Commission to identify areas of primary importance to the rural character of our town. The resulting **Open Space Plan**, along with the results of some follow-up studies, is intended to serve as a guide for future conservation efforts, which can, in effect, be utilized to manage growth.

In 2003, the Natural Resources Outreach Coalition (NROC) conducted a number of public workshops as part of Candia's Master Plan update effort. As a result, a group of Candia residents, with the approval of the Conservation Commission and the Select Board, formed the **Candia Open Space Committee** as a sub-committee of the Conservation Commission. Its purpose is to further the goals of the Open Space Plan.



The Open Space Committee's Guiding Principles

- Candia landowners hold the key to protecting undeveloped property in Candia;
- Governmental boards and committees play an important role in developing ordinances and policies that can aid in this effort;
- Conserving open space slows and limits growth;
- **Open space saves tax dollars** because it does not use most of the town services required by residences and businesses;
- Conservation of open space must be balanced with thoughtful development in order to maintain Candia's quality of life and economic vitality;
- Coordinating conservation efforts with surrounding towns will build a network of managed and natural wild areas that can be enjoyed for generations;
- Sharing what we learn about the many ways property can be conserved will empower landowners to preserve their property to the benefit of both themselves and the town;
- Sharing knowledge of Candia's natural resources will foster the appreciation and enjoyment of our rural environment;
- Creating protected areas will contribute to a healthier environment with clean air, pure water, and abundant recreation areas;
- Conservation of open space helps protect crucial habitat needed to sustain plants and wildlife native to our region.

What the Open Space Committee Does

The Open Space Committee strives to facilitate voluntary land protection by *informing* Candia residents about the need for land conservation and various methods of achieving it, and *assisting* landowners in their conservation efforts. For example, we offer the following:

- Public workshops about land conservation and our natural environment;
- Home-based meetings, hosted by our members, at which invited experts consult with landowners interested in conserving their land;
- Written informational materials (like this brochure);
- Research and information-gathering in support of conservation projects;
- A progress report in the Annual Town Report (part of the Conservation Commission Report).

The Open Space Committee acts as a resource, linking landowners and the general public with recognized experts in the field of land conservation, preservation and management. For example, at our home-based meetings, these specialists introduce landowners to conservation options. Individual consultations can follow in which those options are explored and plans are developed and put into motion, as appropriate to the landowner's goals.

APPENDIX II:
Newsletters

A Message from Ed Fowler

Chairman, Candia Conservation Commission

The Conservation Commission and Open Space Committee would like to thank Candia's voters for their support of our Warrant Article providing an additional \$200,000 for the Conservation Fund, a fund used for protecting/preserving open space. We are currently working to protect three parcels of land totaling about 200 acres. Two would be outright purchases at market value. The third involves a bargain sale of development rights, via a conservation easement, in which the present owner would retain ownership.

The current Conservation Fund balance of just over \$500,000 will not be enough, by itself, to protect all three parcels, so we are presently investigating additional ways to leverage this amount through grants. We look forward to reporting to you on our progress and the results of these efforts. As we mentioned at Town Meeting, a public hearing is required before final action can be taken.

Again, thank you for your support.

Ed Fowler

Some questions from Town Meeting

At the recent Town Meeting, we noted a number of questions raised by residents that indicate some confusion about various aspects of our work. In an effort to better inform residents about our activities, we will devote much of this and future newsletters to clarifying these matters. All

newsletters will be posted on the Open Space page of the Conservation Commission web site:

www.candiaconservationcommission.org

Please feel free to contact us if you have more questions or concerns.

Public use of town-owned land under Conservation-Commission management

Some concerns were expressed at Town Meeting about the public use of town-owned land under Conservation-Commission management. Could the public still use the land? In particular, could the land be used for hunting? Yes, absolutely! As long as usage of town-owned land is not destructive, the Conservation Commission will not limit activities on it.

When we speak of preserving Candia's rural character, we don't just mean visually! We mean all aspects of rural character and the activities associated with it. These include recreational hiking, hunting, fishing, berrying, wildlife watching etc. In general, **our efforts to conserve land are intended to assure that land is available for public use in the future**, not to restrict use.

In fact, our objectives mesh well with the interests of sportsmen and others who enjoy the great outdoors. By protecting land from development we can assure that there will always be land available for recreational activities. And by protecting contiguous blocks of land for wildlife

habitat and migration, we can help assure that there will always be wildlife.

Prioritizing land for protection

We use a number of criteria in determining which parcels of land are important to preserve as open space. Fundamentally, one must realize that if we are truly going to maintain our rural character, we need to preserve all our natural resources, including wildlife habitat and watersheds. Wildlife need a variety of connected habitats to survive and to maintain genetically healthy species. Even some of the smallest birds need extended habitat to survive—not just the larger mammals. In addition, a network of connected parcels containing waterways and wetlands provide for flood control, as well as the cleansing and renewal (aeration) of water.

Our goal is to preserve a network of land that extends up to and abuts with protected land in neighboring towns. This includes land with road frontage. Streams and wildlife don't recognize borders or pavement. Sometimes a small parcel with road frontage is important because it is the only area that wildlife (or water) have left to cross uninhibited by development.

We have a number of large "unfragmented blocks" of land in town. These are important to the maintenance of our natural resources. Obviously, larger parcels within these blocks are important to protect, but sometimes a small lot can be a keystone in the network, so we will consider each parcel that comes before us on its individual merits.

Candia's Open Space News

Vol. 2, No. 1

January 2005

This month: Candia Open Space Committee observes first anniversary; reports on activities.

Candia Open Space Committee
74 High Street
Candia, NH 03034

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Candia, NH 03034

For Reference: If you would like more information about the Candia Open Space Committee (or the Candia Conservation Commission) or if you would like to speak with someone concerning your plans to conserve property here in Candia, please feel free to contact us:

Candia Open Space Committee
c/o Judi Lindsey
822 North Road
Candia, New Hampshire 03034

(603)483-2171

e-mail: judilindsey@aol.com

Committee Members: Judi Lindsey, Chairperson
Joe Miele
Debbie Levesque
Betsy Kruse
Joe Collette
Bob Berendsen

This newsletter was funded by a grant from the New Hampshire Estuaries Project pursuant to a grant from the federal Environmental Protection Agency.



Candia Open Space Committee observes first anniversary; reports on activities

With the close of 2004, the Open Space Committee completed its first full year of work in support of conservation in Candia. Accordingly, we would like to offer residents a report on our efforts since the last newsletter (March 2004). Generally, our activities fall into three categories: Community Outreach, Research, and Training.

COMMUNITY OUTREACH ACTIVITIES

We sponsored a number of events at which land conservation methods were presented and discussed, and we developed supporting written materials. These events ranged from small home-based gatherings to public workshops. Specifically,

- Two informal home-based meetings in August and September at which landowners interested in protecting their land from development were introduced in some detail to various conservation options. These meetings were facilitated by Phil Auger from the UNH Cooperative Extension.
- A public workshop in November featuring the program titled **The Dollars and Sense of Saving Special Places** by Dijit Taylor from the Center for Land Conservation Assistance — Society for the Protection of New Hampshire Forests (SPNHF). The presentation was rich in ideas, but the most prominent message was that growth/development results in higher taxes and that the most effective and permanent way to limit development, and thus taxes, is the conservation easement.

We also developed a brochure describing the Candia Open Space Committee's history, principles, purpose and scope of activities.

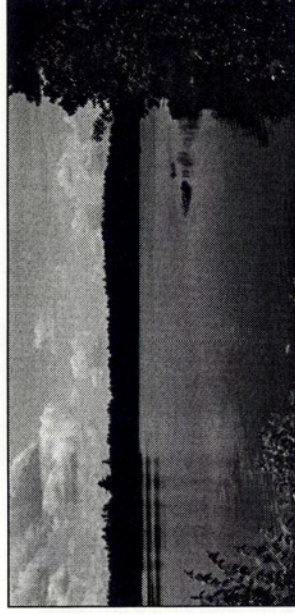
RESEARCH ACTIVITIES

The Open Space Committee conducts community research in support of its mission to preserve Candia's rural character and open space. In particular, we have compiled and maintain:

- A list of Candia properties of high interest with respect to their importance to **wildlife habitat, water supply** and other **natural resources**.
- A list of **wildlife road crossings** used to identify **migration routes**. This is an on-going activity in which residents are invited to record their own sightings. Please feel free to add yours. The list (with a related map) is located in the hallway of Town Hall, next to the Town Clerk's office.

TRAINING ACTIVITIES

To learn more about ways to protect Candia's rural character and open space, we sponsored a number of training workshops. These were primarily for the instruction of Committee members, but the public was welcome to attend — as is the case for



all our events. Specifically,

- In May, a presentation by Barbara McMillan and Julia Peterson from the NH Department of Environmental Services and the UNH Cooperative Extension, respectively, titled **Planning Your Outreach: From Goals to Evaluations**.
- In August, a workshop attended by Candia and Nottingham committee members and facilitated by Amanda Stone and Frank Mitchell, from NROC and the UNH Cooperative Extension, respectively. This workshop addressed the design of a water/well survey form.
- In November, a workshop facilitated by Frank Mitchell concerning the relative roles of the Open Space Committee and the Conservation Commission. Follow-up workshops are planned for early in 2005.

Also, several Committee members attended an August workshop sponsored by the Center for Land Conservation Assistance — SPNHF.

Thanks for the help of so many

We would like to thank all the workshop presenters and facilitators, as identified above, for their knowledge and generous assistance. In addition, we are grateful to the NH Estuaries Project for its grant to the Town of Candia. The grant has supported most of our activities for the second half of 2004.

And thanks to Candia residents for their support at Town Meeting last March; the Conservation Warrant Article almost passed, falling short of a two-thirds majority by only four votes. We're hoping for your support again this year. For details see our next newsletter.

Candia's Open Space News

Vol. 2, No. 2

February 2005

This month: Protecting land from development;
the Conservation Warrant Article.

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 **New Hampshire
Estuaries Project**

Protecting land from development: something worth doing!

Candia's a nice town. We think so, and we imagine you do too. It's close enough to both small and large metropolitan areas (Manchester, Boston), yet still has a rural character, a country charm if you will, that gives us the best of both worlds. Unfortunately, Candia's rural character is threatened, threatened by development. We live in the fastest growing region in the Northeast. Those of us who have been here for a while have seen the effects already. Unless we can find a way to protect our farmland, forests and wetlands, together with their many species of wildlife and related habitat, we are at risk of losing them due to development pressures. That's what we would like to discuss with you in this newsletter.

The Candia Open Space Committee, together with the Candia Conservation Commission, of which we are a sub-committee, is dedicated to preserving Candia's rural character by conserving land, i.e., protecting land from development. Not all land; some development can enhance economic and cultural vitality. It's more a matter of trying to protect enough land so that we are able to *retain* our rural character, to *save* the essence of what we already have. We think that's something worth doing. We're hoping you will too.

We stand ready to help landowners with all aspects of protecting land. For those wishing to conserve their land through a "bargain sale," a donation, or by conveying development rights (via a conservation easement), we are prepared to help defray the moderate costs involved with money from the Conservation Fund. Such acquisitions are essentially gifts from the landowner, acts of great generosity and conviction. But there are other conservation opportunities for which it might be best to purchase land or development rights outright. This will be more expensive, but in addition to preserving rural character, it is cheaper in the long run than allowing land to be developed. **It is well**

established that residential development costs a town more in services than it generates in taxes. So conservation purchases yield an economic benefit to the taxpayer, as well as conservation benefits.

Readiness: being prepared

We need to be ready. We must be prepared to respond to a conservation-purchase opportunity when the landowner is ready to act. To be able to do this in a financially viable way, we must have money available. At the present time, the Conservation-Fund balance (money obtained primarily from the Land-Use-Change Tax) is about \$300,000. But this really is not enough to be able to move swiftly in the case of conservation purchases.

The Conservation Warrant Article

In order to increase the funds available, we have submitted a Warrant Article to the Town requesting \$200,000 from the 2005 budget. It will be voted on at Town Meeting Saturday, March 19. (We have not recommended bond funding because of its yearly recurring cost to the taxpayer.)



To be honest, we would really like to have asked for more — after all, the more we have, the better we are able to respond to conservation opportunities. But we know there are other groups asking for a lot of money for other purposes (school, transfer station), so out of consideration for the taxpayer, we have limited our request to \$200,000 — the rationale being that this would give us enough financial *leverage* to be able to act when opportunity presents itself. At future Town Meetings, we will apprise residents of the land we have been able to protect with these funds.

How much will it cost in taxes?

Candia's total assessed valuation is \$354,989,827. Thus, the \$200,000 we have requested from the 2005 budget will increase the 2005 tax rate by about \$0.5634 per thousand dollars of assessed valuation. You can use this figure to calculate the tax impact for your own home. For example, for a \$210,000 residence, the tax increase would be about \$118. For a \$250,000 residence, about \$141. That amounts to only about \$10 to \$12 per month for an average residence. We hope you will consider this modest amount well worth it for the preservation of Candia's rural character and vote **YES** in support of the Conservation Warrant Article on Saturday, March 19.

For more information

For more information on the Conservation Warrant Article, see the next issue of our newsletter. Also:

On Tuesday, March 15, at 7:00PM in the large meeting room in Town Hall, the Candia Conservation Commission will hold a Public Forum discussing the Conservation Warrant Article. We hope you will attend. Light refreshments will be served.

Candia's Open Space News

Vol. 2, No. 3

March 2005

This month: Protecting Open Space,
Conservation Warrant Article No. 32:
Questions and Answers.

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**New Hampshire
Estuaries Project**

Protecting Open Space Questions and Answers

WHAT IS OPEN SPACE? It's undeveloped land. It's the basic feature that gives our town its rural character: the farmland, fields, forests, wetland etc.

WHY PROTECT OPEN SPACE? Because we want to retain our town's rural character, despite growing development pressures. (There are also economic benefits to protecting open space.)

HOW CAN WE PROTECT OPEN SPACE? By protecting land from development. The legal mechanism for **permanently** protecting land is the **conservation easement**. It is a voluntary contract between the landowner and a qualified conservation organization that permanently extinguishes development (and mining) rights.

WHAT ABOUT CURRENT USE? This is a special taxation plan that allows the assessed valuation for a parcel of land to be based on its *current use*, (for example, farm, forest, etc.) rather than on its true market value. *Current use* results in a vastly reduced tax burden for the landowner. It is true that the Current Use Assessment Program does discourage development by making it economically practical for a landowner to retain ownership of undeveloped land in a rising market. The problem is that *current use* does not really protect against development, it just favors the owner with low taxes as long as the land is not developed. The land can be developed at any time just by taking it out of the program and paying the Land Use Change Tax (10% of market value). **So the current use program does not permanently protect land from development.** It can always be undone.

HOW DOES A CONSERVATION EASEMENT (CE) COME INTO PLAY? Several ways. An owner can choose to donate development rights via a CE. Or an owner can donate land and then we place a CE on it.

Both of these scenarios involve acts of great generosity and conviction: *gifts*. Although such things have happened here in Candia, we can't expect them. Alternately, we can purchase development rights via a CE or we can purchase the land outright and then place a CE on it.

WHAT ABOUT THE ECONOMIC BENEFITS OF PROTECTING OPEN SPACE? It is well established that residential development costs a town more in services than it generates in taxes. So in the long run, we *save* money by protecting land from development.

Conservation Warrant Article No. 32 Questions and Answers

WHAT DOES WARRANT ARTICLE NO. 32 DO? It requests \$200K from the 2005 town budget to be added to the Town's Conservation Fund. This is a fund managed by the Candia Conservation Commission for the purpose of protecting land from development. The \$200K would raise the balance in the fund to about a half a million dollars.

WHY DO WE NEED THAT MUCH? It's not actually all that much! We would really like to have asked for more. In order to be able to respond to opportunities to preserve open space by purchasing land or a conservation easement outright, we could conceivably use much more — as you can well imagine.

WHY NOT ASK FOR MORE? We recognize there are other groups in town requesting a lot of money for other purposes (school, transfer station), so out consideration for the taxpayer, we have limited our request to \$200K. We think this amount, appropriately leveraged (see below), will give us enough financial viability to be able to act when a purchase opportunity presents itself.

ARE THERE OTHER SOURCES OF FUNDS FOR CONSERVING LAND? Yes, and we plan to tap them.

There are grant funds available to partially match (typically 70%) funds raised by the town itself for a conservation purchase. We expect that such grant funds can be used to significantly leverage the money available in the Conservation Fund. But notice that this is a **MATCH**; we need to raise money on our own in order to be able to qualify for these additional funds.

WHO APPROVES PURCHASES FROM THE CONSERVATION FUND? Purchases are recommended by the Conservation Commission, must be presented to the Town at a noticed public hearing, and must be approved by the Board of Selectmen.

HOW MUCH WILL IT COST IN TAXES? Candia's total assessed valuation is about \$355M. So, the \$200K we have requested from the 2005 budget will increase the 2005 tax rate by about \$0.5634 per thousand dollars of assessed valuation. You can use this figure to calculate the tax impact for your own home. For example, for a \$210K residence, the tax increase would be about \$118. For a \$250K residence, about \$141. That amounts to only about \$10 to \$12 per month for an average residence. We hope you will consider this modest amount well worth it and vote **YES** in support of Conservation Warrant Article No. 32 on Saturday, March 19.

For more information

The Candia Conservation Commission will hold a Public Forum discussing these matters on Tuesday, March 15, from 7:00 – 8:00 PM in the large meeting room in Town Hall. We hope you will attend. Light refreshments will be served.

Also, please see previous editions of **Candia's Open Space News**, now available on the Open Space page of the Candia Conservation Commission web site:

www.candiaconservationcommission.org

Candia's Open Space News

Vol. 2, No. 4

April 2005

This month: A message from Ed Fowler.
Our response to some questions from
Town Meeting.

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RESIDENT
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For Reference: If you would like more information about the Candia Open Space Committee (or the Candia Conservation Commission, of which we are a subcommittee) or if you would like to speak with someone concerning your plans to conserve property here in Candia, please feel free to contact us:

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 **New Hampshire
Estuaries Project**

APPENDIX III
Well Survey

CANDIA WELL SURVEY

Final Report to The New Hampshire Estuaries Project

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Summary:

Nottingham

A survey to collect data concerning wells in the Town of Candia, New Hampshire was developed through a coordinated effort between some citizens in the town of Candia, members of NROC, and a group from Northwood, New Hampshire that had a similar project underway. The genesis for the survey in Candia was from the development of an updated Master Plan. There had been interest in finding information on what types of wells were in use in different areas within the town, and if there were any issues that might be identifiable within certain areas of the town. There was also an interest to build a baseline of information concerning wells, with the hopes of re-surveying the town in a few years.

The survey was distributed to all postal nodes in the town in early October. An Excel spreadsheet was developed to collect the information entered on the returned surveys. As the surveys were returned, the spreadsheet was revised to try and collect the greatest amount of data for future reference. It also became apparent early on that some of the questions were not clear enough, or were not easily researchable, so some of the questions became of little value. Only one fifth of the surveys were returned, leading to some question about the accuracy of any conclusions that might be drawn from the results that were tabulated.

There have been no attempts to integrate the collected data with current mapping tools, such as those used for the current town tax maps. The technology did not exist on of the town-owned PCs, was rather expensive, and would have required a good deal of training to be of any use for this report. The emphasis of this effort has been to collect the raw data - it can be used as input into future projects that could go into a deeper analysis of the data.

Method of Collecting the Data:

The survey (Appendix A) was broken into three sections. The first was demographics, the second water quantity and the third water quality. It was discovered as surveys started to be returned that most respondents did not know the tax map number or lot number of their property. Since we were hoping to develop some information based on areas within the town, and tax map number was the mechanism to be used to identify these areas, more research than expected was required. Supporting spreadsheets for each tax map were developed using some reports supplied by the Tax Collector's office. The rows of each spreadsheet had map/lot number, owner, address, and some other information not needed for the survey but kept for possible future reference. When the tax map and lot number were missing from a returned survey, but either street address or name were filled in, manual cross references were made against the tax map spreadsheets to determine the map/lot number. When no direct link could be made, an entry for that surveys data was made in a spreadsheet titled "Unknown". The data from this spreadsheet is part of the summarized data.

To collect the survey data, an Excel spreadsheet was developed for the 15 tax maps, with one worksheet for each tax map. The columns of the worksheets were headed by lot number, with the survey replies to each question entered into rows that reflected the same questions from the survey. All data, including detailed descriptions, was collected. However, the detail descriptions were extremely difficult to quantify, and were helpful only in understanding some of the answers as they appeared in the survey. The tax map worksheets are part of the electronic record of this survey, but are not be part of the printed version. A three page summary worksheet for each detailed tax map worksheet is part of the printed report.

Project Goals and Objectives:

The initial project goal, as defined in the grant application, was "To collect information about Candia's current water usage, and plan for future water needs". During the development of the survey, it became apparent that the goal of water usage was not attainable since water usage in Candia is not metered (all private wells). It also became clear that the survey would serve as a baseline for future research on how housing and business development might impact the water quantity (more wells - possible impact on neighboring well's output). This can become a planning item, but only after some time has passed, and a follow-up survey is conducted.

Data Analysis:

All of the items below, unless otherwise stated, are taken from the Summary spreadsheet.

When reviewing the spreadsheet, the following is the legend for the column heading abbreviations:

Well Use

R-Residential L-Lawn A-Agriculture F-Farm C-Commercial

Type of Construction

B-Bedrock D-Dug SG-Sand/Gravel DP-Driven Point

Should pertain to an asterisk above

COULD PUT ASTERISK HERE RAB = 11/9/05

* A combination of these letters was used when multiple well uses/construction types were indicated

There were a total of 1,723 surveys mailed out. This number was provided by the Candia Post Office, based on their delivery routes. A review of the property tax report (used to develop the tax map/lot spreadsheets) derived a number of 1,330 (the number of properties identified as L/B (Land and Buildings) – the most likely to have wells). Using this number and the number of surveys returned (279), the response percent was 20.22. Though lower than expectations (hoping for 30-35%), this percentage as a statistical measure of replies, just squeaks out as sufficient to add some validity to the analysis of the surveys in total (20 percent being the normative amount).

In all, 310 wells were identified on the surveys by construction type. There were 327 wells identified in the Number of Wells answers. Based on several survey comments, the respondents detailed wells currently in use for most of the responses. The survey asked a series of questions concerning the type of well (Drilled in Bedrock, Drilled in Sand/Gravel, etc.). It was apparent after looking at many surveys that this was a difficult question to answer. Many people thought they had artesian wells, and wondered why this was not a choice. I believe that there were too many choices here, and that the data, though maybe of some value to someone who has worked with this type of data, does not lend itself to any drawable conclusions. If the responses were more complete, with all of the well information (construction type, depth, year drilled) being answered, some additional percentages could have been calculated.

Due to the fact that people were not consistent in answering all questions concerning their wells (answering the use, but not the depth, yield, etc.), the data does not cross match as to totals. This statement is in light of the several categories to be marked off under Type of Well Construction (Depth to Bedrock, Length of Casting, and Well Yield). These have not been added to the summary spreadsheets as the data is limited at best – but all responses have been entered into the detail spreadsheets that are provided electronically.

The Type of residence and Primary (non-residential) Activity categories are part of the spreadsheets, but this only informational – we knew going into the survey that most responses were residential.

Data Analysis: (continued)

A misleading number I found was the number of people that ran out of water in the last five years. We wanted to build a baseline of information concerning this, so in future surveys we could see trends. Of the total responses (279) most (268) gave a response to the question "Have you run out of water during the past five years". 55 of the 268 said yes – close to 21%. This appeared high, but after reading many of the written explanations, it was obvious that many of the outages were due to overuse of the well supply (watering gardens, filling pools, etc.). This question needs to be refined for future surveys.

A question that should have been better worded was if the electric water heater had ever been changed. There should have been an n/a choice. Many responses indicated this anyway, but several people chose to editorialize concerning the question...

The next question, too, got by editing. The question was a check-off for Taste, Smell and Odor. Many asked what the difference between Smell and Odor was...

178 respondents indicated that they had had their water tested in the past. They reported the usual items for New Hampshire – iron, manganese, radon, etc. Around 50 respondents indicated that they had installed some type of water filtration system. Most show a direct link between the water test and the installation per their written answers.

Results and Conclusions:

There were no blatant issues uncovered by the surveys. But, almost 80% did not respond. I can not come up with any trends within certain areas of the town because of this. You can see possible relationships between the age of the well and the depth of the well, but nothing conclusive based on the responses. You can also see that some areas are more prone to color in the water, but again there are not enough responses to make good conclusions.

Overall, this survey can serve more as a starting point for someone with more expertise in the area of hydrology, and more analysis tools at their disposal, so conclusions can be drawn and backed up by the data.

Candia Water Well Survey

*To help your local officials better assess current water needs and plan for the future, please answer the following questions. This information is being collected for **research purposes**. The results of this survey will be reported only in **anonymous summary form**. Thank you for taking time to help us compile this important information.*

We realize you may not have the information available to answer all of these questions.

Please answer whatever questions you can.

If you have your well records, these will be helpful for answering the questions below.

PLEASE PROVIDE YOUR MOST APPROPRIATE RESPONSE FOR EACH QUESTION YOU CAN ANSWER.

*Fold and mail the completed survey in the enclosed pre-addressed, stamped envelope by **October 18, 2004**.*

(optional) Last Name _____ First Name _____

Street Address _____

Tax map & Parcel Number _____ Lot size _____ acres

Number of Wells at this Address _____ Number of Full-Time Residents _____

Please provide descriptive information (if known) for each well on your property, in the space provided:

	Well #1	Well #2	Well #3
Use of Well (indicate with 1st letter) R esidential, C ommercial, S hared/Industrial water supply, A gricultural, L awn/garden irrigation, F arm or Commercial irrigation Other (Describe) _____	_____	_____	_____

Type of Well Construction Drilled in Bedrock	_____	_____	_____
Drilled in Sand/Gravel	_____	_____	_____
Driven Point	_____	_____	_____
Dug	_____	_____	_____
Other (Describe) _____	_____	_____	_____

Total Depth of Well (in feet) _____

Depth to Bedrock (in feet) _____

Length of Casing Installed in Well (in feet) _____

Well Yield (in gallons per minute) _____

Date the well was drilled (or age of well in years) _____

What type of residence occupies your property?

Single family house under 3000 ft² over 3000 ft² Mobile home Apartment

"Attached house" (shared walls between units) (e.g. Condominium or townhouse)

What are the primary activities if the property is non-residential?

Commercial _____ Industrial _____

Farm Nursery Golf Course

More questions on the reverse of this sheet.

Summary

1950-1954	1955-1959	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1990	1991-1994	1995-1999	2000-2004	
5	1	9	3	11	36	19	29	13	23	45	197
1	0	0	1	2	1	3	4	2	3	3	20
0	0	0	0	0	0	0	1	0	1	0	2
0	0	0	0	0	0	0	0	0	0	1	1
6	1	9	4	13	37	22	34	15	27	49	220

APPENDIX A:

WATER QUANTITY ISSUES:

How have you been affected by recent droughts

- No problem Not enough water to irrigate as much as I wanted to
 Well(s) went dry Couldn't irrigate at all

Have you run out of water during the past five years Yes No

If yes, how often have you run out of water?

- Once (state when) _____ More than once (state how often) _____

Regularly

How have you dealt with these water shortages

- Purchased bottled water Purchased bulk water Conserved
 Other (please specify) _____

Have you taken any of the following actions to conserve water? (Please check all that apply)

- Shorter showers Repair running toilet Installed low-flow plumbing fixture(s)
 Reduced area irrigated Water outdoors during early morning or evening
 Installed a water efficient irrigation system
 Other (Please specify) _____

WATER QUALITY ISSUES:

Do you have any of the following color stains in your water fixtures (toilet bowl, etc.)?

- Green Black Blue Rust/brown/orange Other (describe) _____

How often have you had to change your electric hot water heater?

- Never Once (how long ago?) _____
 More than once (state how often) _____

Does your drinking water supply have any unpleasant odor, smell or taste?

- Odor Smell Taste

Are you concerned about the following contaminants affecting your well?

- MTBE Road salt Bacteria Nitrates

Are you aware of any seasonal variations in your water quality?

- No Yes (when, frequency, what problems) _____

Have you had any problems with sediment in your water?

- No Yes Remedial action (if any)

If remedial actions taken, please describe _____

Have you tested your water for quality issues?

- Never tested Yes, I have tested it

If Yes, describe any water quality problems identified _____

Would you be willing to have your water tested at no cost to you? Yes No

Reason for New Well New Home Replace Existing Well Provide Additional Supply

Other (Describe) _____

Thank you - Your participation in this survey is greatly appreciated!

Appendix B: Summary Surveys

Summary

				1378	Possible Respondents				20.25	Percent Response			
LOTS REPLYING	279												
ACRES	2328.17												
Number of Wells	327												
Number of Residents	750												
USE OF WELL	R	R/L	A	F	R/A	R/F	L	C					
WELL 1	251	12	0	1	1	2	0	2				269	
WELL 2	27	0	2	0	0	0	4	0				33	
WELL 3	6	0	0	0	0	0	0	0				6	
OTHER	2	0	0	0	0	0	0	0				2	310 Total
Type of Well Construction	B	D	SG	B/SG	B/DP	DP							
WELL 1	152	44	10	1	1	8		216					
WELL 2	13	20	1	0	0	4		38					
WELL 3	1	3	0	0	0	2		6					
OTHER	2	1	0	0	0	0		3					
	168	68	11	1	1	14		263					
WELL DEPTH	<100	100-149	150-199	200-249	250-299	300-349	350-399	400-449	450-499	>499			
WELL 1	51	19	15	22	13	28	10	13	7	38			
WELL 2	17	1	0	0	2	1	0	4	0	5			
WELL 3	5	0	0	0	0	0	0	0	0	1			
	73	20	15	22	15	29	10	17	7	44			
Date the well was drilled	<1900	1901-1904	1905-1910	1911-1914	1915-1919	1920-1924	1925-1929	1930-1934	1935-1940	1941-1944	1945-1949		
WELL 1	0	0	0	0	1	1	0	0	0	1	0		
WELL 2	0	0	0	0	0	0	0	0	0	0	0		
WELL 3	0	0	0	0	0	0	0	0	0	0	0		
WELL 4	0	0	0	0	0	0	0	0	0	0	0		
Type of residence occupying property	0	0	0	0	1	1	0	0	0	1	0		
Single family house	224												
under 3000 ft2	139												
over 3000 ft2	20												
Mobile home	2												
Apartment	0												
Attached house	2												
Primary activities for non-residential													
Commercial	2												
Industrial	0												
Farm	2												
Nursery	0												
Golf Course	0												
Affected by recent droughts													
No problem	215												
Not enough water to irrigate as I wanted to	16												
Well(s) went dry	13												
Couldn't irrigate at all	5												
Run out of water during the past five years													
Yes/No	55	213											
Once													
More than once	15												
(How Often)													

Summary

Regularly	1									
How water shortages dealt with										
Purchased bottled water	14									
Purchased bulk water	2									
Conserved	27									
Other (specified)										
Actions taken to conserve water										
Shorter showers	56									
Repair running toilet	66									
Installed low-flow plumbing fixture(s)	100									
Reduced area irrigated	39									
Water outdoors during early morning or evening	66									
Installed a water efficient irrigation system	9									
Other (specified)										
Color stains in water fixtures										
Green	20									
Black	6									
Blue	18									
Rust/brown/orange	99									
Electric hot water heater ever changed										
Never	80	39								
Once (how long ago?)										
More than once (how often)										
Drinking w/ unpleasant odor, smell or taste										
Odor	20									
Smell	19									
Taste	28									
Concerned about the contaminants in well										
MTBE	52									
Road salt	57									
Bacteria	59									
Nitrates	34									
Seasonal variations in water quality										
Yes/No	33	202								
<i>If Yes, when, frequency, what problems</i>										
Problems with sediment in water										
Yes/No	92	148								
Water test for quality issues										
Yes/No	178	74								
<i>If Yes, describe quality problems found</i>										
Willing to have your water tested at no cost										
Yes/No	206									
Reason for New Well										
New Home	30									
Replace Existing Well	25									
Provide Additional Supply	7									
Other (Describe)										