COLD RIVER WATERSHED MANAGEMENT PLAN

Covering the Towns of:

Acworth, Alstead, Charlestown, Langdon, Lempster, Marlow, Unity & Walpole

in

Cheshire & Sullivan Counties, New Hampshire

April 2009

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ADOPTION

The *Cold River Watershed Management Plan* was officially adopted by the Cold River Local Advisory Committee at their meeting on April 23, 2009:

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TABLE OF CONTENTS

ACRONYMS

BMP	Best Management Practice
CC	Conservation Commission
CRJC	Connecticut River Joint Commissions
CRLAC	Cold River Local Advisory Committee
FMEEA	Fall Mountain Educational Endowment Association
GIS	Geographic Information System
GSRWA	Granite State Rural Water Association
LID	Low Impact Development
NEGEF	New England Grassroots Environmental Fund
NHACD	New Hampshire Association of Conservation Districts
NHB	Natural Heritage Bureau
NHDES	New Hampshire Department of Environmental Services
NHDOT	NH Department of Transportation
NHFG	New Hampshire Fish & Game Department
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NTU	Nephelometric Turbidity Unit
PWS	Public Water System
RMPP	Rivers Management & Protection Program
RSA	Regulations of State Agencies
RTCA	Rivers, Trails & Conservation Assistance Program
SWRPC	Southwest Regional Planning Commission
TNC	The Nature Conservancy
USGS	United States Geological Survey
UVLSRPC	Upper Valley Lake Sunapee Regional Planning Commission
VLAP	Volunteer Lake Assessment Program
VRAP	Volunteer River Assessment Program

1.0 Acknowledgements

The *Cold River Watershed Management Plan* was developed by volunteers - by residents and friends of the Cold River Watershed - under the auspices of the Cold River Local Advisory Committee (CRLAC).

Volunteers play a unique and vital role in our small communities. From serving on town boards to running important social and recreational programs, volunteers contribute countless hours and seemingly endless energies toward making this Watershed a great place to live. The CRLAC appreciates the many contributions made to our local quality of life by caring people who volunteer their time on behalf of their communities.

One of the many important roles served by volunteers is environmental protection. Working together with government officials and other stakeholders, local people have the power to plan for the future character and condition of the Watershed. This plan represents one management tool that these individuals and groups can use to proactively evaluate land and water use decisions impacting our local natural resources.

While preparing this plan, the CRLAC received valuable technical assistance from the New Hampshire Department of Environmental Services (NHDES), Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC), National Park Service (NPS), NH Association of Conservation Districts (NHACD), NH Fish & Game Department (NHFG), Southwest Regional Planning Commission (SWRPC), Antioch University New England and Professional Geologist Michael Heidorn.

While the CRLAC is responsible for the final content of this edition of the plan, the goal has been to present information and recommendations that reflect the views of a wide range of stakeholders. This goal was acted upon through a series of public meetings, surveys, work sessions, workshops and sampling events spanning the years 1998 to 2008.

This lengthy project could not have been completed without generous funding and/or resources secured by or from many organizations, including:

- Cheshire & Sullivan County Conservation Districts
- CT River Joint Commissions (CRJC) Partnership Program
- Conservation Commissions (CCs) - Acworth, Alstead, Lempster, Walpole, Unity
- Fall Mountain Educational Endowment Association (FMEEA)
- Granite State Rural Water Association (GSRWA)
- New England Grassroots Environmental Fund (NEGEF)
- NHACD AmeriCorps Program
- NHDES Volunteer River Assessment Program (VRAP)
- NHDES Water Quality Planning (604B) Program
- NPS Rivers, Trails & Conservation Assistance (RTCA) Program
- Private donors
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- Town of Alstead Supplemental Environmental Project
- UVLSRPC and SWRPC

The CRLAC would like to especially thank the following individuals who added enthusiasm, expertise and/or support to some aspect of the long planning process:

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- Ted Walsh, NHDES
- Duncan Watson, Walpole CC
- Laura Weit, NHDES
- Peter Wotowiec, Acworth CC

We are not able to list all of the individuals and organizations that donated time and expertise toward this project, nor have we listed all of the volunteers and former CRLAC representatives (see Section 3.0) who participated in related planning events and activities. If you belong to one of those groups and do not see your name listed, please accept our humble apologies - and our heartfelt thanks for your participation.

*[**Cover Photo:** The Cold River flows peacefully upstream of the Drewsville Gorge in Walpole on October 19, 2008. Photo provided by Mike Heidorn of Alstead.]*

2.0 Introduction

The Cold River runs its 22-mile course from Crescent Lake in Unity and Acworth through the lands of Lempster, Alstead, Langdon and Walpole where it empties into the Connecticut River under the Route 12 Bridge. The surrounding terrain that slides each drop of rain, fog and snow toward the River is called the "Watershed," a block of land covering approximately 102 square miles. Marlow and Charlestown have important places at the outer edges of the Watershed, bringing the number of Watershed towns to eight.

A copy of the *Atlas of the Cold River and the Cold River Watershed* (CRLAC and SWRPC, December 2006) is provided in Appendix A. The atlas depicts the location of the Watershed, local political boundaries and the abundant natural resources of the area.

Pardon our pride, but the Watershed is a thing of beauty! The rural character of its landscape is a welcome respite from an increasingly busy outside world. Its special natural resources create opportunities for peaceful homes, forests, farms and recreation as well as innovative businesses. Hard-working residents have relied on those resources to build a rich history of mills and mines as well as timber and maple syrup production.

Within the Cold River Watershed there are approximately 4,000 people and exactly nineteen bridges, nine zip codes, four village stores, three gas stations, two pay phones and zero fast food establishments. Long before the light of dawn, school buses crisscross our hills and valleys in their daily accumulation of over 2,000 miles. The distances to schools, neighbors and modern conveniences can sometimes be a challenge, but our lightly populated rural towns represent a pocket of tranquility in a fast-growing state.

With many a heart's home bound to the towns in the Cold River Watershed, most of us understand intuitively that we share a special environment. But even among ourselves, it can be easy to take a natural resource like water for granted. The relatively clean, abundant water of the Watershed is actually the very reason that most of us don't have to think about it very much. What's to think about? It's just there…isn't it?

Well, it may not always be. Countless examples inside and outside of our region demonstrate serious challenges to the flow and purity of water. These challenges range from small, incremental ones like septic system effluent impacts or changes in drainage at newly developed sites to larger, more dramatic ones like contaminated sites, floods or large groundwater withdrawals. We are not immune from these challenges.

We depend on a healthy Watershed to sustain our way of life. Without it, working forests and farms and other resource-dependent businesses would not thrive. The familiar sounds of a John Deere or an old Ford 8N would become a thing of the past. Seasonal recreation would diminish, as would the revenues generated by seasonal activities and residents. Drinking water from our wells and springs would need to be treated to improve safety or replaced by more expensive imported sources of water.

Without good water quality and a dependable quantity of it, our aquatic, terrestrial and winged life - and the plants we and they depend upon - would not thrive. We would not enjoy the pleasures of swimming, fishing and boating, of simply listening and watching and enjoying the woods, of learning to distinguish between a peeper and a wood frog, a warbler and a thrush, a trout and a bass, a bobcat or a coyote track, a breaststroke and a crawl.

Without good water, the strong rural fabric woven by generations of healthy children and homegrown elders would not have thrived here. Without that fabric, local recreation might be more along the lines of indoor video games in motel lobbies rather than bicycling, hunting or hiking - and community planning might lean more towards building strip malls or casinos rather than keeping village centers strong, mayflies abundant and bobcat territory intact. And as for taking time to keep the River healthy, well…who would really care, since it could be a lot cheaper to finally fill in that paradise and put up that parking lot.

So! What is your vision of the future? If it includes clean, abundant water then this plan is intended to help you and your town achieve that goal. All that water that leaps from our hills and valleys, seeps in and out of the forest floors and grassy patches, expires from the leaves and flowers to fall again as that torrential August storm just as the hay is being brought in…all this is the reason to plan carefully for the future.

To assure the long-term health of the Watershed, abundant clean water should be an over-arching goal toward which our towns steer their land use policies and decisions. Thanks to our rural character, the citizens and elected officials of our Watershed currently have a window of opportunity to work together and do just that.

The *Cold River Watershed Management Plan* is meant to address our individual and collective responsibilities pertaining to water quality and quantity. The topics covered in this plan reflect the choices affecting clean, plentiful water that are frequently made through town planning and landowner decisions regarding:

- Soils, forests and agriculture;
- Stream banks;
- Wildlife;
- Wetlands;
- Recreation and public access,
- Historic structures;
- Roads;
- Local, state and federal regulations; and
- Education.

We recognize that growth will continue to occur in our towns, and that human activity is an integral part of the Watershed. This plan provides guidance on how growth can happen without ruining our water and all that depend upon it. This plan suggests solutions for protection of special places and wildlife while allowing freedom for humans to "do their thing." Finally, this is a plan that will improve the sustainability and tax base of our communities by protecting the quality of life and rural character that is so near and dear to our hearts and the hearts of those who will come in the future too.

We must not leave such things to chance. We should plan for the future now by taking actions and evaluating our progress, by learning from our mistakes and celebrating our successes. Every year passes just as quickly without good management plans as it does with good management plans. But every year that passes with a good plan brings towns one year closer to protecting and improving the strong values that keep most residents happy and healthy, *and* at the cheapest possible cost.

Please read this plan and see what you can do to make it work on your property as well as within the larger arena of town policies. Please participate in your town's governance and/or the myriad of other volunteer opportunities that provide the essential touch of human kindness and solutions. For example, the CRLAC would welcome your participation at monthly meetings, on a water quality monitoring team, helping with grant applications, working on school projects or assisting with our annual workshop series.

This is *our* collective Watershed, which supports *our* beloved families and forms *our* special river. We all have a part to play in keeping the water clean and assuring that there's plenty of it for the future. Let's make it happen!

3.0 Background

This section of the plan includes brief descriptions of the Cold River's classification as a Designated River, the CRLAC, natural features of the Cold River and recent changes to the River. An overview of subsequent portions of the plan is also provided.

Designated River Status

The New Hampshire Legislature enacted the Rivers Management and Protection Program (RMPP) within the NHDES in 1988. The RMPP is designed to help communities protect a river in addition to accommodating a wide range of uses for the river without adversely affecting the very qualities that make rivers such rich resources.

In 1998, local residents and municipal officials spearheaded the application process for acceptance of the Cold River into the RMPP. Our River was accepted into the RMPP and recognized as a significant statewide natural, cultural, scenic and scientific resource by the New Hampshire Legislature in 1999.

Rivers included in the RMPP are called Designated Rivers. The Cold River is one of only fourteen such rivers in the state. Our Designated River is protected under the RMPP

from the outlet of Crescent Lake Dam in Acworth to its confluence 22 miles downstream with the Connecticut River in Walpole. The designation is further broken down as follows:

- From the outlet of Crescent Lake Dam to the most downstream crossing of the Langdon/Walpole town line (approximately 20.3 miles), the River is classified as a "Rural River."
- From the most downstream crossing of the Langdon/Walpole town line to the confluence with the Connecticut River (approximately 2.1 miles), the River is classified as a "Community River."

Designation of the River provides increased protection against the construction of new dams, damaging channel alterations, water quality impairments and the location of solid and hazardous waste facilities in the River corridor. Designation also requires the state to establish protected instream flow criteria to maintain water for instream public uses including water quality, fisheries, recreation and scenic values. Summaries of state and federal regulatory protections afforded to Designated Rivers are provided in Appendix B.

While regulatory protections are important, designation primarily benefits the River through increased public education/awareness and voluntary river corridor planning as demonstrated in this document. The RMPP regulations (as outlined in Chapter 483 of the Regulations of State Agencies, or RSA 483) do not preempt local land use and zoning authority nor the rights of landowners (except at waste facilities).

For additional information on the RMPP and the designation rules, or to review extensive descriptions of significant resources identified in the Cold River Watershed during the River nomination process, please refer to the RMPP portion of the NHDES web site at: www.des.nh.gov/organization/divisions/water/wmb/rivers.

Cold River Local Advisory Committee

A key component of the RMPP is the creation of local advisory committees which encourage responsible stewardship of Designated Rivers. The CRLAC was established for communities along the Cold River upon designation in 1999.

The CRLAC is made up of volunteers representing diverse interests within each of the towns in the designated section of the River. These are the towns of Acworth, Alstead, Langdon, Lempster and Walpole. Each member of the committee is nominated by his or her town officials and is appointed to a three-year term by the Commissioner of the NHDES.

A list of CRLAC members participating in this planning process and annual reports of CRLAC activities are provided in Appendix C. CRLAC's statutory duties include:

- Advise stakeholders on management of the River corridor
- Comment on any government plans that would alter River characteristics/values
- Develop or assist in the development of a River corridor management plan
- Report annually to the NHDES

These obligations effectively provide residents of riverfront communities with a direct and powerful avenue for formal input into local, state and federal decisions affecting the River and the Watershed. The CRLAC serves as a vehicle for that input.

Town officials considering management or regulation of activities within the River corridor and state officials considering any action affecting the River are required to notify the CRLAC of those considerations. This notification process encourages communication essential for effective watershed protection and planning.

According to the RMPP, the CRLAC has a distinct legal existence separate from the state and is not part of state government. The CRLAC performs "public and essential governmental functions not otherwise fulfilled by state government."

Natural River Features

A brief summary of natural River features is provided here as background information. For additional details about the River and its resources, please refer to the *Atlas of the Cold River and the Cold River Watershed* (Appendix A), the RMPP portion of the NHDES web site as referenced above, or the CRLAC web site at www.coldriver.org.

The Cold River drains a total land area of 102 square miles. From its headwaters at Crescent Lake in the hills of Acworth and Unity at an elevation of 1,211 feet above sea level, the River drops steeply to its confluence with the Connecticut River in Walpole at an elevation of 236 feet above sea level. Along the River's 22-mile course and 975-foot drop, the River passes through a mostly rural landscape interspersed with small villages which contribute to the river's vitality and uniqueness.

The Cold River's inaugural plunge from the east side of Crescent Lake lacks the grandeur of the animated stream the Cold is known to be, but soon after leaving the lake the River is joined by many small tributaries in Acworth and Lempster and more than doubles in size. At the Acworth/Lempster border, the River forms the centerpiece of a large wetland complex and important migratory bird area in Keyes Hollow.

The River's character changes little as it works its way downstream through several marshes and woodland areas, but when it reaches South Acworth its valley becomes steep and narrow as it prepares to plunge 60 feet in 0.2 miles over two significant waterfalls. The first fall resides just after a breached millpond dam at Beryl Mountain Road, while the second pours between two pillars of rock into a formation known as Deep Hole.

After Deep Hole, until its confluence with the Connecticut River, the average gradient of the Cold River is still approximately 40 feet per mile. The sharp gradients and steep rocky ledges of the River and its tributaries fostered many mills in the nineteenth century.

From Deep Hole, the River passes under McDermott Covered Bridge (on the National Register of Historic Places) in Langdon and enters Vilas Pool, an impoundment with a recreation center at the head of a small gorge in Alstead. A buried remnant of the River's former channel, complete with giant potholes, is located nearby at Cockhat Hill.

The Cold River broadens as it leaves the gorge and enters Alstead Village. Below the village, the River flows past corn fields and scoops up deep deposits of sand and gravel left by the last glacier to visit the area. After several miles, the valley walls close once again as the River rushes into spectacular staircase of small waterfalls in the Drewsville Gorge at the Langdon/Walpole boundary.

Below the gorge, the River rambles past a smattering of homes, a large quarry and more corn fields and is a popular fishing destination. After passing below Route 12 in Walpole, the River finally sweeps into the larger and slower Connecticut River. A large delta of eroded material has been deposited in this area as a result of historical floods.

Recent Changes to the River

The Cold River, like all rivers, makes slight changes every year. A few rocks might be moved after winter's ice and spring's high water, or a bank might lose some dirt after a heavy rain. A gravel bar may be deposited in one section, while an unstable channel may move a matter of inches in one direction or the other.

But on October 9, 2005, the River dramatically reshaped itself after almost a foot of rain caused a catastrophic flood. Lives were lost, homes and roads destroyed, and the River channel greatly changed in places. The 2005 Flood is a reminder of the dynamic nature of the River and how people should not underestimate the power of water.

We have not attempted here to describe the causes and impacts of the 2005 Flood, nor the recovery, restoration and stabilization efforts that have been completed in the wake of the flood. Interested readers are referred to other more detailed reference sources such as:

- *Too Much Water, Too Much Rain: The Story of the Alstead Flood* (Alstead Historical Society, 2006)
- *Flood of October 8 and 9 on the Cold River in Walpole, Langdon and Alstead and on Warren Brook in Alstead, New Hampshire* (U.S. Geological Survey, 2006)
- *Fluvial Geomorphic Assessment, Cold River, Warren Brook and Bowers Brook* and *Restoration Master Plan for the Cold River, Warren Brook and Bowers Brook* (Horizons Engineering, October 2006 and March 2007)
- Natural Resources Conservation Service (NRCS) Emergency Watershed Program
- Local Selectmen's, CC and Planning Board offices

To the extent possible, we have incorporated lessons learned from the 2005 Flood in this plan. Trying to prepare for and respond to such a dramatic event is not a task easily undertaken, nor is a flood of that magnitude likely to occur again in our lifetimes. However, changes - both small and large - will continue to happen in the River and its environment, and it behooves us all to do our best to plan for the future.

We are proud to be part of the communities that not only joined together back in 1999 to put the Cold River into the RMPP, but also responded so resourcefully and cohesively to

the disaster in 2005. With continued state and federal support, this community spirit gives us good reason to be optimistic about the future management of the Watershed.

Management Plan Overview

A key requirement of the RMPP is to develop and implement river corridor management plans to further protect shorelines and adjacent lands. These plans may include tributary drainage areas as those areas can significantly impact a river corridor.

The *Cold River Watershed Management Plan* is intended to fulfill the river corridor management plan requirements of the RMPP. As such, this plan directly or indirectly covers:

- Recreational and non-recreational uses/activities
- Existing land uses
- Protection of floodplains, wetlands, wildlife habitat and open space
- Structures such as dams and bridges
- Access issues
- Setbacks
- Dredging, filling, mining and earth-moving
- Prohibited uses

This plan is structured to focus on the local resources most significant to managing the Cold River and its Watershed. As noted in the Introduction, the primary resource is the water itself. Therefore, the next section (Section 4.0) is devoted exclusively to water quality and quantity. The following section (Section 5.0) centers on related resources such as plant and wildlife habitat, recreation, land use, and historic and cultural features.

Each section includes a description of the applicable resources and their associated management challenges. A collaborative vision for moving the implementation of this management plan forward is provided in Section 6.0, and specific management goals and action steps are recommended for each identified resource in Section 7.0. A selection of useful references for further investigation is provided in Section 8.0.

4.0 Water Resources Management

This section of the report includes descriptions of the water quality and quantity resources of the Cold River Watershed, and associated management challenges.

Water Quality Resources & Challenges

The Cold River has a Class B water quality classification over its entire length, according to the NHDES. This classification means that the River is "acceptable for fishing, swimming and other recreational purposes and, after adequate treatment, for use as drinking water supplies."

The significance of maintaining a high level of water quality in the Cold River is evidenced by the frequency of its use for a variety of recreational purposes and by the presence of an important coldwater fishery program for trout and salmon. Also, because the Cold River empties directly into the Connecticut River (which has federal "American Heritage River" designation), the maintenance of water quality in our River is a key component of complying with existing management plans for the Connecticut River.

Respondents to the *Cold River Corridor Survey* (Appendix D) listed "Good water quality" as highly important. Trends that they felt may threaten water quality included:

- Recreational abuses (such as destructive behavior or litter)
- Excessive erosion/sedimentation
- Loss of farm land and forest land to development
- Clearing too close to the river or tributaries

Research and visual assessments conducted by the CRLAC support the survey results and suggest that the following are *potential* challenges to managing water quality:

- Storm water runoff from roads and other impermeable surfaces
- Leaking aboveground or underground storage tanks
- Failed septic systems or inappropriate discharges to such systems
- Accidental hazardous materials spills on roadways
- Poor management practices in residential or agricultural settings
- Land clearing for logging or development
- Unmaintained or poorly maintained dams/impoundments
- Sediment transport from tributaries during high flows
- Hazardous waste sites and unlined landfills
- Minimal understanding of natural water quality variations
- Airborne pollutants such as acid rain

The CRLAC established a water quality monitoring program in 2002 to help detect and correct some of the situations that may adversely affect the River's water quality. The program is designed to better understand the Watershed; identify new or recurring pollution sources; encourage water resource discussions in our towns; and provide objective scientific data for local, state and federal planning and enforcement decisions. Those data needed to make those decisions are not being routinely collected by those agencies.

An important component of our volunteer monitoring program is the sharing of water quality data. The CRLAC is committed to improving local understanding of water resource issues through public education and awareness. In addition, the CRLAC seeks to reduce the impact of contamination via an active pollutant identification and mitigation program.

To date, our findings show that water quality in the Cold River and its tributaries is generally classified as *Good* to *Excellent*. This classification is a result of:

- High **dissolved oxygen** levels ranging from about 7 to 12 milligrams per liter (mg/l) and generally at or near 100% saturation, meaning the water is holding the maximum possible amount of oxygen (healthy for trout/salmon)

- Low **turbidity** (amount of suspended material; erosion indicator), usually < 2 nephelometric turbidity units or NTUs
- Low **specific conductance** (amount of electrically charged ions; possible pollution indicator), usually < 100 micromhos per centimeter or umhos/cm
- Low summer **temperature** (healthy for trout/salmon), usually < 70°F
- Low **E. coli bacteria** (possible pollution indicator) levels, usually < 80 counts per 100 milliliters or cts/100ml (safe for swimming)
- Low to average **phosphorous** (essential nutrient and possible pollutant) levels, usually < 0.02 mg/l
- Low **organic nitrogen** and **ammonia** (nutrients and possible pollutants) levels, usually not detected
- Low to average **nitrate** (nutrient; possible pollutant) levels, usually < 0.2 mg/l
- Low **chloride** (salt; possible pollutant) levels, usually < 27 mg/l
- Low to average **aluminum** (metal; possible pollutant) levels, usually < 0.09 mg/l
- Low **copper**, **lead** and **zinc** (metals; possible pollutants) levels, usually not detected

Periodically however, the water quality classification for the Cold River and its tributaries is reduced to *Poor* due to spikes in bacteria, turbidity (sediment), temperature and nutrient levels. In addition, elevated acidity (low pH) levels are frequently observed.

A brief overview of these important water quality issues is provided below:

- **Bacteria:** Significant increases in bacteria levels have been frequently observed following moderate to heavy rain events, including the Flood of 2005. The source of the bacteria is unknown, and may be related to wildlife, septic systems or other factors. Similar situations have been observed elsewhere in NH and the nation. The CRLAC is currently researching assessment alternatives such as genetic fingerprinting of bacteria. In the meantime, the CRLAC advises bathers/boaters to stay out of the streams after moderate to heavy rain events.
- **Turbidity:** Significant increases in turbidity have been observed since the Flood of 2005 in the tributaries and portions of the River at or below Alstead, as well as Bowers Brook in Acworth. Following moderate to heavy rain events, stream banks that have not been stabilized and stream channels that have not been restored release sediment to the water. Bank stabilization and public infrastructure repair work since the Flood have also released sediment.

  Excess sediment smothers underwater habitat vital to the coldwater fishery and delays the ecological recovery of the streams. The CRLAC continues to monitor turbidity levels and support efforts to stabilize and/or restore the River corridor. Rainy day turbidities in 2008 seem to have decreased relative to 2006-07.
- **Temperature:** Elevated average temperatures considered potentially stressful to lethal for trout and salmon have been observed periodically on the Alstead-

Langdon stretch of the River and the lower Walpole section of the River, and on the lower part of Warren Brook since the Flood. Elevated temperatures are routinely seen at the outlets to lakes and ponds but the water tends to cool down as it moves away from those water bodies.

The NHFG routinely performs temperature studies in the River. The CRLAC is monitoring NHFG's data and considering long-term deployment of temperature data loggers to better assess temperature fluctuations and possible impacts to fish.

- **Nutrients:** Relatively elevated phosphorous and/or nitrogen levels have been routinely observed on Crane Brook in Acworth and Great Brook in Langdon. The NHDES recently completed a study on Crane Brook which identified a polluted upstream tributary that is a likely source of contamination. High bacteria levels were also detected there, and NHDES is requiring the tributary to be cleaned up.

  In Langdon, the CRLAC completed additional sampling in 2008 to begin assessing possible upstream pollution sources. Initial results suggest that Brush Meadow Brook, Ram Brook and Jewett Brook (tributaries to Great Brook) may be partially responsible for the elevated nutrient levels observed downstream.

- **Acidity:** Low pH can impact fish health. Many measurements have been less than the minimum standard of 6.5, most likely due to local geology, wetlands and acid rain. This situation is common throughout NH, and is considered a relatively low priority for investigation by the NHDES. The CRLAC will continue to monitor pH levels for the foreseeable future.

Recent annual water quality summaries for the Cold River and its tributaries are provided in Appendix E. For complete annual water quality reports, please visit the VRAP portion of the NHDES web site (www.des.nh.gov/organization/divisions/water/wmb/vrap).

The Lake Warren Association and volunteers on Crescent Lake routinely provide additional water quality data for the Watershed. These voluntary sampling programs focus on not only the lakes but their inlets and outlets as well. In addition to water quality, the groups monitor for invasive weeds that can quickly damage the lakes. The groups are active participants in the state's Volunteer Lake Assessment Program (VLAP).

The lake data complement the stream and pond information collected by the LAC, resulting in a more complete picture of the health of our Watershed. In addition, waterfront landowners and town officials benefit directly from knowing how current land and lake use practices impact water quality. Recent water quality summaries for the lakes are provided in Appendix E. To download comprehensive annual water quality reports, visit the VLAP web site at www.des.nh.gov/organization/divisions/water/wmb/vlap.

The NHDES is required to report to federal officials on the water quality status of the state's waters every two years. A summary of their analyses for 2008 is available at the NHDES web site (www.des.nh.gov/organization/divisions/water/wmb/swqa) and referred to as the *2008 305(b)-303(d) List*. In the summary, streams, ponds and lakes which don't meet applicable water quality criteria are classified as "Impaired."

Maps showing the locations of Impaired waters and routine sampling sites in our Watershed are provided in Appendix F. At first glance, there may seem to be more Impaired areas than our water quality sampling results would suggest. However, most of the Impairments result from low pH readings during one or more sampling events. As discussed above, NHDES does not consider low pH to be a high priority.

There are many compounds that require detailed, expensive laboratory analyses and are therefore not a routine part of the volunteer monitoring programs. One group of common compounds that possibly warrants additional attention is pesticides/herbicides. Recent research suggests that these compounds, including atrazine, can have devastating impacts on wildlife at much lower levels than previously thought. Trace levels of atrazine were detected in the River at Drewsville in 1995 by the U.S. Geological Survey (USGS) and in a local pond with deformed frogs in 2000-01.

Declines in water quality often impact the creatures that live in the water first. For example, aquatic insects are a staple in the diet of trout and salmon, and healthy populations of insects and fish are good overall indicators of water quality. The insects, also known as macro-invertebrates, were surveyed periodically in the River and Warren and Dodge Brooks by the CRLAC, NHDES and Colby-Sawyer College between 1997 and 2006.

NHDES' survey results suggested that insect populations (a) in the Cold River upstream of Alstead and (b) in Warren Brook prior to the 2005 Flood are/were healthy and supportive of aquatic life. The results also showed a dramatic decline in insect populations and a failure to support aquatic life in Warren Brook after the Flood.

For additional information on aquatic habitat and water quality, including a review of fish populations and Flood impacts, please refer to Section 5.0.

Water Quantity Resources & Challenges

The Cold River drains an area of approximately 102 square miles, an area used for many purposes that require an abundant flow of water.

Recreational activities such as swimming and boating, and ecological functions associated with fisheries, wetlands, and wildlife habitat are dependent on a sufficient flow of clean water. That flow dilutes the impact of contaminants introduced by storm water runoff and non-point sources of pollution associated with both residential and commercial land usage. Water in the system is also diverted for commercial purposes and impounded by close to forty dams (mostly small) for both public and private use.

Sustaining sufficient flow to accommodate all of these River-related uses presents a significant challenge. Natural hydrologic processes such as dry summers and droughts limit flows, and flows are further constrained by human water usage.

Although the watershed has not been fully developed or "built-out," the once small communities in the surrounding region are now experiencing larger–than-anticipated demands on both surface water and groundwater resources. Consequently, our residents and

local governments have a unique and valuable opportunity to plan proactively for future water resource needs before such demands present a more challenging obstacle.

The Cold River is known as a "flashy" and generally free-flowing river, which presents yet another challenge to effective watershed management. Runoff from naturally occurring storm or snowmelt events moves rather quickly downstream due to the steep slopes found throughout most of the watershed, the absence of flood control structures and the abundance of relatively impermeable geologic deposits.

Hundreds of years of erosion can occur during short but intense storm events such as those in August 1986 and October 2005. During those two events, maximum flows on the Cold River of more than 75 to 150 times the annual average and hundreds to thousands of times the late summer norm were estimated based on a comparison to historical data.

Streamflow is not simply a surface water issue. Groundwater migrating through bedrock and sand-and-gravel deposits provides the vital base flow upon which the River, its tributaries and wetlands depend. Unlike storm water runoff, groundwater is stored beneath the earth's surface and released slowly to the River system. Consequently, during dry seasons and particularly during severe droughts like the one in 2001-2002, groundwater is the major source of recharge to the system.

Due to the River-aquifer connection, large groundwater withdrawals can significantly reduce the quantity of water available to local streams. While the NHDES requires detailed testing of the impacts caused by new wells pumping over 40 gallons per minute, such testing does not necessarily take into account the cumulative impacts to the watershed. In addition, towns currently have limited authority to restrict groundwater withdrawals.

The cumulative impacts associated with the many private and public wells in our non-sewered watershed are unknown. The localized impacts of such small groundwater withdrawals on streams and wetlands could be significant in some cases. We suspect that in general the volumetric impacts of these withdrawals are at least partially mitigated by the return of pumped water to the ground via individual septic systems.

Any activity in the Watershed that significantly reduces infiltration of rain and aquifer recharge has the potential to adversely impact the quantity and quality of flow in the River system. Runoff from roads, buildings and other impervious surfaces tends to reduce groundwater recharge (and ultimately the base flow of the River) and increase the intensity of storm impacts. Runoff also tends to collect and concentrate many common pollutants prior to directly discharging into streams. Hence, the minimization of such runoff and the proper care of our forested areas are important goals for long-term Watershed health.

Landowners in the Cold River area highlighted the importance of a free-flowing river unimpeded by man-made dams in the *Cold River Corridor Survey* and *Cold River Area Landowner Survey* (Appendix D). The respondents expressed strong interest in maintaining the River system's natural beauty; protecting streams/wetlands; maintaining fish-and-wildlife habitat; avoiding excessive erosion and protecting land from development. Wetlands, forests and agricultural lands were also identified as important traits of the River area.

The survey results confirm our assertion that water quantity is vitally important to residents of the River corridor and Watershed. The traits, trends and interests expressed by the respondents are all directly or indirectly related to water quantity.

Based on the survey results, the background information presented above and the fact that fresh water within the Watershed is a finite resource, the CRLAC considers the following to be the greatest *potential* challenges relative to managing water quantity:

- Storm water runoff from roads and other impermeable surfaces
- Poorly maintained dams or dams without management plans
- Flow alterations due to impoundments/dams
- Future reductions in base flow due to development in the watershed
- Erosion of stream banks and private property
- Water withdrawals, particularly large withdrawals from/near the River or out-of-basin transfers (via bottled water production, for example)
- Discontinuance of the Drewsville Gorge gaging station
- Wasteful water use practices
- Minimal precipitation, surface water and groundwater quantity data
- Loss of wetlands and lack of detailed wetland inventories

Stream flow sustainability is one of the key protection measures provided under the RMPP. The RMPP gives the NHDES the authority and responsibility to maintain flow to support "instream public uses" in the Cold River, and related natural, cultural, scenic and scientific resources. "Instream public uses" include activities relating to navigation, recreation, fishing, conservation, fish and wildlife habitat, protection of water quality, public health, pollution abatement, aesthetic beauty and hydropower production.

The NH Legislature determined in 1983 that "surface water and groundwater are an integrated public resource to be conserved, protected and managed for the public good." The key to effective conservation, protection and management is the development and implementation of integrated local water resource plans. The NH Office of Energy and Planning strongly encourages, but does not require, the development of these plans.

The CRLAC believes that the development and nurturing of collaborative water resource identification and planning efforts are crucial to the future of our communities. The Town of Alstead is currently the only town in the River corridor with a *Water Resource Management and Protection Plan* (SWRPC, May 1994). That document provides a detailed summary of local water resource locations, threats, demands, infrastructure and policies.

While the Alstead document would benefit from updating with modern GIS technologies, aquifer understandings and watershed approaches, it remains a valuable asset. Other Watershed towns would benefit from having similar evaluations. Last year, the CRLAC initiated new discussions about this topic by meeting with local CCs and providing them with detailed maps of sand-and-gravel and bedrock aquifer resources (Appendix F).

In addition to planning, the establishment of a regular program of water quantity monitoring and the development of a combined water quantity-and-quality database are important for our collective future. Without this information, it will be more difficult to

detect and correct situations that adversely affect the River's character and our communities' water resources. While historical gauging information provides valuable insight on flows in the River, more routine and frequent monitoring of surface water and groundwater quantities is needed to establish an effective and useful database.

An important component of the proposed monitoring program is the sharing of water quantity data through the schools and other forums. The CRLAC is committed to improving local understanding of water resource issues through public education and awareness.

Monitoring data analysis should focus on quantifying streamflow and all water withdrawals/returns in the Watershed. Quantity data may also be used to predict the impacts of proposed water uses and identify worst-case development scenarios, future community water needs and the sustainable yields of our aquifer and stream systems.

An important first step toward meeting the above challenges is the replacement of the abandoned USGS streamflow gaging station which operated on the River in Drewsville from 1940 to 1978. According to the USGS, data from this station were used in many valuable studies. Operation of the gage was discontinued due to a federal funding lapse.

The CRLAC has been a vocal advocate for the replacement of the gage since 2003. As a result of a comprehensive review of the state's flow gaging network in 2006, the USGS and NHDES are scheduled to install a new gauge nearby in 2009. The gauge will offer real-time, on-line flow information for recreation, bridge/culvert design, flow management, fisheries management, education and flood/drought monitoring purposes.

5.0 Related Resources Management

This section of the report includes descriptions of the resources and management challenges associated with plants, wildlife, recreation, public access, land use and historic and cultural features in the Cold River Watershed.

Plant and Wildlife Resources & Challenges

Overview

The Watershed is regionally, nationally and globally recognized for its outstanding wildlife habitat and plant communities. Those communities are a valuable resource for both Cheshire and Sullivan County residents and visitors. Healthy communities of native plants and animals rely heavily on each other to survive, as well as on the quality and quantity of water in the ecosystems contained within the Watershed.

In the *Cold River Area Landowner Survey* (Appendix D), survey recipients were asked about the importance of a variety of characteristics related to "quality of life" in the Cold River area. Habitat diversity was rated second highest in importance, after good water quality. Similar results were obtained from the *Cold River Corridor Survey*.

Plant Communities

A diverse array of plants in the Watershed supports organisms from across the spectrum of the animal kingdom, such as fish, mammals, amphibians, birds and reptiles. Because of the Watershed's variety of habitats, from mountain tops to valley wetlands, a large array of plant life has taken root on land and in the ponds, streams and River.

This life includes rare plant species and communities identified by the Natural Heritage Bureau (NHB), which documented the importance of the Watershed to numerous state, national and global plant species that are either threatened, endangered or imperiled including rock sandwort, four-leaved milkweed, meadow horsetail, hackberry, black maple, ciliated willow-herb, northern waterleaf and bulrush.

One of these plants was a driving force behind The Nature Conservancy's (TNC's) 2005 land acquisition along Mountain Brook, a tributary to the Cold River located in Langdon and Charlestown. This acquisition protected 900 acres through a conservation easement and is now managed by the State of New Hampshire as Fall Mountain State Forest.

Forests within the Watershed are mainly composed of maple-beech-birch, white pine or hemlock and host habitat uniquely suited to certain groups of plants and wildlife. Three examples of "exemplary natural ecological communities" are located here according to NHB:

- Southern New England Acidic Rocky Summit/Rock Outcrop Community;
- Central New England Dry Transitional Forest on Acidic Bedrock; and
- Till Community; and Southern New England Floodplain Forest Community.

Aquatic Habitat & Fish

Tiny creatures that live at least a portion of their lives in water include insects and amphibians which are a vital link in the food chain for many species of wildlife. The Watershed is home to many of these sensitive aquatic animals that cannot survive in less than ideal conditions. For example, immature stoneflies must have clean, flowing stream water and spotted salamanders only breed in vernal pools, temporary bodies of water susceptible to human disturbance.

Aquatic insects are a staple in the diet of trout and salmon, and healthy populations of insects and fish are good overall indicators of stream quality. Fish depend not only on the insects but also rely on stable chemistry and temperatures. For example, native wild brook trout live in well-oxygenated water that stays below 70°F during the summer.

The Cold River is known as an important cold water fishery that provides habitat for approximately 13 resident species as recorded in a 1988 survey by the NHFG. Many pools and undercuts in the River provide ideal conditions for cold water fish, and there are enough roadside put-ins and bridges to make the River a favorite destination for cold water anglers.

Naturally-reproducing cold water species found in the River include blacknose dace, longnose dace, northern redbelly dace, common shiner, longnose sucker, common white sucker, creed chub, slimy sculpin and native brook trout. According to the NHFG, the

northern redbelly dace population in the Cold River Watershed is the southernmost known population in New Hampshire. Naturally-reproducing warm water species found in the River include brown bullhead, golden shiner and spottail shiner.

Walleye are reported to be present in the River below Drewsville Gorge, and state biologists also suspect that sea lamprey may be found in the River during spawning time, although this is not documented.

Introduced game species include brown, brook and rainbow trout. The River is stocked annually each spring with thousands of these trout and more than 100,000 Atlantic salmon. The salmon stocking is part of an ongoing anadromous fish restoration effort. Anadromous fish are sea-running fish that swim up rivers to spawn in fresh water.

Stocked salmon grow up in the River for between one to three years, then migrate down the Connecticut River to the ocean. Adult salmon that successfully return to the Connecticut River system either spawn at important gravel mouths such as that of the Cold River or are used to continue the salmon restoration project. In a typical year, very few adult salmon make it back to the Cold River area but restoration efforts continue.

The importance of the Cold River for fish habitat is highlighted by its designation as a Special Focus Area within the Silvio O. Conte National Fish and Wildlife Refuge of the Connecticut River watershed. The designation denotes high priority nursery and rearing habitat for juvenile Atlantic salmon, as well as potential spawning habitat for adults.

The Cold River isn't without its habitat problems. State data shows that temperatures ≥ 70°F have been observed at several sampling sites in the lower Watershed for extended periods between 1999 and 2006. These high temperatures may challenge the local trout and salmon populations and make it difficult for them to thrive, since sustained temperatures above 70ºF are considered stressful or even lethal for those fish.

Portions of the Watershed damaged by the 2005 Flood were the focus of detailed insect (or "macro-invertebrate") and fish community studies by the NHDES and NHFG. Preliminary findings from the studies suggest that (a) insect and fish populations destroyed by the Flood may be beginning to partially recover and (b) aquatic habitat damage remains severe with increased sedimentation and fewer deep pools.

The Warren Brook area has also been monitored for breeding frogs since 1997 by FrogWatch volunteers as part of a nationwide study of declining frog populations through the National Wildlife Federation. Significant declines in Warren Brook frog populations were observed after the 2005 Flood.

Terrestrial Habitat & Wildlife

The Cold River Watershed supports a diverse habitat comprised of wetlands, forest and agricultural open space that is home to a wide variety of wildlife. Especially important are the large wetland systems located in the upper reaches of the River which, along with other wetlands located elsewhere in the watershed, provide important habitat for migrating waterfowl and other birds.

The steep topography of the Cold River valley and its location, remote from the more populated parts of Cheshire and Sullivan Counties, have benefited wildlife in the River corridor. According to the NHFG, Acworth has more deer yards (critical for winter deer survival) than any other community in Sullivan County, with most occurring along the Cold River and its tributaries. Game species such as turkey, deer, bear and moose thrive.

The River supports a number of rare and endangered bird species including the nationally-endangered bald eagle and peregrine falcon which have been sighted in Walpole. The River also supports two state-threatened raptors, the Cooper's Hawk and Osprey. In addition, the state-endangered Sedge Wren is known to breed in Lempster and although not documented there is a good possibility that it may inhabit some of the marshes in that area.

Historical records indicate that the Timber Rattlesnake has been found in the River corridor in the vicinity of Fall Mountain in Walpole, but no recent sightings are documented.

The survival of Cold River plants and animals is continually being challenged with the stresses imposed on their habitat. For example, fragmentation of the habitat by roads and development can limit the ability of wildlife to roam through natural forest cover and breed, forage and hunt. By learning about such potential threats and their effects on wildlife, we will best learn how to keep the Watershed's inhabitants in the healthiest condition possible.

Wetlands, Vernal Pools & Other Landscapes

The abundance of swampy areas known as wetlands in the Watershed is a key feature of significant value to local ecosystems. Wetlands serve as important wildlife habitats that provide food, shelter, breeding areas and migration corridors for terrestrial and aquatic animals. Wetlands also serve as important recharge and/or discharge zones for stratified drift and bedrock aquifers and perform a variety of other key hydrologic functions including the filtration of pollutants and reduction of flooding and storm damage.

Vernal pools are little studied and often overlooked wetland ecosystems that provide important habitat. Vernal pools are temporary bodies of water that exist in many places but are most common in the River floodplain. They characteristically appear as the ground thaws and snow melts following the winter season, and they provide important habitat and breeding grounds for many plant, invertebrate and vertebrate species such as spotted salamanders, wood frogs and fairy shrimp.

Vegetated buffer zones along the River, which stabilize the stream banks and help filter pollutants, also serve as prime habitat for wildlife. These vegetation corridors allow animals to travel freely among sources of food, water and shelter. Removal or development of buffer zones, for buildings or roads for example, not only displaces wildlife but restricts their movement patterns. This restriction can make them more vulnerable.

Other unique ecosystems in the Watershed include forested floodplains and meadowlands, which provide important nesting habitat for bird species such as the declining Eastern meadowlark.

Potential Plant and Wildlife Challenges

Based on the above discussion, the CRLAC considers the following items to be the greatest *potential* challenges relative to managing plant and wildlife habitats:

- Loss of buffer zone habitat through clearing, development and flooding
- Changing land use from forest/meadow to residential, commercial and industrial, particularly when large forested/grassy areas are fragmented
- Erosion problems leading to excessive sedimentation and turbidity, from road runoff and bare or inadequately stabilized soil
- Invasive species (e.g. purple loosestrife, Eurasian milfoil, Japanese knotweed)
- Lack of detailed local wetland mapping and prioritization
- Excess nutrients (e.g. phosphorous, nitrogen) from chemicals used in riparian areas, which can cause algae blooms
- Toxins/pathogens (e.g. lead, mercury, pesticides) and acid rain from the storage, use and spreading of sludge, chemicals, petroleum products and other wastes
- Sources of pollution or habitat degradation negatively affecting water temperature
- Recreational damage such as improper vehicular access to streambeds

Recreation and Access Resources & Challenges

Overview

The Cold River offers 22 miles of outdoor adventures and marvelous climate, zone and environmental changes from its source all the way down to its mouth.

During warmer times or high waters, the Cold River is recognized as a stimulating course for both novice and expert paddlers. In winter the River sometimes serves as a flat run for cross country skiers and snowmobilers, while nearby steep rock faces challenge and exhilarate ice climbers. The River also boasts many pristine swimming holes.

Venturing beyond the River corridor, a person will find hiking trails meandering close to fallen stonewalls and foundations, whispering reminders of times gone by.

In the *Cold River Corridor Survey* and *Cold River Area Landowner Survey* (Appendix D), respondents indicated that they enjoyed the River system for: fishing, swimming, skiing, bird and wildlife observation, walks, canoeing/kayaking and admiring the natural scenic views. Other recreational interests included biking, hunting, photography and snowmobiling.

There is very little public access to the Cold River, but a number of informal access points/areas. The CRLAC recommends that there be safe, clean and healthy informal and formal access to the River in all of our towns.

Fishing

The Cold River has been known for ages as an excellent coldwater trout stream. Each spring, the NHFG works with volunteers to release nurtured populations of salmon, rainbow

and brown trout fry. One reason the River is Designated in the RMPP is the ability of these fry to survive. The River supports nursery, rearing and spawning habitat for these fish.

For additional information on fish populations and habitat, please refer to the Plant & Wildlife Habitat section of this plan.

Boating

Canoeists and kayakers will find Class II and III rapids during spring high water. With the River's steep banks and swift current, as well as the region's severe winters, the natural flow dynamics ensure that one year's run will never duplicate another. The Cold River has been called a "flashy but unpredictable river to set into."

Tubing down the River in summer is also a popular sport. Tubers and boaters must survey the River prior to a trip due to the off-limits ledges at Route 123 in Drewsville and the Cold River Materials rock dam in North Walpole one mile from Route 12.

Swimming

The Cold River has several informal swimming places well-established along its length. The historic Vilas Pool in Alstead offers a formal, town-managed beach and recreation area. All informal and formal swimming sites are important to the cultural history of the River and must be set into the context of town and landowner accommodations.

Snowmobiling

Snowmobile groups use at least two dozen stream crossings in the Watershed, including four bridges spanning the Cold River. Their riding trails are part of a statewide network. Snowmobile Highway #5 traverses through the center of the Watershed. Trail riders reap the benefits of the Watershed's excellent wildlife habitat and scenery.

Hunting

As noted in the Plant & Wildlife Habitat section of this plan, game species such as turkey, deer, bear and moose thrive in the Cold River Watershed. Large tracts of woods and fields in and around the River corridor and Watershed remain as important habitat for these species. These species and others lower in the food chain are dependent on a continued supply of clean abundant water.

Relaxation, Exercise & Observation

As suggested by the surveys in Appendix D, the Cold River corridor offers a natural habitat appealing to folks who observe and photograph wildlife and enjoy a picnic with a dip. The miles of trails and roads make hiking, biking, cross-country skiing and snowshoeing attractive sports. In fact, a majority of respondents to the *Cold River Corridor Survey* indicated a preference for more walking and skiing trails.

For folks needing to unwind, the corridor sights and sounds entice residents and visitors alike, no matter what the season. From forested cover to open wetland, the Cold River corridor provides scenic and ever-changing vistas.

Potential Recreation and Access Challenges

In general, decreasing water quality and/or flows can be a significant threat to most recreation activities. Fishing and hunting can be negatively impacted if the River fauna (i.e. food chain) are altered. High bacteria counts can make swimming unhealthy.

Folks who love the River and its surroundings are dismayed by both casual and deliberate actions of some who dump trash and household items along this scenic corridor. At times, others have vandalized and destroyed property.

Most landowners surveyed in 1999 appeared to prefer little or no change in the current formal and informal accesses to the River. However, some respondents saw a need to increase public access and provide guidance on those locations. Decreasing accessibility and increasing population density may impact the continued viability of recreational activities.

Responsible recreationists are often conservation-minded and an asset to the Watershed. In contrast, a few careless sportspersons can potentially impact water resources via improper trash disposal, increased erosion, use of lead shot/sinkers, etc.

Land Use Resources & Challenges

Overview

Crescent Lake, the headwaters for the Cold River, is surrounded by seasonal and year-round homes and is used heavily in the summer for recreation. The River corridor from the Crescent Lake outlet through Lempster to South Acworth contains relatively undeveloped forestland with significant wetlands, yet it faces increasing residential and commercial development pressure, particularly along major roads such as Route 10.

From South Acworth through Alstead to Drewsville there are three village centers connected by a corridor of agricultural land and forest. Alstead contains a cluster of residences, civic buildings and small businesses. In addition, it contains another large lake (Lake Warren) with heavy recreation usage at the head of Warren Brook.

The section of the River corridor from Drewsville to the mouth of the Cold River is forested but increasingly fragmented by various land uses. The River enters the Connecticut River under the well-traveled Route 12 Bridge and spreads an enormous delta of sand and stone out towards Vermont.

A total of nineteen bridges span the Cold River, six of them owned by the NH Department of Transportation (NHDOT) and the rest town- or privately-owned. Roads tend to be located in close proximity to streams, as in other parts of New England. State highways such as Routes 10, 123 and 123A closely parallel the River and Warren/Dodge Brooks.

Commercial-institutional land use in the Watershed consists mostly of farms and small businesses concentrated along road-stream corridors. Businesses include lumber mills, mines/quarries, builders/contractors, a poultry research facility, small stores, automotive repair facilities, a bank, a laundromat, a florist, a motorcycle racetrack and a timber frame manufacturer. Institutional uses include town offices, schools, churches, youth camps, highway garages, recreation areas, transfer stations, former landfills and a library.

The only gas stations in the Watershed are along the last few miles of the River in Alstead and Drewsville. Cold River Materials, a large gravel and aggregate operation in Drewsville, is the only registered water withdrawal in the Watershed. Operating since the 1950's, this mining business stretches for about a mile along the River.

Residential land use is concentrated along the road-stream corridors and near the village centers but in most cases is scattered throughout the countryside. "Sprawl" in the common suburban sense is not visible here, however the density of development is increasing and local officials are more frequently being asked to review subdivision proposals and comment on environmental considerations with possible water resource impacts.

Local Land Use Planning

A summary of local land use regulations impacting natural resource management in each Cold River Watershed community is provided in Appendix G. A basic description of the roles of local boards and offices is also provided for reference purposes.

The topic of land use regulation is a contentious one among Watershed residents. Some feel that such regulation is an assault on their private property rights and freedom. Others believe that such regulation is the only means of fairly and equitably controlling land use decision-making for the public benefit. Many views fall somewhere in between.

The CRLAC believes that local land use regulations can be an important tool for protecting water resources – but not the only tool, and ideally the tool of last resort. Other tools include education, the employment of best management practices (BMPs) and land conservation. An overview of these other tools is provided in Appendix H.

Responsible stewardship of the environment falls upon each and every one of us, both individually as landowners or visitors and collectively as town board members. Our decision-making needs to both respect private property rights and acknowledge the fact that we share our natural resources and that ecosystems do not stop at property boundaries.

Working Farms & Forests

Many sugar maple orchards exist across the Watershed, including New England's largest. Dairy farms remain, although fewer over the years. Beef animals, sheep and horses continue to dot pastures in each town, and buffalo and beefalo are found on two local farms.

In the *Cold River Corridor Survey* (Appendix D), respondents listed both agricultural lands and forestlands as being of high importance, and perceived the loss of these lands to development as being a major threat to water quality and other Watershed resources. The

trends and activities respondents were most concerned about in relationship to water quality are: land clearing on steep slopes for logging or development, and clearing for development or other activities too close to surface waters.

The CRLAC is committed to supporting our local farms and forestry-related businesses and has a deep respect for the working lands heritage of our community. In most cases, the protection of farms and forests is mutually compatible with the protection of water resources. The use of BMPs as outlined in Appendix H in combination with technical assistance as needed from local non-profits and government agencies can help the forest owner or farmer to meet these goals.

Residential-Commercial Development

The rural nature of the Watershed and its working lands history reflect the independent, entrepreneurial "Yankee" spirit of many of its residents and business owners. While many of us commute out-of-town to work, the small town appeal is strong here and local businesses thrive in communities that are supportive of a wide range of creative endeavors, from farms to managed woodlots, from home-based occupations to light manufacturing, from service businesses and contractors to professional consultants.

As noted in the *Alstead 2007 Master Plan Update*, this region's "lower cost of living, economic vitality, scenic beauty, access to outdoors and appeal of small town life will continue to attract new residents and drive the development of new homes and commercial sites." While the pace of growth is slow and at times imperceptible, local populations are growing and with that growth comes an increasing need for homes and employment.

While we have many different visions and hopes for the future, there appears to be consensus that the Watershed is a great place to live and work. Hence, the primary challenge before us with regards to population growth and associated land uses is to creatively manage those changes in a positive way. Growth management needs to allow for both increased residential-commercial development and protection of the environment.

As noted in the *Alstead 2007 Master Plan Update*, "to adequately prepare for continued development it is important to understand that [this region] is on the edge of very powerful engine of change to the south and east – powerful in terms of numbers, number of people, dollars, households, commercial floor space, and jobs." According to the Town, that engine, in combination with our road corridors and municipal zoning, will have "effects on land values, development patterns, traffic patterns, distribution of jobs versus housing, demand for public services and infrastructure, and the quality of our natural resources ranging from scenic beauty and biodiversity to water supply and clean air."

Most of the land in the Watershed is zoned for rural residential use with a variety of commercial uses allowed by right or special exception. This type of zoning is well known to ultimately result in suburban development patterns such as those surrounding the Springfield-Hartford and Worcester-Boston-Nashua areas to our south and east. Some of these patterns are currently emerging in and around the nearby city of Keene.

The suburbanization and commercial development of rural areas can be viewed as attractive to some and abhorrent to others. Development may occur one new house or building at a time or in large developments or both. Regardless of your views on the matter, it is important to recognize that such development can have negative impacts on water quality and flow/recharge as discussed in Section 4.0 and can fragment and degrade the special ecosystems and wildlife habitats outlined earlier in this Section.

Land Conservation

One method of protecting the Watershed from some of the negative water resource impacts potentially associated with development is to "conserve" properties of environmental significance. Land conservation options available to willing land owners include the outright sales or donations of lands, development rights, purchase options or rights of first refusal to conservation groups. Other options include deed restrictions and current use assessments.

For more information on voluntary land conservation, please refer to Appendix H.

Riparian (Near Stream) Lands

Vegetated zones along local streams (also known as "riparian buffers") are an important part of the watershed, contributing to the physical, chemical and biological equilibrium of dynamic water-related ecosystems. Undisturbed forested riparian zones and associated wetlands along the Cold River protect it from excessive sedimentation, nutrient enrichment and overheating. In addition, native plants in vegetated riparian areas provide important wildlife habitat and essential ecosystem functions, such as binding the soils in place and anchoring stream banks during high water events.

The importance of maintaining riverbank buffers where they exist now, as well as avoiding future disturbances and restoring buffers where they have been lost, cannot be overstated. The Cold River's buffer zones are most fragmented in its lower stretches, with increasing residential, commercial and institutional usage as one travels downstream from Acworth to Walpole.

The 2005 Flood widened the banks of the lower River and its tributaries, making them unstable and more susceptible to erosion and an increase in sediment load. Riparian vegetation partially protected the banks as well as some buildings and infrastructure from the flood's onslaught, but many vegetated buffer areas were severely damaged as a result.

Recent stabilization and restoration work by the NHDES and NRCS, including buffer zone plantings, has begun to address this issue. The NHDOT is working on repairing bridge crossings and road areas located adjacent to local streams.

Drinking Water Supplies

As outlined in Section 4.0, groundwater is critical for providing both surface water recharge and private/public drinking water supplies in our Watershed. Drinking water comes mostly from deep drilled wells, shallow dug wells and springs. Groundwater is pumped or flows naturally under artesian pressure from the wells and springs to supply our homes,

businesses and institutions. Land uses and natural conditions in the vicinity of the wells and springs can change the quality and/or quantity of groundwater that we drink.

In 2005, the CRLAC partnered with GSRWA and local town and school officials to produce the *Drinking Water Protection Plan for the Cold River Watershed*. This document describes local water supplies including Public Water Systems (PWSs) operated by the FMRSD and the Orchard School. PWSs are defined by NHDES as water supplies that have at least 15 service connections or regularly serve at least 25 individuals daily at least 60 days per year. Most local water supplies are small private wells that do not meet the PWS criteria.

The 2005 plan provides a partial inventory of potential sources of drinking water contamination and detailed recommendations for protecting drinking water at each school and throughout the Watershed in general. Facility-specific recommendations include managing issues such as septic systems, fuel tanks, parking areas, farm animals, fire storage, back-up water supplies and naturally-occurring radon. Watershed-wide recommendations include expanding outreach efforts, completing detailed drinking water resource analyses and working with towns to develop aquifer protection provisions in their bylaws.

Emergencies and Hazard Response

Contamination events and natural disasters such as floods and droughts have the potential to negatively, and in some cases irreversibly, impact our water resources as well as our health and use of the land. On any given day, such events have a small probability of occurrence. However, such events have occurred in the past and will most likely continue to occur. So, how do we prepare for such contingencies?

The 2005 Flood along the Cold River showed how critical up-to-date emergency plans and clear communications are in order to have as successful an outcome as possible following an emergency. There are two basic types of emergency plans – emergency operations plans and hazard mitigation plans. The former guides responses to actual emergencies through a uniform set of procedures that responders at all levels of government will use. The latter is intended to reduce or alleviate injuries and the losses of life/property resulting from natural and human-made hazards through long-term strategies.

Both types of plans are required to be adopted by Watershed municipalities in order to receive state/federal disaster preparedness funds. The Towns of Alstead, Charlestown, Walpole and Unity have completed Hazard Mitigation Plans and the Town of Lempster is working with UVLSRPC on the same. The Town of Walpole has an Emergency Operations Plan but the status of such planning in the other Watershed towns is unclear at present.

Emergency plans should contain specifics about what to do when events that threaten our water resources occur, such as floods or spills of hazardous materials (e.g. fuels/fluids from vehicle accidents, etc.). The close proximity of roads to streams in the Watershed increases the risk of spill impacts. We encourage all citizens to review their town's plans to better understand their roles in an emergency, as well as the roles of town officials.

Local fire departments are often the first called or on the scene in the event of a chemical spill or natural disaster. If a Watershed resident or visitor observes such an event

and is unsure of the appropriate response procedures, their fire department should be contacted for guidance. Fire department needs should also be prioritized at town meetings.

In addition to local emergency plans and fire department officials, the different departments of the state government have emergency response units. For River-related concerns, DES should be able to help guide Watershed residents and visitors. The NHDES emergency number during normal business hours is 603-271-3899. For assistance at other times, contact the NH Department of Safety at 603-271-3636.

If there is an immediate life-threatening danger, the observer should call 911.

Potential Land Use Challenges

Based on the above discussion, the CRLAC considers the following items to be the greatest *potential* challenges relative to managing land uses:

- Effective employment of full range of water resource protection tools
- Need for more outreach on voluntary BMPs and technical assistance providers
- Enforcement of existing water resource protection laws, particularly state laws pertaining to groundwater BMPs and shoreland/wetland protection
- Loss of working farms and forests
- Clearing of steep slopes or lands next to surface waters
- Balancing environmental protection with residential-commercial development
- Education on voluntary land conservation options
- Loss or disturbance of vegetated riparian buffers
- Improving drinking water protection throughout the Watershed
- Completion/updating of emergency plans in all Watershed towns

The CRLAC supports land uses and users that are sensitive to the potential impacts of growth and development on our shared water resources. Those impacts can often be minimized via the incorporation of low-cost BMPs into site designs/permits or working proactively with local planning, conservation and emergency officials.

By focusing on results and collaboration rather than an "us versus them" mentality, we believe that the Watershed can accommodate growth and development without significant adverse impacts to its water resources. This goals-oriented partnership of environmentalists, local officials, businesses and citizens is known as "civic environmentalism."

Historic/Cultural Features Resources & Challenges

Overview

For many years, the Watershed was an industrial center housing mills which processed trees, wool, corn, grain, apples and clay into products to be shipped out by rail. Keyes Hollow, East Acworth, South Acworth, Alstead and Drewsville had all become population centers by the late 1700's to the mid-1800s because of water power available for the mills from steep drops and narrow valleys.

Though none of the historic mills remain operational today, at least two of them (including Chase's Mill in East Alstead) are still standing. Several building footings show the location and mark the size of other historic mill operations.

Other important exports from the Watershed included butter, shoe pegs, maple sugar and syrup and earth resources. Large deposits of mica, feldspar and beryl were mined commercially from the mid-1800s to the mid-1900s. Town histories, found in local libraries, provide a fascinating chronicle of these industries and the comings-and-goings of individuals and families, many of whose descendants still reside in the area.

Throughout the River corridor, stone bridges and scenic roads span small tributaries while stone walls continue to guard the livestock and agriculture of long overgrown fields. The McDermott Covered Bridge, spanning the Cold River in the Town of Langdon, is listed on the National Register of Historic Places. Whether paddling down the River, hiking along its banks or swimming in its cold waters, one cannot overlook the astounding history of the region which calls from the past and continues to influence the future.

Potential Historic/Cultural Features Challenges

Based on the above discussion, the CRLAC considers the following items to be the greatest *potential* challenges relative to managing historic/cultural features:

- Need for local historic/cultural resource management plans
- Protection of water quality during renovation/repair of bridges, roads and mills
- Assessment and registration of local historic assets
- Public education on the cultural importance of local water resources

6.0 Moving Forward Together

This section of the report includes a collaborative vision for implementation of the *Cold River Watershed Management Plan*, part of a partnership approach referred to earlier in Section 5.0 as civic environmentalism.

Collaborative Vision

Our guiding vision for this plan is that communities will work together with the CRLAC and other groups/agencies (such as those listed in Appendix I) to protect our shared water resources while encouraging the environmental and economic health of the Watershed.

Watershed communities must look at water resource protection and land development as part of the same picture. Careful and well-planned development as well as maintenance and restoration as needed of existing developed areas will protect water quality/quantity and, by extension, protect both natural and cultural resources in the Watershed.

How can residents, officials and others work together to implement the recommendations in this plan? Ultimately, people care about and protect what they know or

understand to be valuable. Understanding evolves primarily through communication, volunteering on local projects and boards, and public education. To the extent that each one of us in the Watershed can promote these outreach methods and lead by example, we will empower our communities to manage our shared resources as effectively as possible.

Communication between Watershed towns, local residents/visitors, the CRLAC and regional, state and federal agencies has produced a host of water resource success stories in recent years. Such successes include the establishment of an extensive volunteer monitoring program with enhanced NHDES support; the development of numerous local educational seminars on natural resources and flood impacts; the infusion of state and federal assistance during post-flood assessment/mitigation efforts, etc.

Local boards/groups and the CRLAC are made up entirely of volunteers, and continued volunteer involvement is of critical importance. Whether it's replanting vegetation on riverbanks, working on the town plan or monitoring water quality, increased volunteer involvement forges a tightly knit community working together to protect the Watershed. Consider participating in as many of these projects as your schedule and sanity will allow.

Historical societies and conservation commissions have done a great job in reaching out to educate our communities on natural and historic resource issues. Teachers have helped bring the concepts and goals of this plan to their schools, to help kids understand the importance of the Watershed ecosystem and how it relates to their daily lives. The CRLAC created the *Environmental Education Curriculum* in 2002 to support teacher's efforts.

Some of the actions recommended in this plan can be accomplished with small amounts of funding and a modicum of volunteer time and effort. On the other end of the spectrum, some actions will require larger financial resources and professional assistance. The CRLAC maintains communication with agencies that can provide technical expertise and in some cases, funding. Matching such resources with potential Watershed management projects and partners has been and will remain an important focus for the CRLAC.

As we collectively move forward to accomplish the goals in this plan, it will be important to continue to share information and data on a regular basis. Educational programs, clean-ups, town annual reports, newsletters, newspapers and other strategies can be used to keep residents and officials up-to-date on the status of the implementation process.

7.0 Summary of Goals & Actions

This section of the report includes a summary of the current goals and recommended actions for implementation of the *Cold River Watershed Management Plan*.

Goals & Actions Overview

This plan was written to help everyone – including municipal boards, landowners, community organizations, visitors and state/federal agencies – understand what is needed to

keep our Watershed healthy and productive. We all have an interest in maintaining good water quality and quantity. The CRLAC hopes that you find this plan useful to that end.

The following summary of goals and recommended actions is intended to be used for both planning purposes and day-to-day decision-making. To achieve the listed goals will require perseverance, long-term vision, collaboration and some funding. However, working together…with respect and resolve…we can make sure the Cold River Watershed remains a special place for all.

Water Resources Management

Water Quality Goals

- Water quality will be protected and improved as needed, while allowing for a balanced mix of sustainable land uses.
- The chemical/biological relationships between surface water, groundwater and precipitation, as well as the impacts of pollution, will be better understood.
- The need to maintain water quality for human health, biodiversity, recreation and other values will guide the actions of land owners, municipalities and others.

Water Quality Actions

1. BMPs for local land uses (primarily residential) and non-point pollution sources (such as storm water) will be readily available.
2. Water quality monitoring will be continued, including aquatic insect surveys.
3. Indicators to assess water quality will be identified and published.
4. Water well inventories, including water quality information, will be assembled. A water quality profile of the Watershed towns will be developed.
5. Response plans for hazardous spills that may enter streams during accidents will be developed as needed and integrated with local safety personnel training.
6. Potential sources of contamination will be identified and managed appropriately.
7. Building and subdivision design approvals will include infiltration plans to treat pollutants onsite, rather than directing runoff to public waters and roadways.
8. Roads, bridges, dams and culverts will be designed to reduce their contributions of sediment and other pollutants to public waters.
9. Water pollution will be minimized via the proper storage and reduced use of road deicing materials, and snow disposal away from streams.
10. Educational forums will be held on water quality issues.

Water Quantity Goals

- The amount of surface water and groundwater flowing through the Watershed will be protected but allow for economic growth and multiple water uses.
- The physical relationships between surface water, groundwater and weather systems, as well as the impacts of dams/impoundments and water withdrawals/returns, will be better understood.

- The need to maintain flows for human health, biodiversity, recreation and other values will guide the actions of landowners, municipalities and others.

Water Quantity Actions

1. Water level monitoring will be continued in the River and tributaries. Water levels in wells will be monitored to assess groundwater conditions.
2. A continuous flow gaging station will be re-installed on the river, above Drewsville Gorge if possible.
3. Indicators to assess water quantity will be identified and published.
4. Forums will be held on the hydrologic cycle and the connections between streams, wetlands and groundwater.
5. A water well inventory, including depth and yield information, will be developed for the Watershed. An aquifer resource inventory will be completed for bedrock and sand-and-gravel deposits in each Watershed town.
6. State regulations related to instream flow will be finalized and applied.
7. The amount of untreated storm water runoff directed into local roads and streams will be eliminated or significantly reduced.
8. Building and subdivision design approvals will include onsite infiltration plans to recharge groundwater systems rather than treating runoff as a waste product.
9. Culverts and impoundments will be evaluated for potential flood hazards. Public and private dams will be maintained in safe operating condition or removed.
10. A build-out analysis of each town's growth pattern will identify future drinking and non-drinking water demands. The feasibility of meeting those demands will be analyzed and new plans will be developed to satisfy unmet needs.

Related Resources Management

Plant and Wildlife Goals

- The delicate balance of Watershed ecosystems, which support diverse and unique animal and plant populations, will be valued, enhanced and protected.
- The important relationship between habitat needs and water quality/quantity will be understood, appreciated and protected by all.

Plant and Wildlife Actions

1. Critical wildlife habitat and plant communities will be identified using methods such as NHFG's *Identifying and Protecting New Hampshire's Significant Wildlife Habitat* and NHB's *Natural Communities of New Hampshire*.
2. Master Plans and Natural Resource Inventories (NRIs) for each town will be completed/updated as needed using the above information.
3. A Cold River corridor inventory will be completed to prioritize actions needed to address the most vulnerable ecosystems within those bounds.
4. Prime Wetlands will be mapped and approved for each town.

5. Culverts will be inventoried and mapped, noting location, condition, aquatic passage potential, inspection schedule and status. New culverts will be constructed using open bottoms or other methods which support fish habitat.
6. Educational efforts about native, non-invasive plant species will take place. Such species will be used for landscaping and stream bank restoration.
7. Habitat fragmentation will be comprehensively evaluated and mapped.

Recreation and Access Goals

- The River and lakes/ponds will be celebrated, promoted and accessible as recreation resources.
- Flow, temperature and water quality that sustains aquatic life and the ecological values of the River and lakes/ponds will be protected, even while accommodating diverse recreational uses.

Recreation and Access Actions

1. Recreational users will be encouraged to respect landowners and private property, and considered partners in the work to protect water quality and quantity
2. Swimming and boating opportunities will be maintained through partnerships with local lake and River organizations.
3. Invasive aquatic species will be addressed and/or removed as towns and state agencies increasingly provide funds to aggressively protect public waters.
4. Lake management plans will be developed, adopted and implemented.
5. The motorized wheeled vehicle usage on Class VI Roads that abut water bodies will be reduced and managed to prevent erosion/sedimentation.
6. Willing landowners and municipalities will identify new or improve existing public access ways to the River and lakes. Construction of access facilities will not harm or destroy shorelines or stream banks.
7. Passive recreational opportunities will be expanded by creating accessible, integrated systems of trails, greenways and open spaces designed with sensitivity to both natural systems and property rights.

Land Use Goals

- Prime farmland, contiguous forest blocks, critical environmental areas and natural beauty will be recognized as shared resources and conserved as community participation and a strong sense of place continue to grow.
- Negative impacts to water resources and local ecosystems will be minimized through planned residential-commercial development.
- A combination of education, BMPs, land conservation and regulations will be effective at protecting our water resources from degradation. The potential to voluntarily conserve land will be viewed as a vital and viable alternative to land development proposals.
- Vegetative buffers along streams will be maintained and enhanced for water quality, habitat, erosion control, infrastructure protection and scenic purposes.

- Watershed towns will be prepared to protect both human health and the environment in the event of significant man-made or natural disasters.

Land Use Actions

1. Widely available BMPS such as those listed in *BMPs to Control Nonpoint Source Pollution* at www.des.nh.gov will be used for logging, agricultural, residential and business operations to maintain/improve water quality and flow.
2. Protection plans will be adopted and implemented for current and future public drinking water supplies. Plans will account for potential public water supply (including replacement) needs at schools and in densely populated villages.
3. Floodplain development will be strongly discouraged for economic, environmental and safety reasons. Development and clearing on steep slopes and too close to surface water will be discouraged.
4. Local Master Plans will be regularly updated and incorporate this plan and other local water resource protection planning documents by reference.
5. Towns will limit impervious surface coverage on new construction, ideally to less than 10%, to reduce negative hydrologic impacts. Low Impact Development (LID) BMPs from NHDES' *NH Stormwater Manual* (www.des.nh.gov) will be encouraged during site plan reviews and in local ordinances.
6. Transportation and subdivision designs that support walk-able/bike-able communities and reduce our "environmental footprint" will be encouraged.
7. Existing water resource protection laws will be enforced, particularly state laws pertaining to groundwater BMPs and shoreland/wetland protection. Local bylaws (e.g. subdivision, zoning, health, etc.) will be reviewed and updated as needed for compatibility with water resource protection objectives. Bylaw reviews will be coordinated across town lines to maximize effectiveness.
8. Land Conservation and Water Resource Management Plans will be developed or updated and adopted to guide local efforts at protecting natural resources. In the plans, key areas will be identified and mapped, i.e. aquifers, large forested blocks, sites with agricultural or hydric soils, steeply sloped areas, etc.
9. Comprehensive surveys/maps of existing land uses and cover will be completed. Areas in need of protection or restoration will be identified and prioritized.
10. Local and state agencies will increase funding set aside for land purchases critical to water resource protection. Areas of importance will be conserved through public education and partnerships with land conservation organizations.
11. Land owners and municipalities will use BMPs such as those provided by CRJC at www.crjc.org/riparianbuffers.htm along the Cold River and its tributaries to manage floodplains, reduce bank erosion and repair vegetative buffers.
12. Setback requirements consistent with or more stringent than those in NHDES' *Comprehensive Shoreland Protection Act* will be considered for adoption by the Watershed towns for the River's tributaries. Alternatively, the NHDES will consider revising the act itself to be more protective of streams.
13. Buffer zone activities will be completed in accordance with the *Restoration Master Plan for the Cold River, Warren Brook and Bowers Brook*.

14. Hazard Management and Emergency Response Plans will be adopted for each Watershed town. A dam maintenance and dredging plan will be developed with NHDES and implemented for Vilas Pool. Emergency Action Plans for that dam and those on the two lakes will be periodically updated and tested.

Historic/Cultural Features Goals

- The historic character of our communities will be conserved, with special attention to the role of water and other natural resources.
- Historic/cultural sites such as stone walls, mills, scenic roads and bridges will be stabilized/preserved in a manner that protects water quality and flow.

Historic/Cultural Features Actions

1. The River's role in local/regional history will be shared via educational workshops, interpretive programs, oral histories and other collaborations.
2. Land owners will contact local historical societies and the NH Division of Historic Preservation for advice when assessing historic assets on their land.
3. Maps showing the historic and cultural features of all of the Watershed towns will be produced, updated and circulated.
4. Towns will consider establishing historic district or heritage commissions to identify historic/cultural resources and qualify for increased state/federal technical preservation assistance and funding.
5. Significant historic/cultural resources will be identified and protected through the development and adoption of historic/cultural resources management plans.
6. Old Home Days and other historic-themed events will be used to delight our residents and visitors and make historical natural resource connections.

Moving Forward Together

Collaborative Goals

- Increased awareness of our shared and precious water resources.
- Positive individual and public actions to protect those resources.
- Improved understanding of water-related rights and responsibilities.
- Dynamic environmental education opportunities for all ages.

Collaborative Actions

1. Technical/financial resources will be identified and secured to protect our water.
2. Municipal boards and community organizations will encourage the sharing of Watershed information and increasingly engage residents of all ages in projects of resource awareness and appreciation. Towns will increasingly partner with the lake associations and the CRLAC to protect water resources.
3. All CRLAC partners will consider water resource protection as a critical short- and long-term goal. To the extent feasible, towns will incorporate the latest and best protective measures during project planning and permitting.

4. Notification requirements for River corridor projects under state regulations governing the RMPP will be clarified. State and federal agencies will consider increasing financial and technical support for the CRLAC in order for the committee to fulfill its statutory duties.
5. Teachers will use the Watershed and local people and places to engage and inspire students and their families while meeting educational goals. The *Environmental Education Curriculum* will continue to be used and updated.
6. Greenways and trails will be designed and created that encourage citizens to explore the Watershed and appreciate the beautiful place we live in.
7. This plan will provide a common framework for residents and non-residents to increase awareness of the special water resources and habitats all around us.

Implementation Schedule

Individuals, agencies and officials are encouraged to adopt one or more of the above recommendations and develop a schedule for implementing the recommended task(s) based on their available resources as well as their perceived needs and challenges. The CRLAC is committed to collaborating with all stakeholders for plan implementation purposes.

An exact schedule is ***not*** proposed here because the CRLAC understands that the recommendation list is long, that implementation efforts are voluntary and that material and financial resources for such efforts may be quite limited. Urgent or relatively low-cost and less labor-intensive recommendations should be implemented as soon as possible. Less urgent, more expensive or more time-consuming ideas should be prioritized for long-term implementation, as resources allow.

This plan is a working document that should be reviewed and updated on a regular basis. The CRLAC envisions an annual review process to check on implementation progress and a comprehensive update every ten years to keep the plan from becoming outdated.

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APPENDIX A
ATLAS OF THE COLD RIVER AND THE COLD RIVER WATERSHED

Atlas of the Cold River

and the Cold River Watershed

Published by

The Cold River Local Advisory Committee

0 0.5 1 2 Miles

Scale= 1:90,000

N

The Cold River flows 22 miles from its origin at Crescent Lake in Unity and Acworth through Lempster, Langdon and Alstead before joining the Connecticut River in Walpole, New Hampshire. The Cold River Watershed drains an area of approximately 102 square miles, including portions of Charlestown and Marlow. In 1999, the Cold River was accepted into the Rivers Management & Protection Program by the State due to its significant natural, cultural, scenic and scientific resources.

Legend

- Cold River
- Waterbody
- Wetland
- Intermittent Stream
- River or Stream
- Stratified Drift Aquifer
- Town Boundary
- Public or Protected Lands
- Water Quality Monitoring Site
- Church (Historic Register)
- Covered Bridge
- Mill Sites (see Mill Site Key)
- Mine or Quarry
- School
- State Roads (Class I, II)
- Other Roads (Class V)
- Elevation Contours (100 Ft Intervals)

Mill Site Key

1- Jonathan Gove Mill
2- Keyes Brothers Mill
3- Wheeler Mill
4- Buss Mill
5- James M. Reed Mill
6- Jason M. Boynton Mill
7- Hemphill Mill
8- Nathaniel Adams Woolen Mill
9- Cummings Shoepeg Mill
10- Cook & Holt Mill
11- Alstead Paper Mill
12- Gorge Pillowbox Mill
13- Chase's Mill

*Note: Additional mill sites can be found in this watershed.

F ***Crescent Lake:*** This 60 acre lake, only 15 feet deep, is actively monitored to prevent the spread of invasive aquatic plants such as eurasion milfoil.

G ***Keyes Hollow:*** Large wetlands such as this form valuable wildlife habitat and hydraulic connections between streams and aquifers. Keyes Hollow is an important migratory bird area.

C ***McDermott Covered Bridge:*** Built in 1869, 81' long, Town Lattice Truss with light arches, foot traffic only, listed on the National Register of Historic Places, undergoing major restoration.

D ***Stratified Drift Aquifers*** *(See Legend):* Sand and gravel deposits form limited but potentially productive water supplies. The deposits also release groundwater to the river system during dry periods.

E ***Drinking Water*** *(Throughout Watershed):* Drinking water comes from deep drilled wells, shallow dug wells, and springs. These sources are replenished by rain that soaks into the ground and discharges to local streams.

H ***Maple Syrup:*** Home of the largest syrup producer in New England. Sugar maples pump water from the ground to make their sweet sap.

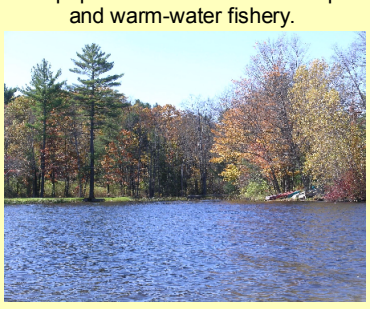
B ***Vilas Pool:*** Built and donated to the Town of Alstead by Charles N. Vilas in 1926. Facilities include a swimming beach, boat rentals, picnic and recreational areas, two pavilions, and a carillon tower.

A ***Fall Mountain State Forest:*** Created in 2005 on 950 acres donated by The Nature Conservancy to protect headwaters of Mountain Brook, a pristine ecosystem of statewide importance.

I ***Dodge Brook:*** Local streams also offer popular fishing holes for native brookies and stocked trout. The river and tributaries serve as vital rearing and spawning grounds for Atlantic Salmon.

J ***Deep Hole:*** A scenic waterfall and ledge outcroppings in a narrow gorge. The Deep Hole is reportedly 35 feet deep.

K ***Lake Warren:*** This 185 acre lake was first dammed in 1770 to provide a reservoir for downstream mills. Today it is a popular summer recreation spot and warm-water fishery.



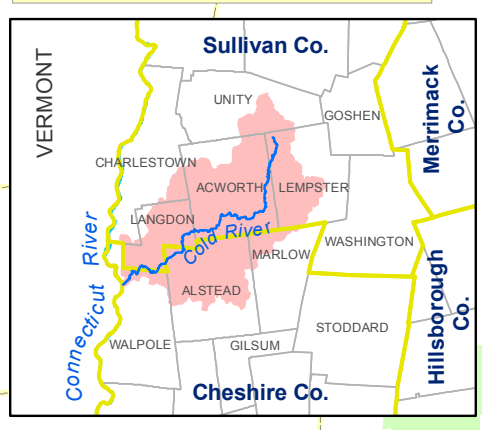
P ***Prentiss Covered Bridge:*** Smallest covered bridge in NH, built in 1874, listed on the National Register of Historic Places, foot traffic only, restored in 2001.

O ***Drewsville Gorge:*** Narrow rock gorge with spectacular staircase of small waterfalls. Former USGS gauging station. Measured flows range from 800 GPM to 10 million GPM.

N ***Cockhat Hill:*** Buried rock gorge with giant potholes in a former channel of the Cold River. Nearby are rare exposures of pre-glacial soil tens of thousands of years old.

L ***Warren Brook:*** Tributaries in the watershed are known to have flashy flows. Steep slopes, heavy rains, dense soils and man-made obstructions can exacerbate flooding.

M ***Conservation Focus Areas:*** Unfragmented lands bordering the Ashuelot River watershed have been identified as "exceptional habitat" for plants, wildlife and ecosystems by The Nature Conservancy.



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PUBLISHED BY THE COLD RIVER LOCAL ADVISORY COMMITTEE

ATLAS OF THE COLD RIVER

AND THE COLD RIVER WATERSHED

with assistance from the Southwest Region Planning Commission
and support from the New Hampshire Department of Environmental Services

WITHIN THE COLD RIVER WATERSHED THERE ARE APPROXIMATELY 4,000 PEOPLE AND EXACTLY NINETEEN BRIDGES, NINE ZIP CODES, EIGHT TOWNS, FOUR VILLAGE STORES, THREE GAS STATIONS, TWO PAY PHONES AND ZERO FAST FOOD ESTABLISHMENTS.

HISTORY

To travel the Cold River is to travel through time. With many steep drops and a narrow valley, the river was an ideal location for water-powered mills. By the late 1700's to the mid-1800s, Keyes Hollow, East Acworth, South Acworth, Alstead, Mill Hollow, and Drewsville had each grown into a population center around water powered industry. Though none of the mills remain operational today, at least two of them are still standing. Exports included lumber, wool, grain, apples, clay, paper, flax, butter, shoe pegs, shingles, maple sugar and syrup. Mining was an important industry as well. Large deposits of mica, feldspar and beryl were mined commercially from the mid 1800s to the mid 1900s. Town histories, found in local libraries, provide a fascinating chronicle of these industries and the comings-and-goings of individuals and families, many of whose decedents reside in the area today.

PLANT & ANIMAL HABITAT

Many of the plant and animal species found in the Cold River watershed are common throughout central New England. Bear, fisher and species of warblers and thrushes live along steep wooded slopes in the uppermost reaches of the watershed. Moose feed on aquatic vegetation in the marshes where swallows, herons, bittern and waterfowl also feed and nest. The border areas around marshes where alder, red osier, red maple, and aspen thrive, are ideal habitat for woodcock.

The watershed is covered with forest mainly composed of maple-beech-birch, white pine, or hemlock and host habitats uniquely suited to certain groups of plants and wildlife species. The NH Natural Heritage Inventory reports examples of three "exemplary natural ecological communities": Southern New England Acidic Rocky Summit/Rock Outcrop Community; Central New England Dry Transitional Forest on Acidic Bedrock and Till Community; and Southern New England Floodplain Forest Community. The Cold River and its tributaries provide pristine aquatic habitat and are part of the Atlantic Salmon Restoration Program through US Fish and Wildlife Service and NH Fish and Game.

Local animal species currently listed as either threatened or endangered at the state or national level are the bald eagle, peregrine falcon, northern harrier, cooper's hawk, osprey, sedge wren, and timber rattlesnake. The Warren Brook area has been monitored for breeding frogs since 1997 by FrogWatch volunteers as part of a nationwide study of declining frog populations. Sixteen plant species are listed as threatened or endangered. Non-native invasive plants such as Japanese knotweed, and purple loosestrife, among others, pose a serious threat to the watershed's ecology.

RECREATION

Recreational opportunities include fishing and swimming plus canoeing and kayaking during high water. Boating can be enjoyed at Lake Warren, Vilas Pool, Crescent Lake, Newell Pond, and Dodge Pond. Swimming holes are located throughout the watershed. The Cold River and its tributaries are stocked with trout and Atlantic salmon by NH Fish and Game. Hunting for turkey, deer, bear and moose remains popular in season. Winter activities include cross country skiing, snowmobiling, ice skating, ice fishing, and snowshoeing.

WATER RESOURCES

Activities such as swimming and boating and ecological functions associated with fisheries, wetlands and wildlife habitat are dependent on a sufficient flow of clean water in local streams. Sufficient flow in these streams is also necessary for commercial withdrawals and fire supply purposes as well as for public and private impoundments created by almost forty dams.

Approximately 50% of the flow in local streams comes from groundwater, especially during summer months. Groundwater is stored in spaces within bedrock (ledge) and sand and gravel deposits also known as aquifers. Groundwater is the primary source of drinking water in the watershed - there are no drinking water reservoirs. Wetlands and springs connect aquifers to local streams.

Sustaining the quality and flow of streams and aquifers to accommodate all local water uses presents a significant challenge. Natural processes such as dry summers and droughts limit flow, while bedrock and soil types can strongly influence water quality. At the same time, local land use choices and accidents can contaminate water supplies or impact neighboring water uses.

Despite these challenges, streams and aquifers within the watershed remain of good quality and water is plentiful for the most part. Local planning and conservation groups are actively seeking ways to sustain and protect water resources for the future. In addition, volunteer monitoring groups on the lakes and streams are producing valuable real-time data for maintaining the long-term health of the watershed.

FLOOD OF OCTOBER 2005

The Cold River Watershed was severely damaged during the 2005 Flood. Four lives were lost. Many homes, businesses, roads, bridges and utility lines were destroyed or damaged. The flood widened the banks of the Cold River and its tributaries, making them unstable and more susceptible to erosion and an increase in sediment load. Wildlife habitat within the corridor was washed away, exposing bedrock in many areas. Healthy populations of fish, frogs and other animals were reduced to just a few survivors.

While a flood of this magnitude is rare, the conditions that caused it (an undersized culvert, dense soils, narrow/steep valleys and heavy rains) are not. River corridor residents, towns and state and federal officials are currently completing the long-term planning, permitting and restoration work that is needed to bring this area back to health. The state recently completed a comprehensive assessment of stream bank stability and has initiated a stabilization project on Warren Brook as well as permanent road and bridge repairs. Federal officials are focusing on debris removal, protection of sensitive areas and re-vegetation.

View from the Warren Brook bridge before (left) and after (right) the flood

The Cold River Local Advisory Committee welcomes your participation at monthly meetings, on the water quality monitoring team, helping with grant applications, working on school projects and assisting with our annual workshop series. We all have a part in keeping the water clean and plentiful.

CONTACT INFORMATION:

1. COLD RIVER LOCAL ADVISORY COMMITTEE: PO BOX 68, S. ACWORTH, NH 03607 -- WWW.COLDRIVER.ORG
2. NH DEPARTMENT OF ENVIRONMENTAL SERVICES RIVERS COORDINATOR: 603-271-8801
3. YOUR TOWN CONSERVATION COMMISSION OR BOARD OF SELECTMEN

ACWORTH · ALSTEAD · CHARLESTOWN · LANGDON · LEMPSTER · MARLOW · UNITY · WALPOLE

APPENDIX B
STATE & FEDERAL REGULATIONS AFFECTING DESIGNATED RIVERS

Regulations Affecting the Cold River as a Designated River

EXISTING FEDERAL AND STATE LAWS AND REGULATIONS AFFECTING DESIGNATED RIVERS

(Excerpted from the *Ashuelot River Corridor Management Plan*, 2006)

(NOTE: This is intended as a helpful reference only. Please consult state/federal officials for complete listings.)

TOPIC	FEDERAL	STATE
I. Water quality		
I A. **Protection of water Quality**	**Clean Water Act: 1972 (3 USC 1251-1376)** Restore and maintain the chemical, biological and physical integrity of U.S. waters. **Wild and Scenic Rivers Act (16 USC Chapter 28)** By executive order, all federal agencies must make all reasonable efforts to avoid negative impacts to all rivers designated as Wild and Scenic and those listed in the Nationwide Rivers Inventory as potential Wild and Scenic Rivers.	**RSA 483:9:** Water quality shall be maintained at class A or B standards. **RSA 483:7-a:** Water quality shall be maintained at Class A or B for rivers designated as "natural" and Class B for rivers designated as "rural", "rural -community" or "community". **RSA 482-A:3:** Permit from DES Wetlands Bureau required for excavation, dredge, fill or construction in or on any banks, flat, marsh or swamp in and adjacent to any waters of the state. **RSA 483-B** Comprehensive Shoreland Protection Act **RSA 485-C** Groundwater Protection Act **Wt 100-800:** NH Wetlands Program rules **Env-Ws 420:** Ground water reclassification **Env-Ws 401:** State surface water discharge permits **Env-Wm 1403**: Groundwater Management and Groundwater Release Detection Permits **Env- Ws 1400**: Shoreline Protection Rules **Env-Ws 1700:** Surface water quality regulations **Env-Ws 451-455** Water Quality Certification Regulations (401 Water Quality Certificate)
I B. **Sources of erosion and sedimentation**	**Soil Conservation Act (16 USC 590a)** Directs Natural Resource Conservation Service to prevent soil erosion through local regulations and watershed improvement projects. **Clean Water Act (33 USC 1239)** relates to regulation of nonpoint source pollution.	**RSA 485-A:17** Alteration of terrain permit, required for major earth disturbance. **Env-Ws 415:** Permits for RSA 485-A: 17 Activities
I B 1. **Lumber harvesting practices**		**RSA 227-J:9** No more than 50% of the basal area of trees shall be cut; leaving a well distributed stand of healthy growing trees within 150 feet of any fourth order or higher stream, or within 50 feet of any other stream which normally flows throughout the year, unless prior written consent of the director of the Division of Forest Lands or the director's agent is obtained and all other state and local permits have been secured. **RSA 485-A:17** Best Management Practices required in timber harvesting. **RSA 482-A:3V** Forest Management limited to minimum impact activities. **Res 5401.02(a)** A permit is required to float timber on surface waters of the state. **RSA 483-B** Comprehensive Shoreland Protection Act **Env-Wm 1400** Shoreland Protection Rules
I B 2. **Road, bridge and building construction**	**Rivers & Harbors Act of 1899: (33 USC 401)** **Clean Water Act (33 USC 1344)** Need federal permit to construct dams, bridges, piers, etc., in any navigable water. **Wild and Scenic Rivers Act (16USC Chapter 28)** By executive order, all federal agencies must make all reasonable efforts to avoid negative impacts to all rivers designated as Wild and Scenic and those listed in the Nationwide Rivers Inventory as potential Wild and Scenic Rivers.	**RSA 482-A:3** Construction of structures in or adjacent to wetlands or surface water require permit from DES Wetlands Bureau. **Wt 100-800:** NH Wetlands Program rules

Regulations Affecting the Cold River as a Designated River

TOPIC	FEDERAL	STATE
I B 3. **Land tilling near the river**		
IB 4. **Dredge and fill activities**	**Clean Water Act (33 USC 1344)** Establishes permit system for dredge and fill activities in navigable waterways. **Wild and Scenic Rivers Act (16 USC Chapter 28)** By executive order, all federal agencies must make all reasonable efforts to avoid negative impacts to all rivers designated as Wild and Scenic and those listed in the Nationwide Rivers Inventory as potential Wild and Scenic Rivers.	**RSA 485-A:17** A permit is required for any terrain alteration in or on border of surface waters or which will alter natural runoff. **RSA 482-A** Permit from DES Wetlands Bureau required for excavation, dredge, fill or construction in or on any banks, flat, marsh or swamp in and adjacent to any waters of the state. **RSA 483:9** No channel alteration activities shall be allowed in rivers designated as "natural". DES shall encourage the use of native vegetation to stabilize stream banks of designated "rural", "rural community" and "community" rivers. **Wt 100-800:** NH Wetlands Program rules
I B 5. **Borrow pits, sand and gravel operations, removal of material from the corridor**		**RSA155E:4-a** A permit from the local Zoning Board of Adjustment is required. No excavations within 75 feet of any navigable river or within 25 feet of any other stream, river or brook which normally flows throughout the year. **RSA 485-A:17** Alteration of terrain permit required for major earth disturbance. **Env-Ws 415** Rules governing alteration of terrain (site specific) permits.
I C 1. **Septic systems**		**RSA 485 A:29** Permit is required prior to system construction. Inspection required before system covered or used. FIX THIS **Env-Ws 1000** Individual sewage disposal system design rules. **Env-Ws 700** Sewerage and waste system treatment system design standards.
I C 2. **Setbacks for septic systems**		**RSA 485-A:29** Submission and approval of plans and specifications for septic systems. **Env-Ws1008.04** Sewage disposal systems shall be at least 75 feet from surface water. Locate septic system no closer than 125 feet from wetlands or water course.
I C 3. **Septage and sludge disposal**	**Clean Water Act (33 USC 1345)** Relates to disposal or use of sewage sludge	**Env-Ws 800** Regulations for removal, transportation, and disposal of sludge. **Env-Ws 1600** Septage Management
I D. **Pollution from agricultural, residential, municipal and industrial sources**	**Soil conservation Act (16 USC 590a)** Directs Natural Resource Conservation Service to prevent soil erosion through local regulations and watershed improvement projects. **Clean Water Act (33 USC 1342)** Requires NPDES permit for point discharge **Clean Water Act (33 USC 1329)** Relates to regulation of nonpoint source pollution.	**RSA 485-A** Water pollution and waste disposal regulations. **RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers **Env-Ws 1400** Shoreland Protection rules
I D 1. **Pesticides**		**RSA 430** All pesticide applications must comply with rules adopted by Pesticides Control Board, NH Dept. of Agriculture. **RSA 483** Setback requirements for certain fertilizers. **RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers. (Agricultural use is exempt). **Pes-1001** Restrictions on the use of pesticides to protect ground and surface waters. **Env-Ws 1400** Shoreland Protection rules

Regulations Affecting the Cold River as a Designated River

TOPIC	FEDERAL	STATE
I D 2. **Manure spreading and fertilizers**		**RSA 431:33-35** Manure and chemical fertilizer handling must be done in accordance with Best Management Practices as published by the NH Commissioner of Agriculture, Markets and Food. **RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers. (Agricultural use is exempt). **Env-Ws 1400** Shoreland Protection rules
ID 3. **Storage facilities for petroleum and/or hazardous materials (under and above ground)**		**RSA 483-B** Comprehensive Shoreland Protection Act **Env-Wm 507** Storage Requirement **Env-Ws 1400** Shoreland Protection rules **Env-Wm-1401** Control of underground storage facilities to prevent and minimize contamination of water. **Env-Wm-1402** Control of aboveground petroleum storage facilities.
I D 4. **Road Salt**		**RSA 485-C:12** Prohibits certain used within any wellhead protection area classified as GAA, including siting or operating a hazardous waste disposal facility or landfill, snow dump, junk or salvage yard or wastewater or septage lagoon, outdoor storage of road salt or other deicing chemicals in bulk.
I D 5. **Disposal of plowed snow**		**RSA 485-A:13, I(a)** Prohibits discharging of sewage or wastes into surface waters without a permit **RSA 485-C:12** Snow dumps are prohibited in designated wellhead protection areas.
I D 6. **Runoff from roads and parking lots**	**Clean Water Act (33 USC 1342)** Establishes regulation of Municipal and industrial storm water discharges.	**RSA 485-A:17** Any person whose proposed terrain alteration will impede natural runoff or create unnatural runoff shall submit detailed plans concerning the proposal and any other requested information to the New Hampshire Department of Environmental Services.
I D 7. **Landfills; solid waste disposal, recycling depots; oil-collecting tanks**		**RSA 483** No new solid waste landfills within the corridor of designated "natural" rivers or segments or within 500 year floodplain of "rural". "rural-community" or "community" rivers. No expansion of existing landfills within 500 year floodplain of designated "natural" rivers. **RSA 483-B** Comprehensive Shoreland Protection Act **Env-Ws 1400** Shoreland Protection rules **Env-Wm 1901** Solid Waste Management Rules. **Env-Ws 2500** Landfill Requirements
I D 8. **Timber operations - slash and mill waste**		**RSA 485-A:15** Litter (garbage, scrap metal, old cars, trees, etc.) shall not be disposed of in, on the ice over, or on the banks of surface waters. **RSA 227-J:10** No disposal of slash and mill waste in any stream, river, or brook which normally flows throughout the year or within 25 feet of a 4th order stream. **RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers. **Env-Ws 1400** Shoreland Protection rules
I D E. **Water quantity, including water withdrawals**	**Federal Power Act (16 USC 791)** Every hydroelectric project on a navigable stream requires a Federal Energy Regulatory Commission permit. **Clean Water Act (33 USC 404)** Permits for dams may be conditioned to assure sufficient flows and restrict withdrawals for the protection of fish and wildlife. **Wild and Scenic Rivers Act (16 USC Chapter 28)** By executive order, all federal agencies must make all reasonable efforts to avoid negative impacts to all rivers designated as Wild and Scenic and those listed in the Nationwide Rivers inventory as potential Wild and Scenic Rivers.	**RSA 483-9** No interbasin transfers area allowed. A protected instream flow level shall be established for each designated river. No new dams are allowed on rivers designated as "natural", "rural" or "rural-community" rivers. **Env-Wr 700** Water uses over 20,000 gpd must be registered and report usage.

Regulations Affecting the Cold River as a Designated River

TOPIC	FEDERAL	STATE
II. Scenic Appearance		
II A. Open space management		**RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers. **Env-Ws 1400** Shoreland Protection rules
II B. Riparian buffer zones		**RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers. **Env-Ws 1400** Shoreland Protection rules
II B 1. Setbacks for buildings and roads		**RSA 482-A:26** No structure extending beyond the shoreline of public water may be used as a dwelling. **RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers. **Env-Ws 1400** Shoreland Protection rules
II B 2. Permitted uses		**RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers. **Env-Ws 1400** Shoreland Protection rules
II B 3. Lot sizes and river frontage		**RSA 485-A:39** Waterfront property sale and site assessment study.
II B 4. Building heights		**RSA 674:16** Zoning
II B 5. Mobile home regulations		**RSA 674:32** Manufactured housing can be regulated but not excluded from a municipality.
II B 6. Junk yard restrictions		**RSA 236:111-129** Motor vehicle recycling yards and Junk-yard regulations. **RSA 236:90-110** Requirements for control of junkyards and automotive recycling yards.
II C. Location of roads and parking lots		**RSA 230; RSA 231** Layout, construction and maintenance of state highways and city, town and village and district highways. **RSA 47:17** Sidewalks, parking and use of public ways.
II D. Building material choices		**RSA 47:22** Regulation of the use of certain building materials by town governments
II E. Timber operations-cutting for views		**RSA 483-B** Comprehensive Shoreland Protection Act: Minimum setbacks for certain rivers **Env-Ws 1400** Shoreland Protection rules
II F. Signs		**RSA 236: 69-89** Regulation of outdoor advertising and signs.
III. Recreation		
III. A Water Sports		**RSA 233-A** Statewide Public Boat Access Program. **RSA 270:73-74** Restricts the operation of skicraft. **RSA 270-D:2** General rules for vessels operating on water. **RSA 482-A** Wetlands permit required for dock construction. **RSA 483:9** No motorized watercraft on designated "natural" rivers. On other designated rivers, headway speed only within 150 feet of shore. **Wt 100-800:** NH Wetlands Program rules. **Saf-C-402** Power boat restrictions on specific water bodies. **Saf-C-404** Boating rules. **Saf-C-407** Rafting rules. **Saf-C-413** Water event and slalom course permits.
III B. Camping		**RSA 216-I** Recreational Campgrounds and Camping Parks **RSA 485-A:23, 24, 25 and 25a; Env-WS-1120** Youth Camps

Regulations Affecting the Cold River as a Designated River

TOPIC	FEDERAL	STATE
III C. **Trail networking**		**RSA 215-A** Off Highway Recreation Vehicle regulations.
III D. **Barrier-free access**	**American with Disabilities Act (42 USC Chapter 126)**	**RSA 275-C** Governor's Commission on Disabilities.
IV. Wildlife and Fisheries		
IV A. **Protection of** **Wildlife and** **Fisheries**	**Dept. of Transportation Act of 1966: (49 USC 1651-59, Section 4 (f))** No US Dept of Transportation projects are allowed on public land important for wildlife, recreation area or wildlife and waterfowl refuge of national, state or local significance or historic properties unless there is no prudent and feasible alternative and there has been all possible planning to minimize harm. **Fish and Wildlife Coordination Act: (16 USC 661-661c)** Whenever a river is altered by a water resource development project, steps should be taken to conserve wildlife resources.	**RSA 207:19-21** Angling and restrictions of fishing.
IV B. **Wildlife**		**RSA 208** Game animals. **RSA 209** Game birds and pigeons. **RSA 210** Fur-bearing animals. **RSA 212-B** Nongame Species Management Act
IV C. **Fisheries**		**RSA 211** Fish, shellfish, lobsters and crabs. **RSA 212** Propagation of fish and game. **RSA 213** Atlantic marine fisheries.
V. Rare communities and species		
V A. **Unique natural communities; threatened and endangered species**	**Endangered Species Act (16 USC 1531-43)**	**RSA 227-C** Governs identification and protection of state historic resources and properties. **RSA 212-A** Endangered Species Conservation Act
VI. Historical and archaeological features		
VI A. **Historical Sites**	**National Register of Historic Places (16 USC 470a) Dept. of Transportation Act of 1966: (49 USC 1651-59, Section 4 (f))** No US Dept of Transportation projects are allowed on public land important for wildlife, recreation area or wildlife and waterfowl refuge of national, state or local significance or historic properties unless there I no prudent and feasible alternative and there has been all possible planning to minimize harm. **National Natural Landmarks (16 USC section 463)** In some instances, there may be National Natural Landmarks on some rivers listed on the Nationwide Rivers Inventory.	**RSA 227-C** Governs identification and protection of state historic resources and properties.

APPENDIX C
CRLAC TOWN REPRESENTATIVES & ANNUAL REPORTS

List of CRLAC Members Participating in the Preparation of the <u>Cold River Watershed Management Plan</u>

Member:	Representing:	Status:
Deborah Hinman	Acworth	Active
Gordon Gowen	Acworth	Retired
Torrey Greene	Acworth	Retired
Carol Drummond	Alstead	Active
Mike Heidorn	Alstead	Active
Samuel Sutcliffe	Alstead	Active
Howard Weeks	Alstead	Retired
Almut Yakovleff	Alstead	Retired
Cathy MacDonald	Langdon	Active
Jen Polcari	Langdon	Active
Joanna Dennett	Langdon	Retired
Sue Lichty	Lempster	Active
Erik Walker	Lempster	Retired
Max Warren	Lempster	Retired
Austin Hunter	Walpole	Active
Charles Montgomery	Walpole	Active
Pam O'Hara	Walpole	Retired
Laura Adams	Walpole	Retired
Duncan Watson	Walpole	Retired

The Cold River Local Advisory Committee:
Acworth, Alstead, Langdon, Lempster and Walpole

The Cold River Local Advisory Committee (CRLAC) consists of citizens appointed by select boards from Acworth, Alstead, Langdon, Lempster and Walpole. These representatives volunteer their time to help municipal boards and residents manage the natural, cultural, scenic and scientific resources of the Cold River watershed. The CRLAC also reviews river corridor projects needing state and federal permits and evaluates water-related issues of local or statewide significance.

CRLAC ACCOMPLISHMENTS IN 2008:

1. Municipal Conservation, Planning & Health Assistance

- Assisted residents/boards/business owners with the resolution of a variety of potential water quality degradation issues.
- Reviewed and commented on stream debris removal, a stream buffer property transfer and road/bridge/gravel pit projects.
- Participated in the Alstead Community Conservation Partnership Task Force and Land Conservation Leadership Course.
- Supported local and state efforts to fund stream restoration projects in Flood-damaged areas and develop partnerships with federal wildlife officials for habitat improvements.
- Advised Lempster officials on potential impacts to Dodge Pond of a contaminated site and proposed subdivision.

2. Workshops, Events & Education

- Participated in the 2008 NH Watershed Conference.
- Completed presentations on water quality testing and ground water resource challenges for Conservation Commissions in Acworth, Alstead, Lempster and Walpole.
- Published/distributed a brief public summary of the 2007 water sampling results.

3. Water Quality & Quantity Monitoring

- Completed the sixth year of our voluntary sampling program, including three "routine" and three additional water quality and water level monitoring events on the Cold River, its tributaries and two ponds (Newell/Dodge).
- Analyzed over 125 water samples in the field for pH, dissolved oxygen, conductivity, turbidity and temperature.
- Raised additional funds for over 150 bacteria, nutrient, metal and salt analyses conducted by the state laboratory.
- Completed a winter road salt impact study in Alstead & Walpole including 70 additional field and lab samples.
- Added 29 new sampling sites on: Warren Brook and Camp Brook (Alstead); Honey Brook (Marlow/Acworth); Dodge Brook and its tributaries (Lempster); and Great Brook and its tributaries including Ram, Brush Meadow and Jewett Brooks (Langdon/Walpole).
- Assisted state/federal officials with the site selection process for a new flow gauging station on the Cold River.

The Advisory Committee welcomes your participation in any of our projects and is actively seeking new members/alternates. We meet the fourth Thursday of each month, 7- 9PM, usually in the Alstead Town Offices. Please contact any CRLAC member for more info.

Sincerely,

Acworth: Deborah Hinman (Chair)
Alstead: Mike Heidorn (Water Quality Monitoring), Carol Drummond and Sam Sutcliffe (Treasurer)
Langdon: Jennifer Polcari (Vice Chair) and Cathy MacDonald
Lempster: Susan Lichty
Walpole: Charles Montgomery (Scribe) and Austin Hunter

The Cold River Local Advisory Committee
Acworth, Alstead, Langdon, Lempster and Walpole

The Cold River Local Advisory Committee (CRLAC) consists of citizen representatives appointed by select boards from Acworth, Alstead, Langdon, Lempster, and Walpole. These representatives volunteer their time to help municipal boards and residents manage the natural, cultural, scenic and scientific resources of the Cold River watershed. The LAC also reviews river corridor projects needing state and federal permits and evaluates water-related issues of local or statewide significance.

CRLAC ACCOMPLISHMENTS IN 2007:

1. Municipal Conservation, Planning & Health Assistance

- Assisted town residents/boards with the resolution of potential water quality degradation and drinking water protection issues.
- Reviewed and commented on the water resource aspects of the draft Alstead Master Plan update.
- Continued work on a voluntary watershed management plan to assist towns in managing their water resources.
- Reviewed and commented on numerous stream bank stabilization and road/bridge projects resulting from the Flood of October 2005.
- Supported state and federal efforts to fund local stream restoration projects to complement/enhance the stabilization work.

2. Workshops, Events & Education

- Began updating the LAC web site.
- Participated in the 2007 NH Watershed Conference and Alstead Festival, including a sampling equipment demonstration.
- Co-sponsored the Alstead Flood Symposium in October at the request of the Alstead Conservation Commission.
- Published a brief public summary of the 2006 water sampling results.

3. Water Quality & Quantity Monitoring

- Completed the fifth year of our sampling program, including three "routine" and three additional water quality and stream level monitoring events on the Cold River and its tributaries.
- Analyzed over 80 water samples in the field for pH, dissolved oxygen, conductivity, turbidity and temperature.
- Solicited and received DES funding for additional bacteria, nutrient and metal analyses conducted at the state laboratory.
- Measured late summer flow rates on the Cold River and Warren Brook.
- Advocated for the replacement of the abandoned flow gauging station at Drewsville Gorge.

The Advisory Committee welcomes your participation on any of our projects. We meet on the fourth Thursday of each month, 7- 9PM, usually in the Alstead Town Offices. To be on our email notices for workshops or water quality monitoring events, please call any LAC member.

Sincerely,

Acworth: Deborah Hinman (Chair)
Alstead: Mike Heidorn (Water Quality Monitoring), Carol Drummond, and Sam Sutcliffe (Treasurer)
Langdon: Jennifer Polcari (Vice Chair) and Cathy MacDonald
Lempster: Susan Lichty
Walpole: Charles Montgomery (scribe), Austin Hunter

The Cold River Local Advisory Committee
Acworth, Alstead, Langdon, Lempster and Walpole

The Cold River Local Advisory Committee (CRLAC) consists of citizen representatives appointed by select boards from Acworth, Alstead, Langdon, Lempster, and Walpole. The CRLAC supports municipal boards and is developing a Watershed Management Plan that will assist towns in managing water resources. The LAC reviews river corridor projects needing state and federal permits and assists on issues of local or statewide significance.

CRLAC ACCOMPLISHMENTS IN 2006:

1. Municipal Conservation, Planning & Health Assistance

- Received a grant to further our work in the watershed on protection plans for drinking water sources at schools.
- Continued work on a voluntary watershed management plan for the Cold River.
- Completed outreach visits to the Acworth, Alstead and Lempster Conservation Commissions regarding post-flood environmental issues and our water quality monitoring program.
- Hosted a joint meeting with Alstead Planning Board, Conservation Commission and Selectboard representatives regarding post-flood environmental issues.
- Reviewed and commented on numerous river corridor rebuilding projects on a local and state level.
- Assisted Alstead with the resolution of a Lake Warren water quality degradation issue.

2. Workshops, Events & Education

- Participated in DES' May 2006 public informational session on post-flood environmental issues.
- Presented *The Health of Our Streams and the October 2005 Flood* at the Alstead Primary School.
- Provided watershed and water quality information at the Lake Warren Association annual meeting and the CT River Joint Commissions' Wantastiquet Region meeting in April.
- Completed the *Atlas of the Cold River and the Cold River Watershed* for public distribution.
- Hosted two field trips to the flood-damaged areas and water quality monitoring sites for Leland & Gray 8th graders from Townshend, VT.
- Presented *Water Resources in the Cold River Watershed* at St. John's Episcopal Church in Walpole.
- Interviewed with local radio, newspaper and television representatives about flood recovery.
- Participated in the 2006 NH Watershed Conference and Alstead Festival.
- Assisted Alstead Historical Society with the assembly of flood-related photos and a review of portions of *Too Much Water, Too Much Rain*, documenting the 2005 flood and its aftermath.

3. Water Quality & Quantity Monitoring

- Completed the initial phase of our comprehensive surface water characterization program.
- Prepared a summary of the successes and challenges of the monitoring program for the inaugural DES newsletter *Streamlines*.
- Completed three "routine" and three additional water quality and stream stage monitoring events on the Cold River and its tributaries as part of NH's Volunteer River Assessment Program (VRAP).
- Added new sampling sites at Newell Pond, Warren Brook and Dodge Brook.
- Solicited and received DES funding for additional bacteria, nutrient, salt and metal analyses.
- Represented the Cold River on the NH Stream Gauging Task Force in Concord.

The Advisory Committee welcomes your participation on any of our projects. We meet on the third Thursday of each month, 7- 9PM, usually in the Alstead Town Offices. To be on our email notices for workshops or water quality monitoring events, please call any LAC member.

Two long time board members stepped down this year. We wish to express our deep appreciation for many years of service to Howard Weeks of Alstead and Pam O'Hara of Walpole.

Sincerely,

Acworth: Deborah Hinman (Chair)
Alstead: Mike Heidorn, Carol Drummond, and Sam Sutcliffe (Treasurer)
Langdon: Jennifer Polcari (Vice Chair) and Cathy MacDonald
Lempster: Vacant
Walpole: Charles Montgomery (scribe), Austin Hunter, Laura Malinoski-Adams

The Cold River Local Advisory Committee

Towns in the watershed: Acworth, Alstead, Charlestown, Langdon, Lempster, Marlow, Unity, and Walpole

The Cold River Local Advisory Committee (CRLAC) consists of citizen representatives appointed by selectboards from Acworth, Alstead, Langdon, Lempster, and Walpole. The CRLAC supports municipal boards and is developing a Watershed Management Plan that will assist towns in managing water resources. The committee also reviews river corridor projects needing state and federal permits and investigates related issues of local or statewide significance.

CRLAC ACCOMPLISHMENTS IN 2005:

1. Municipal Conservation, Planning & Health Assistance

- Continued work on a voluntary watershed management plan for the Cold River.
- Secured an additional year of watershed assistance from the National Parks' Rivers and Trails Program.
- Advised our Lake Associations (Warren and Crescent) on wetland and water quality degradation issues.
- Assisted Alstead with subdivision and stormwater permitting, as well as the development of their master plan survey and evaluation of possible well contamination issues.
- Provided Acworth with guidance on fuel storage tank design and possible impacts to water resources.
- Co-coordinated brainstorming sessions regarding the management and future of the Vilas Pool area.

2. Workshops, Events & Education

- Held the well-attended *Workshop on Protecting Water Quality in the Cold River Watershed* at the Vilas School in March. This event provided an overview of watershed features, threats, uses and management approaches.
- Organized a nature walk (*"Trib Trek")* along Alstead's Camp Brook in February, hosted by David Moody.
- Mentored and assisted Antioch student Dee Caldwell with her hydrology study on Camp Brook.
- Assisted Keene High student Kristen Harkay with her class project involving the Cold River.

3. Water Quality & Quantity Monitoring

- Revised and streamlined our comprehensive surface water characterization program, now in its fourth year, to more closely adhere to NH's Consolidated Assessment Listing Methodology (CALM).
- Initiated an in-stream pilot study of volunteer flow monitoring at Drewsville Gorge with the State of NH.
- Purchased additional sampling supplies and developed field equipment improvements.
- Expanded volunteer participation and trained volunteers in the use and care of monitoring equipment.
- Completed three "routine" water quality and stream stage monitoring events on the Cold River and its major tributaries as part of NH's Volunteer River Assessment Program (VRAP).
- Solicited and received DES funding for additional bacteria, nutrient and metal analyses.

4. Drinking Water Protection Plan

- With the professional assistance of Granite State Rural Water Association, initiated and led a comprehensive evaluation of drinking water protection for public drinking water systems at all schools within the watershed.
- Published a Drinking Water Protection Plan with detailed recommendations for further actions.

5. Post-Flood Response Efforts

- Procured additional water sampling funding and assistance from NH DES, and completed several post-flood monitoring events on the Cold River and Warren Brook.
- Supported efforts to fund floodplain-floodway mapping, erosion/stream bank restoration and Millot Green revitalization projects through the U.S. Geological Survey, NH DES and National Park Service.
- Provided practical recommendations to municipal boards on environmental issues.
- Communicated local landowner information requests to NH DES' Watershed Bureau.
- Assisted private well owners with bacteria/nitrogen contamination and well disinfection concerns.
- Summarized local flood precipitation data for the Town of Alstead.

The flooding that occurred in October 2005 provoked a level of devastation to people's lives and property, as well as to Warren Brook and the Cold River as we know it, and it is impossible to adequately write about it. The Advisory Committee sends our grateful admiration to all those who have worked and continue to work so tirelessly and courageously to find solutions.

The Advisory Committee welcomes your participation on any of our projects. We meet on the third Thursday of each month, 7- 9PM, usually in the Alstead Town Offices. To be on our email notices for workshops or monitoring events, call any member. We thank everyone who has worked with us during the past year, and we are particularly grateful to Ted Walsh of NH DES, Lelia Mellen of NPS and Jen Palmiotto of GSRWA for their many hours of assistance.

Sincerely,

Deborah Hinman, Chair (835-2309)
Jennifer Polcari, Vice Chair (835-2376)

Acworth: Debby Hinman and Laura Malinoski-Adams
Alstead: Howard Weeks, Mike Heidorn and Sam Sutcliffe
Langdon: Jen Polcari and Cathy MacDonald
Lempster: Vacant
Walpole: Pam O'Hara, Austin Hunter and Charles Montgomery

The Cold River Local Advisory Committee

Towns in the watershed: Acworth, Alstead, Charlestown, Langdon, Lempster, Marlow, Unity, and Walpole

The Cold River Local Advisory Committee (CRLAC) consists of citizen representatives appointed by selectboards from Acworth, Alstead, Langdon, Lempster, and Walpole. The CRLAC is developing a Watershed Management Plan that will assist local communities in managing water resources. The committee also reviews all projects needing state and federal permits that could impact the river and works with other conservation groups on related issues of local or statewide significance.

CRLAC ACCOMPLISHMENTS IN 2004:

1. Organizational development

- Continued work on a voluntary watershed management plan for the Cold River.
- Completed eight water quality and flow monitoring events on the Cold River as part of NH's Volunteer River Assessment Program (VRAP).
- Trained volunteers in the use and care of monitoring equipment.
- Initiated an in-stream pilot study of monitoring equipment protocols & accuracies with the State of NH.
- Participated in the first-ever comprehensive water quality sampling program on the VT and NH sections of the Connecticut River.
- Displayed our work at NH's annual Watershed Conference in Concord.
- Created a Cold River logo and a website (www.coldriver.org).
- Worked with ten other advisory committees in NH to keep protected river corridors free from the stockpiling, landspreading, or topdressing of sludge and septage.
- Received grant funding for professional assistance from the Northeast Rural Water Association and National Parks' Rivers and Trails Program for our work in 2005.

2. Annual Workshop Series

- Held the fourth annual Winter Workshops series. Topics this year were butterflies, wetlands, amphibians, winter wildlife tracking, and birds. Many thanks to Alstead's Shedd-Porter Library for providing space for this series.
- Held a wildlife tracking session on snowshoes in the Acworth Wetlands, led by David Anderson of the Society for the Protection of NH Forests.
- Hosted a spring migratory bird walk along Dodge Brook, led by Wendy Ward and Andy Greene of NH Audubon's Mondnock Chapter.

3. Collaboration across the watershed

- Demonstrated our new monitoring equipment at the Acworth Conservation Commission's "conservation technology" workshop and wildlife hike at the Acworth Wetlands.
- Worked with Fall Mountain High School teachers Joe Beer (his English classes created a magazine about the Cold River) and Susan Smith (her Earth Science classes studied macro-invertebrates and GPS mapping).
- Worked to improve excavation permitting procedures in the watershed.
- Worked with the Vermont Institute of Natural Science (VINS) in local schools.
- Provided information and support for grant applications written by town boards and schools.
- Supported the Town of Alstead's efforts to complete a maintenance plan for the Vilas Dam, evaluate recreation area improvement options and find funding for dam repairs.
- Supported the water quality monitoring teams of Lake Warren and Crescent Lake.
- Conducted a survey of Crescent Lake residents about water and land use issues.

The Advisory Committee welcomes your participation on any or all of our projects. If you are interested in joining our committee, please speak with your selectboard. If there is an opening, they may make a nomination to the board. However, with or without official membership status, we welcome all volunteers!

We meet on the third Thursday of each month, 7- 9PM, usually in the Alstead Town Offices. To be on our email notices for workshops or monitoring events, call any member to let us know. We thank everyone who has worked with us during the past year, and we are extremely grateful to Vicky Boundy of Upper Valley Lake Sunapee Regional Planning Commission and Beth Krumrine of NH DES for their hours of work with us on the river management plan.

Thank you for your interest and enthusiasm!

Sincerely,

Deborah Hinman, Chair (835-2309)
Jennifer Polcari, Vice Chair (835-2376)

Acworth: Debby Hinman, Laura Malinoski-Adams, Joanna Dennett (Associate member)
Alstead: Howard Weeks, Mike Heidorn, and Sam Sutcliffe
Langdon: Jen Polcari and Cathy MacDonald
Lempster: Erik Walker
Walpole: Pam O'Hara, Austin Hunter, and Charles Montgomery

Cold River Local Advisory Committee: 2003 Annual Report

Acworth, Alstead, Charlestown, Langdon, Lempster, Marlow, Unity, Walpole

The Cold River Local Advisory Committee (CRLAC) was formed when the Cold was designated a State Protected river by the State Legislature in 1999. The committee consists of citizen representatives appointed by selectboards from the five towns in the watershed that touch the river: Acworth, Alstead, Langdon, Lempster, and Walpole. The CRLAC is developing a River Management Plan that will guide its long-range work throughout the watershed. The committee also reviews all projects needing state and federal permits which could impact the river.

CRLAC ACCOMPLISHMENTS IN 2003

- Organized the third annual Winter Workshops series, which provided education about wetlands, amphibians, winter wildlife tracking, and birds. In addition, a tracking session on snowshoes in the Acworth Wetlands and a spring walk along Lempster's Dodge Brook to find Migratory Birds got lots of people outdoors having a great time. Many thanks to Alstead's Shedd-Porter Library for letting us hold our indoor workshops there. We also worked with the Acworth Historical Society to organize a summer walk along the river behind the Village Store to study native plants and streambanks.

- Produced the River Journal Calendar for 2004. Travis Hussey, our terrific environmental educator and AmeriCorps volunteer, completed his work with 82 students and their four teachers in grades 3-6 at Acworth, Langdon, Goshen-Lempster, and Alstead's Vilas School. Among other things, they studied water conservation, macroinvertebrates (such as stoneflies, mayflies, caddisflies), and wildlife habitats. They also kept nature journals during the year. All this work contributed to a remarkable calendar, sales of which will help fund more environmental education in schools through our partnership with the Fall Mountain Educational Endowment Fund. We are grateful for support from the Vermont Institute of Natural Science, the Connecticut River Partnership Program, the town of Alstead, local conservation commissions, and an anonymous grant source for assistance with projects.

- Completed our first full year of water quality monitoring using the state's VRAP equipment. Test results for pH, temperature, conductivity, dissolved oxygen and turbidity continue to show that the Cold River generally has excellent water quality. Heavy rains, however, occasionally put large amounts of sediment into tributaries, discoloring the river and possibly disrupting aquatic life cycles in certain times of the year. Also, the state has classified parts of the river as "impaired" due to low pH values in the upper stretches of the river and high bacteria counts at Vilas Pool. We hope to expand our monitoring program in 2004 to better understand the relationship between river water quality and precipitation, land use, road salt, bacteria, wetlands, tributaries, etc. Consequently, through local donations and grants from the CT River Joint Commissions and the New England Grassroots Environmental Fund, the LAC has purchased its own water quality monitoring equipment, complete with weather station and velocity meter, as well as nets and other gear. In addition, we trained with NH DES and started a long-term biomonitoring project to track macroinvertebrate populations.

- Participated in the review of the trout habitat project in Walpole designed by the NH Coldwater Fisheries Coalition and Trout Unlimited. We acknowledge and appreciate Cold River Materials for their participation in habitat improvement, redesign of a dam, and removal of an aging overhead "trolley" in their stretch of the river.

- Continued work on a voluntary river management plan for the Cold River.

The Advisory Committee welcomes your participation on any or all of our projects. If you are interested in joining our committee, please speak with your selectboard. If there is an opening, they

may make a nomination to the board. However, with or without official membership status, we welcome all volunteers! We meet on the third Thursday each month, 7-9PM, usually in the Alstead Town Offices. To be on our email notices for workshops or monitoring events, call any member to let us know.

We thank everyone who has worked with us during the past year. With your interest and enthusiasm, our work continues to be enjoyable and productive.

Sincerely, Deborah Hinman, Chair, and Pam O'Hara, Vice Chair

Acworth: Joanna Dennett (Associate member), Laura Malinoski-Adams, Deborah Hinman (835-2309)
Alstead: Howard Weeks, Mike Heidorn, and Sam Sutcliffe
Langdon: Jenny Polcari, Cathy MacDonald
Lempster: Erik Walker
Walpole: Pam O'Hara, Austin Hunter, and Charlie Montgomery (Associate member)

Agency partners:

- Vicky Boundy, Senior Planner of Upper Valley Lake Sunapee Regional Planning Commission
- Steve Couture and Beth Krumrine of DES' NH River Management and Protection Program.

Many thanks to previous CRLAC members Gordon Gowen and Torrey Greene of Acworth; Max Warren of Lempster; Duncan Watson and Tina Tidd of Walpole; Almut Yakoleff of Alstead, and Joanna Dennett of Langdon.

APPENDIX D
COLD RIVER CORRIDOR & AREA LANDOWNER SURVEYS

U V L S R P C

Cold River Corridor Survey

Summer 1999

A cooperative effort of Upper Valley Lake Sunapee Regional Planning Commission, Friends of the Cold River, and UNH Cooperative Extension

Funded by an EPA 604(b) grant provided by NH Department of Environmental Services and assistance from US Fish & Wildlife Service Silvio O. Conte National Fish & Wildlife Refuge

INTRODUCTION

During the summer of 1999, Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) conducted a survey of owners of land within one-quarter mile of the Cold River. The purpose of the survey was to assist the Friends of the Cold River and the future work of the local river advisory committee by obtaining information on issues of concern to corridor landowners. The survey was developed by UVLSRPC with assistance from the Friends of the Cold River, UNH Cooperative Extension, and Southwest Region Planning Commission.

The survey was made possible with EPA 604(b) funding provided by the NH Department of Environmental Services (NHDES). UNH Cooperative Extension also provided funding through the US Fish & Wildlife Service Silvio O. Conte National Fish & Wildlife Refuge for the development of a computerized database of landowner names and addresses. UVLSRPC also wishes to acknowledge the many hours of volunteer effort provided by the Friends of the Cold River and others associated with our Commission.

This report includes a summary of results, detailed results, and a copy of the survey and cover letter which landowners received.

SUMMARY OF RESULTS

Surveys were mailed to 513 owners of property within one-quarter mile of the Cold River. This represented all but a few properties for which current owner information was not available from town offices. Properties were identified utilizing a GIS map developed by UVLSRPC with assistance from a previous EPA 604(b) grant provided by NHDES. A cover letter was provided explaining the purpose of the survey and encouraging recipients to respond within two weeks. A post paid envelope was included. Approximately six weeks later when data entry was completed, 170 surveys had been received, for a response rate of 33.1%.

Responses were fairly distributed according to the number of parcels in each of the six corridor communities. The average lot size reported by respondents was also reflective of the land ownership patterns in the area surveyed.

Approximately one-third of respondents reported owning land that the Cold River runs through or abuts. Two-thirds of respondents represent the views of those who own property nearby, but not on, the River. The average length of time respondents have owned property in the Cold River corridor is 22 years, reflecting a survey population with a long history of knowledge of the River corridor. Fewer than a third reported that the River played a role in their decision to purchase the property.

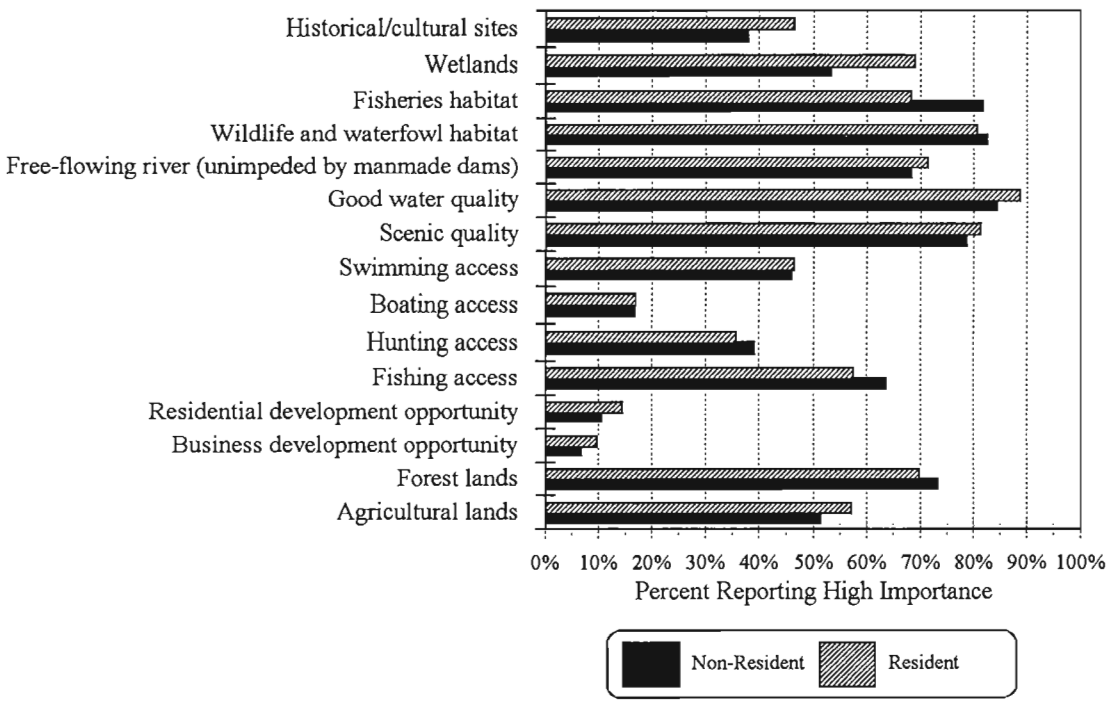
The vast majority (68.5%) of respondents reported that the present use of the property is as their primary residence. The importance of the area's natural resources is reflected in the numbers utilizing their land for a second or vacation home (13.7%), recreation (17.9%), and conservation (14.9%). More owners reported their land as being idle (16.1%) than as either in farming (11.3%) or forestry (13.1%). However, when farming and forestry are combined (24.4%), resource-based industries represent the second most highly reported use of the land.

Most respondents (82.7%) indicated plans to continue the present use of their property. A very high number (40.5%) indicated their intent to keep their land in the family. Conservation of some or all of the land is an interest of 19% of respondents. A significantly higher number (12.5%) indicated plans to sell their land as a whole parcel than reported plans to subdivide (1.2%).

Of those respondents that felt public access was an issue applicable to their property, three times as many allow public access than do not. Of those that reported that they do, only 12% reported that they are considering restricting access in the future. The most highly reported problem associated with public use of the River was littering or illegal dumping.

Survey recipients were asked their opinions of the importance of several characteristics of the Cold River and the lands along it. Choices of "low", "medium", "high" or "no opinion" were given. More than half of survey respondents indicated "high" importance of agricultural lands, forest lands, fishing access, scenic quality, good water quality, free-flowing river (unimpeded by manmade dams), wildlife and water fowl habitat, fisheries habitat and wetlands. Business development opportunity received the highest number of "low" responses (73.8%), followed by residential development opportunity (54.6%). When responses of those who indicated use of the land as their primary residence were compared to those who did not, the same patterns were seen among the two groups.

FIGURE 1



Most respondents indicated some kind of recreational enjoyment of the river corridor. Fishing, bird/wildlife watching, hiking/walking, sight-seeing when driving, and sitting by the River were each indicated by more than half of respondents as activities they or other members of their household enjoy on or along the River.

Responses to a question asking which of a variety of options would enhance users' ability to enjoy recreational activities were quite mixed. The majority of respondents favored "no change" to public access (57.6%) or fish stocking (52.1%). The option most favored by respondents for an increase is walking/skiing trails. A high number of respondents (45.3%) favor a decrease in shoreline development.

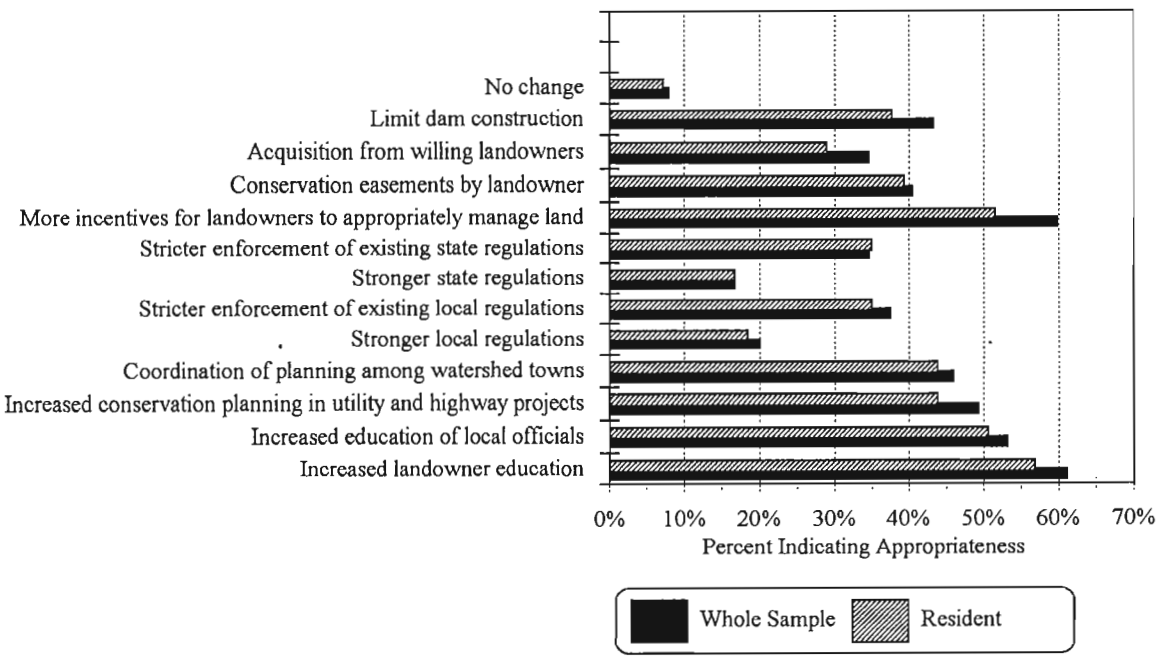
Several questions were included asking respondents about trends and activities which may threaten the quality of water or other resources associated with the Cold River. The trend receiving the highest number of responses was recreational abuses, such as rowdy behavior or litter. More than twenty percent of respondents have also noticed excessive erosion/sedimentation, loss of farmland and forest land to development, and clearing too close to the River or tributaries. Less than a third (28.2%) reported noticing no problems at all.

After asking which trends survey recipients had noticed, the survey next asked which from the same list corridor landowners were concerned about. Respondents most often indicated concern about water pollution (46.9%). While this corresponds to the high importance of good water quality indicated by respondents earlier, it should be noted that this number far exceeds the percentage who indicated that they have actually noticed water pollution (18.9%). Stormwater runoff from roads, parking lots and other impermeable surfaces, land clearing on steep slopes for logging or development, septic systems, and clearing for development or other activities too close to surface waters were the most frequently reported causes of surface water problems.

The final question asked landowners to indicate which tools they feel are appropriate for protecting the River and its resources. Of the sample as a whole, more than half indicated a desire for increased landowner education (60.9%), more incentives for landowners to voluntarily manage land appropriately (59.6%), and increased education of local officials (53.0%). Stronger local (19.9%) and state (16.6%) regulations were the least popular options. Only 7.9% indicated that no change was needed.

A similar pattern was seen when responses of the group of respondents who indicated the land was used as their primary residence were examined separately.

FIGURE 2



COMPLETE SURVEY RESULTS

1. In which town or towns below do you own property and approximately how many acres do you own there?

169 Responses

39.6%	a. Acworth (avg. 93 acres)	11.8%	d. Lempster (avg. 40 acres)
31.4%	b. Alstead (avg. 12 acres)	1.8%	e. Unity (avg. 10 acres)
16.0%	c. Langdon (avg. 59 acres)	14.8%	f. Walpole (avg. 5 acres)

2. Do you own land that the Cold River runs through or abuts?

166 Responses

33.7% Yes 66.3% No

3. How long have you owned your property near the Cold River?

165 Responses

avg. 22 Years

4. Did the River play a role in your decision to purchase your property?

168 Responses

29.2% Yes 48.2% No 22.6% Not applicable, not involved in the decision to purchase

If yes, how?

Water is good
Fishing and recreation. (Responses = 21)
Unspoiled waterway and natural surrounding woodlands.
Eventual site for vacation and retirement homes.
Price of land was an ultimate factor in purchase.
Have always enjoyed it, however, "Deep Hole" in back of the house is a headache - too many out-of-towners swimming.
I like the river.
Water availability.
Nice location.
Unspoiled beauty and nearness to Walpole, NH
Scenic Quality. (Responses = 9)
It made the land more appealing.
As a buffer at the rear of our property.
But not a substantial role as if does not come near the house.
Scenic & Ecologically interesting.
It made a nice camp site close to home.
Contributing to general aesthetic ambiance of the area.
To build a home.
Privacy. (Responses = 2)
Asked to buy it.
Have always loved Cold River and wanted to live by it.
Peaceful and water activities.
At Crescent Lake.
Because I wanted an old mill and of course the river.
We wanted water on our property, Honey Brook which is actually on our property feeds into Cold River.

5. What is the present use(s) of your property? Please check up to three answers.

168 Responses

68.5%	a.	Primary residence
13.7%	b.	Second or vacation home
8.9%	c.	Rental property
11.3%	d.	Farming
13.1%	e.	Forestry
4.8%	f.	Commercial/Industrial
17.9%	g.	Recreation
7.7%	h.	Investment
14.9%	I.	Conservation
16.1%	j.	Idle
3.0%	k.	Other:

Haying and Maple syrup
To raise four boys in the country.
Masonic Lodge Recreation.
Inheritance.
Camping.

6. What plans do you have for your property in the future? Please check up to three answers.

168 Responses

82.7%	a.	Continue present uses as listed above
4.1%	b.	Build primary residence
1.8%	c.	Build seasonal residence
1.2%	d.	Subdivide
1.2%	e.	Business development
19.0%	f.	Conserve or protect some or all from development
40.5%	g.	Keep in family
12.5%	h.	Sell as whole parcel
3.6%	I.	Other:

Might divide into 2 house lots.
Not sure.
I am taxed as if it's a building site.
Possibly revert to single family dwelling.
Recreation.

7. Do you permit public access for recreation across your property?

165 Responses

38.6%	Yes
5.4%	Yes, but considering restricting in future
15.1%	No
40.4%	Not really applicable to my property

8. Have you been affected by any of the following problems related to public use of the Cold River on or near your property? Please check as many as apply.

160 Responses

10.6%	a.	Failure to respect "No Trespassing" signs
6.9%	b.	Crop or woodland damage
32.5%	c.	Littering or illegal dumping
9.4%	d.	Noise
6.3%	e.	Vandalism
3.1%	f.	Overuse
1.3%	g.	Fire
8.8%	h.	Rowdy behavior
7.5%	I.	Erosion of riverbank
27.5%	j.	No problems
33.1%	k.	Not really applicable to my property
5.6%	l.	Other:

Someone broke down beaver dam at south end of property.
Failure to respect "Safety zone"and "non-motorized vehicle" signs.
Person setting up deer stands without permission.
Pollution of water due to salt shed. Water feeds onto Cold River. (Responses = 2)
Constant persistence by F M realty or owner to subdivide near us
"Theft".

9. Please circle that which best represents your opinion of the importance of each of the following characteristics associated with the Cold River and the lands along it.

	Low	Medium	High	No Opinion	N
a. Agricultural lands	10.9%	21.8%	55.1%	11.6%	147
b. Forest lands	4.1%	15.6%	70.7%	9.5%	147
c. Business development opportunity	73.8%	7.1%	8.5%	10.6%	141
d. Residential development opportunity	54.6%	23.4%	12.8%	9.2%	141
e. Fishing access	6.5%	30.3%	59.2%	3.9%	152
f. Hunting access	27.0%	29.7%	38.0%	6.8%	148
g. Boating access	45.8%	29.6%	16.2%	7.4%	142
h. Swimming access	1.6%	32.7%	46.0%	5.3%	150
I. Scenic quality	2.6%	11.8%	80.3%	5.3%	152
j. Good water quality	1.3%	8.4%	87.0%	3.2%	154
k. Free-flowing river (unimpeded by manmade dams)	16.0%	8.0%	70.0%	6.0%	150
l. Wildlife and waterfowl habitat	2.5%	12.1%	80.9%	4.5%	157
m. Fisheries habitat	3.4%	17.4%	72.5%	6.7%	149
n. Wetlands	8.1%	20.3%	63.5%	8.1%	148
o. Historical/cultural sites	21.6%	24.3%	43.2%	10.8%	148

P. Other:

Kayaking (low) & high quality natural trout fishery (high).
Walking access. (High)
Stage coach rides on my property/ Stage coach use to run from Boston to Bellows Falls VT.
Land owner priority. (High)
Leaving it alone. (High)
It would be nice for the area not to be over-developed to keep it at its present state - a "haven" for those who appreciate the wilderness.
Leave Villas Dam alone.

10. What recreational activities do you or other members of your household enjoy on or along the Cold River?

169 Responses

53.8%	a. Fishing	60.9%	h.	Hiking/walking
24.3%	b. Hunting	29.0%	I.	Bicycling
18.9%	c. Canoeing or kayaking	47.3%	j.	Swimming
54.4%	d. Bird/wildlife watching	56.8%	k.	Sight-see when driving
28.4%	e. Nature photography	50.3%	I.	Sitting by the river
23.1%	f. Cross country skiing	13.6%	m.	None
18.3%	g. Snowmobiling		n.	Other:

Camping.
Picnicking-Villas Pool.
Wading.
Monthly meetings Masonic Lodge.
Horseback riding. (Responses = 2)
Restoring my spirits.
Snorkeling, surfing, electric boats, rock hunting, insect observation.

11. For each of the following, please circle the answer which would enhance your ability to enjoy the recreational activities such as those listed above.

	Decrease	No Change	Increase	No Opinion	N
a. Public access	12.9%	57.6%	19.4%	10.1%	139
b. Fish stocking	2.1%	52.1%	36.6%	9.2%	142
c. Publicly-owned riverfront property	19.5%	36.1%	27.8%	16.5%	133
d. Private property owners allowing the public to have access across their property	11.0%	43.4%	26.5%	19.1%	136
e. Parking at publicly-owned riverfront property	15.7%	44.0%	23.9%	16.4%	134
f. Maintenance of public accesses	5.2%	42.5%	34.3%	17.9%	134
g. Walking/skiing trails	4.3%	38.4%	47.8%	9.4%	138
h. Snowmobile trails	23.4%	42.3%	16.8%	17.5%	137
I. Shoreline development	45.3%	33.6%	9.5%	11.7%	137

j. Other

Camping. (No change)
Bike trails.
Help towns prevent river bank erosion. (Increase)
Rip/Rap. (Increase)
I have no info on public access in my area. A written map or guide would be helpful.
Items A through J = "control it"
Trail bike. (Increase)
Keep ATV's away.

12a. Have you noticed any of the following trends along the River? Please check as many as apply.

149 Responses

8.7%	a.	Excessive or unusual flooding
20.8%	b.	Excessive erosion/sedimentation
18.9%	c.	Water pollution
5.4%	d.	Loss of or damage to historical or cultural sites
20.1%	e.	Loss of farmland to development
22.8%	f.	Loss of forestland to development
18.1%	g.	Inadequate public access
41.6%	h.	Recreation abuses, for example rowdy behavior or litter
11.4%	I.	Loss of wetlands

Friends of the Cold River

Summer 1999

Dear Landowner in the Cold River Corridor:

You are receiving this survey if you own property within 1/4 mile of either side of the Cold River. The survey is being sent by the Friends of the Cold River in collaboration with the Upper Valley Lake Sunapee Regional Planning Commission. We are seeking your input and interests on the recreational, educational, and water quality issues pertaining to the Cold River.

We would like to know how landowners feel about a number of issues, thus are sending a survey to each of the following groups of people:

- All landowners within 1/4 mile on each side of the Cold River. (The river "corridor")
- All landowners of 10 acres or more in each town that touches the Cold River.
- All landowners within 1/4 mile of Crescent Lake, the Cold River's headwaters.

You may receive more than one survey. If you do, **please respond to each one**, for each has a different focus despite overlap on several questions. You are the critical partner in a healthy river, for without your historic good care of the lands closest to the river, the Cold River would not be the healthy and diverse river that it is.

Please return your survey in the **enclosed stamped envelope within two weeks**. The Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) will tabulate and analyze the survey responses. All responses are, and will remain, anonymous.

The Cold River area is served by both the UVLSRPC in Lebanon and the Southwest Region Planning Commission in Keene, both of whom support this project. Each of these planning commissions has been an instrumental partner with the Friends of the Cold River as we have successfully nominated the river for inclusion in the NH Rivers Management and Protection Program. The UVLSRPC was our primary assistant in the preparation of the nomination application and accompanying information. The Cold River nomination was passed by the NH legislature in late April of this year and a Local Advisory Committee will soon be formed to develop voluntary management plans for the care of the river in each of the towns it flows through.

Thank you very much for taking the time to complete this survey. If you would like to be involved with the work of the Friends of the Cold River, please contact me at the address listed below or at dhinman@sover.net.

Sincerely,

Deborah Hinman, Chair
Friends of the Cold River, PO Box 26, Acworth, NH 03601

COLD RIVER CORRIDOR QUESTIONNAIRE - SUMMER 1999

1. In which town or towns below do you own property and approximately how many acres do you own there?

____ a. Acworth _____acres
____ b. Alstead _____acres
____ c. Langdon_____acres
____ d. Lempster_____acres
____ e. Unity _____acres
____ f. Walpole _____acres

2. Do you own land that the Cold River runs through or abuts? ____ Yes ____ No

3. How long have you owned your property near the Cold River? ____ Years

4. Did the River play a role in your decision to purchase your property?

____ Yes ____ No ____ Not applicable, not involved in the decision to purchase

If yes, how? _____

5. What is the present use(s) of your property? *Please check up to <u>three</u> answers.*

____ a. Primary residence
____ b. Second or vacation home
____ c. Rental property
____ d. Farming
____ e. Forestry
____ f. Commercial/Industrial
____ g. Recreation
____ h. Investment
____ i. Conservation
____ j. Idle
____ k. Other (please specify) _____

6. What plans do you have for your property in the future? *Please check up to <u>three</u> answers.*

____ a. Continue present uses as listed above
____ b. Build primary residence
____ c. Build seasonal residence
____ d. Subdivide
____ e. Business development
____ f. Conserve or protect some or all from development
____ g. Keep in family
____ h. Sell as whole parcel
____ i. Other (please specify) _____

7. Do you permit public access for recreation across your property?

____ Yes ____ Yes, but considering restricting in future ____ No ____Not really applicable to my property

8. Have you been affected by any of the following problems related to public use of the Cold River on or near your property? *Please check as many as apply.*

____ a. Failure to respect "No Trespassing" signs
____ b. Crop or woodland damage
____ c. Littering or illegal dumping
____ d. Noise
____ e. Vandalism
____ f. Overuse
____ g. Fire
____ h. Rowdy behavior
____ i. Erosion of riverbank
____ j. No problems
____ k. Not really applicable to my property
____ l. Other (please specify) _____

9. Please *circle* that which best represents your opinion of the importance of each of the following characteristics associated with the Cold River and the lands along it.

a.	Agricultural lands	*Low*	*Medium*	*High*	*No Opinion*
b.	Forest lands	*Low*	*Medium*	*High*	*No Opinion*
c.	Business development opportunity	*Low*	*Medium*	*High*	*No Opinion*
d.	Residential development opportunity	*Low*	*Medium*	*High*	*No Opinion*
e.	Fishing access	*Low*	*Medium*	*High*	*No Opinion*
f.	Hunting access	*Low*	*Medium*	*High*	*No Opinion*
g.	Boating access	*Low*	*Medium*	*High*	*No Opinion*
h.	Swimming access	*Low*	*Medium*	*High*	*No Opinion*
i.	Scenic quality	*Low*	*Medium*	*High*	*No Opinion*
j.	Good water quality	*Low*	*Medium*	*High*	*No Opinion*
k.	Free-flowing river (unimpeded by manmade dams)	*Low*	*Medium*	*High*	*No Opinion*
l.	Wildlife and waterfowl habitat	*Low*	*Medium*	*High*	*No Opinion*
m.	Fisheries habitat	*Low*	*Medium*	*High*	*No Opinion*
n.	Wetlands	*Low*	*Medium*	*High*	*No Opinion*
o.	Historical/cultural sites	*Low*	*Medium*	*High*	*No Opinion*
p.	Other (please specify)_____	*Low*	*Medium*	*High*	*No Opinion*

please continue on to side 2

10. What recreational activities do you or other members of your household enjoy on or along the Cold River? *Please check off as many as apply.*

____ a. Fishing
____ b. Hunting
____ c. Canoeing or kayaking
____ d. Bird/wildlife watching
____ e. Nature photography
____ f. Cross country skiing
____ g. Snowmobiling
____ h. Hiking/walking
____ i. Bicycling
____ j. Swimming
____ k. Sight-see when driving
____ l. Sitting by the river
____ m. None
____ n. Other (please specify) _____

11. For each of the following, please *circle* the answer which would enhance your ability to enjoy the recreational activities such as those listed above.

a. Public access	*Decrease*	*No Change*	*Increase*	*No Opinion*
b. Fish stocking	*Decrease*	*No Change*	*Increase*	*No Opinion*
c. Publicly-owned riverfront property	*Decrease*	*No Change*	*Increase*	*No Opinion*
d. Private property owners allowing the public to have access across their property	*Decrease*	*No Change*	*Increase*	*No Opinion*
e. Parking at publicly-owned riverfront property	*Decrease*	*No Change*	*Increase*	*No Opinion*
f. Maintenance of public accesses	*Decrease*	*No Change*	*Increase*	*No Opinion*
g. Walking/skiing trails	*Decrease*	*No Change*	*Increase*	*No Opinion*
h. Snowmobile trails	*Decrease*	*No Change*	*Increase*	*No Opinion*
i. Shoreline development	*Decrease*	*No Change*	*Increase*	*No Opinion*
j. Other (please specify) _____	*Decrease*	*No Change*	*Increase*	*No Opinion*

12a. Have you noticed any of the following trends along the River? *Please check as many as apply.*

____ a. Excessive or unusual flooding
____ b. Excessive erosion/sedimentation
____ c. Water pollution
____ d. Loss of or damage to historical or cultural sites
____ e. Loss of farmland to development
____ f. Loss of forestland to development
____ g. Inadequate public access
____ h. Recreation abuses, for example rowdy behavior or litter
____ i. Loss of wetlands
____ j. Loss of wildlife habitat
____ k. Loss of fish habitat
____ l. Destruction of or injury to critical environmental areas
____ m. Building too close to the River or tributaries
____ n. Clearing too close to the River or tributaries
____ o. Other (please specify) _____
____ p. None

12b. In the list above, please now go back and circle the <u>three</u> you are the most concerned about.

13. For each activity listed below which you feel is an actual or potential surface water quality problem in the Cold River area, please write a **1**, **2**, or **3** to indicate the severity of the problem.
Please use a **1** *to indicate you are aware of this activity being conducted in a manner which may have the <u>potential</u> to impair surface water quality;*
a **2** *to indicate you are aware of <u>some</u> surface water quality impairment resulting from this activity;*
a **3** *to indicate you are aware of <u>much</u> (widespread or serious) surface water quality impairment resulting from this activity.*
Leave blank if you are not aware of any problems associated with the activity.

____ a. Stormwater runoff from roads, parking lots and other impermeable surfaces
____ b. Land clearing on steep slopes for logging or development
____ c. Stormwater runoff from farmlands
____ d. Septic systems
____ e. Clearing for development or other activities too close to surface waters
____ f. Boating, due to shoreline erosion, oil & gas, stirring up of sediments, nonnative species
____ g. Impairment of the ability of wetlands to "filter" pollutants, by dredging, draining, or filling
____ h. Activities or objects too close to the river's edge resulting in downstream litter or pollution
____ i. Other_____

14. Which of the following do you feel are appropriate for protecting the Cold River and the resources associated with it? *Please check off as many as apply.*

____ a. Increased landowner education
____ b. Increased education of local officials
____ c. Increased conservation planning in utility and highway projects
____ d. Coordination of planning among watershed towns
____ e. Stronger local regulations
____ f. Stricter enforcement of existing local regulations
____ g. Stronger state regulations
____ h. Stricter enforcement of existing state regulations
____ i. More incentives for landowners to voluntarily manage land appropriately
____ j. Permanent protection for sensitive areas through conservation easements by landowner
____ k. Permanent protection for sensitive areas through aquisition from willing landowners
____ l. Limit dam construction
____ m. Other (please specify) _____
____ n. No change

Thank you for completing this questionnaire! Please include any additional information you feel would assist the Friends of the Cold River to develop priorities for future activities on a separate sheet of paper.

The Friends of the Cold River wish to thank Upper Valley Lake Sunapee Regional Planning Commission, NH Department of Environmental Services, UNH Cooperative Extension, and the Silvio O. Conte National Fish and Wildlife Refuge for their support for this survey.

MICE

U V L S R P C

Cold River Area Landowner Survey

Summer 1999

A cooperative effort of UNH Cooperative Extension,
Friends of the Cold River, and Upper Valley Lake
Sunapee Regional Planning Commission

Funded by
US Fish & Wildlife Service
Silvio O. Conte
National Fish & Wildlife Refuge

INTRODUCTION

During the summer of 1999, Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) conducted a survey of the owners of ten acres or more in six Cold River area towns: Acworth, Alstead, Langdon, Lempster, Unity and Walpole. The purpose of the survey was primarily to assist the UNH Cooperative Extension in identifying areas where future landowner education is most needed and determining what medium is most effective for providing information to landowners. Coupled with a survey of landowners within a quarter-mile of the Cold River conducted at the same time, and a future survey of owners around the River's headwater, Crescent Lake, the survey also provides a basis for future planning efforts of the Friends of the Cold River, the local river advisory committee forming under the NH Rivers Management and Protection Program, and the two regional planning commissions serving the area, UVLSRPC and Southwest Region Planning Commission.

The survey questions were developed through a cooperative effort of UNH Cooperative Extension and the Friends of the Cold River with assistance from UVLSRPC. The landowner name and address database was compiled by UNH Cooperative Extension from the most recent town tax records. Funding was provided through the US Fish & Wildlife Service Silvio O. Conte National Fish & Wildlife Refuge. Many hours of volunteer effort were provided by the Friends of the Cold River to prepare the surveys for mailing, and by volunteers associated with UVLSRPC to open and prepare the responses for coding.

This report includes a summary of results, detailed results, and a copy of the survey and cover letter which landowners received.

SUMMARY OF RESULTS

Surveys were sent to the 1,471 owners of land parcels ten acres or larger and 466 replied, for a response rate of 31.7%. Responses were fairly well distributed across the six communities.

TABLE 1

Community	Number of Responses*
Acworth	106
Alstead	117
Langdon	40
Lempster	59
Unity	93
Walpole	66

*Totals to more than 466 due to several owners with land in more than one community.

More than half of respondents (61.5%) own less than 50 acres in the Cold River area. The average respondent has owned the property for about 20 years and has a positive view of the area; 64.9% responded that they felt the overall quality of life was excellent or very good in the Cold River area. Only 6.8% felt it was fair or poor.

TABLE 2

Size of Ownership	% of Respondents
Less than 20 acres	29.7%
20-49 acres	31.8%
50-99 acres	17.4%
100-149 acres	10.3%
150-199 acres	4.6%
200+ acres	6.2%

For the majority of respondents (59.6%), the Cold River area property is their primary residence. Almost half of those who live in other NH communities live in either Charlestown, Claremont, Newport or Keene. Almost as many respondents reported that Connecticut was their primary residence (46) as reported living in NH communities outside of the study area (49); 24 respondents live in Massachusetts, 14 in other New England states, and 35 in other regions.

Several other uses in addition to primary residence were strongly reflected in the survey results. Open space (e.g., wildlife habitat) was indicated by 57.2% of respondents, forestry by 41.3%, and recreation by 37.4%. Most respondents (83.7%) indicated that they plan to continue their present uses of the property. Almost half (49.6%) plan to keep it in the family. More than a third (36.5%) plan to conserve or protect some or all from development. A significantly larger number of respondents plan to sell as a whole parcel rather than plan to subdivide (18.0% vs. 4.6%).

More than three-quarters (77.7%) of respondents permit public access across their property; more than a third of these either have, or are considering, some restrictions. Almost half of respondents (46.5%) reported that they have been affected by no problems related to public use of their, or nearby, land. Almost one-third (32.4%) reported that they have been affected by littering.

Popular local recreational activities among survey respondents and their households include hiking/walking (77.5%), bird/wildlife watching (65.1%), swimming (48.1%), cross-country skiing/snowshoeing (46.6%), and fishing (45.3%). Only 4% of respondents indicated that they do not participate in any local recreational activities.

Less than a fifth (19.3%) of survey respondents indicated that they have a written management plan for their farm or forest lands. Although the sample size is relatively small in the larger parcel size categories (due to a larger number of small parcels), there appears to be a relationship between the size of the ownership and the development of a management plan; approximately half of respondents who own 100 acres or more reported that they do have a management plan.

TABLE 3

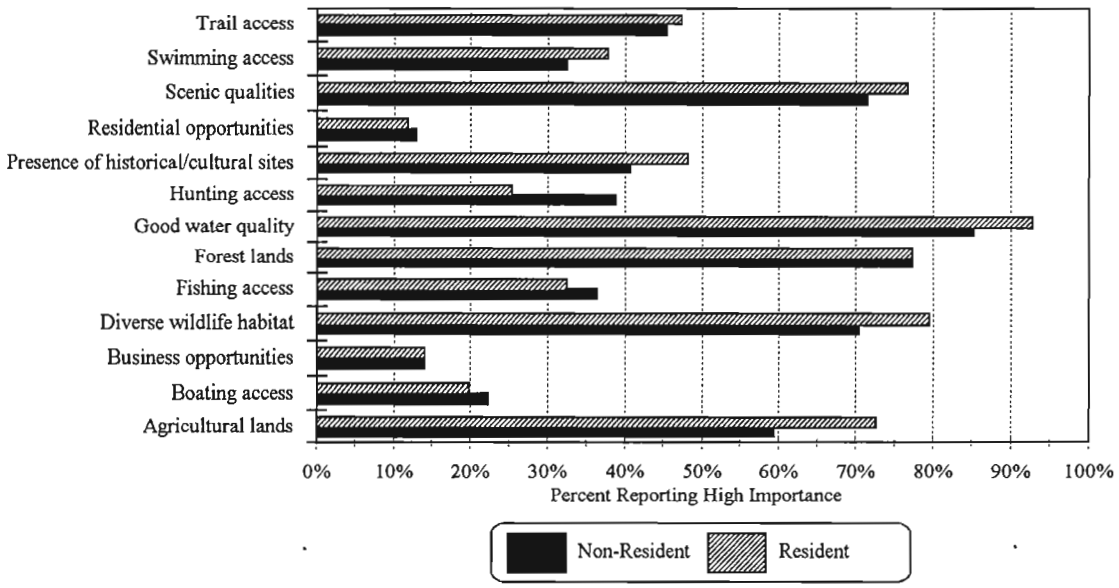
Size of Ownership	% of Respondents in Each Size Category with Management Plan
Less than 20 acres	4.7%
20-49 acres	11.0%
50-99 acres	22.4%
100-149 acres	48.0%
150+ acres	52.2%

Only one-third of respondents without a written management plan indicated that they would not be interested in guidance to develop a management plan (24.7 said yes, 41.9% not sure). More than half (58.9%) responded that they are not aware of existing BMP's. Responses were mixed relative to knowledge of where to find professional assistance with land management; a bit less than half (45.1%) responded that they did know where to find assistance, a third (33.0%) that they did not, and 21.9% are not always sure.

Landowners were asked their level of interest in a variety of topics related to the management of their land. Over half of respondents expressed a high level of interest in maintaining the land's natural beauty, protecting streams and wetlands, protecting the land from development, identifying and maintaining wildlife habitat, and identifying/maintaining stone walls and other cultural resources. Interest was lowest in growing horticultural products, improving animal or crop production, and improving production of syrup and other forest products.

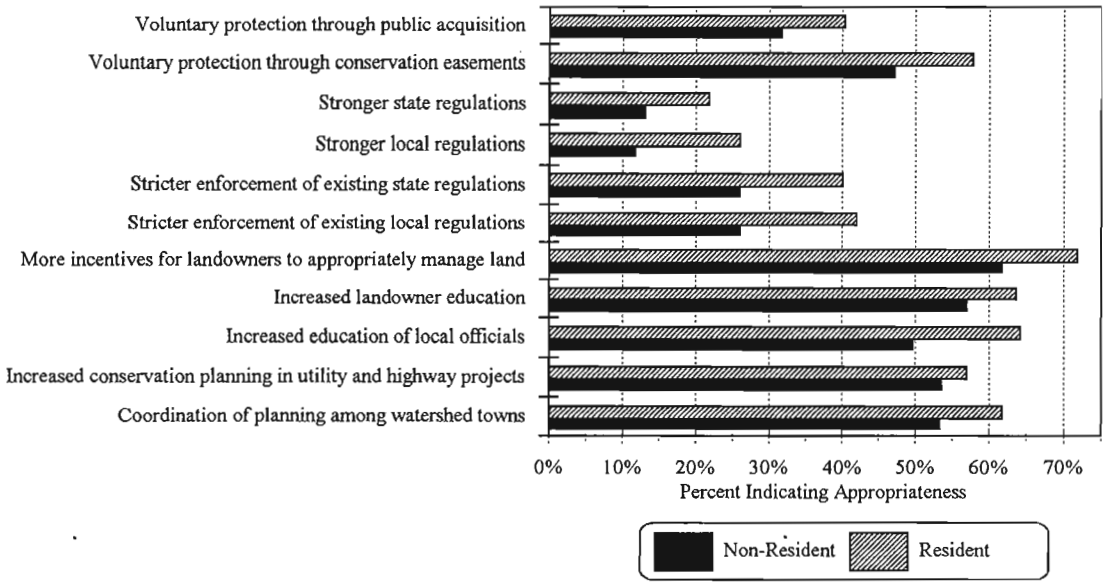
The survey also asked for recipients' opinions of the importance of a variety of characteristics related to the "quality of life" in the Cold River area in general. More than half noted the high importance of agricultural lands, diverse wildlife habitat, forest lands, good water quality, and scenic qualities. Business opportunities and residential opportunities were the characteristics most frequently indicated as being of low importance. The same patterns were seen in the responses of those that indicated that they used their land as their primary residence and those that did not.

FIGURE 1



Recipients were asked for their opinions of the appropriateness of a variety of methods for protecting the area's natural resources. The most favored option was more incentives for landowners to voluntarily manage land appropriately, followed by increased landowner education, increased education of local municipal officials, and coordination of planning among watershed towns. Other options receiving "high" appropriateness ratings from a majority of respondents were increased conservation planning in utility and highway projects and voluntary protection through conservation easements. Again, very similar results were seen in the responses of residents and non-residents.

FIGURE 2



The survey closed with several questions about how best to get natural resource and land management information out to landowners. Almost three-quarters of respondents indicated that they generally find out about upcoming events in the local newspaper. Thirty-five people wrote in that they hear about things by "word of mouth" from friends, family or neighbors. The preferred method for learning about information is newsletters (67.5%). For those interested in attending workshops, weekends and evenings are preferred to weekdays.

COMPLETE SURVEY RESULTS

1. In which town or towns below do you own property and approximately how many acres do your own there?

466 Responses

	% of respondents by community	average size
a) Acworth	22.7%	60 acres
b) Alstead	25.1%	78 acres
c) Langdon	8.6%	53 acres
d) Lempster	12.7%	79 acres
e) Unity	20.0%	76 acres
f) Walpole	14.2%	56 acres

2. How would you rate the OVERALL quality of life in the Cold River area in which your property is located?

410 Responses

Excellent	Very good	Good	Fair	Poor
25.1%	39.8%	28.3%	6.1%	0.7%

3. How long have you owned property in the Cold River region?

445 Responses

Average 20.7 Years

4. If your permanent residence is not in one of the towns listed above, where is it?

In another NH town. If so, which one?

49 Responses

Antrim	1	Nashua	1
Charlestown	6	New London	1
Claremont	7	Newport	4
Concord	1	Nottingham	1
Deerfield	1	Salem	1
Francetown	2	Sandown	1
Goshen	1	Sharon	1
Henniker	2	Springfield	1
Hillsboro	1	Sunapee	1
Hollis	1	Surry	1
Keene	4	Washington	1
Lebanon	1	Webster	1
Litchfield	1	Westmoreland	1
Marlow	2	Wilton	1
Merrimack	1		

Out of state. If so, which one?

119 Responses

Arizona	1	New Jersey	7
California	2	New York	9
Colorado	2	North Carolina	1
Connecticut	46	Oklahoma	3
Florida	3	Rhode Island	6
Hawaii	1	Vermont	5
Illinois	1	Virginia	1
Maine	3	Virgin Islands	1
Maryland	1	West Virginia	1
Massachusetts	24		
Missouri	1		

5. What is the present use of your property in the Cold River area? Please check the four most important uses.

460 Responses

a.	59.6%	Primary residence
b.	14.1%	Second or vacation home
c.	5.7%	Rental property
d.	17.6%	Farming
e.	41.3%	Forestry
f.	3.5%	Commercial/Industrial
g.	16.1%	Investment purposes
h.	37.4%	Recreation
i.	57.2%	Open Space (e.g., wildlife habitat)
j.	11.3%	Other:

1) Site for future vacation and retirement home.(Responses=6)
2) Future residence.(Responses=7)
3) Woodlot.(Responses = 3)
4) Place to do creative work; also gardening.
5) Gardening, eventually- possibly chicken flock.
6) Hunting (Responses = 6)
7) Been in family for years.(Responses = 2)
8) Camping & Shooting.
9) Biological Riches sink/source.
10) Home/office business.(Responses = 2)
11) Breeding horses.
12) Seasonal camp.
13) Land in Walpole willed to me & sister by parents. We lived in Walpole since 1943. My father's family lived in Walpole since the mid 19th century.
14) Tree wood for house and greenhouse.
15) Large garden.
16) Wetlands conservation.
17) 25 Apple trees and 200 Blueberry Bushes
18) Hobby farm.
19) Christmas Tree farm.
20) Pasture; wood for heating.
21) For my privacy.
22) A peaceful and beautiful retreat! (Responses = 2)
23) Pasture for livestock.
24) Gravel pit (sand).
25) Gardening.(Responses=5)
26) Bed & Breakfast Lodge.
27) Educational institute.
28) Horse boarding.
29) 27 Acres current land use.
30) Greenhouses.
31) Firewood for stove use. Preserve nature plants, flowers and garden and just general enjoyment of retirement.

6. What plans do you have for your property in the future? Please check up to four answers.

460 Responses

a.	83.7%	Continue present uses as listed above
b.	7.6%	Build primary residence
c.	2.8%	Build seasonal residence
d.	5.0%	Develop a business
e.	36.5%	Conserve or protect some or all from development
f.	49.6%	Keep in family
g.	4.6%	Subdivide
h.	18.0%	Sell as whole parcel
i.	3.3%	Other:

1) Use as primary residence
2) Make more suitable for wildlife.
3) Wildlife refuge.(Responses = 3)
4) Maybe donate to conservancy.
5) Certified tree farm in current use.
6) Sell main home.
7) Acquire additional open land.(Responses = 2)
8) Acquire additional open land. (Responses =2)
9) Farm - animals i.e., steer.
10) Building camp. (Responses = 2)
11) We are retired and residence might have to be sold at some point.
12) Conserve the land for agriculture.
13) Try to keep the neighbors zoo up on his own property NOT MINE!
14) Live and let live.
15) Just enjoy it.
16) Possibly use for agricultural purposes.
17) Add some trailers.
18) Sustained yield forestry.

7. Do you permit public access across your property?

449 Responses

48.1%	Yes
22.9%	Yes, but with restrictions
6.7%	Yes, but considering future restrictions
22.3%	No

8. Have you been affected by any of the following problems related to public use of the lands on or near your property? Please check as many as apply.

441 Responses

a.	7.0%	Crop or woodland damage
b.	3.9%	Erosion of streambanks
c.	12.7%	Failure to respect "No Trespassing" signs
d.	2.3%	Fire
e.	32.4%	Littering
f.	12.2%	Noise
g.	1.8%	Overuse
h.	6.3%	Rowdy behavior
i.	15.0%	Vandalism
j.	46.5%	No problems
k.	13.8%	Other:

1) Theft of camping equipment.
2) Crossing boundary lines when property next door was logged. Trees on my property cut.
3) Traffic on woods road.
4) Someone broke down a beaver dam.
5) Respect the "no wheel vehicle signs"
6) Dangerous hunting practices.(Responses = 6)
7) Someone stole trout from private pond.
8) Damage to stone walls (by town highway dept.)
9) Erosion from road bed.
10) Light pollution of night sky from outdoor lighting of neighbors property.
11) Snowmobile trails cleared without permission.
12) Theft. (Response = 7)
13) Hunting without permission.
15) Unauthorized logging.(Responses = 3)
16) By the road washing out.
17) FWW salt storage shed is polluting my spring water & running off onto Cold River.
19) Extensive beaver damage.
20) Jolly Roger Track.
21) ATV vehicles and four wheel drives going through fields.
22) Take down "Tree Farm" signs.
23) Failure to respect " Safety Zone" & "No motorized vehicle".
24) New houses.
25) Destruction of fences.
26) Occasional lack of respect and abuse of privilege.
27) Close.development (trailers) harassing livestock, etc.
28) Lack of town records or poor information.
29) Comm. land clearing nearby 200+ acres.
30) Unauthorized camping.
31) Seeing more people in the area!.
32) Stolen Christmas trees - one or two chopped down and taken off without permission.
33) Barking dogs.
34) Road damage from storms.
35) House broken into.
36) Block driveway.
37) Damage to bushes from snowmobiles.

9. What local recreational activities do you or other members of your household enjoy? Please check as many as apply.

453 Responses

a.	45.3%	Fishing	j.	48.1%	Swimming
b.	32.5%	Hunting	k.	29.1%	Bicycling
c.	37.3%	Canoeing or kayaking	l.	17.4%	Mountain biking
d.	9.7%	Motor boating	m.	12.8%	All terrain (motorized) vehicles
e.	65.1%	Bird/wildlife watching	n.	10.2%	Other (see below)
f.	25.8%	Nature photography	o.	4.0%	None
g.	46.6%	Cross country skiing/snowshoeing			
h.	18.5%	Snowmobiling			
i.	77.5%	Hiking/walking			

1) Camping.(Responses = 7)
2) Horseback riding.(Responses = 16)
3) Skiing.
4) Sitting out by the river.
5) Art.
6) Picking berries.
7) Running.
8) T.S.I.
9) Roller Blading.
10) Skiing down hill.
11) Target Shooting.(Responses = 2)
12) Gardening.(Responses = 7)
13) Bridge competition & Golf.
14) Tree farming.
15) Mule Riding.
16) "Sittin' n Rockin'."
17) 3-D Bow Shooting.
18) Drawing / Painting etc.
19) Wild garne.
20) Peace and Quiet.
21) Golf.

10. Do you have a written management plan for your farm or forest lands?

455 Responses

19.3% Yes 41.2% No 14.5% Not applicable 2.4% Don't know

11. If not, would you be interested in guidance in developing a management plan?

360 Responses

24.7% Yes 33.3% No 41.9% Not sure

12. Are you aware of existing agricultural and forestry Best Management Practices (BMP's) guidelines?

445 Responses

24.5% Yes 58.0% No 17.5% Not sure

13. Do you know where to find the appropriate professional assistance in managing your lands?

448 Responses

45.1% Yes 33.0% No 21.9% Not always sure

14. Which of the following would be of interest to you for your lands? Please place checks in the column that best describes your level of interest in these topics for your land.

	Low	Medium	High	Not Sure	*N*
a. Grow horticultural products	44.6%	24.2%	23.5%	7.6%	*327*
b. Identify and maintain wildlife habitat	6.7%	22.0%	68.9%	2.3%	*386*
c. Identify/maintain stone walls & other cultural resources	13.3%	32.8%	50.4%	3.5%	*369*
d. Improve animal or crop production	47.7%	24.6%	22.8%	4.8%	*333*
e. Improve production of syrup/other forest products	42.7%	31.2%	22.1%	3.9%	*330*
f. Improve the soils	25.8%	36.2%	34.4%	3.7%	*326*
g. Improve timber/firewood production	22.1%	31.4%	43.6%	2.9%	*344*
h. Leave it alone: no management activities planned now	30.1%	18.2%	39.6%	12.2%	*336*
i. Maintain the land's natural beauty	3.1%	11.6%	83.5%	1.8%	*387*
j. Not sure what to do/Not applicable	47.3%	11.7%	12.8%	28.2%	*188*
k. Protect from development	8.2%	13.6%	73.1%	5.1%	*376*
l. Protect streams and wetlands	3.3%	14.8%	79.8%	2.2%	*366*

m. Other:

1) Improve wetlands on property. (Medium)
2) Visual landscape. (High)
3) Tree Farming. (High)
4) Control growth.(High)
5) Prevent roads and development (High)
6) Small government bureaucracy. (High)
7) Keep taxes down. (High)(Responses = 3)
8) Privacy. (High)(Responses = 3)
9) Clearing brush and trees. (High)
10) Create nature preserve. (High) (Responses =3)
11) Solve the zoo problem.(High)
12) Gardening organic w/companion planting; No pesticides it really works.(High)
13) Development on land and connecting to others.(Medium)

15. Please place a check in the column that best represents how important these characteristics are to you for the "quality of life" associated with your Cold River area town.

	Low	Medium	High	No Opinion	*N*
a. Agricultural Lands	7.4%	19.2%	67.5%	5.9%	*391*
b. Boating access	39.9%	30.6%	20.5%	9.0%	*366*
c. Business opportunities	48.3%	29.7%	13.9%	8.1%	*360*
d. Diverse wildlife habitat	2.6%	18.4%	75.8%	3.3%	*392*
e. Fishing access	22.6%	36.4%	33.8%	7.2%	*376*
f. Forest lands	2.3%	17.1%	77.1%	3.5%	*398*
g. Good water quality	0.7%	6.7%	89.8%	2.9%	*420*
h. Hunting access	42.6%	23.0%	30.2%	4.2%	*378*
i. Presence of historical/cultural sites	11.1%	37.2%	45.1%	6.6%	*379*
j. Residential opportunities	48.8%	31.3%	12.1%	7.8%	*371*
k. Scenic qualities	2.5%	19.5%	74.5%	3.5%	*400*
l. Swimming access	21.0%	37.0%	35.6%	6.3%	*376*
m. Trail access	18.4%	30.6%	46.3%	4.8%	*376*
n. Other (Please specify)					

1) Privacy. (High)
2) Zoning Laws.(High)
3) Snowmobile trails.(High)

16. Which of the following options are appropriate for conserving land and the natural resources associated with it? Please place a check in the column that best represents your opinion of the appropriateness of these options for conservation.

	Appropriateness of these options in the Cold River area				
	Low	Medium	High	No Opinion	*N*
a. Coordination of planning among watershed towns	5.6%	24.1%	58.2%	12.1%	*373*
b. Increased conservation planning in utility and highway projects	8.2%	27.9%	55.4%	8.5%	*377*
c. Increased education of local municipal officials	5.1%	27.5%	58.4%	9.0%	*389*
d. Increased landowner education	5.4%	27.2%	60.7%	6.7%	*389*
e. More incentives for landowners to voluntarily manage land appropriately	4.0%	22.0%	67.8%	6.3%	*400*
f. Stricter enforcement of existing local regulations	19.1%	28.7%	35.4%	16.8%	*376*
g. Stricter enforcement of existing state regulations	20.5%	27.8%	34.3%	17.0%	*370*
h. Stronger local regulations	31.3%	30.2%	20.2%	18.3%	*361*
i. Stronger state regulations	33.1%	29.0%	18.4%	19.2%	*359*
j. Voluntary protection through conservation easements	8.4%	26.6%	53.3%	11.6%	*379*
k. Voluntary protection through public acquisition	19.3%	31.1%	36.7%	12.9%	*357*
l. Other (please specify)					

1) Enforce junkyard laws. (High)
2) Let federal government buy and manage. (High)
3) Leave it alone. (High)
4) Needs to be local, too many area specific things and property specific things in all areas of the state for blanket state regulations; besides like the EPA they get overdone and wind up restricting those who care and they're not conducive to getting people to work on environmental protection or conservation.
5) Some rural towns can't afford to grow.
6) Noise abatement. (High)

17. Where do you generally find out about upcoming events in your area? Check all that apply. Specify if you wish.

425 Responses

a. 74.6% Local daily or weekly newspaper
b. 9.2% Statewide newspaper
c. 31.1% Local newsletters
d. 29.2% Local radio station
e. 16.0% Local TV station
f. 42.1% Direct mailings
g. 30.4% Community bulletin boards
h. 4.0% The local library
i. 5.9% The internet
j. 12.9% Other _____

1) Newsletters like the NH Audubon.
2) Tree farm info (newsletter).
3) When we visit I usually grab one of the local news papers
4) Church.
5) Word of mouth.(responses = 34)
6) Local country store (Wills Place).
7) Weekly shoppers papers.
8) Cooperative Extension
9) "Space" issue.
10) Conservation committee meeting.
11) Wife.
12) Have not pursued.
13) Local shopper.
14) The Flea, Wicked Good, It's Classified.

18. How do you prefer to learn about natural resources and management information? Check all that apply.

434 Responses

a. 26.3% Workshops
b. 22.6% Books
c. 67.5% Newsletters
d. 40.0% Fact Sheets
e. 32.0% Individual contact with a professional
f. 24.4% Field trips with an experienced leader
g. 20.3% Meet informally with others of similar interests
h. 1.8% Other:_____
i. 11.8% Not really interested in this topic

1) Internet.
2) Very little time available at this time.
3) My education.
4) E-Mail.
5) Conservation commission.
6) Call other available local or state experts.
7) I'm open to suggestions.
8) Have not pursued.
9) Self taught.

19. When would you prefer to attend workshops or other information sessions?

287 Responses

a) 23.0% Weekdays b) 49.8% Evenings c) 42.5% Weekends

Friends of the Cold River

Unity, Lempster, Acworth, Alstead, Langdon, Walpole

Summer 1999

Dear Cold River Area Landowner:

You are receiving this survey if you own 10 or more acres within the towns that border the Cold River. The survey is being sent by the Friends of the Cold River in collaboration with UNH Cooperative Extension, Upper Valley Lake Sunapee Regional Planning Commission, and the US Fish and Wildlife Service Silvio O. Conte National Fish & Wildlife Refuge. We're seeking your input and interests on management, conservation, and educational opportunities related to the natural resources of the Cold River area.

We would like to know how landowners feel about a number of issues, thus are sending a survey to each of the following groups of people:

- All landowners within 1/4 mile on each side of the Cold River. (The river "corridor")
- All landowners of 10 acres or more in each town that touches the Cold River.
- All landowners within 1/4 mile of Crescent Lake, the Cold River's headwaters.

You may receive more than one survey. If you do, **please respond to all**, for each has a different focus despite overlap on several questions. You, a landowner, are the critical partner in a healthy watershed, for without your historic good care of the lands and waters in our region, the Cold River area would not be the healthy and diverse area that it is.

UNH Cooperative Extension, with their interest and expertise in caring for forest lands and other natural resources, has been of enormous help to us. If you'd like more information on managing your forest lands, wildlife habitats, and water resources, you may contact Extension directly at 1-800-444-8978 in addition to answering the survey.

Please return your survey in the **enclosed stamped envelope within two weeks.** The Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) will tabulate and analyze the survey responses. The Cold River area is served by both the UVLSRPC in Lebanon and the Southwest Region Planning Commission in Keene, both of whom support this project and the conservation activities within the Cold River area.

Thank you very much for taking the time to complete this survey. All responses are, and will remain, anonymous.

Sincerely,

Deborah Hinman, Acworth, NH
Chair, Friends of the Cold River

Partnerships between **UNH Cooperative Extension, Upper Valley Lake Sunapee Regional Planning Commission, US Fish & Wildlife Service Silvio O. Conte National Fish & Wildlife Refuge,** and the **Friends of the Cold River** have contributed to preparing, funding, and analyzing this survey and to other projects and events in the Cold River Watershed area.

COLD RIVER AREA LANDOWNER QUESTIONNAIRE: SUMMER 1999

1. In which town or towns below do you own property and approximately how many acres do you own there?
   a) Acworth (_____acres) d) Lempster (_____acres)
   b) Alstead (_____acres) e) Unity (_____acres)
   c) Langdon (_____acres) f) Walpole (_____acres)

2. How would you rate the OVERALL quality of life in the Cold River area in which your property is located?
   Excellent Very good Good Fair Poor

3. How long have you owned property in the Cold River region? _____ Years

4. If your permanent residence is not in one of the towns listed above, where is it?
   ___ In another NH town. If so, which one? _____
   ___ Out of state. If so, which one? _____

5. What is the present use of your property in the Cold River area? Please check the four most important uses.

   a) ___Primary residence
   b) ___Second or vacation home
   c) ___Rental property
   d) ___Farming
   e) ___Forestry
   f) ___Commercial/Industrial
   g) ___Investment purposes
   h) ___Recreation
   i) ___Open Space(e.g., wildlife habitat)
   j) ___Other (please specify)_____

6. What plans do you have for your property in the future? Please check up to four answers.

   a) ___Continue present uses as listed above
   b) ___Build primary residence
   c) ___Build seasonal residence
   d) ___Develop a business
   e) ___Conserve or protect some or all from development
   f) ___Keep in family
   g) ___Subdivide
   h) ___Sell as whole parcel
   i) ___Other (please specify)_____

7. Do you permit public access across your property?

   ____Yes ____Yes, but with restrictions ____Yes, but considering future restrictions ___No

8. Have you been affected by any of the following problems related to public use of the lands on or near your property? Please check as many as apply.

   a) ____Crop or woodland damage
   b) ____Erosion of streambanks
   c) ____Failure to respect "No Trespassing" signs
   d) ____Fire
   e) ____Littering
   f) ____Noise
   g) ____Overuse
   h) ____Rowdy behavior
   i) ____Vandalism
   j) ____No problems
   k) ____Other (please specify) _____

9. What local recreational activities do you or other members of your household enjoy? Please check as many as apply.
   a)____Fishing
   b) ____Hunting
   c) ____Canoeing or kayaking
   d) ____Motor boating
   e) ____Bird/wildlife watching
   f) ____Nature photography
   g) ____Cross country skiing/snowshoeing
   h) ____Snowmobiling
   i) ____ Hiking/walking
   j) ____ Swimming
   k) ____ Bicycling
   l) ____ Mountain biking
   m) ___ All terrain (motorized) vehicles
   n) ____Other (please specify)_____
   o) ____ None

10. Do you have a written management plan for your farm or forest lands? ___Yes ___No Not applicable ____
    ___Don't know

11. If not, would you be interested in guidance in developing a management plan? ___Yes___No___Not sure

12. Are you aware of existing agricultural and forestry Best Management Practices (BMP's) guidelines?
    ___Yes ___No ___Not sure

13. Do you know where to find the appropriate professional assistance in managing your lands?
    ____Yes ___No _____Not always sure

Please turn the page over and continue.

14. Which of the following would be of interest to you for your lands? Please place checks in the column that best describes your level of interest in these topics for your land.

		Your interest in these topics:			
a)	Grow horticultural products	Low	Medium	High	Not sure
b)	Identify and maintain wildlife habitat	Low	Medium	High	Not sure
c)	Identify/maintain stone walls & other cultural resources	Low	Medium	High	Not sure
d)	Improve animal or crop production	Low	Medium	High	Not sure
e)	Improve production of syrup/other forest products	Low	Medium	High	Not sure
f)	Improve the soils	Low	Medium	High	Not sure
g)	Improve timber/firewood production	Low	Medium	High	Not sure
h)	Leave it alone: no management activities planned now	Low	Medium	High	Not sure
i)	Maintain the land's natural beauty	Low	Medium	High	Not sure
j)	Not sure what to do/Not applicable	Low	Medium	High	Not sure
k)	Protect from development	Low	Medium	High	Not sure
l)	Protect streams and wetlands	Low	Medium	High	Not sure
m)	Other (please specify)	Low	Medium	High	Not sure

15. Please place a check in the column that best represents how important these characteristics are to you for the "quality of life" associated with your Cold River area town.

		Importance of these characteristics to the "quality of life" in the Cold River area.			
a)	Agricultural lands	Low	Medium	High	No Opinion
b)	Boating access	Low	Medium	High	No Opinion
c)	Business opportunities	Low	Medium	High	No Opinion
d)	Diverse wildlife habitat	Low	Medium	High	No Opinion
e)	Fishing access	Low	Medium	High	No Opinion
f)	Forest lands	Low	Medium	High	No Opinion
g)	Good water quality	Low	Medium	High	No Opinion
h)	Hunting access	Low	Medium	High	No Opinion
i)	Presence of historical/cultural sites	Low	Medium	High	No Opinion
j)	Residential opportunities	Low	Medium	High	No Opinion
k)	Scenic qualities	Low	Medium	High	No Opinion
l)	Swimming access	Low	Medium	High	No Opinion
m)	Trail access	Low	Medium	High	No Opinion
n)	Other (Please specify)	Low	Medium	High	No Opinion

16. Which of the following options are appropriate for conserving land and the natural resources associated with it? Please place a check in the column that best represents your opinion of the appropriateness of these options for conservation.

		Appropriateness of these options in the Cold River area			
a)	Coordination of planning among watershed towns	Low	Medium	High	No Opinion
b)	Increased conservation planning in utility and highway projects	Low	Medium	High	No Opinion
c)	Increased education of local municipal officials	Low	Medium	High	No Opinion
d)	Increased landowner education	Low	Medium	High	No Opinion
e)	More incentives for landowners to voluntarily manage land appropriately	Low	Medium	High	No Opinion
f)	Stricter enforcement of existing local regulations	Low	Medium	High	No Opinion
g)	Stricter enforcement of existing state regulations	Low	Medium	High	No Opinion
h)	Stronger local regulations	Low	Medium	High	No Opinion
i)	Stronger state regulations	Low	Medium	High	No Opinion
j)	Voluntary protection through conservation easements	Low	Medium	High	No Opinion
k)	Voluntary protection through public acquisition	Low	Medium	High	No Opinion
l)	Other (please specify)	Low	Medium	High	No Opinion

17. Where do you generally find out about upcoming events in your area? Check all that apply. Specify if you wish.

a) ___Local daily or weekly newspaper
b) ___Statewide newspaper
c) ___Local newsletters
d) ___Local radio station
e) ___Local TV station
f) ___Direct mailings
g) ___Community bulletin boards
h) ___The local library
i) ___The internet
j) ___Other _____

18. How do you prefer to learn about natural resources and management information? Check all that apply.

a) ___Workshops
b) ___Books
c) ___Newsletters
d) ___Fact Sheets
e) ___Individual contact with a professional
f) ___Field trips with an experienced leader
g) ___Meet informally with others of similar interests
h) ___Other: _____
i) ___Not really interested in this topic

19. When would you prefer to attend workshops or other information sessions?

a) ____Weekdays b)_____Evenings c) _____Weekends

The partnership between **UNH Cooperative Extension**, the **Upper Valley Lake Sunapee Regional Planning Commission**, the **Silvio O. Conte National Fish and Wildlife Refuge**, the **US Fish and Wildlife Service**, and the **Friends of the Cold River** has been a valuable combination of resources that has resulted in the preparation, funding, and analysis of these surveys as well as support for other natural resource events in the Cold River communities of Acworth, Alstead, Langdon, Lempster, Unity and Walpole.

APPENDIX E
RECENT WATER QUALITY MONITORING SUMMARIES

Cold River Local Advisory Committee
P.O. Box 68, South Acworth, NH 03608
Serving the Watershed Towns Of: Acworth, Alstead, Charlestown, Langdon, Lempster, Marlow, Unity & Walpole
Online at: www.coldriver.org

COLD RIVER WATER QUALITY CHARACTERIZATION PROJECT
Sampling Results: 2008

The Project: Now in its seventh year of service to the towns in the Cold River watershed, the Cold River Local Advisory Committee's (LAC's) sampling team is pleased to present the latest results of its watershed-wide stream monitoring project. The project focuses on assessing water quality and flow by developing a comprehensive long-term database of representative physical, chemical and biological measurements at a growing number of key sites (now over fifty) in Acworth, Alstead, Langdon, Lempster, Marlow and Walpole.

Why Are We Doing This? Landowners in our towns have repeatedly identified water quality as a significant concern in detailed surveys. The LAC is completing this project to address that concern – to better understand the watershed, to identify new or recurring sources of pollution, to encourage discussions about water resources and to provide objective and credible scientific data for local, state and federal decision-making. Those data are not being collected on a regular basis by our resource-limited agencies.

How Are We Funded? We are an all-volunteer group that is largely self-funded. In 2003, we purchased state-of-the-art sampling equipment by securing local donations and grants from the CT River Joint Commissions and New England Grassroots Environmental Fund. The equipment has allowed us to develop an extensive and quick but accurate sampling program that is cost-effective. We've also received valuable technical assistance and partial lab fee funding from the NH Department of Environmental Services (DES).

What's So Special about the Cold River Watershed? The Cold River was recognized as a significant statewide natural, cultural, scenic and scientific resource by the NH Legislature in 1999 upon acceptance as a Designated River. It is one of only 14 such rivers in the state. The watershed is regionally, nationally and globally recognized for its outstanding wildlife habitat and plant communities. The rural character of the watershed creates opportunities for working forests, farms, recreation and peaceful homes.

Water Quality Testing Results: Between 02/08 and 11/08, water quality in the Cold River and its tributaries generally remained *Good* to *Excellent* with some exceptions:

- **Dissolved Oxygen** is the amount of oxygen in the water, which is critical to aquatic life. Most measurements were well above the minimum standard of 5.0 mg/L.
- **pH** is the acidity of water, which can impact fish health. Many measurements were below the minimum standard of 6.5, most likely due to local geology, wetlands and acid rain.
- **Turbidity** is the amount of suspended material in the water. Most Turbidity readings were very low but higher levels continued to be observed in portions of the watershed damaged by the October 2005 flood. These areas are vulnerable to erosion by rain storms that wash sediment from exposed or de-stabilized stream banks into the water.

- **Specific Conductance** can be an indicator of pollutants such as road salt, septic waste or yard/field runoff entering the water. Specific Conductance was low on most occasions but relatively elevated in Dodge Brook, Dodge Pond, upper Honey Brook, Ram Brook, Brush Meadow Brook, tributaries to Little Brook and Crane Brook, and road runoff.
- **Temperature** ranged from 32°F to 76°F. Temperature is a critical parameter for many processes, and values in excess of 70°F may be stressful to lethal for trout/salmon. Low temperatures were generally observed but individual readings ≥ 70°F were recorded for Warren Brook, Dodge Pond, Keyes Hollow/Crescent Lake outlets and the lower river.
- **Bacteria (*Escherichia coli*)** presence may suggest harmful pathogens in the water from animal waste or septic effluent. Historical data show that bacteria levels at local swimming holes in the river exceed the maximum standard after summer rain storms. Dry weather sampling in '08 also detected high levels in Crane Brook and the river below Vilas Pool.
- **Phosphorus** (P) and **Nitrogen** (N) can increase algae and plant growth and decrease the amount of oxygen in the water. Possible sources of P/N include natural materials, residential/agricultural fields and septic systems. Low P/N levels were generally observed but higher levels were seen on Crane, Jewett, Brush Meadow and Ram Brooks.
- **Aluminum** and **Other Metals** can be toxic to aquatic life. Three Aluminum samples were collected from Warren Brook in '08. Two exceeded the applicable standard.
- **Chloride**, usually from road salt, can be toxic to aquatic life. Very low Chloride levels are commonly observed. In the lower watershed, elevated levels were observed in winter road runoff but not the streams. Summer data suggested that the Dodge Pond and Dodge Brook warrant further testing. Test data from that area will be collected in '09.

Water Flow Monitoring Results: The LAC measured stage (stream level) at most sampling sites. Stage is directly proportional to flow and can impact water chemistry. Stage readings were within previously observed ranges. A new stream flow gauge is scheduled to be installed on the Cold River in 2009 to replace the Walpole gauge abandoned in the 1970's. The gauge will offer real-time, on-line flow information for recreation, bridge/culvert design, fisheries, education and flood/drought monitoring purposes.

Biological Sampling Results: Aquatic insects are a staple in the diet of trout and salmon, and healthy populations of insects and fish are good overall indicators of stream quality. Macro-invertebrate (aquatic insect) and fish community studies completed by the LAC, DES and the NH Fish & Game Department suggest that (a) aquatic habitat upstream of flood-damaged areas is healthy, (b) habitat damage in the lower watershed was severe with increased sedimentation and fewer deep pools and (c) insect and fish populations destroyed by the flood may be beginning to partially recover.

For more information on this project, contact the LAC (835-2328) or DES (271-2083). New volunteers are always welcome and needed. A detailed report on the 2007 results is available at http://www.des.state.nh.us/wmb/vrap.

CRESCENT LAKE WATER QUALITY SUMMARY: 2008

Crescent Lake has participated in the NH Volunteer Lake Assessment Program since 1990. Each year the VLAP volunteers gather water samples from multiple, predetermined locations. This sampling is done three times a year in June, July, and September. The samples are tested at DES approved labs. The Conservation Commissions of the towns of Acworth and Unity share the laboratory costs for the testing.

Water is tested for Chlorophyll-A, Transparency, Total Phosphorus, Phytoplankton, Cyanobacteria, pH, Acid Neutralizing Capacity, Conductivity, Dissolved Oxygen and Temperature, Turbidity, Bacteria, and Chloride. At the suggestion of the State we only test for bacteria on an as needed basis, which is usually once a year when the state biologist joins us. Phosphorus is a good indication of bacteria problems.

Each of these parameters contributes to creating an overall picture of the health of Crescent Lake. Comparing the same year samples to each other provides data during different weather conditions and during different levels of lake activities. Comparing data year to year gives a historical profile and positive and negative trends. A complete record of current year and historical data is available each year in March.

Crescent Lake has had very little change in its chemistry since 1990. There has been some degradation in the clarity of the lake. The clarity of the lake is closely tied to the weather conditions in the days before and the day of sampling, and to the amount of activity on the lake around the time of sampling. Crescent Lake is approximately equal to the state median for most parameters as compared to all lakes in NH, and is equal or slightly better than the state median for similar lakes.

The Crescent Lake Association completed its eighth year of successfully keeping the lake clean and free of exotic weeds. This was made possible through the dedication of the volunteers on the Milfoil Committee, and the dedication of our Lake Hosts. During the summer season Lake Hosts are on duty seven days a week inspecting boats and trailers for exotic weeds that could be transported from other water bodies on boats and trailers. In 2008 692 boats were inspected. In addition to this program, lake association volunteers participated in the annual lake bottom inspection, and the weed watcher program. All of this is made possible through the financial support of the Towns of Acworth and Unity, the Crescent Lake Association, CLA member contributions, and state grants.

July 5th 2008
Lake Report to Lake Warren Association
From Kate Tarlow Morgan

Observations and Recommendations from 2007(a summary):
(The entire report is readable at www.des.state.nh.us.)

1) Chlorophyll-a, a pigment found in plants, is an indicator of algal abundance. The chlorophyll-a concentration found in water gives an estimate of the concentration of algae. Algae lives on phosphorus which is produced by natural ground decay (as run-off and within the Lake). Phosphorus levels are then increased by road and salt run-off, lawn fertilizer, poor landscaping, animal waste, gray water, boat activity, and poor septic. **Overall, the historical data trend line shows an increasing in-lake chlorophyll-a trend. Since 1991, this fluctuation has ranged between 2.81 and 9.01 mg/m(3).**

2) *Transparency*, a measure of water clarity, can be affected by the amount of algae and sediment from erosion. Historical data shows that Lake Warren is still below the NH State Mean. However, over time there has been a decreasing trend for in-lake transparency. Reasons for this include: increased algae growth, frequent rainstorms, and large boat activity in shallow areas. **Historical data trend line shows that the 2005 and 2006 mean transparency is slightly less than the state median. Overall the results point to a variable, but overall decreasing (worsening) trend for in-lake transparency.** It is important to continue to stabilize stream banks, lake shorelines, and dirt roads to reduce non point pollutants. Enforce low-wake zones for boats in shallow lake areas.

3) *Phosphorus*, a nutrient for plant and algae growth. Too much phosphorus can lead to increase in plant and algae growth. **The historical data trend for 2007, 2006, like 2005, continues to show a variable phosphorus trend**, **continuing to fluctuate between 7 and 19 ug/L, since 1991.** We need to keep testing to get a broader picture. It's important to continue awareness of phosphorus loading sources such as poor septic, animal waste, gray water, lawn fertilizer, road and construction erosion, and natural wetlands. Also, direct boat activity in shallow areas on the Lake can stir phosphorus deposits up off the bottom and add to the phosphorus count.

4) *Phytoplankton* exists in a lake and undergoes a natural succession during the growing season. They are an indicator of general lake quality. However, there are certain Cyanobacteria or Blue-Green Algae that are not welcome. In 2001, in the fall, Lake Warren had the presence of type of Blue-Green Algae that is not healthy for the Lake. We witnessed a return of Blue-Green Algae again in 2003, 2004, and 2005. **Results showed a "very abundant" rating of phytoplankton (the highest rating possible).** We will monitor phytoplankton this season again.

It's helpful if residents report any significant algae blooms to the VLAP Coordinator. Blooms will appear as a thick film of varying colors on the surface of the water (not to be confused with the yellow powder of early or late summer pollen). It is important to remember, however, that many phytoplankton populations undergo a natural succession during the summer and do not present a threat to the Lake or living things. It is the blue-green type that is of concern.

5) *Lake pH*, measure of acidity, results from the presence of granite bedrock and the deposit of acid rain. Last year we commented that there was not much that could be done to increase the Lake pH. Our Lake is acidic and always has been. It still remains not too acidic for the fish to inhabit. However, 2004 tests noted that the **lower level (hypolimnion) of the lake was more acidic than before** -- which is likely due to the decomposition of organic matter and the release of acidic by-products into the water column. This may also stimulate the proliferation of phytoplankton, and Cyanobacteria**. The mean for 2006 at the deep spot for testing ranged from 6.45 to 6.42 which continues to be in the acidic range.**

6) *Acid Neutralizing Capacity* records the ability the Lake to resist the effect of acid rain. Historical data shows that Lake Warren continues to remain low and is less than the State Mean. In 2002, the Lake was designated as 'moderately vulnerable' to acidic inputs and has a lower ability than many lakes to buffer acidic inputs. In 2003, D.E.S. determined our Lake as "critically sensitive" to acidic inputs. **In 2004, the findings fluctuated back to "moderately vulnerable." This trend has stayed the same from 2005 to 2007. The NH mean for lakes and ponds is 4.9 mg/L. Lake Warren weighs in as 3.8 mg/L, which is good news as it continues to be only moderately vulnerable.** We can only hope for the best as the effects of ANC is a global issue and related to industrial and petroleum output from human activity.

7) *Conductivity* is the ability of water to carry an electric current. Sources of increased conductivity are due to human activity including septic, agricultural and road runoff (which contains salt) and new developments in the watershed as a whole (such as building sites, logging, and new roads). **Lake Warren's conductivity has gradually increased over time; and it is greater than the NH State Mean**. **This continues to be true for 2007. Conductivity has increased for the Deep Spot and remained elevated overall in many of the inlets.** Typically, increasing conductivity indicates the influence of pollutant sources associated with human activities i.e. septic, road run-off, and new development, which expose new soil and bedrock areas. It is interesting to note that rock itself breaks down over time, whereby becoming a nutrient-loading pollutant. ***D.E.S. has recommended that we conduct a shoreline conductivity survey of the lake to help identify sources of the problem. We need volunteers for this.***

8) *Dissolved Oxygen and Temperature Data*. Oxygen in lakes is vital to fish and amphibians as well as bottom feeding organisms. The life of these creatures acts as a barometer for the health of the lake. **Dissolved Oxygen was very low in the summer of 2005. Interestingly, in 2006, D.O was higher**. **2007, Oxygen was quite high in the deep spot in September.** The effects of D.O. can appear confusing in that we want oxygen for the fish, but too much indicates an overgrowth of Algae (as we have seen of late) that produces oxygen as a by-product of photosynthesis. At the same time, internal phosphorus loading causes oxygen depletion during the summer. If anyone wants to research this seeming contradiction, this would be appreciated.

9) *Turbidity* is caused by suspended matter such clay, silt and algae. Water clarity is strongly influenced by turbidity. **Most tributary measurements were quite elevated in 2005 -- indicating the possibility of erosion and/or sampling disturbances**. **This trend continued for 2006. In 2007, the trend for turbidity was relatively low. This is good news.** We need to continue, however, look further into possible causes such as damaging erosion and/or high phosphorus inflow at these spots.

10) *Bacteria Sampling*: The samplings we made in 2007, all were **recorded with low levels** and no concern needed. Our standards are set by state standard of 88 counts per mL designated for public bathing places.

11) Introducing a new testing Category: Total Kjeldahl Nitrogen and Nitrite + Nitrate Nitrogen!!! Nitrogen is another nutrient that is essential for the growth of plants and algae. Nitrogen is typically the limiting nutrient in salt-water bodies and if it is located in bodies of fresh water, this is an indication of elevated phosphorus concentrations. **For 2006, the ratio of total Nitrogen to Phosphorus in our Lake was 30 (greater than 15) indicating that the lake is phosphorus-limited. This means than any additional phosphorous-loading will stimulate additional plant and algal growth. Chloride sampling was not conducted in 2007.**

Recommendations for 2008

1) This is the third year D.E.S. recommends that we conduct a Conductivity Survey around the Lake. This data will assist in our tracking of the causes. This survey may be assisted by the State's recommendation for all homeowners to check their septic systems in case they may have been damaged by the floodwaters of October 2005.

2) Residents can continue to be actively aware of what effects the Lake such as septic, fertilizer, landscaping, animal waste, gray water, boat activity -- as well as understand the influences of broader inputs such as agricultural runoff, new

building sites upstream, logging, and natural watershed effects. Talk to your neighbor, educate one another.

3) We can continue to envision Lake Warren 25 years from now. What would you like to see? What would you like to change? What would you like to stay the same? It is an opportune time to be doing this kind of work since the Town of Alstead is also embarking on community visioning for the future health and well being of the town.

*__To Note__: our Sampling efforts for 2007 got EXCELLENT in the report for field sampling procedures. **We welcome your volunteer efforts!!** Besides which IT'S FUN!!

TESTING DATES ARE:

JULY 27, SUNDAY IN THE MORNING
AUGUST 31 SUNDAY, IN THE MORNING

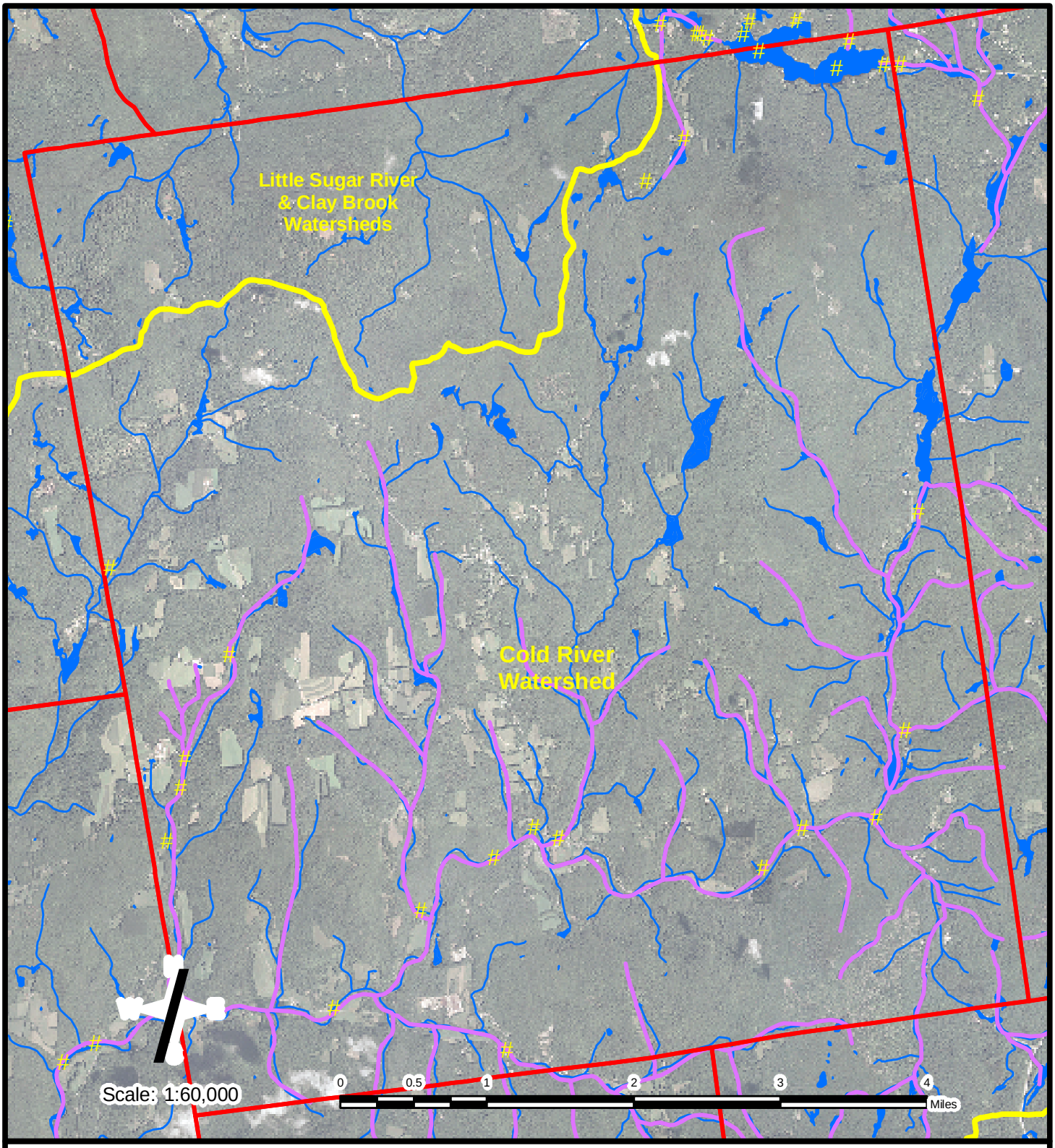
CALL 835 -2825 IF YOU ARE INTERESTED.

WE ALWAYS NEED DRIVERS TO DELIVER SAMPLES TO CONCORD!

THANK YOU FOR YOUR INTEREST AND YOUR ACTION

Chlorophyll-a = Greater than NH Median
Transparency = Slightly less than NH Median
Phosphorus = Approximately even with NH Median
pH = Slightly acidic
Acid Neutralizing Capacity = Less than NH Median
Conductivity = Greater than NH median, elevated
Dissolved Oxygen = Somewhat depleted
Turbidity = Slightly lower
Chloride = Less than acute, but greater than normal

APPENDIX F
LOCAL SURFACE WATER & GROUNDWATER RESOURCE MAPS



Legend

- Existing/Historic Sampling Station
- Intermittent/Perennial Stream/Wetland
- Impaired Waterbody *(DES Draft 2008 303d-305b List)*
- Town Boundary

Source(s): GRANIT NAIP Quad Images 19_36, 19_37, 19_43 & 19_44 (2003)
GRANIT Polit. Bdys., Hydrography, NWI & Watershed Bdys. Datalayers (2008)
NHDES Sampling Station & Assessment Unit shapefiles (2008)

Figure 1

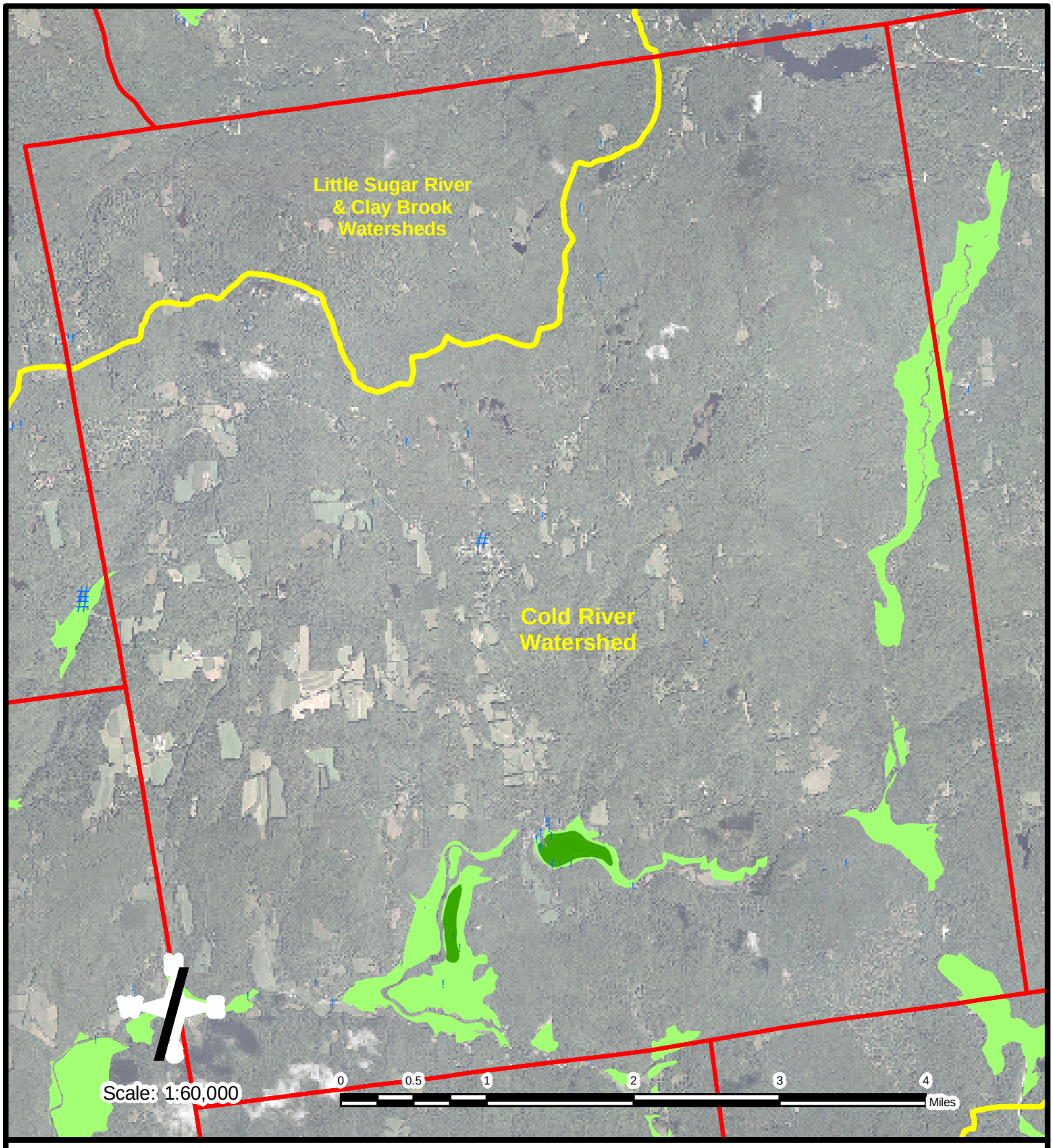
SURFACE WATER RESOURCES

Cold River Watershed, Acworth, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

- Moderate Transmissivity Aquifer (<1,000 ft²/d; <40ft)
- High Transmissivity Aquifer (>1,000 ft²/d; >20ft)
- # Public Water Supply Well
- Well, Boring or Spring
- Town Boundary

Source(s): GRANIT NAIP Quad Images 19_36, 19_37, 19_43 & 19_44 (2003)
GRANIT Political Bdys., WBSS, Transm. & Watershed Bdys. Datalayers (2008)
SWRPC Watershed Boundary (2007) & DES PWS (2008) data

Figure 2

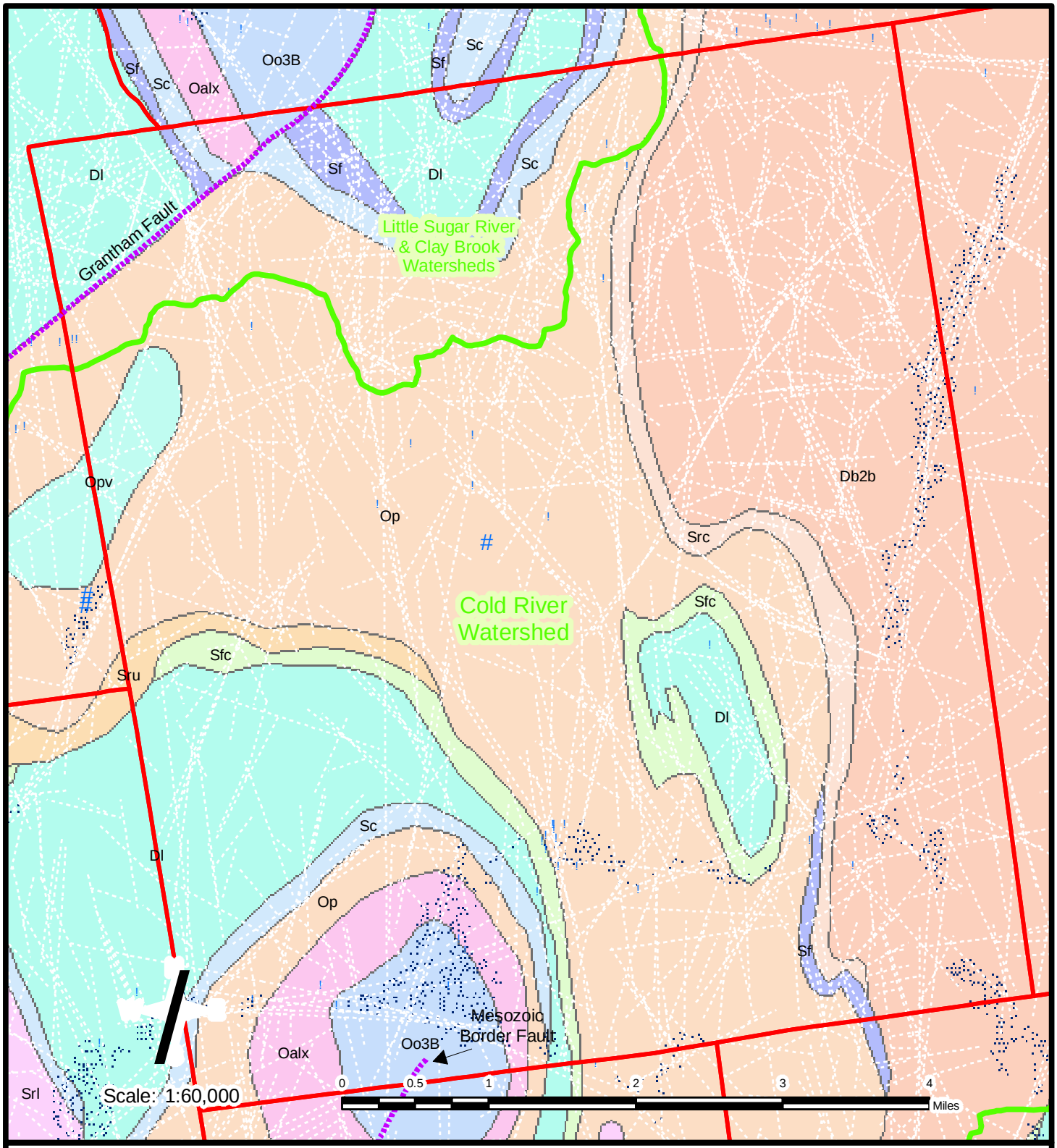
GRAVEL AQUIFER RESOURCES

Cold River Watershed, Acworth, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

- Gravel Aquifer Recharge Zone
- USGS Fracture Trace (shown in white)
- # Public Water Supply Well
- Well, Boring or Spring
- Dl Bedrock Unit (Db2b=Bethlehem Granod.; Dl=Littleton Fm.; Sc=Clough Quartzite; Sf=Fitch Fm.; Sfc=Fitch+Clough Fms.; Sru/Src=Rangeley Fm.; Op/Opv=Partridge Fm.; Oalx=Ammonoosuc Volcanics; Oo3B=Oliverian Pluton)
- Town Boundary

Figure 3

BEDROCK AQUIFER RESOURCES

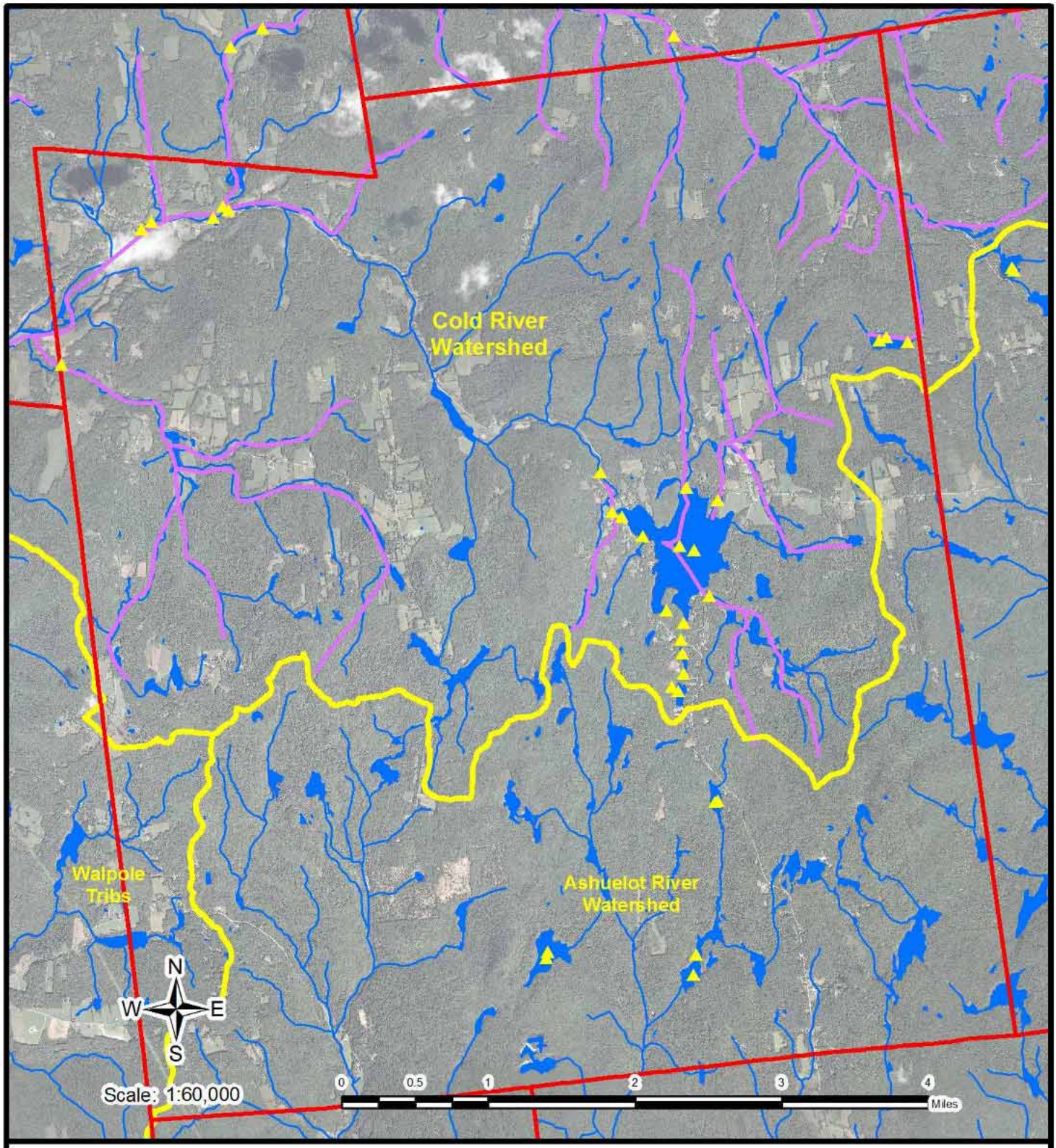
Cold River Watershed, Acworth, NH

Granite State Rural Water Association

Cold River LAC

Source(s): SWRPC Watershed Boundary (2007) & DES PWS (2008) data
GRANIT Political Bdys., WBSS, Transm., Bedrock, Lineament & Watershed Bdys. Datalayers (2008)

July 2008



Legend

- Existing/Historic Sampling Station
- Intermittent/Perennial Stream/Wetland
- Impaired Waterbody *(DES Draft 2008 303d-305b List)*
- Town Boundary

Source(s): GRANIT NAIP Quad Images 5_43 & 5_44 (2003)
GRANIT Political Bdys., Hydrography & Watershed Bdys. Datalayers (2008)
NHDES Sampling Station & Assessment Unit shapefiles (2008)

Figure 1

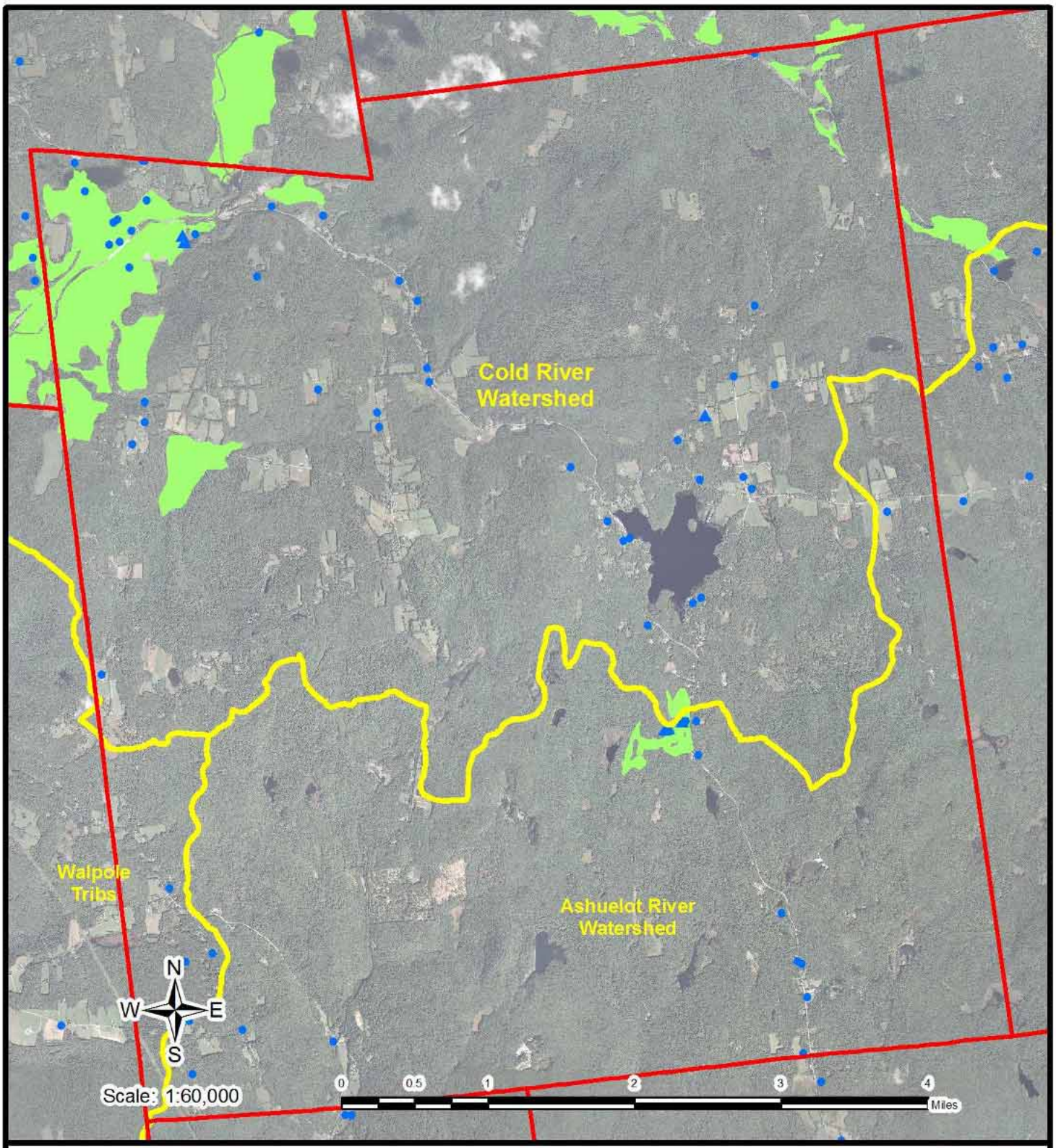
SURFACE WATER RESOURCES

Cold River Watershed, Alstead, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

- Moderate Transmissivity Aquifer (<1,000 ft²/d; <40ft)
- High Transmissivity Aquifer (>1,000 ft²/d; >20ft)
- Public Water Supply Well
- Well, Boring or Spring
- Town Boundary

Source(s): GRANIT NAIP Quad Images 5_43 & 5_44 (2003)
GRANIT Political Bdys., WBSS, Transm. & Watershed Bdys. Datalayers (2008)
SWRPC Watershed Boundary (2007) & DES PWS (2008) data

Figure 2

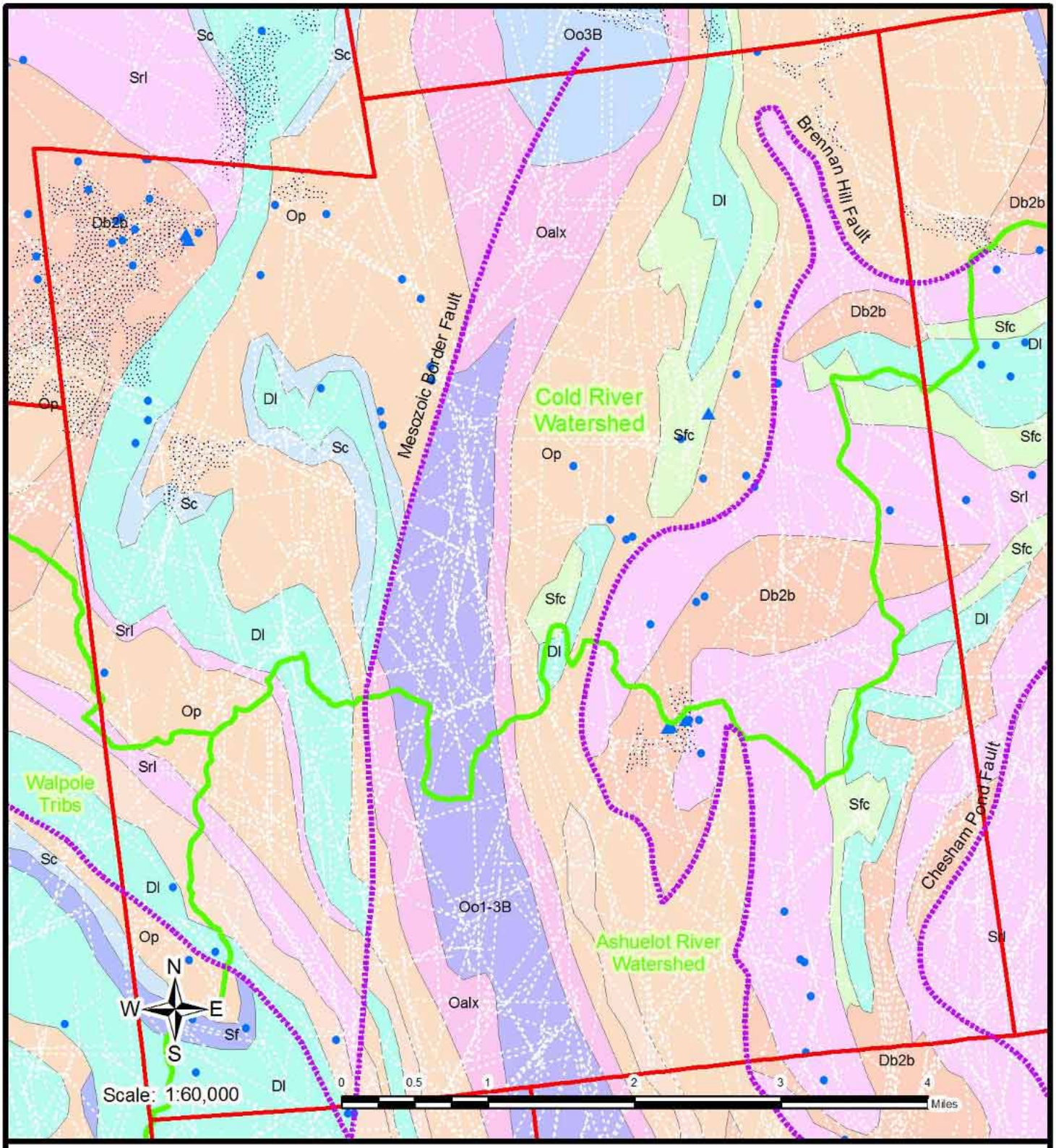
GRAVEL AQUIFER RESOURCES

Cold River Watershed, Alstead, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

- Gravel Aquifer Recharge Zone
- USGS Fracture Trace (shown in white)
- Public Water Supply Well
- Well, Boring or Spring
- Dl — Bedrock Unit (Db2b=Bethlehem Granod.; Dl=Littleton Fm.; Sc=Clough Quartzite; Sf=Fitch Fm.; Sfc=Fitch+Clough Fms.; Srl=Rangeley Fm.; Op=Partridge Fm.; Oalx=Ammonoosuc Volc.; Oo3B/Oo1-3B=Oliverian Pluton)
- Town Boundary

Figure 3

BEDROCK AQUIFER RESOURCES

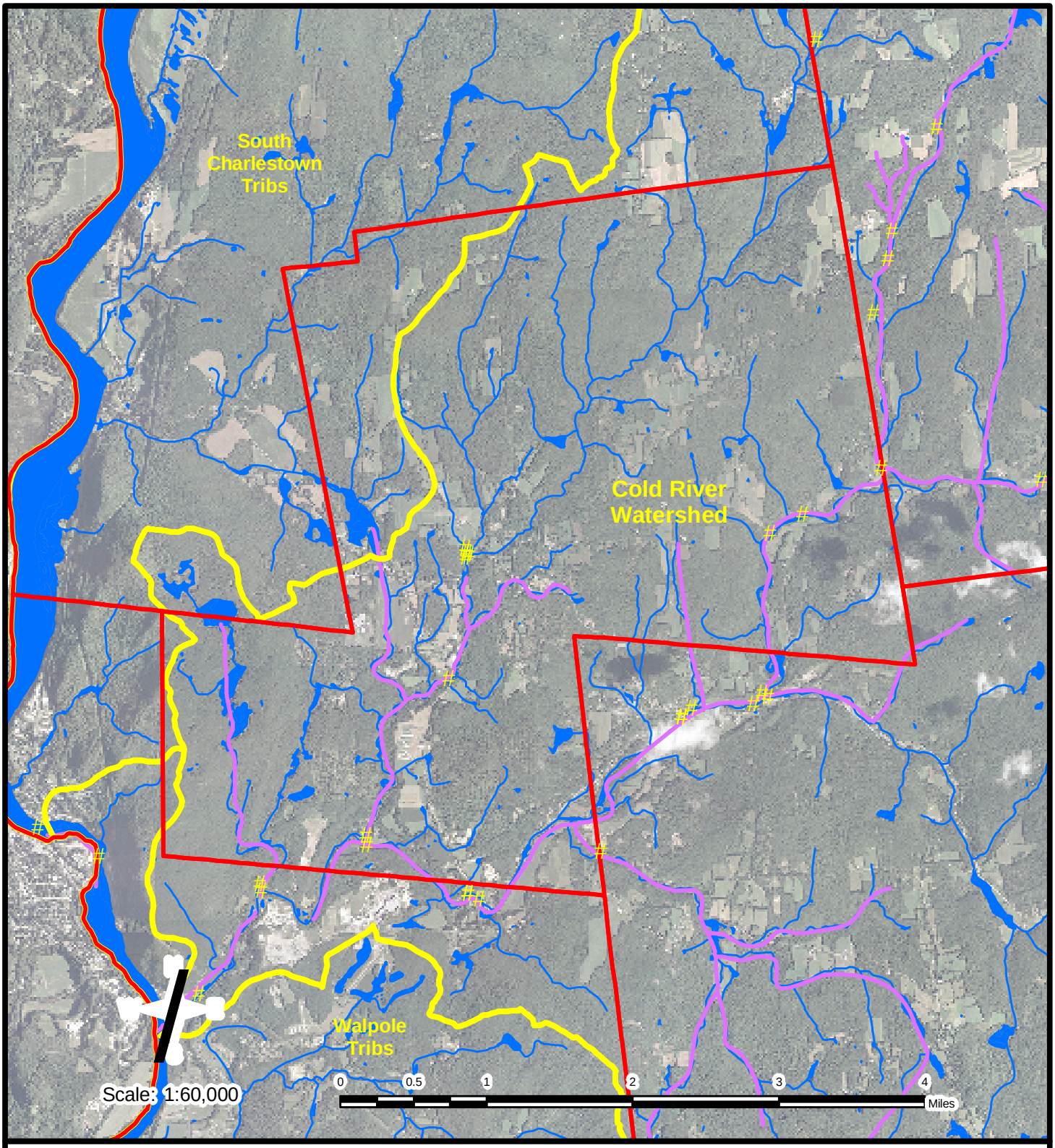
Cold River Watershed, Alstead, NH

Granite State Rural Water Association

Cold River LAC

Source(s): SWRPC Watershed Boundary (2007) & DES PWS (2008) data
GRANIT Political Bdys., WBSS, Transm., Bedrock, Lineament & Watershed Bdys. Datalayers (2008)

July 2008



Legend

- Existing/Historic Sampling Station
- Intermittent/Perennial Stream/Wetland
- Impaired Waterbody *(DES Draft 2008 303d-305b List)*
- Town Boundary

Source(s): GRANIT NAIP Quad Images 5_43 & 19_43 (2003)
GRANIT Political Bdys., Hydrography & Watershed Bdys. Datalayers (2008)
NHDES Sampling Station & Assessment Unit shapefiles (2008)

Figure 1

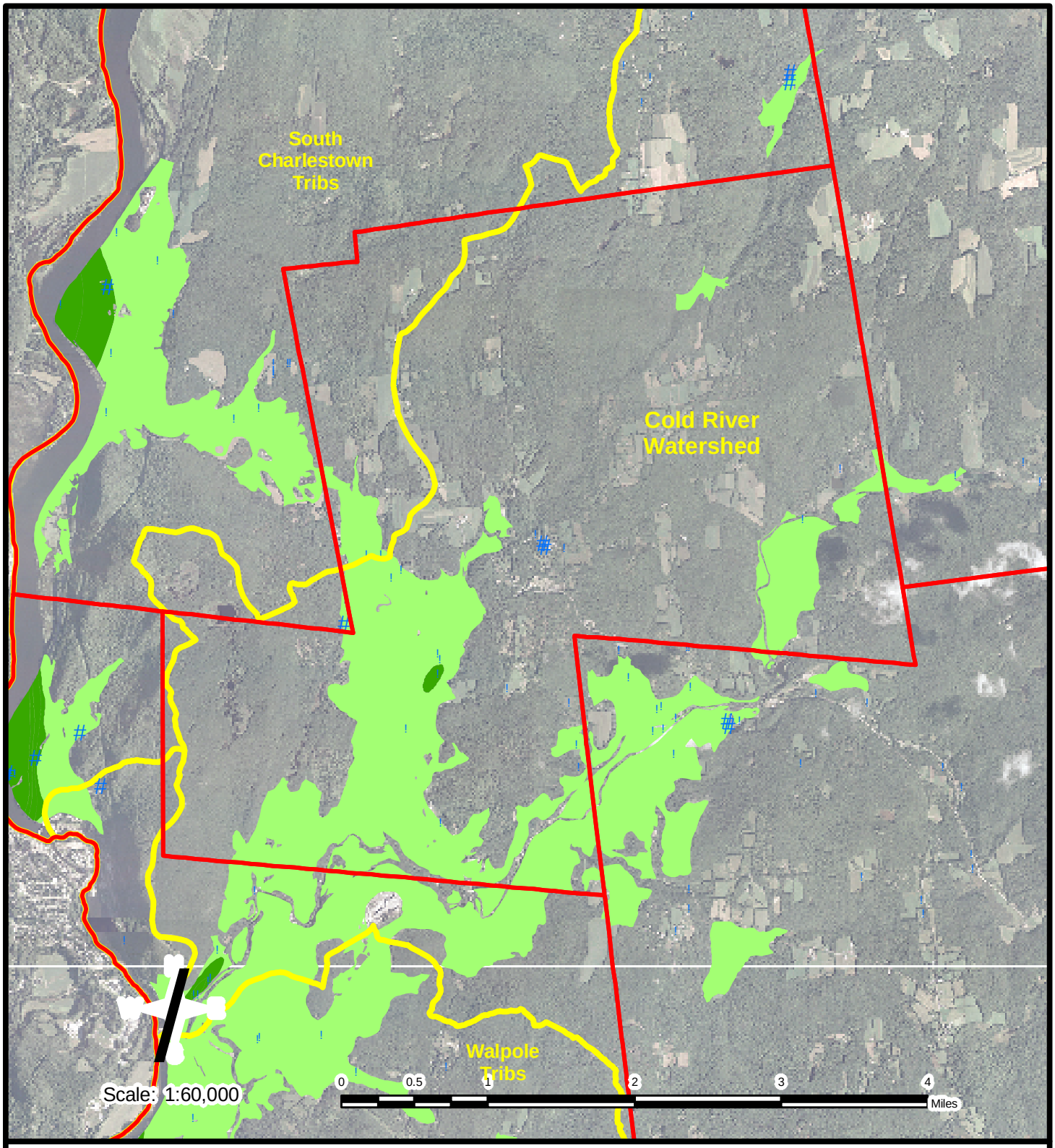
SURFACE WATER RESOURCES

Cold River Watershed, Langdon, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

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- High Transmissivity Aquifer (>1,000 ft²/d; >20ft)
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- Well, Boring or Spring
- Town Boundary

Source(s): GRANIT NAIP Quad Images 5_43 & 19_43 (2003)
GRANIT Political Bdys., WBSS, Transm. & Watershed Bdys. Datalayers (2008)
SWRPC Watershed Boundary (2007) & DES PWS (2008) data

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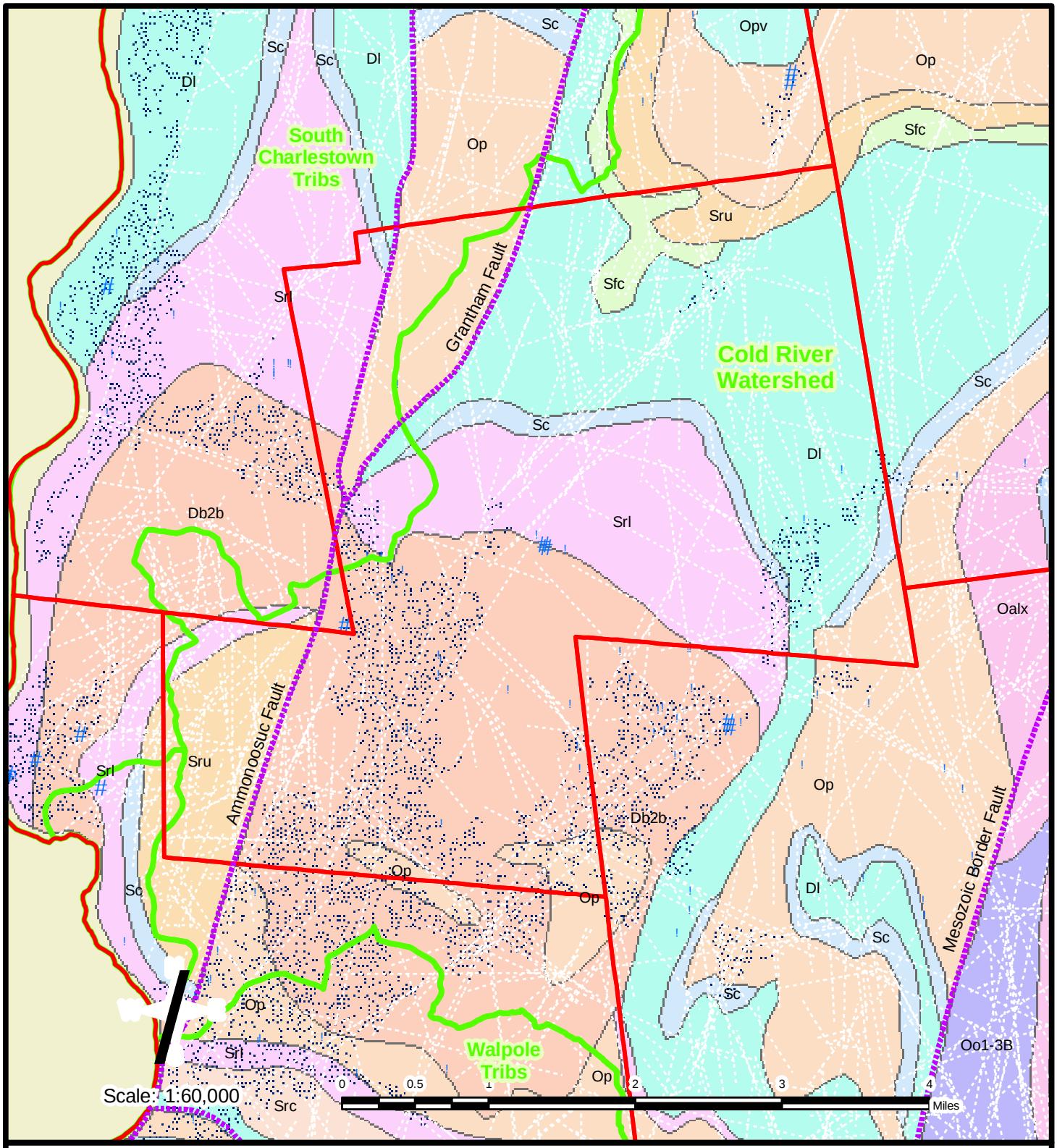
GRAVEL AQUIFER RESOURCES

Cold River Watershed, Langdon, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

- Gravel Aquifer Recharge Zone
- USGS Fracture Trace (shown in white)
- # Public Water Supply Well
- Well, Boring or Spring
- Dl Bedrock Unit (Db2b=Bethlehem Granodiorite; Dl=Littleton Fm.; Sc=Clough Quartzite; Sfc=Fitch+Clough Fms.; Srl/Sru/Src=Rangeley Fm.; Op/Opv=Partridge Fm.; Oalx=Ammonoosuc Volc.; Oo1-3B=Oliverian Pluton)
- Town Boundary

Figure 3

BEDROCK AQUIFER RESOURCES

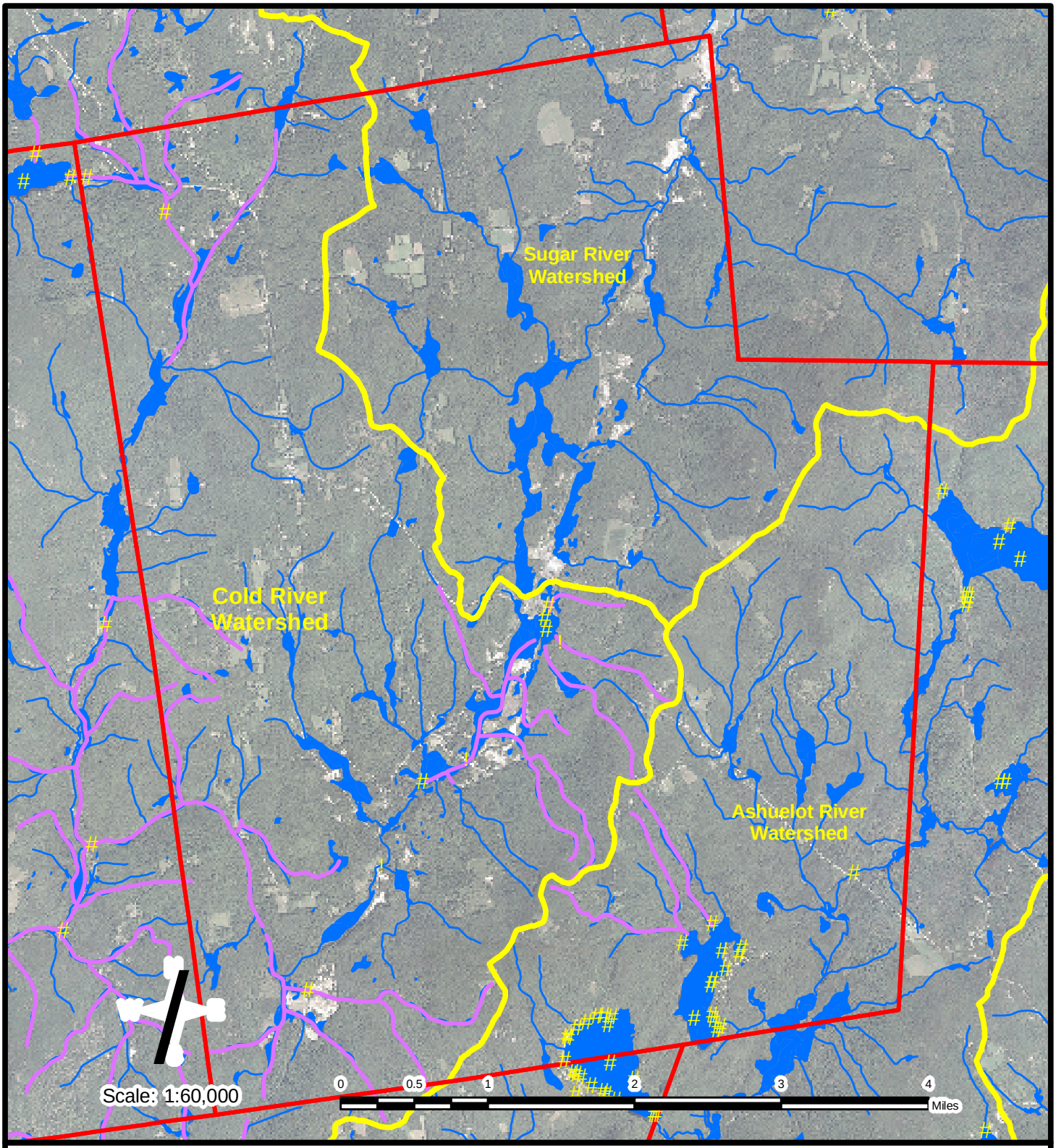
Cold River Watershed, Langdon, NH

Granite State Rural Water Association

Cold River LAC

Source(s): SWRPC Watershed Boundary (2007) & DES PWS (2008) data
GRANIT Political Bdys., WBSS, Transm., Bedrock, Lineament & Watershed Bdys. Datalayers (2008)

July 2008



Legend

- Existing/Historic Sampling Station
- Potential Sampling Station
- Intermittent/Perennial Stream/Wetland
- Impaired Waterbody *(DES Draft 2008 303d-305b List)*
- Town Boundary

Source(s): GRANIT NAIP Quad Images 19_37 & 19_44 (2003)
GRANIT Political Bdys., Hydrography & Watershed Bdys. Datalayers (2008)
NHDES Sampling Station & Assessment Unit shapefiles (2008)

Figure 1

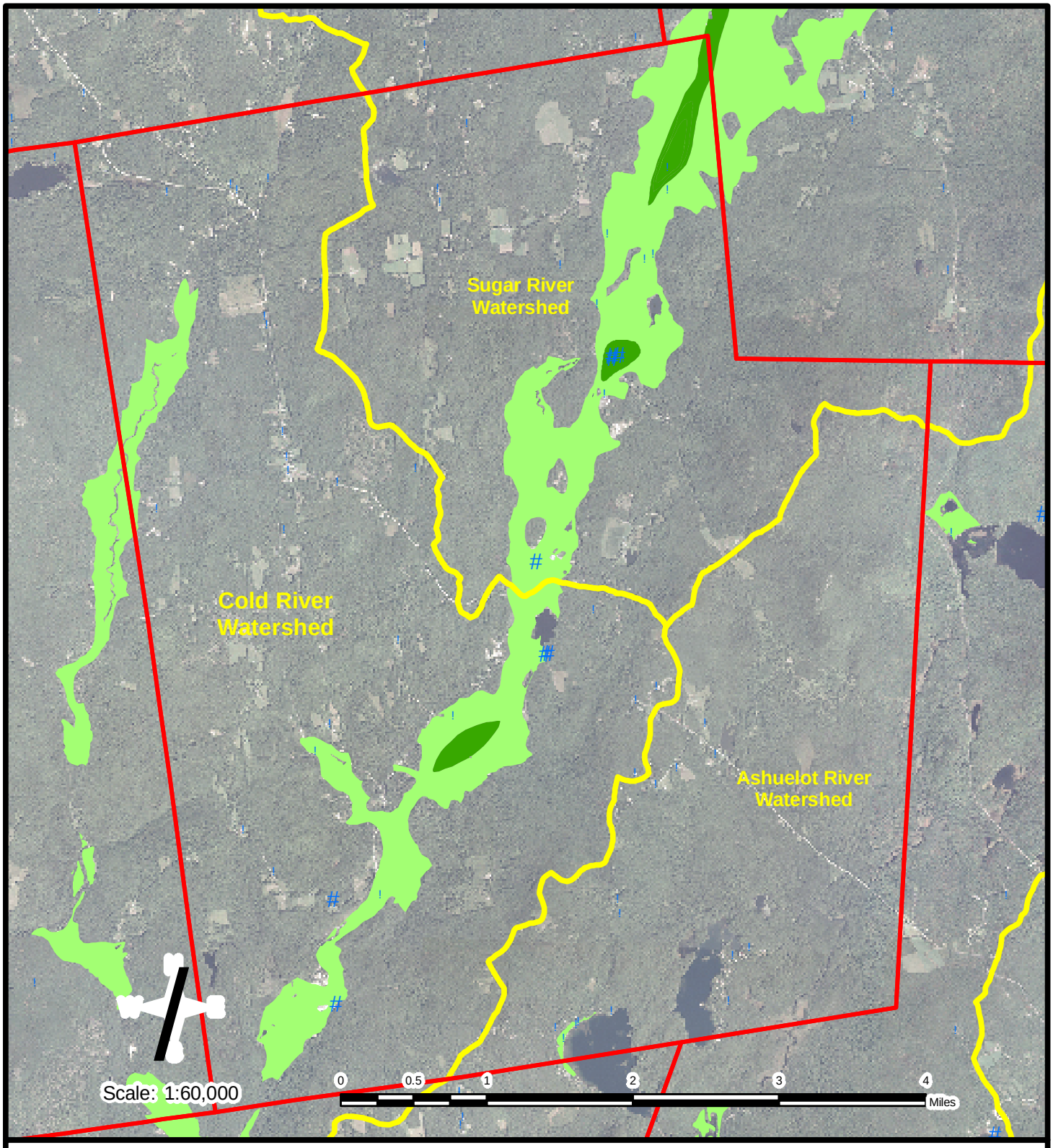
SURFACE WATER RESOURCES

Cold River Watershed, Lempster, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

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- High Transmissivity Aquifer (>1,000 ft²/d; >20ft)
- # Public Water Supply Well
- Well, Boring or Spring
- Town Boundary

Source(s): GRANIT NAIP Quad Images 19_37 & 19_44 (2003)
GRANIT Political Bdys., WBSS, Transm. & Watershed Bdys. Datalayers (2008)
SWRPC Watershed Boundary (2007) & DES PWS (2008) data

Figure 2

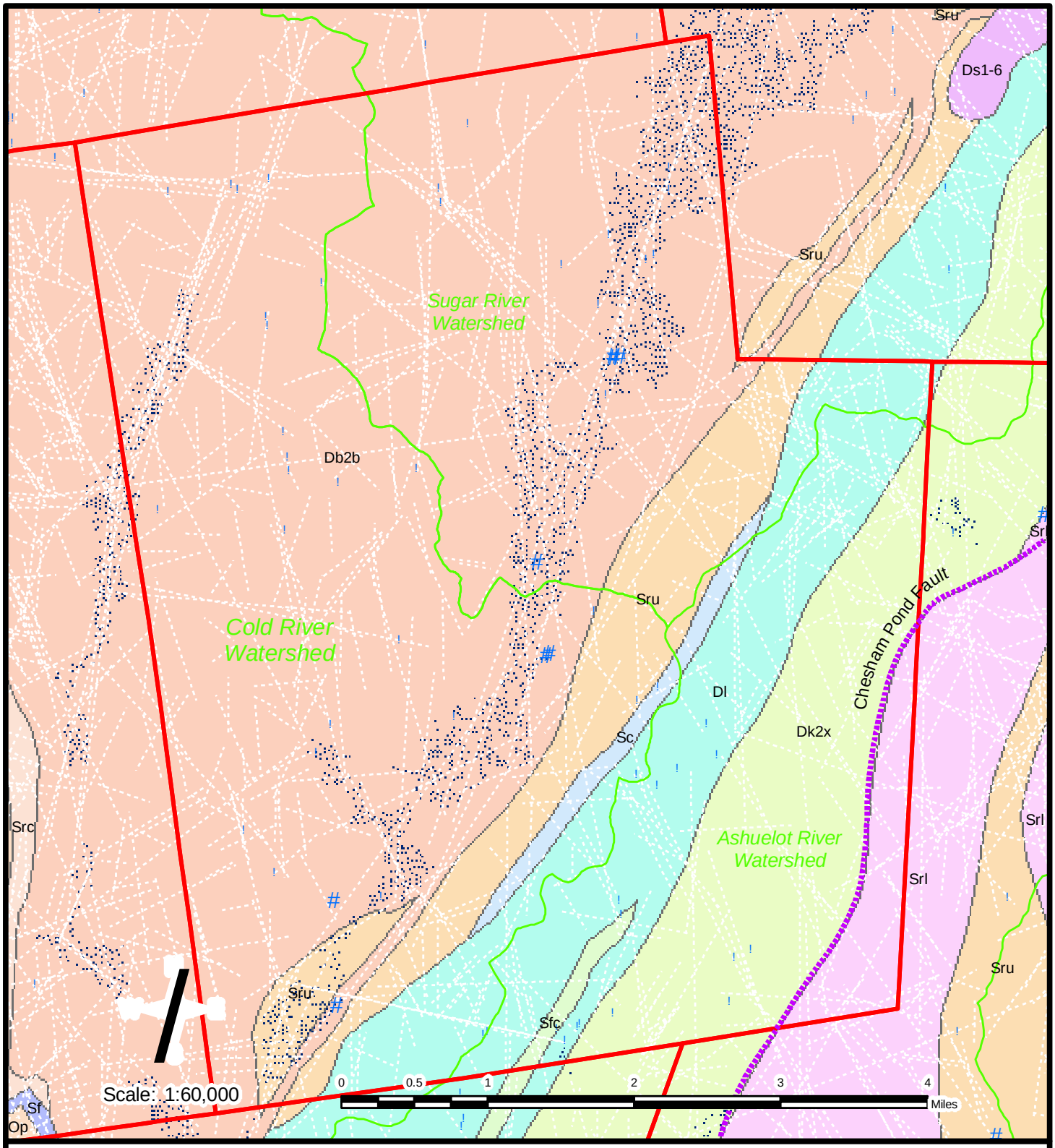
GRAVEL AQUIFER RESOURCES

Cold River Watershed, Lempster, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

- Gravel Aquifer Recharge Zone
- USGS Fracture Trace (shown in white)
- # Public Water Supply Well
- Well, Boring or Spring
- Dl Bedrock Unit (Db2b=Bethlehem Granod.; Dk2x=Kinsman Granod.; Dl=Littleton Fm.; Sc=Clough Quartzite; Sfc=Fitch+Clough Fms.; Srl/Sru=Rangeley Fm.)
- Town Boundary

Figure 3

BEDROCK AQUIFER RESOURCES

Cold River Watershed, Lempster, NH

Granite State Rural Water Association

Cold River LAC

Source(s): SWRPC Watershed Boundary (2007) & DES PWS (2008) data
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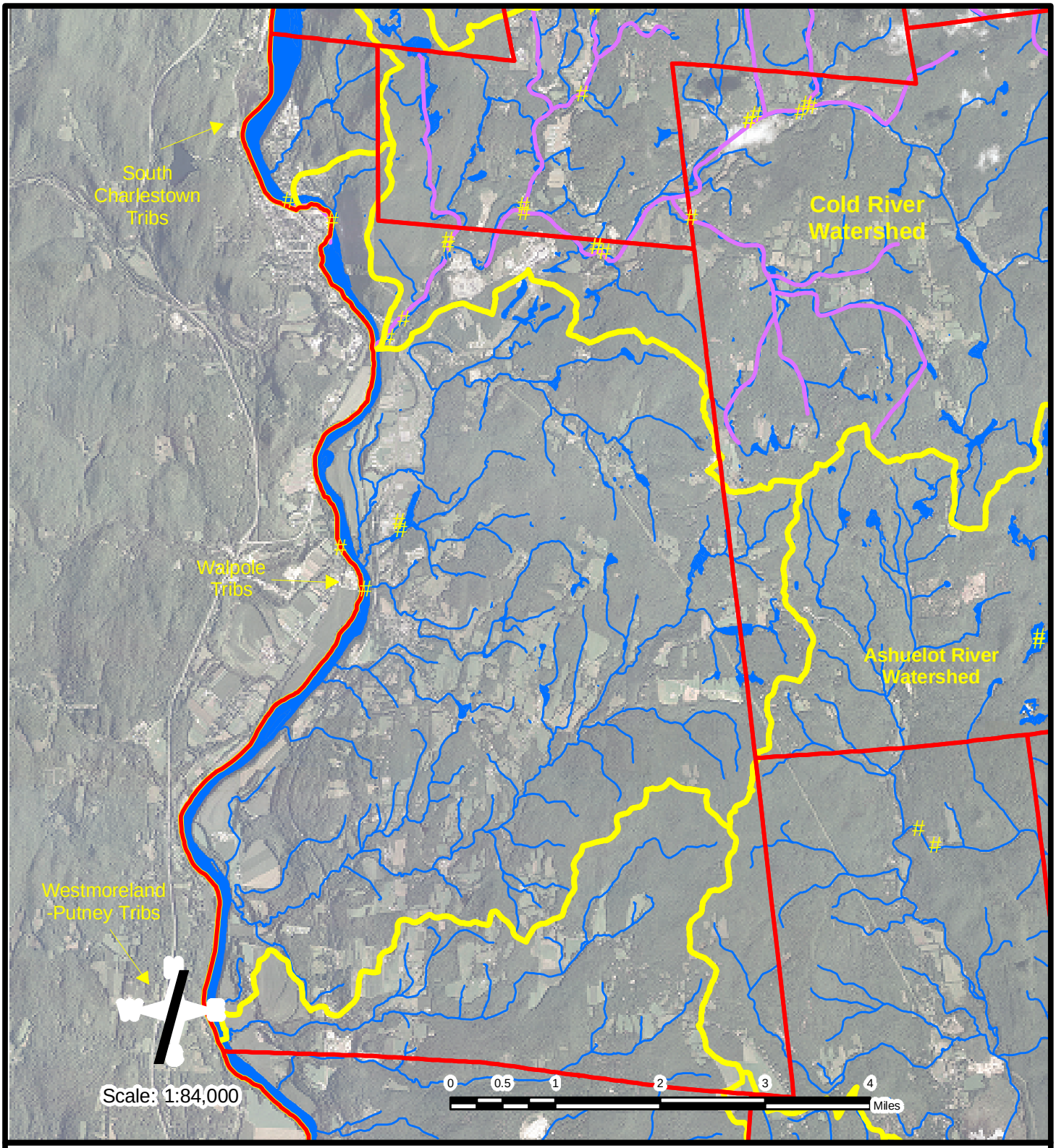
July 2008



Legend

- Existing/Historic Sampling Station
- Intermittent/Perennial Stream/Wetland
- Impaired Waterbody *(DES Draft 2008 303d-305b List)*
- Town Boundary

Source(s): GRANIT NAIP Quad Image 5_43 (2003)
GRANIT Political Bdys., Hydrography & Watershed Bdys. Datalayers (2008)
NHDES Sampling Station & Assessment Unit shapefiles (2008)

Figure 1

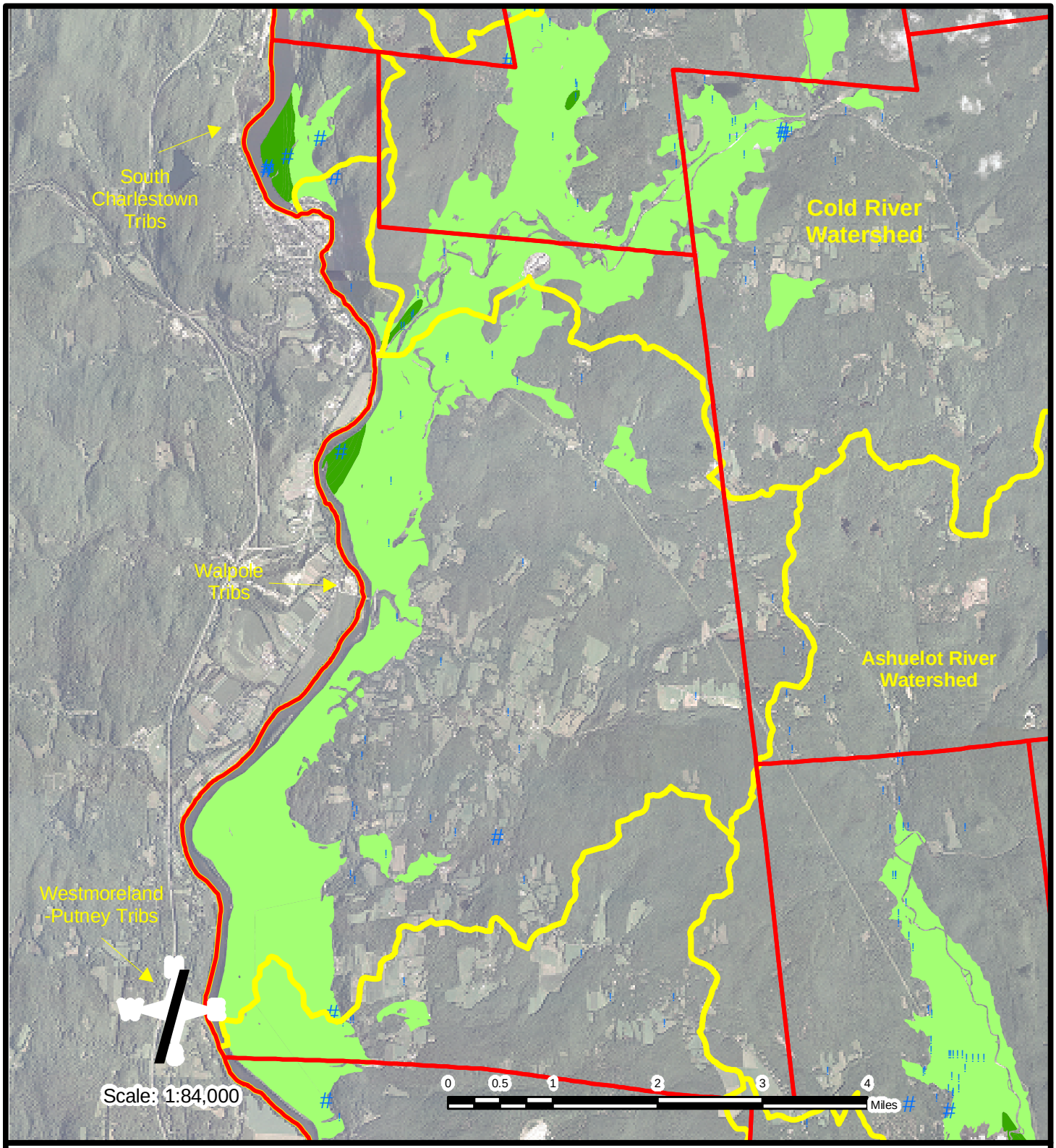
SURFACE WATER RESOURCES

Cold River Watershed, Walpole, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

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- High Transmissivity Aquifer (>1,000 ft²/d; >20ft)
- # Public Water Supply Well
- Well, Boring or Spring
- Town Boundary

Source(s): GRANIT NAIP Quad Image 5_43 (2003)
GRANIT Political Bdys., WBSS, Transm. & Watershed Bdys. Datalayers (2008)
SWRPC Watershed Boundary (2007) & DES PWS (2008) data

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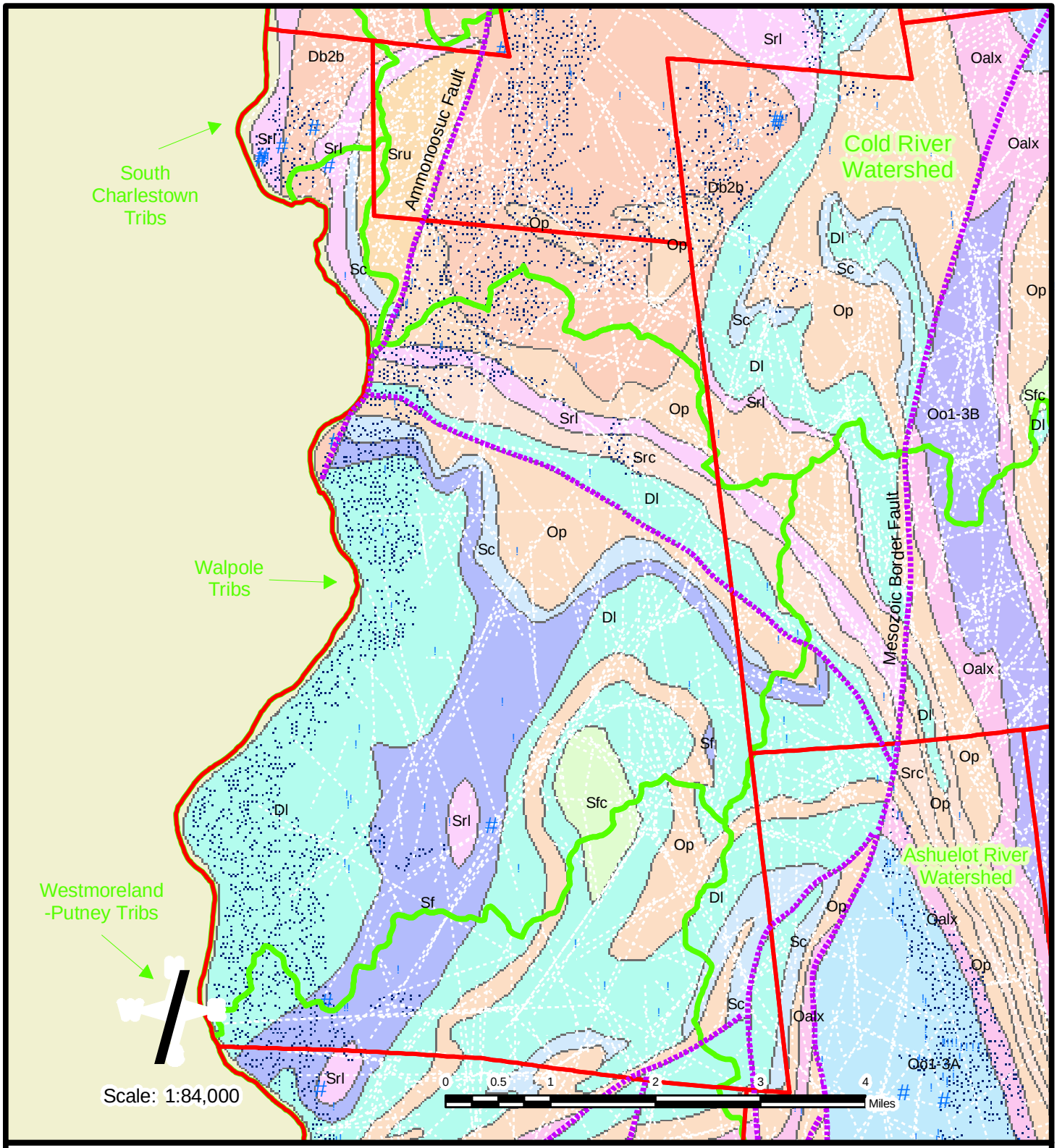
GRAVEL AQUIFER RESOURCES

Cold River Watershed, Walpole, NH

Granite State Rural Water Association

Cold River LAC

July 2008



Legend

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- Dl Bedrock Unit (Db2b=Bethlehem Granod.; Dl=Littleton Fm.; Sc=Clough Quartzite; Sf=Fitch Fm.; Sfc=Fitch+Clough Fms.; Srl/Src/Sru=Rangeley Fm.; Op=Partridge Fm.; Oalx=Ammonoosuc Volc.; Oo1-3A/Oo1-3B=Oliverian Pluton)
- Town Boundary

Figure 3

BEDROCK AQUIFER RESOURCES

Cold River Watershed, Walpole, NH

Granite State Rural Water Association

Cold River LAC

Source(s): SWRPC Watershed Boundary (2007) & DES PWS (2008) data
GRANIT Political Bdys., WBSS, Transm., Bedrock, Lineament & Watershed Bdys. Datalayers (2008)

July 2008

APPENDIX G
LOCAL LAND USE REGULATIONS MATRIX & REGULATORY OVERVIEW

Local Land Use Regulations Matrix

Insert MATRIX here!

Cold River Watershed Management Plan

Local Land Use Regulatory Overview

(Adapted from the *Ashuelot River Corridor Management Plan*, 2006)

Roles of Local Boards & Offices

Note: The synopsis of each board or office is followed by reference to NH legislation by which each is established and empowered as Revised Statutes Annotated (RSA) Chapter Number.

Town Meeting / Local Legislative Body / Voters

The voters residing within the political boundaries of a NH Town are collectively known as the Local Legislative Body. For all practical purposes, the Local Legislative Body acts at Town Meeting - either annual meetings or special meeting convened for emergency matters. All local ordinances and codes must be ratified by the Local Legislative Body. Voting takes place by ballot prior to Town Meeting and on the floor of the Town Meeting. *NH RSA 39.*

Board of Selectmen

Selectmen, the executive office of Local Government, are elected by the Local Legislative Body. Selectmen's responsibilities are broad, including financial and personnel management of town government, municipal law and code enforcement, and overseeing Town Meeting. Selectmen are typically designated to enforce the zoning ordinances, health codes and building codes by provisions of those laws. *NH RSA 41.*

Planning Board

The Planning Board is one of three land use boards which cities and towns may establish by vote of the local legislative body. The historic commission and heritage commission are the other two. The fourth land use board, the zoning board of adjustment is established by law where ever a zoning ordinance in adopted. Planning Board members may be either appointed by local Selectmen or elected by local legislative body. Planning Boards are required to develop and **maintain municipal Master Plans.** Planning boards are also typically responsible for **amendments to the zoning ordinance**. In towns with zoning ordinances, Planning Boards may also adopt regulations for the Board's use in **reviewing site plans** where a change of land use or expansion of existing use is proposed. Where site plan regulations exist all such proposals are subject to the Board's review and approval prior to issuance of building permits. Planning Boards may also develop and adopt subdivision review regulations with or without a zoning ordinance. *Variously: RSA 673 and 674.*

Zoning Board of Adjustment

Zoning Board of Adjustments is established as a provision of any adopted zoning ordinance as board of **appeals for administrative interpretation of the spirit and intent of the zoning ordinance, for variances from explicit provisions of the zoning ordinance, and for special exceptions as provided for by the zoning ordinance.** Appeals and requests for special exceptions arise from applications for building permits or subdivision or site plan approval. Zoning Board members are either elected by local legislative body or appointed as prescribed by the local legislative body. The Zoning Board may grant a variance only if the Board finds that literal enforcement of the zoning ordinance will result in unique hardship to the applicant and that granting the variance is not contrary to public interest. Notice that diminished economic return may not constitute a hardship. Zoning Boards may also be designated to hear appeals regarding applications for building permits. *RSA 674 and 676*

Cold River Watershed Management Plan

Local Land Use Regulatory Overview

Conservation Commission

Conservation Commissions are established by local legislative body to advise other town officials and boards regarding **the use and protection of natural resources** within their town. Commission members are appointed by the Selectmen or Mayor. State law prescribes more specific responsibilities to index open space and identify areas of aesthetic or ecological value including wetlands, and make recommendations for the protection or management of those areas to the Board of Selectmen. Conservation Commissions also have the opportunity to comment on applications for NH Wetlands Permits. *RSA 36-A*

Heritage Commission / Historic District Commission

Historic District Commissions are established by local legislative body to advise other town officials and boards in matters of **inventorying and protecting the towns cultural resources**, primarily man-made features and their natural, historic and aesthetic contexts. Historic District Commission members are appointed by Selectmen or Mayor. Historic District Commissions are established by local legislative bodies where a historic district has been established. Historic District Commissions have a responsibility to make recommendations for the adoption or amendment of a historic district ordinance and regulations. *Variously, RSA 673, 674 and 676.*

Code Enforcement / Health Officer / Building Inspector

The Board of Selectmen is authorized to enforce building codes and zoning ordinances as well as a health officer to enforce public health laws and rules. The local legislative body may elect to establish a building inspector or other code enforcement officer to perform those duties under supervision of the Selectmen.

Cold River Watershed Management Plan

Local Land Use Regulatory Overview

Relationship Between the Master Plan, Zoning Ordinance, and Site Plan & Subdivision Review

The municipal **Master Plan is a statement of policies for the use of land and other resources within a town**. Master Plans typically set forth goals and objectives for the future use of land and other resources with recommendations for a variety of regulatory and non-regulatory measures. The policies and recommendations of the Master Plan should be based on the findings of research into the historic, recent, and expected future conditions of various natural and social resources. Master Plans are the responsibility of Planning Boards, however, any residents can initiate and participate in the creating or revising a local Master Plan. Typically, Master Plans are updated by the Planning Board with cooperation of other local boards and the general public and often consultant services are used for research, mapping, and/or analysis. The local Master Plan is an official but advisory document which requires adoption by the Planning Board following a public hearing process.

Zoning is local law which establishes 1) standards for lot dimensions and 2) permitted uses for land within a town. Ideally, the Zoning Ordinance implements the future land use recommendations of the Master Plan. The Master Plan is the public policy which justifies the establishment of the lot standards and permitted uses required by the Zoning Ordinance. Zoning may also regulate the placement and characteristics of signs, the allowable extent of impermeable surfaces, and the emission of noise, light, or smoke from properties. The geographic boundaries of zoning districts, that is the lands where those district standards apply, may be either 1) fixed and defined by natural features, streets and roads, or property boundaries, or, 2) defined by the occurrence of certain conditions, such as wetlands or steep slopes. In the latter, the standards of "overlay districts" are invoked only where specified conditions are discovered. Zoning standards can be proposed by the Planning Board or by any other resident through petition to Town Meeting (submitted to Selectmen) with required public hearings (see *RSA 39:3*). Zoning Ordinances are adopted by vote of the local legislative body.

Subdivision and Site Plan Review Regulations are used by the Planning Board to review the specifications of proposed new lots created by subdivision and/or proposed new uses on a property or the expansion of an existing use. The review is to ensure compliance with local and state requirements. Site Plan Review regulations are criteria by which the Planning Board determines if 1) the application contains sufficient information for the Board to review the application based on the provisions of the regulations and 2) the proposed change or expansion of use conforms to the spirit and intent of the zoning ordinance and the master plan. Site plan and subdivision review typically assess lot dimensions, environmental and historic resource conditions, erosion control and drainage plans, and the layout of roads and utilities.

Updates to subdivision and site plan review regulations provide an opportunity to encourage **low-impact development** (LID) practices via the site plan review process, design standards and special permit authorization standards. LID methods minimize water resource impacts via on-site infiltration of storm water and other techniques. Towns may require builders/developers to retain runoff on-site or discharge it to a watercourse without material impact on abutting properties. Additionally, a Town may require that storm water be managed in accordance with state-of-the-art techniques such as those identified in the *New Hampshire Stormwater Manual.*

Conservation Oriented Zoning Standards

Conventional zoning creates use districts with fixed boundaries where the properties within the boundaries are subject to the dimensional and use standards prescribed by the ordinance. District boundaries are often defined property lines, road and town boundaries. Fixed boundary districts cannot address resource protection needs adequately. Historic or natural resources are often scattered across the landscape without regard to the geometry of political boundaries, property lines, or roads. **Overlay zoning was developed to protect dispersed but important resources. Wetlands, steep slopes, shorelands and other areas with special geologic, hydrological or ecological characteristics are best protected using overlay zoning.** The use standards for overlay districts are developed, approved and administered in the same protocol used for conventional zoning. The difference is that the standards are only invoked and supersede the standards of fixed boundary districts where the special conditions occur.

Floodplain zoning deserves a special note. Many towns have floodplain zoning districts wherein local use standards conform to the Federal Emergency Management Administration's requirements for the federal flood insurance program. Property owners are not eligible for flood insurance benefits unless the town in which they are located enforces FEMA floodplain use standards. These standards were not designed as environmental protection measures. They are primarily intended to limit property damage and personal injury in the event of a flood. The standards address design and construction of building, fuel tanks and septic systems in floodways - areas designated as susceptible to 100-year floods. Environmental benefits of this program are ancillary but real. For example, FEMA standards prevent the release of fuels, sewage, and debris during a flood. Towns can develop local floodplain protection standards in addition to the FEMA standards for the purpose of protecting natural resources of floodplains.

Cluster development is an innovative zoning technique which allows for smaller individual lot sizes created by subdivision with the stipulation that the overall development density for the entire development project conforms to the prevailing zoning district standards. This is accomplished by requiring the developer to set aside some percentage of the original property as open space. For example, if a district has a two-acre minimum lot size a developer could subdivide a twenty-acre forest property into ten building lots. That project would conform to the district density standard of one house for every two acres. It would also turn the entire twenty acres into front and back yards. If the town has **a general provision of the zoning ordinance** to allow cluster development, the developer could create ten half-acre lots, use some additional acreage for a private road, and leave the remaining ten or twelve acres as undeveloped forest and deeded as conservation land. The district density standard of one house for every two acres is maintained; the neighborhood, town, watershed retain some conservation land; and the developer has ten marketable properties.

Transfer of development rights is another innovative technique by which as **a general provision of the zoning ordinance** property owners or developers may increase the density or intensity of a land use on one property by decreasing the allowable density on another. This is accomplished by one property owner literally paying another property owner to transfer some quantity of density from the second property to the first. For example, a developer with designs for housing construction in a one-acre-minimum-lot-size district could pay another property owner in that district the difference in the value of the latter's undeveloped property under one- acre lot size zoning standards and, say, two-acre lot size standards. That transaction would restrict the latter's

property to a lower density and allow the developer to increase the density in his housing development. This has applications in conservation if the town has areas or properties targeted for greenbelt development, for example. Town officials could facilitate the purchase of development rights from properties targeted for land conservation.

Historic districts are authorized by state statute and become jurisdictions with land use standards distinct from the town's prevailing zoning ordinance. While created under the same protocol as a conventional zoning district, historic districts can be subject to strict specifications for building design, exterior renovation, landscaping and even paint colors in order to preserve the historic integrity of the district. Historic districts are typically village centers or industrial building complexes.

Aquifer or source protection districts are another type of overlay zoning that may be applied to limit land uses over important aquifer areas to those that will not adversely affect water quality by contamination or water quantity by preventing recharge of the aquifer. Protected areas may include entire aquifers or portions of an aquifer deemed particularly valuable for a certain purpose such as source protection areas surrounding public supply wells. The Town of Walpole has adopted the latter type of land use control for its municipal wells, for example. The purpose of their *Town Well Source Protection Ordinance* is "to protect, preserve and maintain existing and potential groundwater supply and groundwater recharge areas within the known aquifer from adverse development, land use practices or depletion.

Other Local Regulatory Standards

Other land use regulations potentially protective of water resources adopted by or being considered for adoption by municipalities cover the following topics:

- Well abandonment
- Watershed protection
- Shore lands or stream buffers
- Hazardous materials
- Wetlands conservation
- Steep slopes
- Stormwater runoff management
- Septic systems
- Earth excavation
- Private well construction/testing
- Floor drains
- Fuel storage

Topics such as these may be included in zoning, subdivision/site plan, general or health bylaws/regulations, or some combination thereof depending on the town's needs. Local regulations concerning these topics may be adopted to remove loopholes or weaknesses in existing ordinances or to clarify or strengthen local control, as authorized by the state.

APPENDIX H
LOCAL LAND USE MANAGEMENT TOOLS (NON-REGULATORY)

Cold River Watershed Management Plan

Local Land Use Management Tools (Non-Regulatory)

(Adapted from the *Ashuelot River Corridor Management Plan*, 2006)

The CRLAC recommends the following non-regulatory approaches to manage public and private activity for the purpose of preventing or minimizing environmental damage from routine activities in our towns, industry, country neighborhoods and forests:

Public Education

There is a proven relationship between people's understanding of the workings and values of the natural environment with their willingness to live their daily lives in ways that protect the health of our environment. Effective public education can take many different forms and consist of many different messages. Interested groups or individuals are encouraged to move ahead with their ideas and not hesitate to begin with modest efforts.

- Provide information to stimulate critical thinking about connections between routine activity and consequences which may not be apparent to most citizens, business owners, or public officials.
- Very basic information such as a diagram of the water cycle or a description of the poisons kept under most kitchen sinks can stimulate critical thinking about how each of us affects environmental health.
- Public education is about enabling people to make changes. Make the alternatives to damaging or dangerous activities and materials plain to the audience.
- Likewise, positive messages should be part of a public education campaign. Bring local history and natural features to residents' attention, or describe the activities of area conservation organizations and how residents can be involved.
- Avoid overloading the audience with details. Present the fundamentals with enough detail to clarify and make it real. And, always provide the audience with contacts or other ways to get more information to get involved.

Information enlightens and empowers. Most of us want to do what is right for our own welfare and to be good neighbors. Public education for conservation and environmental protection can give people the information they need to do that. There is no end to the need for public education.

How to get information to people . . .

Some towns have local newsletters. The towns will usually print public education materials.

Single page fliers can be very effective. Local business leaders or civic groups are often willing to defray the cost of printing and postage when the fliers acknowledge their generosity. Printed fliers can also be made available at public places (libraries, post offices, schools, town meeting, etc.) and private gathering places by permission (e.g. stores, taverns, fraternal organizations, etc.).

Workshops, seminars or guided walks featuring speakers or instructors from any of the many local or regional conservation agencies and organizations are often very popular and can be held in conjunction with other community activities such as meetings of local groups or town government. Presentations can also be made by local experts or enthusiasts.

Public involvement activities, e.g. canoe trips, bird watching, wildflower walks, trail maintenance and roadside clean-up are excellent ways to build appreciation for local environmental conditions and the values of natural resources.

Local Land Use Management Tools (Non-Regulatory)

Assistance for designing and conducting public education...

Discussing your public education ideas with local teachers, school principals, or school district staff can provide access to the very important audience: students. Ask local teachers about their curriculum and discuss the inclusion of conservation ideas and awareness of local resources in their classroom activities. These meetings can create a tremendous flow of information and ideas both ways. Many public schools have innovative and effective approaches in place.

Keene State College has primary and secondary education, geography, and environmental studies programs which can provide student interns for a variety of research and outreach activities. Likewise, Antioch New England Graduate School has programs in environmental studies, resource management, environmental education and communications. Internships are a required part of Antioch's degrees and the School has provided some excellent interns for environmental projects in the Cold River Watershed. Institutions such as The Harris Center for Conservation Education and Stonewall Farm conduct ongoing environmental education programming and can provide professional advice in designing and conducting public education.

Public education for conservation and environmental protection is eligible for funding under some private and public grant programs. Grant funds can enable the development of highly effective publications, seminars, videos or radio messages and the use of professional communications and conservation services. The Connecticut River Joint Commissions Partnership Program, NH DES Non-Point Source Program and the NH Charitable Foundation are potential sources of grant funds.

The arts are another important vehicle for public education. Local artists and musicians often draw ideas and inspiration from their natural surroundings, and may be able to assist directly or indirectly in educating the public about environmental issues. The Watershed is home to many creative and talented individuals and groups, many of whom have already made important contributions to environmental awareness. The effects of the 2005 Flood were documented in this way.

Local Land Use Management Tools (Non-Regulatory)

Best Management Practices *to prevent damage from* Timber Harvest, Soil Erosion, Stormwater Runoff, and Potential Contamination Sources

Environmental agencies and industry associations have developed sets of guidelines to be used during activities that disturb soil and terrain, re-route surface water runoff, or involve the handling of chemicals that will be pollutants if released into the environments. Rather than prohibit activity that has the potential to harm environmental and public health, public policy supports managing those high risk activities to prevent or minimize environmental harm. The guidelines for managing high risk activities are known universally as Best Management Practices or BMPs. **BMPs can be part of advisory public education, or BMPs can also be required as part of other permitting or regulatory processes.**

Timber Harvest

There are several authoritative sources for timber harvest BMPs. The NH Dept. of Resources and Economic Development, the NH Timberland Owners Association, the Society for the Protection of NH Forests and UNH Cooperative Extension Service all provide publications of these BMPs, which are principally aimed at preventing soil erosion and minimizing damage to the remaining timber stand. The Society for the Protection of NH Forests has also produced a publication and video on the subject of timber harvest aesthetics.

Timber harvest BMPs address construction and reclamation standards for landings and skid trails. Slowing runoff over exposed soil, reducing loss of forest soil to erosion, and preventing sedimentation of surface waters are primary goals during and after harvest.

- Careful planning for the location and grade of landings and skid trails to minimize slopes where soil is exposed.
- Installation of water bars to divert runoff from the trails rather than allowing trails to become stream beds during storms and spring snow melt.
- Using culverts, bridges, or fords made of limbs at stream crossings on skid trails and truck roads are called for during logging.
- Reclamation practices include restoring original slopes and seeding exposed soil with grass mixtures.
- Measures to reduce damage to residual timber stand include careful felling and skidding as well as intelligent planning of skid trails.

These kinds of measures require some planning and additional costs but in the long run protect the health of the timber stand and the forest ecology. The goal is to attain harvest goals with the least possible impact on the rest of the forest.

Soil Erosion on Construction Sites

Soil erosion during construction with excavation and road building can damage nearby streams and ponds by clouding the water, covering the bottom, and adding excessive nutrients to the aquatic system. Erosion also means the loss of valuable soil from the site.

During construction while the soil is protected by plants or other cover, erosion can best be checked by trapping runoff in basins dispersing it across open flat areas to reduce to the speed of the water which will allow the soil to settle to the ground. Silt fences made of hay bales or synthetic mesh both slow soil-laden water to allow settling and filter soil out of running water. Another approach is to avoid grading or piling dirt to create steep slopes which can become rushing streams during rainstorms carrying away tons of soil.

Requirements for erosion and sedimentation control measures are common elements of site plan review regulations and the State's Site Specific or Alteration of Terrain permit. The NHDES and USDA Natural Resources Conservation Service are excellent sources of assistance regarding erosion and sedimentation BMPs.

Storm water Runoff

Storm water runoff from pavement and rooftops poses two threats to a river system: 1) increased amount of water draining to streams which will increase the magnitude of flooding downstream and decrease the amount of water soaking in to the soil and recharging ground water and 2) transport of chemical pollutants in solution or as sediment directly from pavement to streams.

BMPs for storm water management are designed to slow runoff, allow water to infiltrate into the soil on-site, and allow sediment to settle out before runoff leaves the site. A common management system directs runoff into grassy swales and retention basins. Modern systems can also provide a means of removing contaminants on-site or improving groundwater recharge via LID technologies. Storm water management is a common element of site plan review. The NRCS and NHDES are excellent sources of assistance regarding storm water runoff BMPs. The University of New Hampshire's Stormwater Center is currently researching and evaluating the performance of a wide range of conventional and innovative storm water controls.

Potential Contamination Sources

Potential contamination sources (PCSs) are places where the storage, handling, use or transportation of regulated substances in regulated quantities take place. The U.S. Environmental Protection Agency has listed dozens of chemicals that are toxic to plant and animal life if released into the environment. These chemicals are regulated by federal and state agencies whenever they are found in "regulated quantities". For example, the transportation and storage of fuel oil is often regulated only in quantities of 1,100 gallons or more while other potentially hazardous substances are regulated when only 10 or 15 pounds are used.

To help build a local awareness of the hazards of PCSs, BMPs for PCSs have been developed by the NHDES to provide local officials some yardstick by which to assess the conduct of local businesses or other activities in handle potential contaminants. These BMPs were designed in conjunction with the Ground Water Protection Act and the Wellhead Protection Program. PCS BMPs can also be advised for non-regulated threats, such as unregulated quantities of toxics or for non-regulated substances such as livestock manure.

PCS BMPs address weather-proof storage; keeping spillage/wastes from regulated substances contained; preventing release into sewers, soil or runoff; and having an emergency response plan that dictates a chain of contacts and actions in the event of an accident. Planning Commissions, Conservation Commissions and the NHDES are sources of assistance regarding PCS BMPs.

Local Land Use Management Tools (Non-Regulatory)

Conservation Easements

Concern for the fate of undeveloped land is prevalent among residents and municipal boards in the Cold River Watershed. Preventing or restricting development by regulation is contentious and can be unfair to property owners; land is capital and each land owner is entitled by constitutional law to a reasonable economic return on their investment in land. There is also legal precedent for the existence of a valid public purpose in the protection of wilderness and other undeveloped land. The public benefits include preservation of biological diversity, protection of drinking water supplies, conservation of timber, and the simple fact that "green space" makes people feel good.

An equitable way to provide the public benefits of undeveloped land without imposing economic hardship on landowners is the use of conservation easements to protect land from development. Conservation easements are legal mechanisms by which a buyer pays the landowner value of the land's development potential. That is, the difference between the value of the land at full development potential and the value of the land with limited-or-no development potential. The landowner can retain ownership of the land but is legally bound by a deed restriction against developing the land. The easement can be purchased by any private or public entity with legal standing to expend funds and own property.

The Monadnock Conservancy, the Society for the Protection of NH Forests, the Nature Conservancy, the Audubon Society of NH and the NH Dept. of Resources and Economic Development all facilitate, purchase and/or monitor conservation easements in southwest NH. Municipalities, property owner associations and local land trusts can also purchase easements.

Easements can also be donated by landowners. Donation can provide landowners with various tax advantages. And, of course, outright purchase of land for conservation is another alternative.

There are also innovative zoning systems that allow trading of development credits between zoning districts to allow higher density development in one zoning district in return for limiting development in another. The burden of financing that trade-off falls on developers. This is an alternative to easements or purchase, which does not require the municipality or conservation group to raise funds.

The Monadnock Conservancy is working with the Towns of Alstead and Walpole to coordinate comprehensive planning for land conservation via the development of "open space" plans. A key component of the plans is to encourage voluntary conservation easements.

APPENDIX I
DIRECTORY OF LOCAL, STATE & FEDERAL ASSISTANCE

Cold River Watershed Management Plan

Directory of Local, State & Federal Assistance

(Adapted from the *Ashuelot River Corridor Management Plan*, 2006)

Town Government

Each town is governed by officials as designated by the local legislative body (a.k.a. Town Meeting, or City Council). Local officials and boards whose roles include issues related to stewardship of the Cold River Corridor include the Board of Selectmen, Planning Board, Conservation Commission and Health Officer. Contacting the Town Clerk, Administrator or Selectmen's office is often the most efficient way to reach local officials due to annual changes in town office business hours, meeting times for local boards, and the names of those officials.

There are several organizations that maintain directories of local officials, including SWRPC (357-0557), UVLSRPC (448-1680), NH Department of Transportation (271-3734), and the NH Municipal Association (1-800-852-3358).

Acworth Town Office 835-6879

Alstead Town Office 835-2986

Charlestown Town Office 826-4400

Langdon Town Office 835-2389

Lempster Town Office 863-2698

Marlow Town Office 446-2245

Unity Town Office 543-3102

Walpole Town Office 756-3672

Cold River Watershed Management Plan

Directory of Local, State & Federal Assistance

Cold River Regional Organizations & Agencies

Alstead Area Citizens Trust

P.O. Box 484, Alstead, NH 03602
Tele: 352-2585, email: molesky.dennis@gmail.com
Dennis Molesky, AACT Board

Local non-profit land trust helping Alstead area communities achieve betterment, growth and prosperity by (a) promoting education/recreation, conservation, historic preservation, sustainable land management and community cohesion, (b) identifying/protecting local and regional assets such as open space, forests and habitat and (c) fundraising to support these goals.

Antioch New England Graduate School

Environmental Studies Department, 40 Avon St., Keene, NH 03431
Tele: 283-2326, email: sbockus@antioch.edu
Sarah Bockus, Practicum Coordinator

Antioch offers graduate programs in environmental studies and resource management. Antioch faculty/students have worked with private and public entities on a great variety of research, public education, and policy-making projects, and are valuable resources for local conservation projects.

Cold Pond Community Land Trust

P.O. Box 212, Acworth, NH 03601
Tele: 603-499-0899, email: walteralderman@yahoo.com or cpclt@sover.net
Walt Alderman, CPCLT Representative

Local non-profit land trust formed to protect farm and forest land, encourage the growth of local agricultural connections, and educate the surrounding population about the value of small farms and fresh food. CPCLT provides secure affordable access to land and housing for community residents and promotes ecologically sound land-use practices.

Cold River Local Advisory Committee / VRAP

P.O. Box 68, South Acworth, NH 03607 / 375 Pratt Road, Alstead, NH 03602
Tele: 835-2309, email: dhinman@sover.net / Tele: 835-2328, email: heidorn1@sover.net
Deborah Hinman, Chair / Mike Heidorn, VRAP Coordinator

The CRLAC is authorized to develop and promote the Cold River Watershed Management Plan and afforded the opportunity to review and comment on applications for environmental permits within the River corridor. Principal interests are public education for watershed stewardship and giving assistance to local land use boards regarding the same. The CRLAC includes representatives from five corridor towns and hosts an extensive volunteer water quality monitoring program (VRAP).

Connecticut River Joint Commissions

P.O. Box 1182, 154 Main Street, Charlestown, NH 03603
Tele: 826-4800, email: Sharon.Francis@crjc.org
Sharon Francis, Executive Director

The CRJC is a strong advocate for public involvement in water resource decision-making and is active with the legislatures and environmental agencies of both states as well as at the federal level. A number of outstanding fact sheets and BMPs for protecting water resources are available on their web site, and they offer a small grants program which funds local conservation and education tasks.

Cold River Watershed Management Plan

Directory of Local, State & Federal Assistance

Connecticut River Watershed Council

15 Bank Row, Greenfield, MA 01301
Tele: 413-772-2020, email: cgwyther@ctriver.org
Chelsea Reiff Gwyther, Executive Director

Public education and interagency networking regarding stewardship and environmental policy. The CRWC works to protect the CT River valley by building partnerships, conducting research, producing publications and initiating programs that encourage local activism and discovery. CRWC staff includes three River Stewards who assist others and take action when threats or opportunities arise.

Crescent Lake Association / Crescent Lake VLAP

Crescent Lake Road, Lempster, NH 03605 / 34 Lake Road, Newport, NH 03773
Tele: 863-1021, email: lbyates@myfairpoint.net / Tele: 863-8838, email: sugarcanoe@aol.com
Fred Yates, CLA Secretary-Treasurer / Stan Rastallis, VLAP Representative

Fall Mountain Regional School District

159 East Street, Charlestown, NH 03603
Tele: 826-7756, email: dlivingston@sau60.org
Debra Livingston, Superintendent

The FMRSD operates several elementary/middle schools and a regional high school in the Watershed. The District has been supportive of CRLAC sampling efforts and FMRSD students have participated in sampling as well as created a Cold River Journal. Grades 3 - 6 participated in the CRLAC's Environmental Education Curriculum, resulting in a River Journal Calendar.

Lake Warren Association / VLAP

Pine Cliff Road, Alstead, NH 03602 / Prentice Hill Road, Alstead, NH 03602
Tele: 835-6523, email: dhoganjr@yahoo.com / Tele: 835-2825, email: mowkat@webryders.com
David Hogan, LWA President / Kate Tarlow Morgan, VLAP Coordinator

The Lake Warren Association hosts a number of social gatherings each year and maintains a vigorous lake monitoring program. The program includes support of Lake Hosts at the public boat ramp to monitor incoming boats as well as an in-lake invasive plant inspection process. Routine and comprehensive chemical/physical monitoring of water quality is completed by VLAP volunteers.

Monadnock Conservancy

P.O. Box 337, 15 Eagle Court, Keene, NH 03431-0337
Tele: 357-0600, email: ryan@monadnockconservancy.org
Ryan Owens, Executive Director

The Conservancy's mission is to promote land conservation for preserving the natural and cultural heritage of southwest NH, including Alstead, Marlow and Walpole. The group has a network of local members who represent the Conservancy to their respective towns, and vice-versa.

NH Fish and Game Department, Region 4

15 Ash Brook Court Keene, NH 03431
Tele: 352-9669, email: reg4@wildlife.nh.gov
Lt. Craig Morrocco, Conservation Officer

This NHFG office is staffed by an officer whose principal duties are public safety and law enforcement, and can contact other NHFG personnel, e.g. fisheries and game biologists.

Directory of Local, State & Federal Assistance

The Orchard School
114 Old Settlers Road, Alstead, NH 03602
Tele: 835-2495, email: theorchardschool@valley.net
Eleanor Elbers, Director

The Orchard School provides early childhood education, summer camps and a community center. It strives to be an accessible place of learning that nurtures a sense of the community and the land, and foster connections between rural communities and the world beyond.

Southwest Region Planning Commission
20 Central Square, 2nd Floor, Keene, NH 03431
Tele: 357-0557, email: tmurphy@swrpc.org
Tim Murphy, Executive Director

Provides local planning assistance; conducts regional planning activities; provides liaison between state and local interests; maintains and manages a repository of socio-economic, environmental, and geographic information; and participates in statewide policy and program activity in all matters regarding community planning. Serves 36 towns in Cheshire and Hillsborough Counties and is one of nine NH regional planning agencies.

Upper Valley Lake Sunapee Regional Planning Commission
30 Bank Street, Lebanon, NH 03766-1756
Tele: 448-1680, email: cwalker@uvlsrpc.org
Christine Walker, Executive Director

Provides local planning assistance; conducts regional planning activities; provides liaison between state and local interests; maintains and manages a repository of socio-economic, environmental, and geographic information; and participates in statewide policy and program activity in all matters regarding community planning. Serves 26 towns in Sullivan and Grafton Counties. Is one of nine NH regional planning agencies.

University of New Hampshire Cooperative Extension, Cheshire/Sullivan Counties
800 Park Ave Keene, NH 03431 / 24 Main Street, Newport, NH 03773-1515
Tele: 352-4550, email: Carl.Majewski@unh.edu / Tele: 863-9200, email: Chuck.Hersey@unh.edu
Carl Majewski, Administrator (Cheshire Cty.) / Chuck Hersey, Co-Administrator (Sullivan Cty.)

Provides NH citizens with research-based education and information, enhancing their ability to make informed decisions that strengthen communities, sustain natural resources and improve the economy. As part of a national system, accesses the knowledge and expertise of other state land-grant universities. Staff work with local volunteers and specialists from UNH to design and conduct educational programs that meet societal, environmental and economic needs.

US Fish and Wildlife Service, Conte Refuge
103 East Plumtree Road, Sunderland, MA 01375
Tele: 413-548-8002, email: Andrew_French@fws.gov
Andrew French, Project Leader

Implements research, habitat management, and public education regarding the purposes of the Silvio O. Conte National Wildlife Refuge for the Connecticut River valley. Refuge activity includes in-stream habitat protection for migratory fish in the Cold River and tributaries.

Cold River Watershed Management Plan

Directory of Local, State & Federal Assistance

County-Level Organizations & Agencies

Cheshire County Conservation District
11 Industrial Park Drive, Walpole, NH 03608
Tele: 756-2988, email: amanda.costello@nh.nacdnet.net
Amanda Costello, District Manager

Sullivan County Conservation District
24 Main Street, Newport, NH 03820-1500
Tele: 863-4297, email: janice.heighes@nh.nacdnet.net
Janice Heighes, District Manager

Statewide Organizations

Appalachian Mountain Club, NH Chapter
P.O. Box 298, Route 16, Gorham, NH 03581
Tele: 466-2721, email: PaulBerryAMCNH@aol.com
Paul Berry, Chair

Activities include public education and political activity regarding environmental policy, land conservation, and environmental education. Maintains Appalachain Trail and trail amenities.

NH Audubon Society
84 Silk Farm Road, Concord, NH 03301
Tele: 224-9909, email: nha@nhaudubon.org
Rick Minard, President

Activities include public education and political activity regarding environmental policy, land conservation, and environmental education. Organizes an annual migratory bird census in the Ashuelot River Watershed conducted by local volunteers.

NH Association of Conservation Commissions
54 Portsmouth Street, Concord, NH 03301
Tele: 224-7867, email: CarolAndrews@nhacc.org
Carol Andrews, Executive Director

Provides networking among NH Conservation Commissions through a quarterly newsletter and participates in legislative activity regarding environmental policy.

NH Farm Bureau
295 Sheep Davis Road, Concord, NH 03301
Tele: 224-1934, email: robj@nhfarmbureau.org
Rob Johnson, Executive Director

Cold River Watershed Management Plan

Directory of Local, State & Federal Assistance

NH Rivers Council

54 Portsmouth Street, Concord, NH 03301
Tele: 228-6472, email: carl@nhrivers.org
Carl Paulsen, Program Director

Public education and networking among grassroots organizations, state and federal agencies and legislators regarding river protection policy and programming; supports NH Rivers Management and Protection Program implementation.

NH Timberland Owners Association

54 Portsmouth Street, Concord, NH 03301
Tele: 224-9699, email: jstock@nhtoa.org
Jason Stock, Executive Director

Landowner association participating in public education and political activities regarding land management, timber management and marketing, and public policy.

NH Youth Conservation Corps, Student Conservation Association

689 River Road, P.O. Box 550, Charlestown, NH 03603-0550
Tele: 543-1700, email: agency-help@thesca.org
Dale Penny, President

Organizes and manages student work teams for conservation activities.

NH Wildlife Federation

54 Portsmouth Street, Concord, NH 03301
Tele: 224-5953, email: dufresne03@gmail.com
Bob Dufresne, Secretary

The Nature Conservancy, New Hampshire Field Office

22 Bridge Street, 4th Floor, Concord, NH 03301
Tele: 224-5853, email: mzankel@tnc.org
Mark Zankel, Deputy State Director

Sierra Club, NH Chapter

40 North Main Street, 2nd Floor, Concord, NH 03301
Tele: 224-8222, email: phope@worldpath.net
Peter Hope, Outings Chair

Society for the Protection of NH Forests

54 Portsmouth Street, Concord, NH 03301
Tele: 224-9945, email: jdifley@forestsociety.org
Jane Difley, President/Forester

Activities include public education and political activity regarding environmental policy; promotes land conservation and forest management; owns and manages conservation land.

Trout Unlimited - NH
18 Low Street, Concord, NH 03301-4902
Tele: 226-3436, email: jmaccartney@tu.org
Jim MacCartney, River Restoration Specialist

Activities include public education and political activity regarding stream protection. Also conducts stream habitat improvement and restoration projects and promotes stewardship.

State Government Agencies

NH Department of Environmental Services
29 Hazen Drive, P.O. Box 95 Concord, NH 03302-0095
Tele: 271-8801, email: scouture@des.state.nh.us
Steven Couture, Rivers Coordinator

Volunteer Lake Assessment Program
Sara Steiner, Coordinator, Tele: 271-2658

Volunteer River Assessment Program
Ted Walsh, Coordinator, Tele: 271-2083

NH Department of Resources and Economic Development
172 Pembroke Road, P.O. Box 1856, Concord, NH 03302-1856
Tele: 271-2411, email: sboucher@dred.state.nh.us
George Bald, Commissioner

Division of Forests and Lands
Tele: 271-2214

NH Natural Heritage Bureau
Tele: 271-2215

NH Department of Transportation, Bureau of Environment
P.O. Box 483, 7 Hazen Drive Concord, NH 03302-0483
Tele: 271-3734, email: chood@dot.state.nh.us
Charlie Hood, Administrator

NH Fish and Game Department
11 Hazen Drive, Concord, NH 03301
Tele: 271-351, email: director@wildlife.nh.gov
Glenn Normandeau, Executive Director

NH Department of Cultural Resources
20 Park Street, Concord, NH 03301
Tele: 271-2392, email: vmcleod@library.state.nh.us
Van McLeod, Commissioner

Cold River Watershed Management Plan

Directory of Local, State & Federal Assistance

NH Office of Energy and Planning
4 Chenell Drive, Concord, NH 03301-8501
Tele: 271-2155, email: amy.ignatius@nh.gov
Amy Ignatius, Director

NH Division of Historical Resources
19 Pillsbury Street, Concord, NH 03301-3570
Tele: 271-3483, email: preservation@dcr.nh.gov
Elizabeth Muzzey, Director

Federal Government Agencies

US Army Corps of Engineers, New England District
696 Virginia Road, Concord, MA 01742-2751
Tele: 978-318-8111, email: larry.b.rosenberg@usace.army.mil
Larry Rosenberg, Public Affairs Chief

US Environmental Protection Agency, Region 1
One Congress Street, Suite 1100, Boston, MA 02114-2023
Tele: 888-372-7341, e-mail: davanzo.thomas@epa.gov
Tom D'Avanzo, Assistance & Pollution Prevention Office Manager

US Fish and Wildlife Service, New England Regional Office
300 Westgate Center Drive, Hadley, MA 01035-9587
Tele: 413-253-8200, email: northeast@fws.gov
Marvin Moriarty, Regional Director

US Geologic Survey, New Hampshire
361 Commerce Way, Pembroke, NH 03275
Tele: 226-7800, email: dc_nh@usgs.gov
Keith Robinson, Science Center Director

Conducts research, maintains data and issues reports regarding geology and hydrology including stream flow data, ground water distribution, and water use.

US National Park Service, New Hampshire/Vermont
Marsh-Billings-Rockefeller National Historical Park, 54 Elm St, Woodstock, VT 05091
Tele: 802-457-3368, email: lelia_mellen@nps.gov
Lelia Mellen, Rivers, Trails & Conservation Assistance Program