R e c r e a t i o n

O n

H o o s a c L a k e

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Table of Contents

Introduction

Since Hoosac Lake, also known as Cheshire Reservoir, was created in 1869, the relationship of the Lake to the people of Cheshire and the surrounding area has gone through a number of changes. From the Lake's beginning as a purely industrial resource, to its early twentieth century golden age as a recreation destination, to the years of neglect and Eurasian milfoil infestation, to the current promise of a renaissance of sorts on the Lake, the ups and downs of Cheshire Reservoir's past parallel those of Cheshire and the Berkshire region in general. With recent developments in the management and facilities of the Lake and a resurgence of the Berkshire economy, due in large part to increased tourism, the people of the region have an opportunity to restore the Lake to its central role in the area's cultural and social life.

As the reservoir is freed of the weeds that have choked its waters for decades there are many different interest groups vying for use its waters and shores. While many of these interests are somewhat incompatible, it will be possible, with some creative regulation, cooperation, and compromise, to accommodate a wide range of uses on the three basins of Hoosac Lake. Over the past several months, we have explored many of the plans that have been developed for the future of the Lake and sought the opinions of people on all sides of the issues in an attempt to balance the competing interests in order to develop regulatory, management, and development options to restore the Lake to its lost place of prominence in the town and the region. In the following report, we will explore many of the issues that will shape the future of recreation on the Lake and we will lay out a number of possible scenarios for the future of recreation and regulation on the Lake and its shores. We are confident that, with a little cooperation and compromise,

the Lake can be managed such that it will be as central to the lives of future generations as it was to those who have grown up swimming, boating, and fishing its waters.

Site Description

Geography

Cheshire Reservoir lies in the Hoosac River Valley in northern Berkshire County in western Massachusetts. The Lake is flanked by the slopes of Mt. Greylock on the west and by North Mountain, which is part of the Hoosac Range, on the East. Collected behind the dam on the northern edge of the Lake, the headwaters of the South Branch of the Hoosic River form the three basins of Hoosac Lake. The basins, which all together have about 500 acres of surface area, are aligned on a roughly North – South axis and descend in size from the North and Middle Basins to the substantially smaller South Basin (Lake District Management Plan, 56). The Lake's water flows from the South Basin into the Middle Basin via a culvert under Ingall's Crossing then into the North Basin via a culvert under Farnam's Causeway. The Lake is in both the Town of Cheshire, whose center lies just north of the North Basin, and the Town of Lanesborough, which is centered several miles to the southwest of the South Basin. Route 8, a major state highway, runs around the northern rim of the Lake and along its eastern edge while a number of small roads provide access to the neighborhoods on the western shores. An abandoned railroad bed, now being converted to a mixed use trail, runs along and through the eastern part of the Lake. With the Mt. Greylock Reservation to the west and the Appalachian Trail to the east, Hoosac Lake is ideally situated for outdoor recreational

development. The Cheshire Quadrangle USGS Topographical Map, which covers the area of and around Cheshire Reservoir is included as Appendix 1.

Geographic Location of Cheshire Reservoir

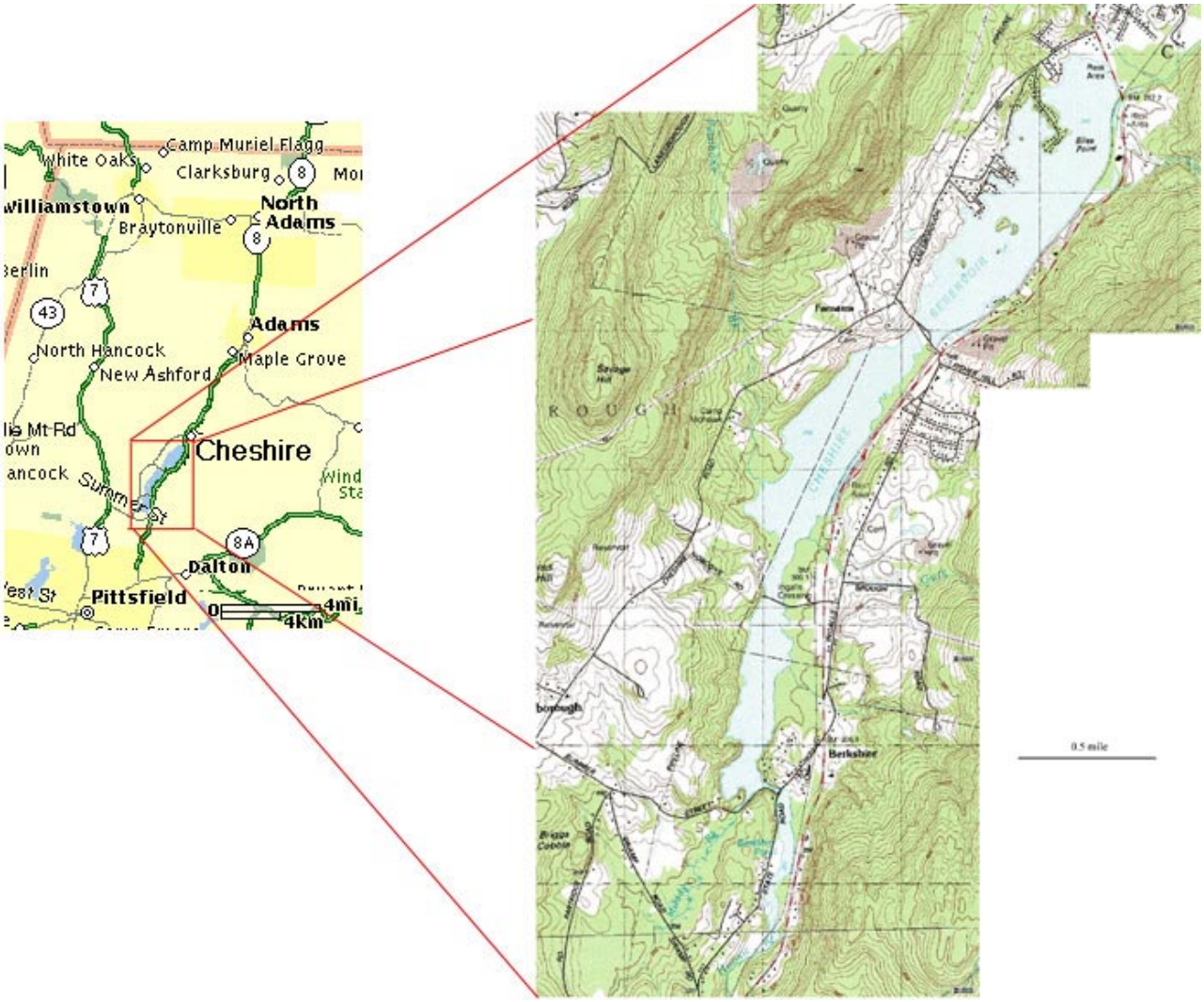

Figure 1. Cheshire Reservoir is located in northern Berkshire County in Western Massachusetts.

Watershed and Lake Description

The future of recreation on Hoosac Lake will, like the past uses of the Lake, be largely defined by the physical, chemical, and biological character of the Lake and its surroundings. The bedrock of the lowland areas, and the lake bottom and surrounding valley floor, are primarily a weak carbonate-rich rock type that contributes to the high buffering capacity and eutrophication vulnerability of the Lake. Because much of what is now the drainage basin of Cheshire Reservoir was, roughly 10,000 years ago, the floor of glacial Lake Bascom, glacial deposits of sand, gravel, lake silt, and clay overlie the bedrock and form the lake bottom and surrounding soil profile. Over the course of the last forty years, the lake bottom has gone from the glacial sand and gravel, which is ideal for swimming and boating, to a mucky mess of decomposing weeds which is said to temporarily stain the skin of swimmers (Blazejewski, 2000).

Fed by several streams, including Kitchen Brook, Pettibone Brook, Gore Brook, and Collins Brook, the Lake is, in essence, a river whose flow has been slowed and whose banks have been widened significantly. In addition to the many stream inflows, up to half of the Lake's recharge is said to come from upwelling from the many underlying aquifers through the cracked bedrock. The groundwater recharge and the stream inflows into the Lake give it a relatively short renewal time of roughly 15 days, meaning that the Lake's waters are, in theory, completely flushed every 15 days. Hoosac Lake, like much of the Hoosic River, is quite shallow, with an average depth of 1.6 meters. The shallowness of the Lake and with its quick renewal time play an important role in determining its chemical and biological character. Because it is so shallow and its waters are quite clear, during the non-winter months sunlight is able to warm the whole water column and wave action stirs the waters such that the Lake has virtually no temperature stratification between its surface waters and the lake floor. Lakes that have

no temperature stratification are known as "monomictic" and are somewhat rare in the Berkshires. Monomictic lakes like Cheshire Reservoir provide ideal growing conditions for macrophytic vegetation, including Eurasian milfoil (*Myriophyllum spicatum*) (Blaikie et al., 6).

As mentioned earlier, the Lake's carbonate rich bedrock gives the waters a high acid buffering capacity. Samples of lake water range in alkalinity from 80 to 104 $CaCO_3$/l. This relatively high alkalinity ensures that the Lake's pH remains close to neutral (pH 7.2-7.65), which is nearly ideal for Eurasian milfoil. Dissolved solids, coliform, and ion concentrations were all found to be right around the normal range for lakes in the area. Dissolved oxygen concentrations are reported to be somewhat low in the summer months, which suggests that aquatic weeds are contributing to an unhealthy biotic environment in the Lake (Blaikie et al, 7).

Over the past several decades, the biological character of Cheshire Reservoir has been dominated the by weed Eurasian milfoil. Freeing the Lake of it has been a constant battle since milfoil outcompeted another aquatic weed that had infested the Lake since

Figure 2. Milfoil choked Middle Basin

Figure 3. Milfoil-free North Basin following this summer's diquat herbicide appliction

the 1960's. Though the diquat herbicide that was applied this summer has completely cleared the weed from the North Basin, milfoil still chokes the two upstream basins and will continue to be a threat to the entire Lake for the foreseeable future. As described above, Hoosac Lake's geochemical character make the waters highly productive and prone to eutrophication; it is a near perfect habitat for macrophytic aquatic weeds like Eurasian milfoil.

Years of milfoil infestation and sporadic herbicide applications have reduced the biodiversity in the Lake considerably. During the late summer, "when the Lake is completely glutted and its current stilled," by milfoil, there are occasional algal blooms in the protected coves around the Lake (Lake District Management Plan, 21). Though the Lake has populations of Northern pike, chain pickerel, perch, and panfish and is stocked with small-mouth bass, the milfoil problem has reduced populations and severely limited fishing access to the Lake. Though the waters of the southern two basins of Hoosac Lake are severely choked with weeds, many species of migratory birds, including Canada geese, mallards, and wood ducks stop at the Lake and the extensive surrounding wetland areas during their migrations (Lake District Management Plan, 21).

Figure 4. Canada Geese in the South Basin of Hoosac Lake, Fall

For a more comprehensive description of the geology, hydrology, chemistry, and biology of the Lake and the surrounding area, see the "Lake Management Plan For The North Basin of Hoosac Lake," prepared by The Hoosac Lake Recreation/Preservation District in 1996.

Area Land Use

Within a few miles of Cheshire Reservoir there is a wide variety of different types of development and land use. Land use on the western shores of the North Basin is primarily residential. Nearly one hundred households are situated on small lots which are clustered there. Many of the houses were built as seasonal cottages and have since been converted to year-round dwellings. Though many of the homes on the Northern Basin are located within 20 to 30 feet of the waterfront, all are outfitted with septic systems. Though direct flows of household wastewater into the Lake have been eliminated in the last 10-15 years, there is some concern that leaching from lakefront septic systems may be contributing to nutrient loading in the Lake (Blaikie et al, 1997). While the primary land use on the eastern shores of Hoosac Lake is commercial, there is one waste disposal site located off of Nobody's Road, on the Middle Basin, that is primarily an automobile junkyard. Most of the land around the southern two basins is old agricultural land and forestland. There are several sand and gravel pits located around the Reservoir in addition to the lime quarry near the abandoned U.S. Gypsum factory on the western shore of the Middle Basin.

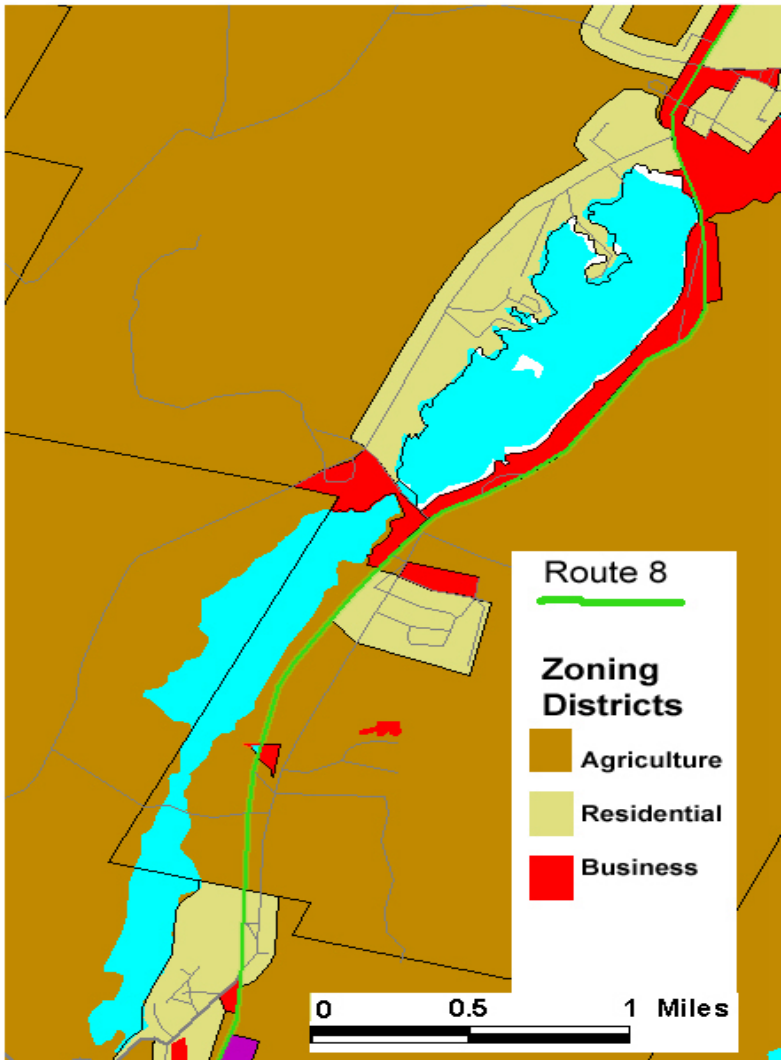

Figure 5. Zoning map of Cheshire Reservoir shows dominant land use patterns

History of Hoosac Lake

The Town of Cheshire was incorporated in 1793 after being established as a frontier community populated primarily with Baptists from Rhode Island. The southern boundary between Cheshire and Lanesborough, which now cuts across the Middle and South Basins of Hoosac Lake, was configured along religious lines such that the

Presbyterians in the area would be Lanesborough residents and the Baptists would live in Cheshire (Raynor, 475).

Though the early history of Cheshire is primarily agricultural, by the late eighteenth century, iron ore mining had begun in the town. Through the early decades of the nineteenth century, textile, dairy, iron, and glass industries became important to Cheshire's economy. In 1847 Berkshire Glass Works began operation using the newly discovered deposits of nearly 100% pure silica from the floor of glacial Lake Bascom. In 1866 the Adams Cheshire Reservoir Company, a group of corporate interests from Adams and North Adams, bought 1000 acres at the headwaters of the South Branch of the Hoosic River and in 1869 built a dam and flooded the land in order to create the "big reservoir" to control the flow of water for hydropowered textile mills down river (Lake District Management Plan, 56; Raynor, 169).

Figure 6. The dam on the north end of the North Basin of Hoosac Lake in its current state of disrepair.

In 1874 the Farnam brothers started a lime quarry and kiln operation on the western edge of the Lake which continued to operate until the 1960's (Raynor, 173). Though Hoosac Lake was still primarily viewed as an industrial resource, in the 1880's Cheshire became something of a second home and resort destination for city dwellers from New York City (Raynor, 178).

During the twentieth century, Hoosac Lake underwent a transition from being viewed as a purely industrial resource to being a recreational destination. In 1912 the

Hoosac Reservoir Company, a subsidiary of Arnold Print Works, bought the Lake, including the dam, water rights, surrounding parcels of land, and confined islands (Blaikie et al, 19). Though its usefulness as an industrial resource dwindled as the mills in Adams closed in the 1950's and the U.S. Gypsum factory closed in the 1960's, the Lake enjoyed a period of high recreational use during the middle of the twentieth century. Between 1958 and 1972, Robert Horn operated Horn's Beach as a swimming, picnic, boat-launching, and general recreation area at Shadowland Cove, in the northwestern corner of the Lake. During the 1950's and 60's the Lake was a central part of Cheshire life as it was used extensively for boating, swimming, fishing, and other activities during the warm months and for hockey, ice skating, and ice cutting during the winter months (Blazejewski, 2000).

Starting in the 1960's, aquatic weeds became the constant nemesis of those managing and using the Lake for recreation. The primary mode of introduction of Eurasian milfoil is by trailered boats transported from other affected lakes. Over the last several decades, milfoil control efforts have been sporadic at best. Early on in the Lake's infestation, the Massachusetts Department of Environmental Management (DEM) made occasional applications of herbicides, but the funding structure of the agency did not lend itself to efficient treatment of the problem. In the late 1970's, the Hoosac Lake Commission was formed to study and fund weed treatment options. The Commission became the Hoosac Lake Association in 1986 and continued to deal with the milfoil problem until 1989, when Raymond Shea bought the Lake and discontinued weed treatment altogether. Shea was a private businessman who, operating under his corporate identity as the Central Water District, had bought five other lakes for a total of $5 before

buying Cheshire Reservoir for $110,000 with the apparent intent of selling the Lake to the State for a considerable profit.

Even as it became more and more weed-choked and less available for recreation, the people of Cheshire continued to value the Lake highly. The results of a survey that was part of the 1991 Town of Cheshire Open Space Plan listed swimming and fishing as two of the top five activities for townspeople and surface and ground water protection as two of their top three environmental priorities. As Shea continued to refuse to allow any treatment of the Lake's weeds, property values on the Lake plummeted from $80,000 for a one-acre lakefront lot in 1989 to $40,000 for the same lot just four years later. Though they did not vote to approve the required funding, in 1992 the people of Cheshire voted for the Town to buy the Lake by eminent domain and continued to make plans for development on Farnam's Causeway. After a fruitless 1993 petition drive to encourage the State to buy the Lake, the Hoosac Lake Association was incorporated as the Hoosac Lake Recreation/Preservation District by act of the State legislature in 1994. The incorporation gave the Lake District legal authority to tax and spend funds as well as to receive State, Federal, and local funds for the maintenance and rehabilitation of the North Basin of the Lake, but not to regulate or restrict uses on the Lake. However, Mr. Shea was vigorously opposed to the District's incorporation and to many of its actions, including the creation of the 1996 Lake Management Plan (Blaikie et al, 1997).

In the end, the only thing that Mr. Shea, and the managers of the Lake District agreed on was that Shea should not own the Lake. After years of wrangling and negotiations, the now defunct Berkshire County government bought the Lake from Shea in June of 2000 and immediately turned it over to the State of Massachusetts. Currently the Lake is owned by the Massachusetts Department of Capital Asset Management and

Maintenance (DCAMM). Plans are for Department of Environmental Management to take control of both the Lake and the Ashuwillticook "Rail Trail" as soon as the deal works its way through the bureaucracy.

Relevant Laws and Regulations

Development and management of Hoosac Lake will need to take into account several state and local laws, as well as the actual and potential jurisdiction of existing management entities. This section outlines the relevant aspects of the Massachusetts Wetlands and Rivers Protection Acts and the Cheshire and Lanesborough Zoning Bylaws. Additionally, this section addresses the statewide regulations by the Department of Environmental Management covering use of waterways and trails, and the bylaws of the Hoosac Lake Recreation and Preservation District.

Wetlands and Rivers Protection Acts

The Massachusetts Wetlands Protection Act was passed in 1972 to halt the loss of wetland areas, in recognition of wetlands' importance for water quality, flood control, and biodiversity. Under the Wetlands Act, actions that may affect wetlands are subject to the oversight of a local Conservation Commission (ConCom). Protectable wetlands include permanent bodies of water such as Hoosac Lake, as well as bordering vegetated wetlands (which are defined by presence of wetland indicator species or by soil hydrology). For any project that will affect a protected area, the developer must file a Notice of Intent with the ConCom detailing the proposed actions, potential effects on protected wetlands, and plans for mitigation of adverse impact and replication of

destroyed wetlands. Additionally, the Notice of Intent must include plans for management of stormwater, flood storage capacity, and a detailed delineation of existing protectable wetlands and surrounding buffer zones. The ConCom may then approve the project, or may impose additional mitigation requirements. Since the lake spans the Cheshire-Lanesborough border, actions affecting the entire lake must be approved by both Cheshire and Lanesborough. Cheshire has an independent Conservation Commission, while in Lanesborough the Board of Selectmen takes on this role.

The Rivers Protection Act is a 1996 amendment to the Wetlands Act, expanding the protection of major rivers. The Rivers Act applies to Hoosac Lake, despite some internally conflicting language regarding its application (Blaikie et al., 1997). This puts protection requirements on a buffer zone that extends to 200 feet beyond the edge of the lake.

These laws limit the extent and character of allowable development around the lake. Any major project must be carefully designed to minimize wetlands impact, and development of existing vegetated wetlands (including most of the perimeter of the South and Middle Basins) is unlikely to be approved. Plans for waterfront development must meet a high standard, showing that there are "no practicable alternatives," and that the action will have "no significant adverse impacts." (Blaikie et al., 1997) With careful planning and choice of sites, small-scale lakefront recreational developments can probably meet this standard.

Zoning

The Zoning Bylaws of both Cheshire and Lanesborough are relatively unrestrictive. Most public recreational uses are allowed in all zones (including business,

residential, and agricultural) (Table 1, from Blaikie et al). The North Basin is zoned commercial on the eastern shore and residential on the western shore. The Middle and South Basins in both Cheshire and Lanesborough are zoned agricultural, except for a portion of the South Basin in Lanesborough which is zoned residential. The two most likely locations for development, the existing boat ramp site on the North Basin and Farnam's Causeway separating the North and Middle Basins, are both zoned for business (MassGIS Berkshire County vector data; see figure 5).

In addition to the relatively open policies on allowable uses, the zoning bylaws also include dimensional requirements. Requirements for lot coverage and setbacks restrict new development to large lots, although in some exceptional cases the Zoning Board of Appeals may grant a variance. The zoning bylaws also require parking space, although this is not a hard-and-fast restriction. Instead, Cheshire mandates "adequate space for employees, customers, service, and supply areas." (Town of Cheshire 1978).

Department of Environmental Management Regulations

Massachusetts Law 304 CMR 12 contains the regulations for lands administered by the DEM's Division of Forests and Parks, including water bodies and rail trails. According to this law, all motorized vehicles are prohibited on rail trails, except for construction and maintenance vehicles (section 12.30).

The law also imposes a speed limit of 12 miles per hour on all Division of Forests and Parks waterways, unless otherwise posted. Boats towing water skiers may travel up to 35 m.p.h. (section 12.34)

Lake District Bylaws

The Hoosac Lake Protection/Recreation District was incorporated in 1994 under state law, with the mission of restoring and managing the North Basin of Hoosac Lake. The Lake District Charter gives the organization the power to tax, spend, study, and manage the lake, but the district has no legal authority to regulate uses or enforce regulations.

Existing Plans for Hoosac Lake

Several public agencies and organizations have been involved in management and planning around Hoosac Lake, including the Lake District, the Town of Cheshire, the Massachusetts Department of Environmental Management, and MassHighways. Planning for future recreational development around the lake should be informed by the long-term goals and ideas expressed in these existing plans.

In 1996, the Lake District published the Lake Manangement Plan for the North Basin of Hoosac Lake. The plan has 7 goals (included as Appendix 4), which, according to a March 2000 memo to DEM Commissioner Peter Webber, are "still sound and relevant." These goals include public acquisition of the lake, herbicide-based weed control, a boat ramp on Farnam's Causeway, reduction of nutrient-loading from surrounding residential areas, consideration of biological control of milfoil, and monitoring of dam conditions. Since March when the management plan goals were reaffirmed, public acquisition of the lake has been completed and the district has embarked on a five-year program of milfoil control using the Reward herbicide

The key points that apply to recreation planning are the new boat ramp for the North Basin, and the intention to "restore recreational use of the North Basin for boating,

fishing, and swimming." The plan includes a sketch map of potential development at the causeway, including a boat ramp, beach, and picnic area (Figure 7). According to the March 2000 memo, this goal will "dovetail nicely with the improvements the Massachusetts Highway Department is planning in this location." MassHighway is currently developing the north side of Farnam's Causeway, constructing a parking lot and composting toilet for users of the Ashuwillticook "Rail Trail" (MassHighway 2000). (Figure 8)

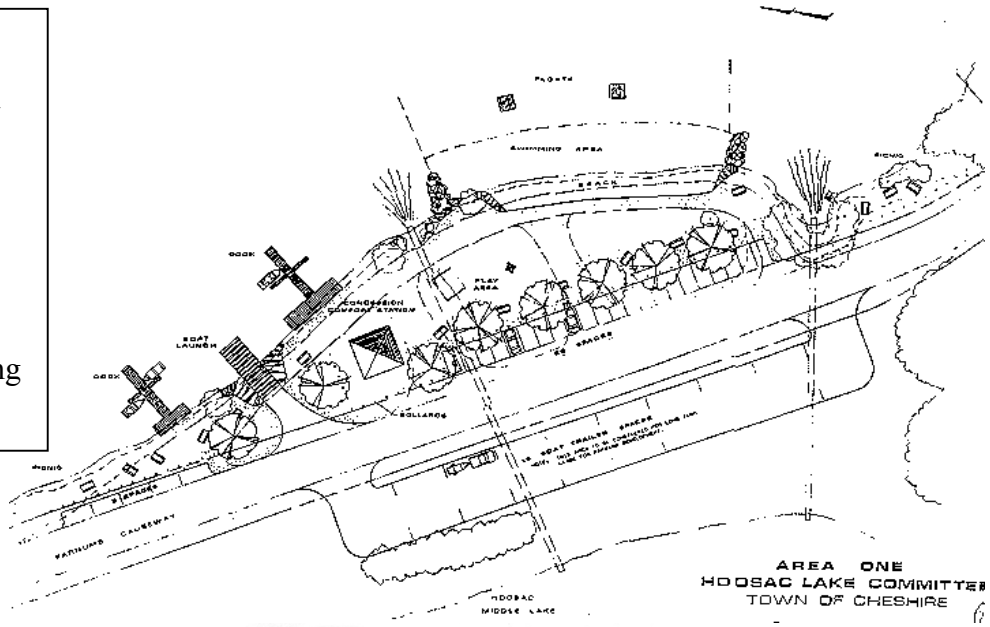

Figure 7. Plans for the development of Farnam's Causeway from the 1996 Lake District's Lake Management Plan. Includes parking for both cars and boat trailers, boat ramp and docks, swimming area, and restrooms.

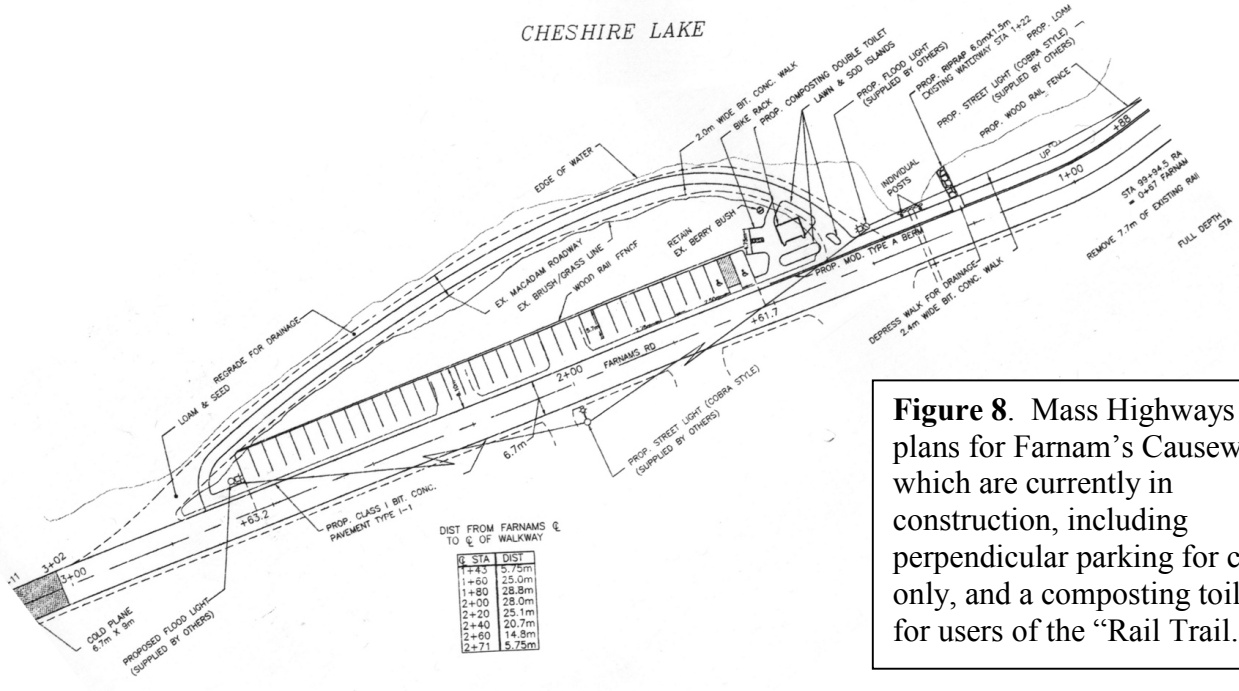

Figure 8. Mass Highways plans for Farnam's Causeway which are currently in construction, including perpendicular parking for cars only, and a composting toilet for users of the "Rail Trail."

Complementary development is tentatively planned for the privately owned south side of the causeway. Development on that site could include additional parking, a seasonalrs' market or craft fair, or a non-motorized boat launch (Saradoff, 2000). Making this area the focus of recreational development could make the causeway a community gathering place as well as a tourist destination.

The Lake District plan encompasses only the North Basin, and planning for the Middle and South Basin will be largely the responsibility of the DEM. According to a memo to the Commissioner, "internal DEM planning indicates that it would be most appropriate to manage the South and Middle Basins as a wildlife habitat." This statement does not explicitly exclude the possibility of recreational development, but suggests that high-intensity development may be confined to the North Basin.

Options

This section outlines various different actions that could be taken by agencies managing the Lake, and discusses their pros, cons, and feasibility. Our considerations of the future of the Lake fall into three categories. First is the possibility of an expansion of the Lake District to include the Middle and South Basins. Second are possible regulations of recreation on the Lake, which would be implemented by the DEM, as the Lake District does not have the power to enforce regulations. Third are possible developments of facilities for recreation on the Lake, which, together with the control of milfoil, would also enhance recreational use of the Lake. Projects in this third category would most likely be undertaken by the Lake District.

Expansion of the Lake District

Currently the Lake District includes, as members, the 90-100 households with land abutting the North Basin of the Lake (Dugas, personal communications. An expanded Lake District would also include the few owners of property abutting the Middle and South Basins and would be in charge of milfoil control and development of recreational facilities in both South Basins as in the North Basin.

One advantage of the expansion of the Lake District is that milfoil control would become more efficient. The river carries any milfoil in the Middle and South Basins downstream from south to north, continuously contaminating the North Basin and thus increasing the degree of continuous weed control necessary in the North Basin. Therefore, control of milfoil in the North Basin only is inefficient and should not be seen as a long-term solution. According to current plans, the DEM will take charge of milfoil control in the Middle and South Basins as soon as the Lake is transferred to them from DCAMM. It seems likely that, under DEM management, control of milfoil in the Middle and South Basins would, like the control of milfoil on the Lake prior to Shea's ownership, be sporadic and fail to effectively limit the milfoil population.

Another advantage of an expansion of the Lake District is that it would allow for more coordinated management of the three Basins for different, often conflicting uses. The Lake District would develop a Management Plan for the Middle and South Basins, as they did for the North Basin (Adams, personal communication); such a Management Plan would have to take into account the many plans and interests that now exist, including the DEM's preference for managing the southern two basins primarily as wildlife habitat.

When the Lake District was first formed, its formation was crucial to the purchase of the Lake from Mr. Shea. Given the attitudes of certain Lanesborough selectmen the creation of a Lake District encompassing all three basins was unlikely, and it was reasonably decided that even if unified management by the Lake District was desirable, it was not worth a decrease in the probability of purchase (Dugas, personal communication). Now, the benefits of an expansion might outweigh the costs; still, there are several barriers to such an expansion.

The first barrier is potential conflict with Lanesborough selectmen over the conditions of the expansion, or even over the expansion itself. The Lanesborough selectmen refused to provide funds for the purchase of the Lake from Raymond Shea (Dugas, personal communication). They could likewise be averse to an expansion that would result in the Lake District regularly asking the Town of Lanesborough for money or other involvement in the management of the Lake. One reason for their relative lack of interest is that the center of Lanesborough is much farther from the Lake than the center of Cheshire. Another is that Lanesborough has much less land abutting the Lake than Cheshire, and that land is much less densely populated.

Figure 9: Motorboats on the Lake, and a rider of an ATV on the Rail

The second barrier to an expansion of the Lake District is a potential lack of funding: management of the other Basins would require more funds than the addition of new members to the tax

base, along with any money obtainable from the Town of Lanesborough, would bring in. Currently the Lake District obtains funding from taxes on its members and from the government of the Town of Cheshire. The District is also applying for a grant from the DEM (Dugas and Fisher, personal communications). This type of grant can be as large as $5000. The DEM has enough funding to give grants to most groups with reasonable proposals, but there is a requirement that DEM funds be matched by funds from other sources (Adams and Dugas, personal communications).

The third barrier is that the expansion of the Lake District, like the creation of a Lake District, would require an Act of the Massachusetts State Legislature (Adams, personal communication). The Act would take time and will not go forward without the agreement of the selectmen of Cheshire and Lanesborough. Depending on the impressions that the townspeople may have about the existing Lake District, the expansion may or may not receive the necessary public support.

Though an intermunicipality Lake District could potentially be bureaucratically complicated, there are examples of lake districts that have successfully bridged between two towns. Representatives of the Lake Districts of Styles Reservoir and Burncoat Pond, which are both on the border of the towns of Lester and Spencer in southern Wouster County, report that the intermunicipal nature of their districts has resulted in little more than having to file all documents twice.

Possible Regulations

The regulations we considered were: 1) restrictions on the use of motorboats on the Lake, 2) restrictions on the use of jetskis, 3) restrictions on the use of snowmobiles on the Rail Trail, and 4) restrictions on the use of ATVs on the Rail Trail. If the Middle and

South Basins are de-weeded, the acceptable use patterns could be different in the different basins.

Possible restrictions on motorboats could be seen along a continuum from no restriction through many degrees of partial restrictions to the unlikely possibility of an outright ban. A partial restriction would likely be in the form of a horsepower restriction, which could effectively limit the speed and noise of motor boat traffic on the Lake. Other possibilities would be lowering the speed limit and restricting motorboats in only one or two of the basins. Possible restrictions on jetskis also represent a continuum, though horsepower restrictions would be less meaningful for jetskis. Allowing jetski use in only one or two of the basins could also be a viable option.

Tighter restrictions on water recreation could make the Lake more conducive to non-motorized recreation such as canoeing and rowing by reducing noise levels and high speed traffic on the water. As long as there is some milfoil in the Middle and South Basin, restriction of motorized recreation there would reduce the transfer of milfoil to non-contaminated areas.

Current users of the Ashuwillticook Rail Trail include riders of snowmobiles and ATVs. It is improbable that the trail will continue to be used by ATVs once it is paved; however, use by snowmobiles will remain a pertinent issue. Possible restrictions on snowmobile use include banning and intermediate measures such as restrictions by time of day or by speed. However, it seems more appropriate that snowmobiles either be allowed or restricted. General DEM regulations state that snowmobiles will not be allowed on such trails as the Rail Trail; however, DEM representative Paul Adams stated that if conventional uses of the trail include snowmobiling, then snowmobiling will be allowed to continue. The decision would not be based entirely on issues relevant to the

Lake, as it does not seem feasible to regulate the section of the trail that runs alongside the Lake differently from the rest of the trail. Restriction of snowmobile use on the Trail would make it more conducive to non-motorized recreational uses such as skiing and snowshoeing by reducing noise levels and high speed traffic during the winter months.

Possible Recreational Developments

The recreational developments we considered were: 1) construction of a swimming area or beach, 2) repair of the boat ramp on the North Basin, 3) construction of a boat ramp on the Middle Basin, 4) construction of a fishing pier, and 5) clearing and lighting of an area for ice skating in winter. Control of milfoil in the Middle and South Basins is another project that facilitates recreation on the lake, and could compete with other recreational development projects in terms of funding.

A public swimming area could be a valuable resource, encouraging community use of the Lake. It could be created by the Lake District, the Town of Cheshire, or the DEM. Lifeguards would of course be desirable but not required if "swim at your own risk" signs are posted (Adams, personal communication). One obstacle is finding an acceptable location: most of the shore is either wetland or privately owned, or both. The old site of Horn's beach has been developed for residential use. Massachusetts Highways' plans (Figure 8) would have to be changed in order to develop the north side of Farnam's Causeway in accommodate a beach there, as was proposed in the Lake District's Management Plan (Figure 7). Though it would require some reshaping of existing plans, constructing a swimming area or beach on the north side of Farnam's Causeway seems to be the most feasible option at this point. Another obstacle is the

unpleasant black mud that covers much of the bottom of the lake around the shoreline, which caused significant problems for Horn's beach (Blazejewski, 2000).

Figure 10: The existing boat ramp at the North end of the Lake

The existing boat ramp (shown at right) on the northern end of the North Basin on Route 8 is in poor, deteriorating condition. Repair would require extension and repaving, and would greatly increase the availability of the Lake to users of motorboats, to the extent that there would likely be inadequate parking during periods of high use. Another possibility would be to alter Mass Highway's plans for the north side of Farnam's Causeway to allow for construction of a boat ramp, either in addition to or instead of repairing the existing ramp. It is likely that a boat ramp at this location would also increase traffic and the need for parking spaces; however, the parking area planned for the causeway is much larger than the parking that exists by the existing boat ramp, and accommodations for boat trailers could also be included in planning the lot.

A boat ramp could also be constructed on the Middle Basin of the Lake, making it more available to motorboat use. Such a ramp will essentially only be useful if milfoil is cleared from the Middle Basin, and it could be difficult or impossible to find a suitable

location for such a launch. Currently, some motorboat users launch from a dirt area on the south side of Farnam's Causeway, but that area is privately owned and is unlikely to be developed so as to accommodate more motorboat traffic in the future. A lower-level version of this option would be to construct a small launch for non-motorized boats only; there are tentative plans for the construction of such a launch for public use on the private land on the south side of the causeway.

The construction of a fishing pier would be a larger project that would presumably be on the North Basin. This would require significant funding both in the initial investment and for seasonal maintenance. Docks and piers are subject to numerous regulations. It should be noted that there currently are no docks or piers of significant size on the Lake.

Lastly, an area could be cleared and lighted for ice skating and hockey during the winter months. Such an area could be opened to the general public, used by children's hockey teams, and used for special events. The Lake was used for skating in the past, but like other recreation on the Lake, that use has dropped significantly since its purchase by Raymond Shea though milfoil does not directly interfere with the use of the Lake for skating (Blaike et al., appendix 2). Therefore, this is not necessarily a better time than any other to begin clearing an area for skating.

The issue of milfoil control in the Middle and South Basins, which would be the responsibility of the DEM or the Lake District, whichever manages those two basins, is critical. If the Middle and Southern basins are not treated for milfoil, the infestation will continue to worsen, harming the ecosystem and decreasing the

Figure 11: Eurasian Milfoil

recreational value of those basins. It is also important to consider that milfoil present in the Middle and South Basins will flow downstream through the culverts that connect the basins. While motorboats that have been used on other milfoil-infested lakes also transport the weed to Hoosac Lake, it is important that the input be reduced as much as possible. The control of the weed downstream while it continues to clog the Lake upstream is not a long-term solution.

Given that the only DEM planning thus far concerning the Middle and South basins indicates that it would best be managed as wildlife habitat, it may be best to use biological methods of control such as milfoil weevils in the Middle and Southern Basins even though a chemical herbicide is being used in the North Basin; however, in this project we consider only the presence and consistency of milfoil control. For a summary of advantages and disadvantages of methods of biological control, see Blaike el al.

Like the possible regulatory schemes that we considered, most recreational developments around the Lake can be seen as continuums of possibilities. For example, there are various possible sizes for boat ramps, and a swimming area could have lifeguards or not. Milfoil control as well can be seen as a continuum, with more or less irregular or incomplete control in the middle.

Public Opinion Survey

We conducted an opinion survey to gauge the level of public demand for each of these options. We mailed 100 surveys to households in the Lake District, and distributed 100 surveys in public spaces around Cheshire. The questions in our survey were focused on regulation of motorized recreation and priorities for development of recreational facilities; the surveys mailed to households of the Lake District also included a question

regarding members' opinions of a possible expansion of the Lake District. A copy of the survey is included as Appendix 2.

Questions

We asked each respondent to choose from several options for regulation of personal watercraft (jet-skis), motorboats, snowmobiles, and ATVs, ranging from a complete ban to no restriction and including as intermediate options limitations on engine size, speed, hours of operation, and limited access to part of the lake. We also asked respondents to rank several potential improvements according to priority. These improvements included a swimming area, expanded milfoil control, improvement of boat ramp access on the North Basin, construction of a boat ramp n the other basins, maintenance of an ice skating area, and a fishing pies. Additionally, we asked Lake District members whether they would want to expand the Lake District to include management of the Middle and South Basins, and what level of tax increase they would accept in order to make that transition occur.

Within two weeks, we received 22 responses from Cheshire and 38 responses from the Lake District. An additional 10 surveys from Cheshire and 9 from the Lake district arrived too late to be included in the tabulated results. This strong response rate suggests that Hoosac Lake is viewed as an important resource by the community as a whole, as well as by Lake District members.

Results

Generally, responses were similar for both surveyed groups. The Cheshire community is fairly polarized over the place of motorized recreation around Hoosac Lake, but this polarization does not represent a conflict between the Lake District and the

wider community. Rather, the differences in opinion among Lake District members seem to mirror a split in the whole community.

Responses to the regulation questions are shown for Cheshire and the Lake District (Appendix 3, Figures 1&2). Approximately 35-45% of respondents are against any sort of restriction on the lake, and 5% advocate a total ban on motorized use. Prohibition of personal watercraft was considerably more favored, with about 50% support. The most popular choice was horsepower limits on all basins of the lake

Surprisingly, we found very little support for separate regulation of the North Basin from the other two basins. Most people seem to think either that motorboats and jet-skis should be allowed everywhere, or that jet-skis should be prohibited and horsepower limits should be applied everywhere.

Responses to our questions on motorized use of the Ashuwilticook rail trail were similar to responses for the motorboat questions (Appendix 3, figure 3). The most popular choice was partial restriction through speed limits and limited hours of operation. A sizeable fraction (25-30%) supported the existing ban on all motorized vehicles, and an additional 15-20% supported prohibition of ATVs, while a small fraction was against any restriction. For these questions, the Cheshire survey group was slightly more polarized toward complete prohibition or no regulations, while the Lake District favored partial restriction by a heavier margin.

Results from the question on improvement priorities are shown in Appendix 3, figures 4 and 5. For both survey groups, the swimming area was rated the highest priority overall. Expanded milfoil control and boat ramp improvements on the North Basin also received considerable support, while construction of a boat ramp on the Middle Basin was seen as a low priority. This is an interesting contrast with the attitude

toward regulation of the Middle Basin; it seems that many community members are suspicious of regulations even when they have no problem with the Middle Basin being a *de facto* no-motor zone due to lack of boat ramp access. Again, we found very little difference between Cheshire and Lake District responses to these questions (Appendix 3, figure 6). These results point to the same priorities as the fact that town plans have included boat ramp improvements on the North Basin and construction of a swimming area.

Although we asked respondents to estimate the number of times they would use each of these improvements monthly, the results of this question add little to our understanding. Most respondents did not answer this section, and the answers we received show no clear trend.

Finally, the results of our third question help assess the possibility of expanding the Lake District (Appendix 3, figure 7). Although a sizeable number of members are absolutely opposed to District expansion, the majority favor expansion, and some are willing to accept substantial increases in the Lake District taxes.

In interpreting these results, readers should keep in mind that this was not a scientific poll, and should not be taken as an exact representation of public opinion. Our sampling method was not random, and results may be biased by who chose to fill out and return the surveys. However, we believe the survey exposes some issues that are very important to a broad section of the community. Given the close correspondence of Cheshire and Lake District responses, we believe the results to be reasonably accurate.

Models of Lake Use

In planning the future of recreation on the Lake, the Lake District and other institutions managing the Lake will need to assemble a set of positions on the various interconnected issues facing the Lake. We have put together models of four such sets. Each model is designed to be internally coherent in terms of the activities they permit and encourage, and the models are selected to represent, between them, a wide range of possibilities. Managing groups could adopt the principles behind one of the models, while changing certain particular components, or they could base regulations on a model not proposed here.

Model #1: No Action/ Low Intensity

No Expansion of the Lake District

No control milfoil on the Middle and Southern Basins

No legal limits on motorboats on any of the Basins

No legal limits on jetskis on any of the Basins

Continued prohibition of snowmobiles on the Rail Trail

No more than minimal development of recreational facilities: no creation of a swimming area, no construction of or repair of a boat ramp, no construction of a fishing pier, no clearing of an ice skating area

This model represents minimal action, minimal intensity of recreation, and a low level of regulation. Even given the absence of restrictions, the intensity of motorboat and jetski use would remain low on all basins. On the North Basin this would be due to the low quality of the boat ramp, which would continue to slowly deteriorate. On the South

Basin, milfoil infestation would continue to worsen making boat access even less available than it is now.

The primary advantages of this model are that monetary costs (both to the Lake District and to other groups) are very low, no new conflicts between interest groups would be created, and it would not upset that portion of the community that dislikes regulations in principle. Also, noise levels would remain low, as would levels of disturbance of habitat on the Middle and South Basins. Disadvantages are that any recreational use of the Middle and South Basins would essentially be impossible, access to the North Basin for motorized vehicles would grow as a problem, motorized use of the North Basin would continue to make non-motorized boating less plausible, the Middle and South Basins would continue to eutrophy, damaging the ecosystem. Additionally, milfoil would continue to flow downstream to the North Basin if the weed is not eliminated from the southern basins. Under this "No Action" option, the benefits of a swimming area, a fishing pier, and a skating area would not be enjoyed by the members of the community and surrounding communities.

Model #2: High Intensity

Expansion of the Lake District

Control, by the Lake District, of milfoil in the Middle and Southern Basins

No restrictions on motorboats on any of the Basins

No restrictions on jetskis on any of the Basins

No restrictions on snowmobiles on the Rail Trail

A high level of development of recreational facilities: creation of a swimming area, construction of boat ramps on all 3 Basins, construction of a fishing pier, and clearing of an ice skating area

This model represents, in some ways, the opposite of the first model. It maximizes development and recreation on the Lake. Like the first model, it minimizes regulation, but in the "high intensity" model, use of the Lake in general and motorized use in particular increase dramatically.

Advantages of this model include that it would permit and facilitate many uses (all motorized uses, as well as swimming, fishing, and skating), it would widen the user base and potentially aid the economy of the area by attracting visitors, and the Middle and South Basins would cease to eutrophy and would not transfer milfoil to the North Basin. Disadvantages include that it would be very costly, that an expansion of the Lake District would require an Act of the Massachusetts legislature, that the expansion could create conflict between Cheshire and Lanesborough, that the lake would be largely unavailable for non-motorized uses, that intense use of the Middle and South Basins would disturb habitat, and that noise levels would be high on all three basins.

Model #3: Moderate Intensity #1: North Basin-centered

No expansion of the Lake District

Sporadic control, by the DEM, of the milfoil in the Middle and Southern Basins

Fairly lenient horsepower limits on the North Basin; prohibition of motorboats on the South Basin

Prohibition of jetskis on all Basins

Continued prohibition of snowmobiles on the Rail Trail

A high level of development of recreational facilities: creation of a swimming area, repair of the boat ramp on the North Basin, construction of a fishing pier, and clearing of an ice skating area

This model represents a compromise between motorized and non-motorized uses of the North Basin of the Lake. It assumes that the sporadic milfoil control that was characteristic of the DEM's management before Shea purchased the Lake would continue. Horsepower limits and the prohibition of jetskis would compensate for the increased motorized use made possible by the construction of a boat ramp. The Lake District, by not expanding, would increase the funding available for recreational developments on the Lake and would be able to complete various projects. However, this does not necessarily mean that the degree of development we chose to represent would be preferable.

Advantages of this model are that it allows the most common motorized use, motorboating (primarily low horsepower fishing boat use at this point), and facilitates this use by making boat launching easier, while it is also more conducive to many forms of non-motorized use than the present situation. This model also keeps noise levels low by prohibiting the louder motorized uses of high horsepower boats and jetskis. The

recreational developments have obvious benefits as resources for many people in the area. Disadvantages of this model include that certain users of motor vehicles would be highly dissatisfied, that motorized users and non-motorized users would continue to have to share the same space, allowing for some continuing conflict, and that the Middle and South Basins would continue to eutrophy and transfer milfoil to the North Basin.

Model #4: Moderate Intensity #2: Integrated management

Expansion of the Lake District

Control, by the Lake District, of the milfoil in the Middle and Southern Basins

No restrictions on motorboats on the North Basin; prohibition of motorboats on the South Basin

No restrictions on jetskis on the North Basin; prohibition of jetskis on the Middle and South Basins

Continued prohibition of snowmobiles on the Rail Trail

An intermediate level of development of recreational facilities, including a swimming area and repair of the boat ramp on the North Basin, but no fishing pier and no clearing of an ice skating area

This model represents a division of the Lake into two parts so as to more effectively facilitate non-compatible uses. It assumes that the Lake District, after expanding to include all three basins, would take on the deweeding of the Middle and South Basins guided by a Lake Management Plan like the Plan developed for the North Basin. This project would presumably reduce the availability of Lake District funds for recreational development around the Lake. Our estimate of the level of recreational development plausible with this model includes a swimming area/ beach and the repair of the boat ramp on the North Basin; however, as with the North-Basin centered moderate

intensity model, a different level of taxation than that which would be necessary for this level of development may be preferred.

Major advantages of this model include that it allows all of the current uses, and that it is more conducive than the present situation to both motorized boating (due to the construction of the boat ramp) and non-motorized boating (due to the availability of the Middle and South Basins for non-motorized use. Ecological advantages include that milfoil is not transferred from the Middle and South Basins, that decreased eutrophy of the Middle and South Basins improves their ecosystem health, and that there would be relatively little human disturbance to the ecosystem of the Middle and South Basins. Also, noise from snowmobiles would not be a problem in winter. The public swimming area would have obvious benefits for the community. Disadvantages include that an expansion of the Lake District would require an Act of the Massachusetts legislature, that the expansion could create conflict between Cheshire and Lanesborough, that there could still be conflict between different motorized users (for example, between fishers using low-horsepower motorboats on the one hand, and jetskis on the other), that noise levels in summer would be high around the North Basin, and that benefits of a higher level of recreational development would be forgone.

A Community Resource

With the recent increases in tourism in the Berkshire region of Western Massachusetts and the many promising plans that are now on the table for development and management on and around Hoosac Lake, this is a moment of very real opportunity for the Lake District and the Towns of Cheshire and Lanesborough to use the natural

beauty of the Lake to bring economic benefits to the area. Though the promise of increased tourism dollars might be a motivating force behind restoring the Lake and encouraging smart development on its shores, those who stand to benefit most from a renewed Hoosac Lake are the potential year-round users of the Lake who live in Cheshire and the surrounding towns. With the emergence of the Lake District and the possibility of its expansion, the management responsibilities of Cheshire Reservoir now rest on the shoulders of those who are most integrally tied to the Lake on a day-to-day basis. If the District were expanded to cover all of the Lake's basins, the model of local control could lead to a more integrated, efficient, and comprehensive planning approach. The division of the Lake into three basins and its division between two towns are now sources of both difficulty and opportunity. With creativity and compromise in planning and management the division of the basins may be used to facilitate a number of different and often incompatible uses.

The people of Cheshire and the surrounding area who have dedicated themselves to the rehabilitation of the Lake are now in a position from which to restore this young lake to the position of centrality in the Town that it held before the milfoil forced the fishermen and the swimmers from its waters. The current plans for development of the Ashuwillticook "Rail Trail" and Farnam's Causeway, along with the plans further afield at the U.S. Gypsum factory site, at the south side of the Causeway, and at the Greylock Glen development just a few miles way in Adams bode well for the future of a weed-free Hoosac Lake as a true community and regional resource. In the not-too-distant future, the Lake could be the scene of farmers' markets and crafts sales on Farnam's Causeway, Fourth of July fireworks overhead, water skiing, boating, and canoeing in the various basins, and family gatherings on the sands of a new swimming beach.

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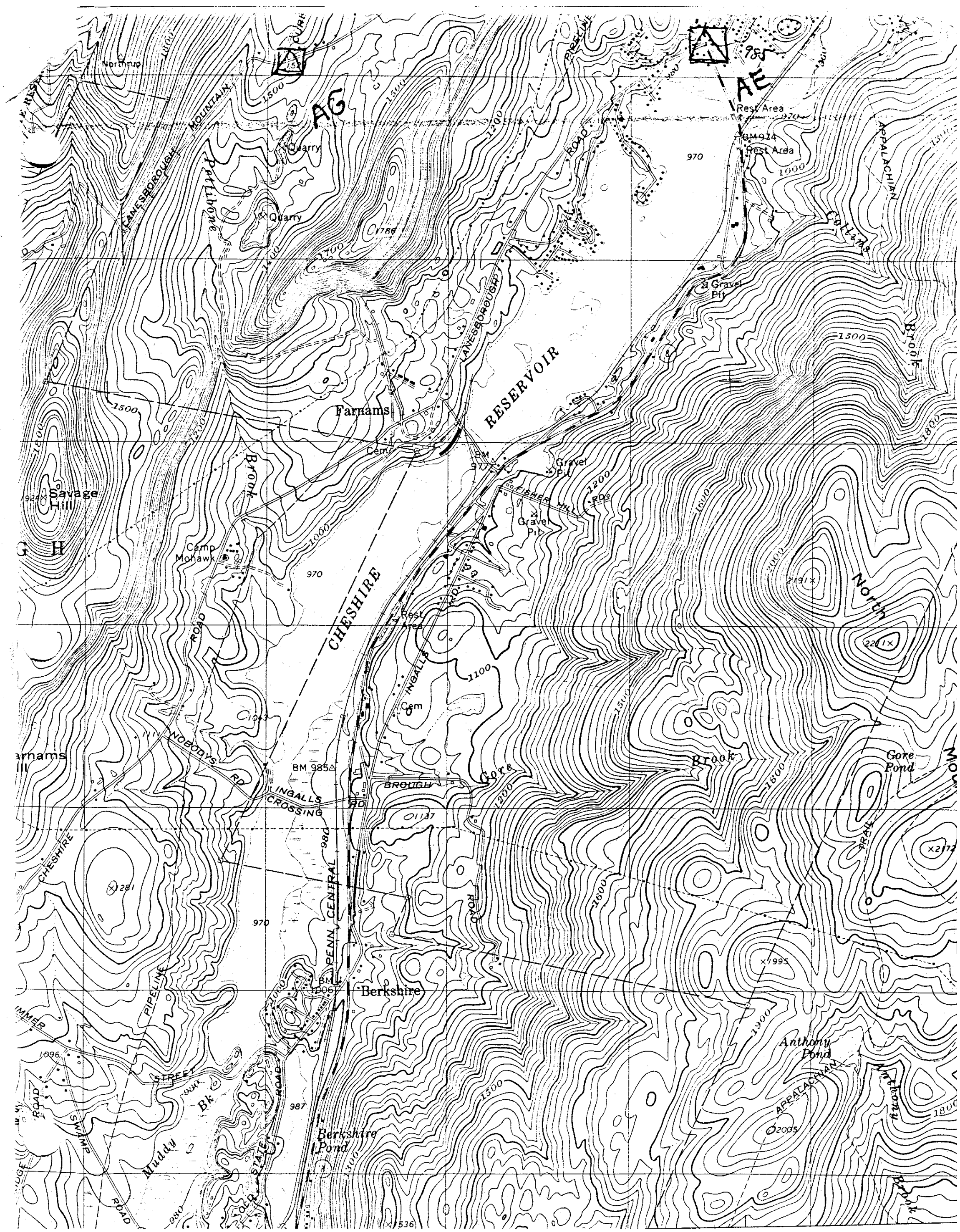
Appendix 1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Brook
LANESBOROUGH
RESERVOIR
Farnams
Cem
BM 977
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Gravel Pit
Savage Hill
Brook
Camp Mohawk
CHESHIRE
North
Rest Area
INGALLS
Cem
Farnams Hill
NOBODY'S RD
BM 985
INGALLS CROSSING
BROUGH
RD
Gore
Brook
Gore Pond
TRAIL
CHESHIRE
PENN CENTRAL
ROAD
PIPELINE
Berkshire
Anthony Pond
APPALACHIAN
STREET
Muddy
Bk
ROAD
STATE
Berkshire Pond
SWAMP
ROAD
Anthony
Brook

Appendix 2

Cheshire Reservoir Recreation Survey

We are Williams College students conducting a study of potential recreational development on the Cheshire Reservoir. The opinions of the community are very important to us as we evaluate the options for the lake's future. Please take a minute to fill out this survey on possible improvements and regulatory actions. Fold and seal the sheet, and return to the address on the reverse side.

Section 1 (Mark as many as apply)

1. Personal watercraft (jetski) use on Cheshire Reservoir should:
   a.) not be restricted
   b.) be allowed in only the North Basin
   c.) be prohibited in all basins
   d.) other _____

2. Motorboat use on the North Basin of Cheshire Reservoir should:
   a.) not be restricted
   b.) be subject to horsepower limits
   c.) be prohibited
   d.) other_____

3. Motorboat use on the Middle and South Basins of Cheshire Reservoir should:
   a.) not be restricted
   b.) be subject to horsepower limits
   c.) be prohibited
   d.) other _____

4. Summer motorized use (ATV/ATC) on the newly constructed "Rail Trail" should:
   a.) not be restricted
   b.) be subject to speed limits
   c.) be subject to limited hours of operation
   d.) be prohibited
   e.) other _____

5. Winter motorized use (snowmobile) on the newly constructed "Rail Trail" should:
   a.) not be restricted
   b.) be subject to speed limits
   c.) be subject to limited hours of operation
   d.) be prohibited
   e.) other_____

Section 2: **The following is a list of possible improvements of Cheshire Reservoir. In the first column, please rank the options from most important (1) to least important (7). In the second column, please estimate the number of times you would use each facility per month in the appropriate season.**

	Importance	**Estimated Monthly Use**
Swimming area / beach	_____	_____
Milfoil control on the Middle and South Basins	_____	N/A__
Boat ramp improvements on the North Basin	_____	_____
Construction of a boat ramp on the Middle Basin	_____	_____
Clearing and lighting of an ice skating area	_____	_____
Construction of a fishing pier	_____	_____
Other _____	_____	_____

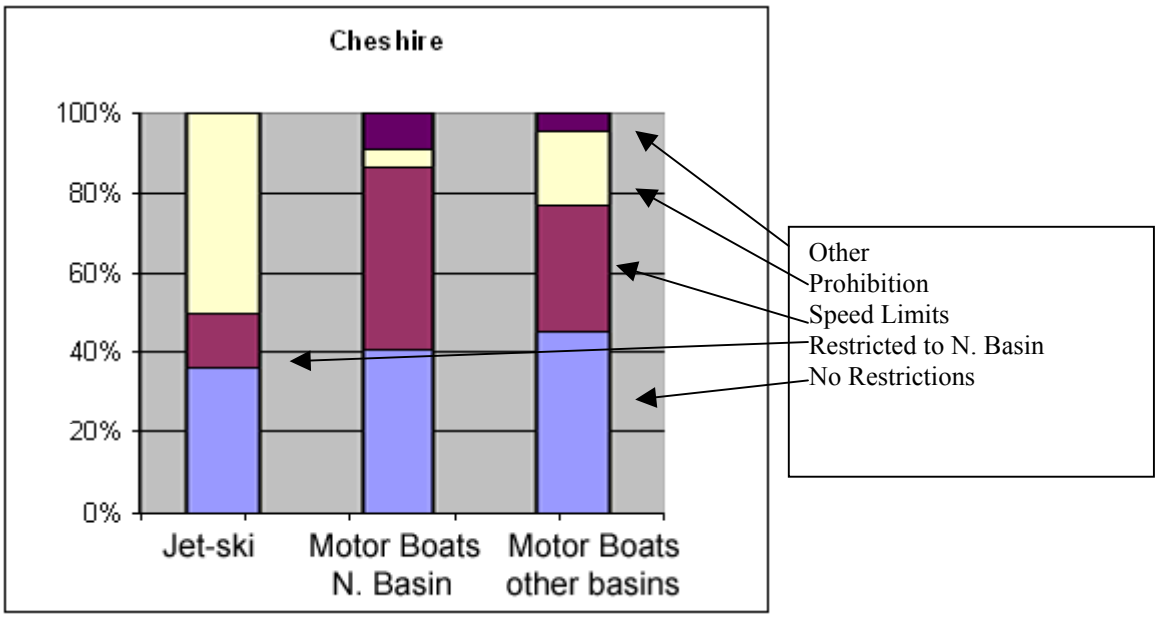
Section 3: In which of the following situations would you support expanding the Lake District to integrate management of the Middle and Southern Basins?

Under no circumstances.
Only if your Lake District fee remains the same.
If your Lake District tax increases by no more than 10% of what you currently pay.
If your Lake District tax increases by no more than 25%.
Even if your Lake District tax increases by 25-40%.

Comments (use reverse if necessary)

Appendix 3

Figure 1



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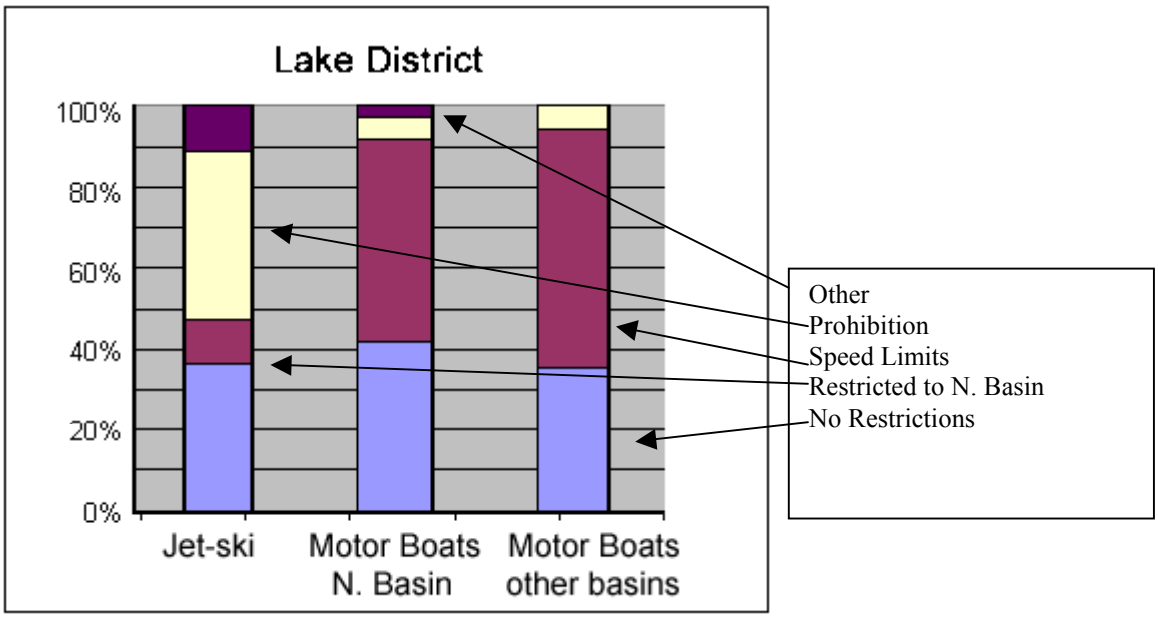
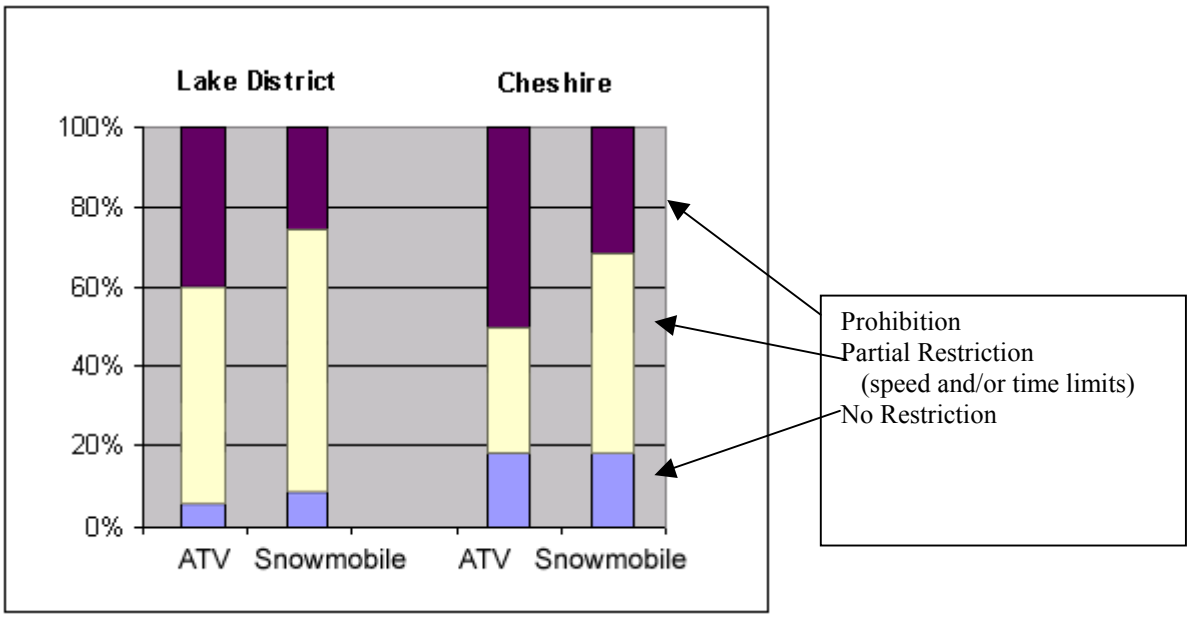


Appendix 3

Figure 3.



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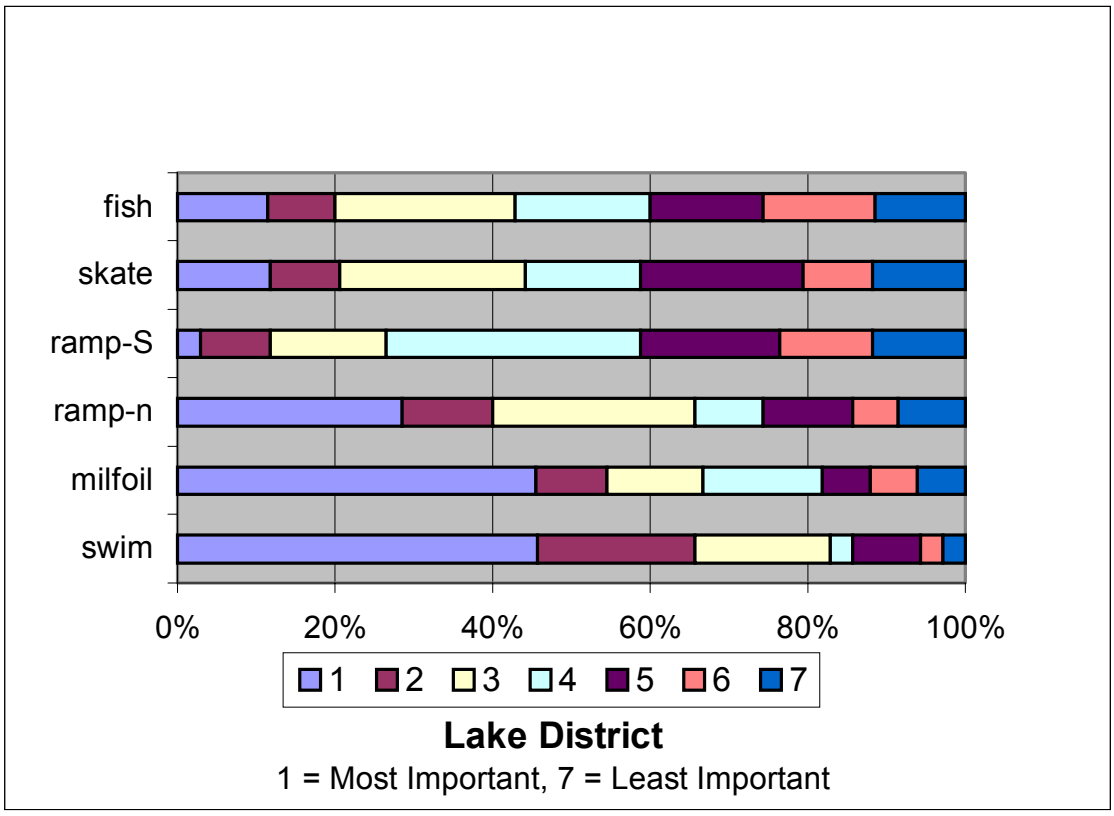

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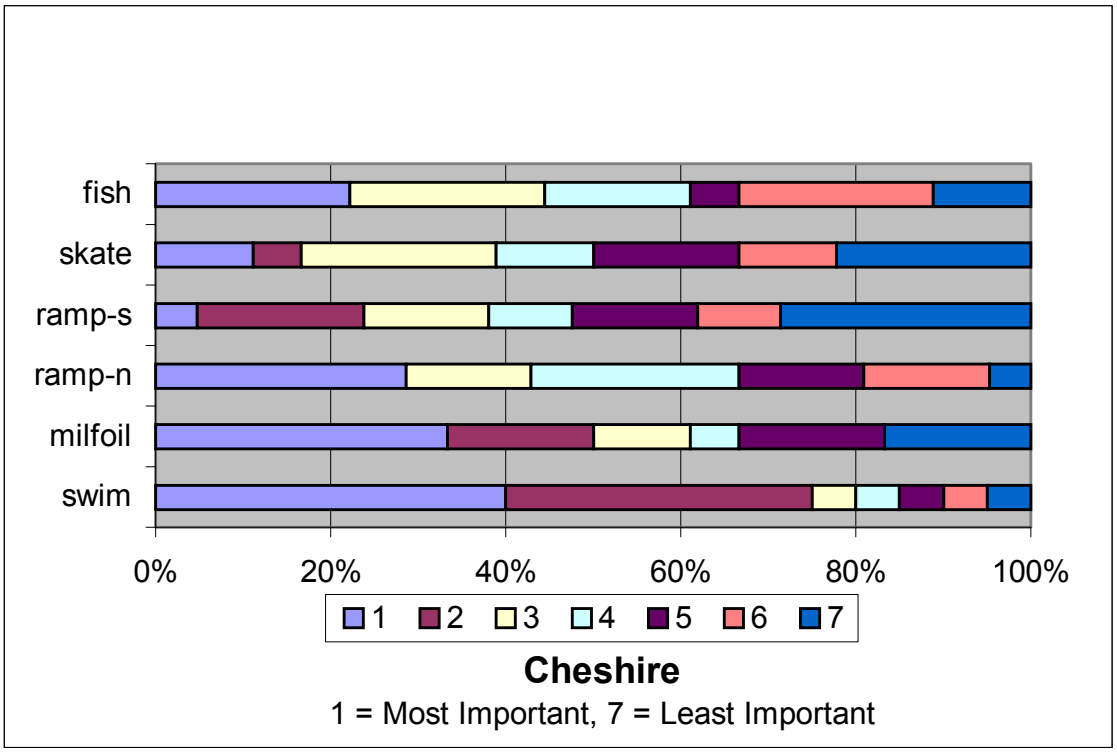

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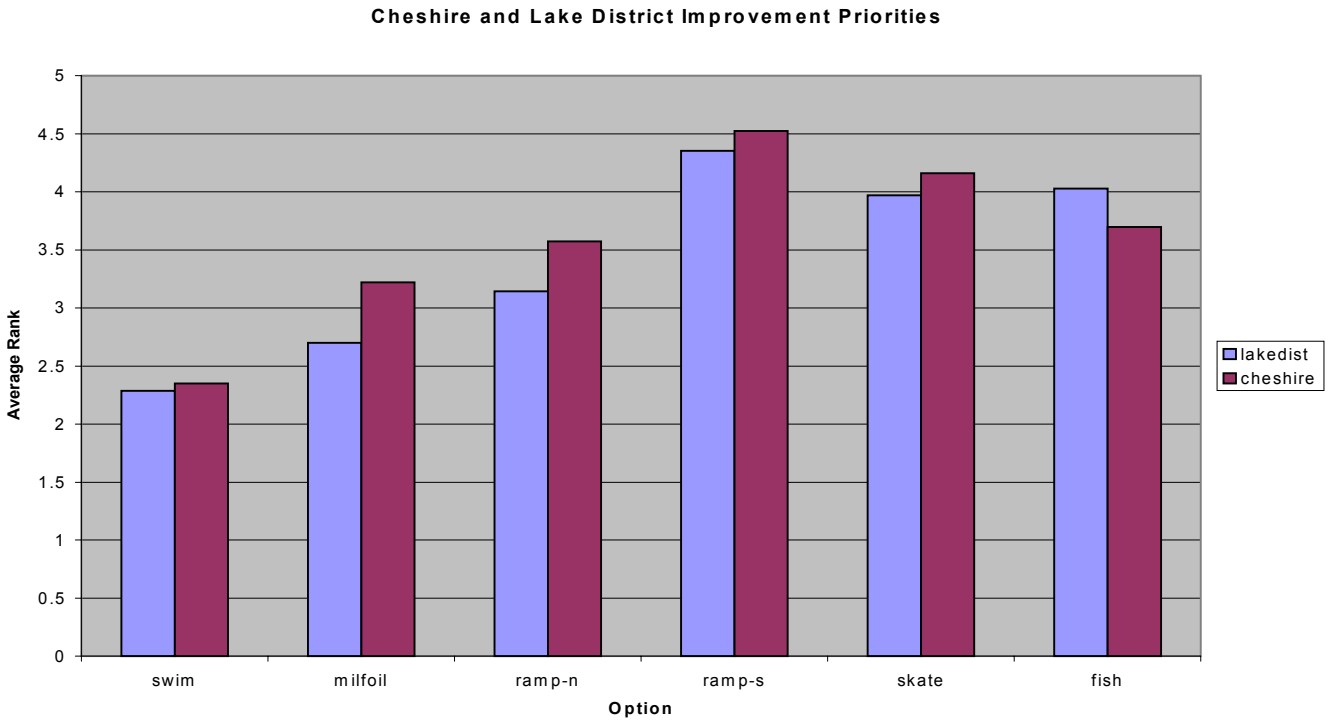

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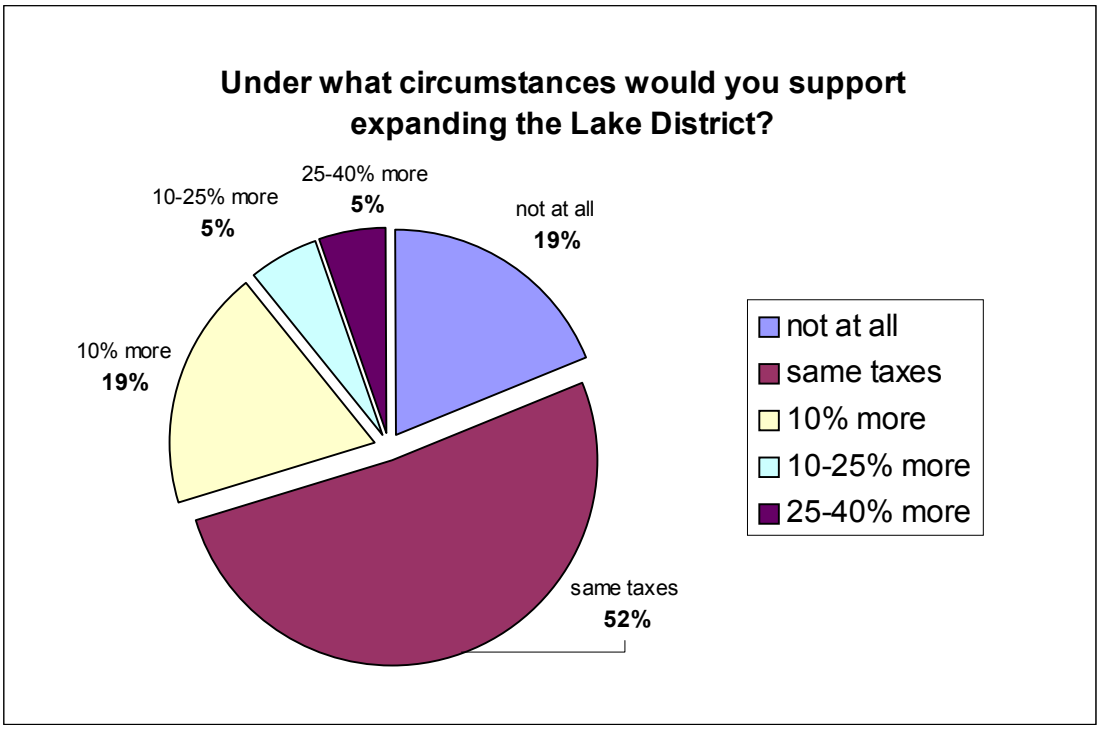

Appendix 4

Lake Management Plan

I. Lake Management Goals

1. That the District advocate and support public ownership of the North Basin through State purchase or eminent domain taking.

2. That the District raise revenues and/or apply for grants to fund de-weeding of the lake with herbicides, either in complete or selective manner.

3. That the District should support and help facilitate the installation of a public access boat ramp on the south rim causeway with support of funds from the Public Access Board in order to restore recreational use of the North Basin for boating, fishing, and swimming.

4. That the District educate its members about the importance of controlling use of fertilizers, high phosphate detergents, as well as the necessity of septic system setbacks when possible.

5. That the District should monitor phosphorous run-off within the lake's watershed, as well as set up a system for continued monitoring of water quality.

6. That the District should encourage further consideration of the use of biological methods of weed control.

7. That the District continue to monitor the condition of the dam and control the the water level in accordance with the guidelines of the appropriate agencies and with respect to the environment of downstream habitats.

75