

Chateaugay Lakes Watershed Management Plan

September, 1999

Table of Contents

Watershed Map.....	2
Background	3
Overview	
Watershed Planning Project	
Purpose.....	3
Process.....	4
Implementation.....	4
Planning and Zoning.....	5
Regional	
Local	
Lake Level Management.....	7
Water Quality.....	8
Wastewater Management	
Erosion/Sedimentation	
Ecology.....	12
Endanged/Threatened/Protected Species	
Nuisance Nonnative Species	
Recreation.....	13
Economic.....	14
Education.....	15
Priorities.....	15

1. Overview

Upper and Lower Chateaugay Lakes are located in the northern Adirondack Mountains of upstate New York, at an elevation of 399 meters above sea level. Drainage is via the Chateaugay River, which enters the St. Lawrence River at Chateaugay, Quebec, Canada. Surface level of both lakes, the Narrows connecting the lakes, and the riverine outlet is regulated by the Forge Dam. The watershed area is 261 km², with the surface area of the two lakes totaling 12.8 km². Upper Chateaugay Lake is oligotrophic and exhibits seasonal thermal stratification. Lower Chateaugay Lake is mesotrophic, with limited thermal and oxygen stratification due to wind mixing. The lakes support a healthy and diverse sport fishery, and are a popular destination for recreational activities. Residential development on the shoreline of Lower Chateaugay Lake and the Narrows is moderate to high, development on Upper Chateaugay Lake is low to moderate. Away from the shoreline, residential development is primarily in the hamlets of Lyon Mountain and Standish, with the most of the watershed being undeveloped forest land.

2. Watershed Planning Project

The Watershed Planning Project is a collaboration between the NYS Federation of Lake Associations (FOLA), the Chateaugay Lakes Association, and the Department of Environmental Conservation (DEC). The Chateaugay Lakes Watershed was selected as one of eight in New York State for a pilot study, funded by US Environmental Protection Agency Watershed Planning Grants. The total budget for the Chateaugay Lakes Watershed Planning Project was \$6,500. The goals of the project are to bridge the gap between local and state management efforts, and to organize management priorities into a Management Plan. The project assembled existing data and collected new information to produce a technical report, The State of the Chateaugay Lakes. The technical report was used to guide discussions of issues and management options, and to develop specific recommendations for implementation.

A Watershed Management Team was formed, with membership from representatives of local government, interest groups, and citizens from several areas of the watershed. Through broadcast mailing, press release, and open invitations, representation from a variety of stakeholders was solicited. The Watershed Management Team oversaw fiscal expenditures associated with compilation of The State of the Chateaugay Lakes, and developed this Watershed Management Plan through discussion and written comments.

2. Purpose

The purpose of the Watershed Management Plan is to develop and prioritize management actions, and to support funding applications for environmental projects. Each recommended action includes a cost estimate in parentheses. Several of the actions are dependent upon securing sufficient funding for implementation.

3. Process

The process used for development of this Management Plan generally followed a model of U.S. Environmental Protection Agency funded lake diagnostic-feasibility studies. This involved a fact finding component (The State of the Chateaugay Lakes report), and a consensus-building portion (Watershed Management Plan.) Lake Champlain and Upper Saranac Lake are examples of other area lakes which have conducted similar Watershed Planning Projects. The scale of the Chateaugay Lake Watershed Planning Project was greatly reduced compared to the aforementioned watersheds, due to budgetary constraints.

The State of the Chateaugay Lakes report is a snapshot of available information and conditions within the watershed. The Watershed Management Plan however, is intended to be a living document. Occasional reevaluation of management priorities, based upon new information, implementation successes, or changed conditions, will ensure that the document remains current. This will also allow continuing discussion of controversial items while proceeding with work on consensus items. Implementation progress may be tracked in plan updates every 3-5 years.

4. Implementation

Like many other watersheds, management efforts in the Chateaugay Lake watershed have been hampered by the division of local government jurisdictions. The availability of town and county resources and local ordinances are not uniform within the watershed. Environmental management in the watershed is further complicated by the jurisdictional overlap of state agencies responsible for managing natural resources. Successful plan implementation is dependent upon reducing these historic barriers to consensus building. In watershed management this may be accomplished by creating a watershed or shoreline district, with the district board serving as a body overseeing implementation.

There is a shoreline district inclusive of all segments of the Chateaugay Lakes, created in Chapter 994 of the Laws of New York 1969. This district was created by New York State, upon a petition from the towns of Bellmont, Dannemora, and Ellenburg, “to maintain and control the water levels...for the purposes of fire protection, the preservation of real property values, the enhancement of the scenic beauty of the towns, the preservation of the public safety, recreation, and the conservation of fish and aquatic life within the towns.” The Water Level Control Board (WLCB) was created to oversee the district, consisting of three representatives appointed by each of the towns. The WLCB is advisory only, the towns each levy, administer, and collect district taxes. Its primary function has been to guide fiscal and technical management and decision making related to the Forge Dam.

Since completion of reconstruction of the Forge Dam, the WLCB has not convened on a regular basis, largely because of the perception that run-of-the-river management has eliminated the WLCB role. Representatives feel that control of the water levels now lies with the agencies of New York State. However, given the broad purposes listed in the enabling legislation, the role of the WLCB could be expanded to include watershed planning and implementation.

The Watershed Management Team was formed to guide the process of developing a Watershed Management Plan. It was not intended to have an open-ended existence, nor to become a new institution of government. In the absence of another body taking on the task of plan implementation, the Watershed Management Team will continue to meet and discuss management issues, to foster plan implementation through advisement of local, county, and state officials, seeking implementation funding, and assessing management priorities.

Recommendation:

Stakeholders should continue to meet as necessary to oversee Management Plan implementation, provide a forum for discussion of management issues, and act as an advisory board for town and county government on a broad range of management issues.

The cost associated with this recommendation is for the expense of legal advice. Three possible bodies to establish the framework for these meetings are:

1. The role of Water Level Control Board could be broadened to give greater consideration to the range of purposes detailed in the enabling legislation. This would require the towns to delegate the necessary authority and appoint active representation to the Water Level Control Board.
 2. The Watershed Management Team could be continued as a discussion forum.
 3. The Chateaugay Lakes Association could continue their role as a discussion forum and an advocacy group for plan implementation. (\$2000)
5. Planning and Zoning
- a. Regional

Zoning laws are generally intended to maintain environmental and aesthetic conditions, by separation of incompatible uses into different zones. Site Plan review laws have a similar intent, but instead of separating use by zones, rely upon review of development site plans to identify and avoid incompatible or environmentally damaging uses. Zoning is the most frequently used means of planning and controlling the pace, nature, and consequences of development. In the Chateaugay lakes watershed, environmental planning is primarily conducted at a regional level, with all state and private lands in the Adirondack Park zoned under the Adirondack Park Agency Act. This Act classifies land according to characteristics, purpose, and development intensity, specifying compatible uses, minimum lot size, and required setbacks. The Act is administered by the New York State Adirondack Park Agency.

Regional zoning may preserve aesthetic conditions in the watershed, but by itself, zoning is generally not an effective means of protecting water quality. Water quality may be impacted by development in two ways. Sediment and nutrients can be carried to lakes by runoff from the construction site or removal of vegetative cover from the lot. Nutrients in incompletely treated waste water from private septic systems can also reach the lakes, particularly in shallow soils and soils with low permeability. To assess the effects of development regulated by a zoning law

controlling minimum lot size and setback, buildout scenarios can be developed. Maximum buildout is the point at which all usable lots have been subdivided and developed. Maximum buildout has been determined for the shoreline area, but not for the entire Chateaugay Lake watershed. Within the shoreline area, maximum buildout would result in a tripling of residential structures and a doubling of private docks.

The Watershed Planning Project developed a computer model which can predict water quality impacts of additional development, and be used as a management tool in considering development scenarios. This model assumes phosphorus to be the limiting factor for algal growth in the Lakes, and is based upon the number of residential structures and the percentage of various land uses in the watershed. Values derived from published sources for phosphorus runoff estimates from developed, agricultural, and forest land use were applied to the Chateaugay Lakes watershed. These estimates are similar to values which were measured with a higher degree of accuracy in the Lake Champlain study. Since land cover and loading from wastewater discharges (septic systems and municipal facilities) are the principal sources of phosphorus, these values are easily modified variables in the model. Scenarios on development and wastewater treatment improvements can be simulated, and combined with cost estimates, can provide cost-benefit information to managers and decision makers.

Using existing data, the model estimated that septic systems are currently the source of 10% and 28% of the phosphorus entering Upper and Lower Chateaugay Lakes, respectively. A more complete analysis would allow the phosphorus model to be linked to buildout scenarios, increasing the accuracy and utility of both methods of predicting the effects of development on the Chateaugay Lakes.

1. Local

The Town of Ellenburg passed a local zoning ordinance in 1991. In 1994 the Chateaugay Lakes Association contracted a consultant for development of a shoreline zoning plan, the Chateaugay Lakes Management Plan. This plan was not townwide, nor inclusive of the entire watershed, but covered an area of 2000 feet around the lakeshore. This “spot zoning” concept may be more favorably received than townwide zoning, but has not been enacted by the shoreline towns.

Recommendation:

Comment on the Chateaugay Lakes Management Plan should be solicited from planners with the expertise to evaluate local and regional zoning plans. The Chateaugay Lakes Association should request that the Adirondack Park Agency evaluate and provide critical comment on the Chateaugay Lakes Management Plan. (\$500)

Recommendation:

A presentation to the town boards and/or general public by experts on the potential effects of development should be scheduled. The session should include questions and answers on the legal, economic, and environmental ramifications of zoning or other local

ordinances to control development. (\$500-2000).

6. Lake Level Management

Lake level has been a very controversial issue for several years. The Forge Dam, which controls lake level, was reconstructed in 1994. Prior to this, lake level was manipulated to reduce flooding, primarily by winter drawdown. State agencies opposed this practice, believing that manipulation of lake level was ecologically damaging. Downstream hydropower producers were impacted by erratic river flows. Since reconstruction, the Forge Dam has been operated as run-of-the-river, with no manipulation of the gates. Extreme weather events in 1996 and 1998 caused extensive flooding throughout the region, including the Chateaugay Lakes. Some residents feel that the damage from this flooding could have been reduced by proactive drawdown.

Hydrology is a complicating factor in flooding on the Chateaugay Lakes. Sandbars and narrow bridge openings reduce the cross-sectional area through which the water flows, and act as barriers to water flow during flood stage. Recognizing the importance of watershed hydrology, state agency permits mandated that the towns “install a continuous monitoring flow and water level device at the dam as well as a staff gage at the dam and at locations within the Lower and Upper Chateaugay Lakes. Daily water level elevation readings shall be recorded from all three staff gages.” and “prepare, in consultation with the Agency and DEC, a study of the management of water levels within the impoundment over the first full five year period after the dam has been repaired...” (APA Permit 92-52.)

In response to flooding in 1998, the shoreline towns requested state permits be modified “to allow a drawdown over the course of the winter and to allow use of the gates...for the purpose of regulating water levels” (July 16, 1998 letter from Attorney Brian Stewart to DEC and APA.) The Chateaugay Lakes Association passed a resolution of support and brought the issue to the attention of elected representatives. State agencies have expressed a willingness to negotiate the specifics of data collection and study preparation, but denied the requested permit modifications because neither of the requirements for study has been satisfied. The towns are currently seeking funding to study and report on the watershed hydrology through the NYS Environmental Protection Fund and the Federal Flood Hazard Mitigation Program.

The goal of lake level management is to minimize the effects of flooding on the Chateaugay Lakes and River, while balancing ecological and property damage. In addition to the question of whether state or local government should have responsibility for management of the town-owned dam, there are significant technical issues to be resolved. Compromise will be required of all involved parties to achieve a consensus on management. Ultimately, if management options other than run-of-the-river are to be considered it will be necessary to develop a rule curve for the Chateaugay Lakes. A rule curve provides a target elevation for any given time of the year, and an allowable range of variation from the target. This is used to guide decision making on water releases and lake drawdown.

Recommendation:

A hydrologic study to investigate dynamics of water flow through the Lake system should be conducted to guide management actions. The study should consider the effects of hydrologic constrictions, snowpack, lake level, and downstream impacts. (\$25,000-\$50,000)

Recommendation:

Educational materials on construction to mitigate the effects of flooding should be developed and made available to watershed residents. (\$1,000-\$2,000)

Recommendation:

A rule curve for the Chateaugay Lakes system should be developed, including target lake elevation for various times of the year.

Recommendation:

Due to the international implications of flood events in the Chateaugay River watershed, the towns should request that the US Army Corps of Engineers Cold Regions Research and Engineering Laboratory study and report on the watershed hydrology.

7. Water Quality

Water quality is a broad category, including issues of taste, odor, appearance, and the chemical makeup of water. Water quality is most often measured by levels of nutrients (phosphorus and nitrogen), chlorophyll (amount of algae present), light penetration (indicator of suspended matter), and coliform bacterial counts. The first three are an indication of trophic status of the lake, i.e. the stage of advancement of eutrophication. Eutrophication is the natural process whereby a lake traps and over time fills with sediment. Pollution of a lake with excessive sediment and nutrients from human activities can greatly accelerate this process. Fecal coliform bacteria counts are a measure of the contamination of a lake from human sewage.

In New York State, surface water is classified according to best use:

Class	Best Use
AA	drinking water supply with only disinfection
A	drinking, with sedimentation/filtration and disinfection
B	contact recreation
C	fish propagation
D	fishing
(T)	supports trout.

Upper and Lower Chateaugay Lakes, the Narrows and Outlet are all classified B(T), most tributary streams are C(T) or D. Waterbodies in which best use are not met are considered impacted, with the use precluded, impaired, stressed, or threatened, depending upon the degree of impact.

The DEC maintains a list of impacted waterbodies, the Priority Water List. Lower Chateaugay Lake is listed as being stressed for aesthetics and threatened for fishing due to

nutrients and pathogens from on-site septic systems. Franklin County has reported that during drawdown for dam reconstruction, numerous improperly installed or functioning septic systems were observed. The Citizens Statewide Lake Assessment Program (CSLAP) collected data on nutrients and chlorophyll, and other measures of water quality. This data indicated that from 1991 to 1993 Lower Chateaugay Lake experienced increasing phosphorus and chlorophyll levels throughout the summer. After completion of the Lyon Mountain Wastewater Treatment Facility, in 1994 and 1995, this increase was not observed.

To identify trophic status and trends in the Chateaugay Lakes, a phosphorus budget was developed. The estimated phosphorus budget for Lower and Upper Chateaugay Lakes are shown in Figures 1 and 2, respectively.

Figure 1. Total phosphorus import/export loadings for Lower Chateaugay Lake.

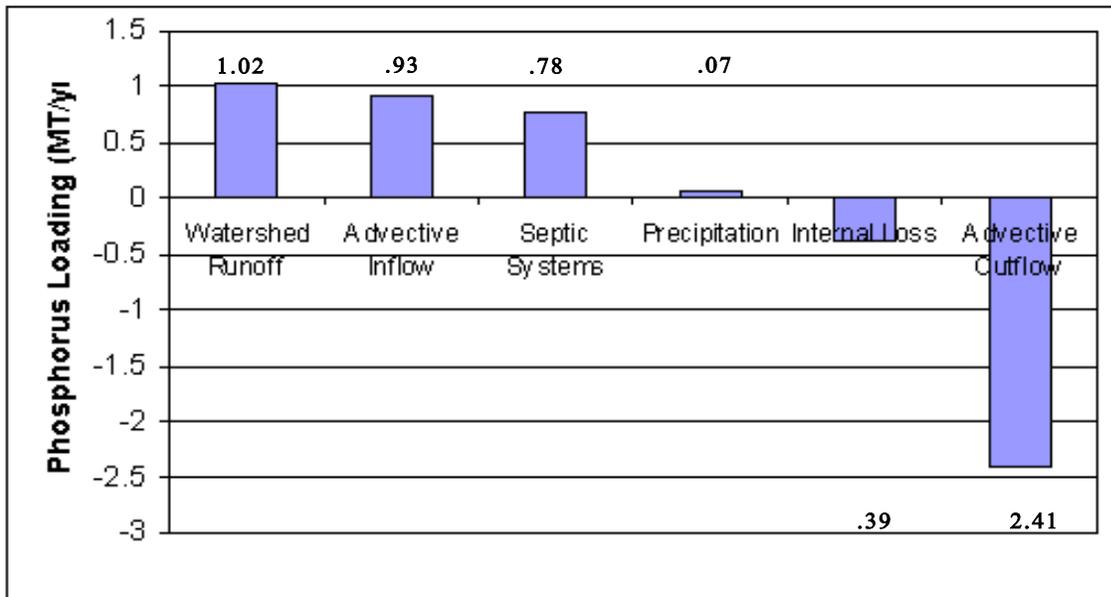
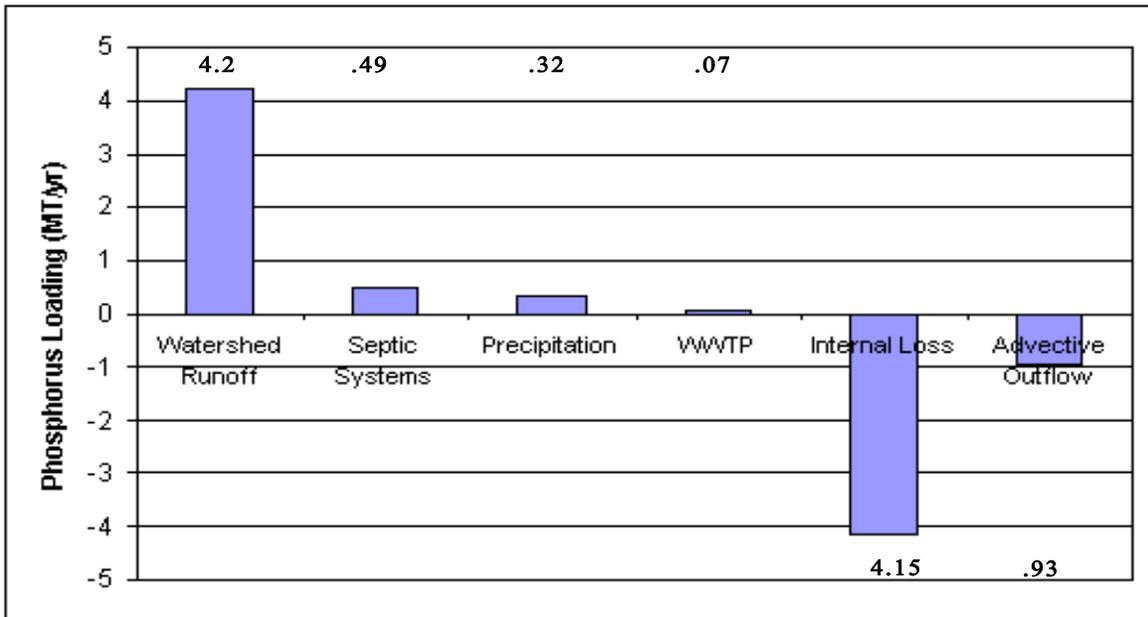


Figure 2. Total phosphorus import/export loadings for Upper Chateaugay Lake.



The precision and accuracy of this model is limited by the data available. The only measured values in the formula are in-lake concentration and wastewater treatment plant (WWTP) loading. Other values are estimates, based upon literature values and partial data. Additional data would better quantify loading estimates and allow a higher level of precision in modeling efforts. Results of the model indicate that future efforts should concentrate on the Narrows, Outlet and Lower Lake, where human-caused, and therefore manageable, sources of phosphorus are greater.

1. Wastewater Management

Based upon the computer modeling of existing data, private septic systems and the Lyon Mountain Waste Water Treatment Plant contribute 10% and 1%, respectively, of the phosphorus loading to Upper Chateaugay Lake. In Lower Chateaugay Lake, 28% of phosphorus loading comes from shoreline septic systems. However, detection of failed septic systems and quantification of pollutant loads from these systems is unmeasurable, and estimates which do not factor in the variable of soil type can be very imprecise.

Particularly on the Narrows and Lower Lake, small lot size is a limitation to the development of properly functioning septic systems. Conversion of seasonal camps to year round homes without upgrading the septic system is common throughout the Adirondacks, and has the potential increase both bacterial and nutrient pollution. In addition to lot size limitations and potential overloading of existing systems, some areas of the lake shoreline may have limitations on septic systems due to soil type.

To achieve the best use of funding, it would be beneficial to establish a long-term goal for wastewater management. Construction of public wastewater treatment facilities to serve portions of the shoreline may be beneficial, particularly if the discharge point is downstream of

the Forge Dam. However, if it is determined that low population density and consequent high cost per user makes public wastewater treatment unfeasible, then effort should be directed towards maintenance and enhancement of private septic systems.

2. Erosion/Sedimentation

Soil erosion and sedimentation of the eroded particles in the aquatic environment are natural processes which are a component of eutrophication. In addition to effecting lake eutrophication and water quality, sedimentation also has effects the stream environment. The sediment particles fill interstitial spaces in the stream bed used by aquatic macroinvertebrates, and can interfere with fish spawning. Human activities can increase the rate of these natural processes, primarily construction/maintenance of buildings and roads, and extractive land uses such as agriculture and silviculture. To minimize these effects, commonly accepted Best Management Practices (BMPs) have been developed for road maintenance, farming, and logging activity. Information on BMPs is available from DEC and the County Soil and Water Conservation Districts.

Recommendation:

Existing private septic systems should be inventoried and evaluated. (\$20,000-\$50,000)

Recommendation:

Educational materials regarding septic system installation and maintenance should be made available to all landowners within the watershed. (\$5,000-\$10,000)

Recommendation:

The Chateaugay Lakes Association should request Clinton and Franklin counties to complete soils mapping for the watershed to current standards.

Recommendation:

Information on soils along the shoreline and within 500 feet of tributary streams should be compiled to determine limitations upon septic systems. This information should be presented in a soils map. (\$10,000-\$30,000)

Recommendation:

New septic systems should be installed in compliance with building code. Codes and enforcement should be uniform throughout the watershed. (\$0)

Recommendation:

Lake water quality monitoring should be continued (\$2,000-\$4,000 per year).

Recommendation:

Tributary gaging and water quality monitoring should be conducted to better define nutrient loading, sources, and effects. (\$20,000-\$30,000)

Recommendation:

Government and private sector institutions should follow BMPs relevant to their industry,

to the extent fiscally practical. (unknown)

8. Ecology

The Chateaugay Lakes watershed provides habitat characteristic of its position on the border between the Adirondack massif and the St. Lawrence Valley. Elevation, hydrology, and past land use practices influence current land cover, providing a diversity of boreal and temperate deciduous forest habitat. In addition to the commonly observed wildlife species typical of Adirondack lakes, the remote character of portions of the watershed provide habitat for species intolerant of human presence. Through the processes of natural succession, forest products harvesting, and recolonization by extirpated species, ecology of the watershed is a dynamic balance. Actual or potential threats to this balanced ecosystem from human activities are atmospheric deposition of pollutants, introduction of exotic species, and a change in the current practice of sustained yield forestry.

1. Endangered species

No endangered species are recorded as resident in the watershed. The Osprey is listed as threatened, and four nest sites have been recorded within the watershed. Nest sites of the Common Loon, which is listed as Protected, have also been recorded. In addition to these listed species, rare habitats have been documented in wetlands within the watershed, and caves near the summit of Norton Peak.

2. Nuisance nonnative species

Introduction of nonnative species is a concern nationwide. An increase in speed and volume of trans-oceanic traffic has made it possible for many species to accidentally be introduced to North America. These introduced species may find favorable habitats, without the controls of their natural predators, resulting in a population explosion and harmful effects upon native species. All habitats and ecozones may be effected by exotic species. Exotic species which have been introduced to the Chateaugay Lakes watershed include:

Plants:

Norway Spruce, Scotch Pine, European Larch, and Purple Loosestrife, a rapid-growing perennial which crowds out native vegetation in wetlands.

Other:

Gypsy moth, Dutch Elm disease, Beech Bark disease.

Species introduced to the Chateaugay Lakes include:

Plants:

Eurasian Milfoil: A submersed rooted, perennial with long branched stems which often form a mat at the surface. It has little food value for wildlife, and interferes with

recreation. Milfoil reproduces vegetatively from fragments, and can be controlled by harvesting, benthic barrier mats, and chemical applications.

Fish:

Golden Shiner, Perch, Bass, Pike, Salmon.

Exotic species which are present in North America and have the potential for future impact on the Chateaugay Lake watershed include:

Plants:

Curly Pondweed, Water chestnut, which is an extreme nuisance in southern Lake Champlain, and expanding northward.

Fish:

Round Goby, Eurasian Ruffe, European Rudd.

Other:

Zebra Mussel, a rapidly-spreading bivalve mollusc from the Caspian Sea, will likely be present soon. This exotic has caused extreme ecological impact to many North American waters. Hopefully, the low calcium concentrations (<10 mg/l) will limit zebra mussel growth below nuisance proportions. Woolly adelgid, which causes mortality to hemlock trees, is expanding from southern New York State, Pine false webworm, which is present in Franklin County and lethal to White Pine, Pine shoot moth, Asian Long Horn Beetle, and Pear Thrips, which threaten deciduous trees.

Recommendation:

Human actions which have a deleterious effect on endangered, threatened, or protected species should be avoided, and a complete evaluation of effects and possible alternatives should be conducted prior to proceeding with potentially harmful actions.

9. Recreation

The Chateaugay Lake watershed is used for diverse recreational activities, including motor boating, canoeing, sailing, snowmobiling, hiking, fishing, and hunting. Recreational use is mostly by individuals, but occasionally local businesses or groups such as snowmobile or fish and game clubs organize sponsored events. These clubs may also act as advocacy groups, participating in resource management and lobbying activities.

Public recreational access is provided by the NYSDEC Boat Launch at the top of the Narrows. Little of the shoreline is publicly owned, so most nonresident access is for recreational fishing or pleasure boating. Estimates of resident:nonresident use of the launch are approximately 30%:70%. Winter access is not provided through the boat launch due to unsafe ice conditions in the Narrows.

Recommendation:

The DEC should repair and maintain the boat launch. (\$100,000-300,000)

Recreational user conflicts are increasing, especially related to excessive boat speed through the congested Narrows section. Law enforcement of water-based recreation is within the jurisdiction of the State Police, Environmental Conservation Police, and the County Sheriff. However, none of these agencies have the resources to provide full-time law enforcement coverage to the Chateaugay Lakes. In addition to enforcement, education plays an important role in providing safe and enjoyable recreational opportunities.

Some municipalities have responded to the dual needs of enforcement/education by hiring a Lake Warden for the recreational season. A Lake Warden works to ensure that all residents and visitors are aware of and in compliance with the law. The level of responsibilities of the lake Warden are at the discretion of local government. In some cases the Warden has been deputized by a law enforcement agency, in other cases no law enforcement powers have been granted.

Recommendation:

A Lake Warden could be hired to assist recreational education and enforcement efforts. (\$5,000-\$15,000)

10. Economic

Environment and economics are often viewed as diametrically opposed, i.e. protection of one degrades the other. Others view environment and economics as co-dependent, i.e. you can't have one without the other. Economic considerations in watershed planning are complex, depending upon the natural character of the watershed and the level of economic development. A complete economic assessment is beyond the scope of this project. Even estimating the economic value of the Chateaugay Lakes as a natural resource is difficult, given the many variables of property value, revenues from tourist-related businesses, and aesthetic considerations.

One value of lakes is manifested in shoreline property values, which often are higher than nearby off-shore properties. To evaluate this situation, the sum of the assessed value of properties within the Water Level Control District and the Total Assessed Value for each Town was calculated, using County Real Property Services 1996 data. The results of this analysis are presented in Figure 3.

Figure 3.

Town	Total Assessment	WLCD Assessment	WLCD % of Townwide Total
Bellmont	\$78,024,835	\$14,395,503	18.4%
Ellenburg	\$87,382,797	\$20,645,552	23.6%
Dannemora	\$72,169,709	\$22,362,382	31.0%

Related to the issue of town tax levy is that of local services provided. Some watershed residents, particularly in the Town of Ellenburg, have expressed dissatisfaction with the amount of services received per tax levy. This is exacerbated by the situation of seasonal residents, who receive none of the value of local school taxes and do not have a vote in local elections.

Recommendation:

A balance between economic and environmental concerns should be maintained throughout Management Plan implementation. (No cost)

11. Education

Watershed Management Plans which focus implementation efforts on collaboration and education rather than regulation gain greater local support, and are more likely to achieve success. In addition, education is often the most cost-effective means of implementing management plans. In the Chateaugay Lakes watershed, education efforts can be applied to several management actions.

Recommendation:

A Registration Booth/Information Kiosk should be installed at the DEC Boat Launch gather information on and provide information to lake users. (\$500-\$1,000)

12. Priorities

Based upon the consensus of the Watershed Management Team, the highest priority issues are lake level, wastewater management, and recreational use. The highest priority recommendations are to conduct a hydrologic study, inventory existing septic systems, and repair the DEC boat launch.

