

# Village of Whispering Pines

## Lake Management Plan

### Thagards Lake

**EXPLANATORY NOTE:** This plan addresses Thagards Lake and the Little River between the bridge at Rays Bridge Road and the bridge at South Lakeshore Drive (Thunder Bridge.) The fingers of water south of Little River in the vicinity of the 11<sup>th</sup> through the 16<sup>th</sup> holes of the Country Club of Whispering Pines West Course are not included. Unless otherwise stated in the Plan, Thagards Lake refers to both the Lake proper and the portion of Little River described above.

#### **INTRODUCTION**

In 2007, the Lakes and Watershed Board of the Village of Whispering Pines initiated a planning effort for all its lakes. The purpose of this planning is, in part, to fulfill a component of the Whispering Pines Land Development Plan. The specific purpose of each lake plan is to ascertain current status of each lake, perceptions of Village residents on lake uses, and identify and prioritize management needs for each lake. The integration of individual lake plans is anticipated to contribute to a Comprehensive Lakes Management Plan, which should form the basis for prioritization of management by the Village.

#### **I. STATUS:**

A. Thagards Lake is a 207 acre lake located in the northern portion of the Village of Whispering Pines, NC, including 0.6 miles of the Little River west of the lake proper (approx. 9 acres). Thagards Lake is unique among the eight lakes currently owned by the Village since it is by far the oldest, and the only lake to impound a major water source, the Little River. Thagards Lake history dates back to 1759, when Charles Hurd received a 100 acre grant of land. In an early example of 'flipping a property', Hurd sold the property to Nicholas Smith in 1764. Five years subsequent, in 1769, Smith built a dam and gristmill near the northeast shore of the current Thagards Lake. Sold in 1773 to John Ray, the gristmill was to remain in operation for more than 100 years. The mill and pond remained in the Ray family until 1850, when they were sold to William C. Thagards who, in 1866, built a new dam and sawmill. In 1900, the property was sold to Donald and Mose McDonald who built stone and concrete dams for a cotton mill. In 1902, the property again changed hands, being sold to I.F. Chandler who constructed an electrical power plant. In 1920, the dam and power plant were sold to Electric Power and Light Company, and in 1923, it went to Carolina Power and Light. In 1928, the dam burst in the

vicinity of the current marina near Carolina Water, effectively ending the commercial use of the dam and waters. In 1930, James Warren Watson purchased the property and repaired the dam in 1942. In 1959, the property was sold to A.B. Hardee in one of the initial purchases for the future Whispering Pines. In July 1964, the dam broke and the lake remained drained for the year it took to complete the construction of the current dam (actually a series of four dams) and the lake to fill to its current level and shoreline. In 1983, the Village of Whispering Pines purchased the dam and lake from A.B. Hardee.

B. The history of the dam impounding the Little River and creating Thagards Lake, as noted above, dates from 1769 with the original pond and mill. That early dam was located in the NE corner of the present lake, the remnants of which are now submerged. The location of the current dam is believed to date back to 1866 with the dam and mill constructed by William C. Thagards. In 1902, MacDonald and Chandler constructed a stone dam, though details of what portions of the earlier dam were incorporated into their design are unavailable. Nevertheless, in 1928, that portion of the dam where the marina is now located ("plate section", see below) was washed out when the Chandler's Lake dam (Nick's Creek vicinity Highway 22) burst and flooded Thagards Lake. The dam remained unattended until 1942 when J.P. Watson replaced the dam with a rock fill section, an earth section, and a concrete spillway, enlarging the lake to its present size. This dam burst in 1964 when the rock fill section gave way. The dam was repaired by Charles T. Main, Inc., with work completed August 1965. The 1964 flood event involved a lake level at approximately 290.6 feet (above mean sea level – MSL) and an estimated river flow of 3000 cubic feet per second. The maximum flood on record (dating from circa 1927) was 5000 cubic feet per second in 1945, which over-topped the earth dike. The maximum design flood for the dam repairs made in 1964/65 is 6000 cubic feet per second with a maximum lake level of 290.8 feet MSL. The dam as it currently exists consists of four sections. Southwest to northeast, these are: concrete ogee primary spillway section (1964); earth fill section (1942; heightened and protected with rip rap 1964); a concrete emergency spillway section (1902); and, the "plate section" consisting of steel plates installed vertically and mounded with dirt on both sides located immediately behind the current marina. The "plate section" of the dam is located on property owned by Carolina Water Service. The primary spillway section also contains a 5'x5' sluice gate that can be opened/closed manually. Other pertinent data relative to the dam: Total drainage area at the dam is approximately 42,000 acres, or 65.8 square miles; the dam is categorized as "high hazard" by both the State and Corps of Engineers' criteria; the dam is classified as "intermediate" according to national criteria and "medium" by State criteria; and the maximum storage capacity is 2505 acre-feet. The dam was last inspected March 5, 2007. That inspection "revealed no apparent problems with the dam." In April 2007, however, a Notice of Deficiency was sent to Carolina Water Service by the NC Department of Environment and Natural Resources (DENR) citing Carolina Water for failure to secure DENR approval prior to conducting repair/construction activities above the "plate

section” of the dam and requiring Carolina Water Services to retain the services of a professional engineer to prepare the plans and specifications for repairs/construction. In a February 2008 letter, DENR indicated Carolina Water Services had complied with the Notice of Deficiency.

C. Thagards Lake is surrounded by 174 lots which have 113 residential dwellings (excluding the apartments at 133 South Lakeshore Drive.) One large lot, 10 South Lakeshore Drive is home to Thagards’ Park, recorded by deed as “Cascade Park” but not referred to by that name. Lots 57 and 59 Lakeview Drive comprise what is often referred to as the swimming park, or the North Park, though the park is recorded by deed as Beech Park. The two parks provide shoreline access to Thagards Lake, with Thagards’ Park and its asphalt ramp providing boat access. Most of the shoreline is earthen, though approximately 20% is hard banked with principally wooden bulkheads. An estimated 100 docks and piers are presently in place.

Maximum depth of Thagards Lake is 12 feet, with most of the deeper water located on the eastern end of the lake (dam side.) The estimated average depth is six to seven feet, with the western end of the lake (Thunder Bridge side) significantly more shallow, in many areas four feet or less. Shallow from its inception, the natural process of sedimentation in Thagards Lake has a greater relative impact, particularly when compounded by the additional sedimentation resulting from Little River upstream development and increased storm water runoff as the build out of lots around the lake nears completion. During seasonal rain events (4-6” in less than 24 hrs) the lake level can rise by 12-14 inches. During extended droughts, the lake level has been known to drop 18-30 inches (droughts of 2002 and 2007.) Compared to the other lakes in the Village, however, because of the flow from Little River and several intermittent streams, Thagards Lake is generally the slowest to lose its water level and the quickest to recover.

Residents are allowed to draw water from Thagards Lake for residential irrigation purposes, under permit, except in severe drought conditions. There are currently 65 systems in place, though a few (less than five) are not in use. CCWP currently does not draw from Thagards Lake for irrigation of the golf courses.

The water quality of Thagards Lake is generally indicated to be good. The 2001 Lakes Assessment Report, based on samples taken in July of that year, indicated the following for Thagards Lake:

Trophic State: Mesotrophic (moderately productive)

Average Surface Conditions: (mg/l)

DO: 7.50 mg/l    Total N: <0.05            NH3: <0.05            NO2+NO3: <0.05

Total KN: <.05    TotalP: .03                      PO4: <0.01

Total DS: 24                      Total SS: <5.0

pH: 7.21                      Sp. Conductivity: 30 *umhos*                      Avg Chlorophyll- *a*: 1.98 *ug/l*

Alkalinity: (taken, not reported)

Avg Secchi Depth (Water Clarity): 2.6 ft                      Stratification Depth: 6.5 ft

The lakes assessment report noted that the low water clarity reading (2.6 ft) is mostly attributed to the natural water color, appearing darker than the other Village lakes, and not to abundance of phytoplankton (low chlorophyll-*a*) and other suspended matter (low total SS) in the water column. The report also noted that Thagards Lake, because of its shallowness, is more susceptible to aquatic plant infestation.

At the time of the Foster fisheries survey (October, 2004), water sampling indicated the following:

Hardness: 30 mg/l                      Alkalinity: 24 mg/l                      pH: 6.5

Dissolved Oxygen above 8' depth: 6.2-10.5 mg/l

Secchi Disk Visibility: >36 inches

A volunteer staffed water quality monitoring program will be implemented in the fall, 2008, to provide more frequent testing of common water quality indicators (temp, dissolved O, pH, water clarity, etc.) Annual testing for fecal coliform, or ecoli, is performed by the Village staff, with June 2008 results at the ten Thagards Lake testing sites ranging from 4-28 parts per 100ml (>200 parts per 100ml is the state threshold for additional testing.)

Aquatic vegetation in Thagards Lake consists primarily of fragrant water lily, floating heart and water-shield--floating leaf plants--especially in the shallow areas of the western half of the lake. Bladderwort, milifoil, and spikerush, all submergents, occur. Nuisance levels of submergents (bladderwort and spikerush) occur in coves and numerous locations along the shoreline, requiring spraying with herbicide (twice in 2008.) Periodically, floating vegetation also reaches nuisance levels requiring herbicidal treatment (once in 2007, none in 2008.) Grass carp were reportedly introduced in Thagards Lake in 1995, along with the other Village-owned lakes, however, none have been observed for a considerable time.

Fish species in Thagards Lake are largemouth bass, bream (bluegill), crappie, shellcracker (Red Ear sunfish), southern pike (chain pickerel), bullhead, channel catfish, suckers, golden shiners, and yellow perch. In addition, anglers report the presence of freshwater eels. Fish management has consisted of stocking programs, and limited artificial habitats (Christmas trees), to no great effect. The Foster survey in 2004 classified the lake fish community as unbalanced.

#### Public Outreach/Input

The individual lake representatives serving on the Lakes and Watershed Board are identified in the Village website and contact information provided. Thagards Lake and other Village residents provide input directly to the Thagards Lake representative at any time.

In the process of developing this lake management plan, a public forum conducted August 4, 2007 by the Chairman and Thagards Lake Representative of the Village Lakes and Watershed Board requested public inputs on lake issues and areas of concern. The results from the public forum were augmented through an extensive questionnaire administered to all Village residents in late 2007. Updates on issues of concern to Thagards Lake residents have been provided by the Thagards Lake Representative in town hall meeting format in February, March, and August 2008.

#### Management Responsibility

Village ordinances (Article II) govern use of water for irrigation, operation of watercraft, codes of conduct and dress, piers and floats, vegetation control, access areas, regulations and safety rules (for watercraft and swimming), fishing, permits, penalties, and maintenance of aquatic ecology.

Responsibility for management of the Village lakes rests with the Village Council, generally upon recommendation of the Lake and Watershed Board (LWB), made in accordance with the individual lake plan and the comprehensive lakes management plan. Thagards Lake interests are brought to the LWB by the lake representative. Enforcement is via the Village Police Department, except as otherwise appropriate.

## **II. PERCEPTIONS**

Perceptions of the status of Thagards Lake and suggestions for matters of attention were accumulated from a series of sources - from public forums, from the 2007 village-wide questionnaire, and from numerous conversations with residents and other users of Thagards Lake by the Thagards Lake representative to the LWB and by other Village officials.

The Village Lake Management Questionnaire administered Village-wide in the fall of 2007 resulted in responses from 71 residents who described themselves as living on Thagards Lake. Responses to all questions by these residents, along with their written comments, formed the principal basis for the survey data. The Questionnaire was comprised of a set of general questions and a set of lake-specific questions (Section A), the lake of interest being chosen by the respondent. Thagards Lake was chosen as the lake of interest by 54 of 245 questionnaire respondents who indicated that they did not live on a lake. A section of the questionnaire asked all respondents to complete an 8-question section (B) regarding Thagards Lake. A total of more than 270 respondents answered most of those 8 questions.

Questionnaire response numbers for individual questions were somewhat variable, as some respondents did not answer every question. Consequently, percentages are expressed as proportion of those answering any individual question.

Inputs on perceptions from various sources were consolidated and organized as follows:

## II. Introduction

### II.1. Lake Infrastructure

- Dam/Spillway
- Access and Boat Launches
- Docks and Retaining Walls

### II.2. Watershed Activities and Effects

- Disturbance
- Sedimentation
- Dredging
- Water Withdrawals

### II.3. Water Quality

- Water Clarity
- Pollution Sources
- General Water Quality Monitoring

### II.4. Aquatic Vegetation

## II.5. Winter Water Level Drawdown

## II.6. Boating

- Regulations
- Registration
- Mooring Buoys

## II.7. Fisheries

## II.8. Parks

- Parking/Boat Storage
- Swimming Areas
- Picnic Areas
- Pets
- Sanitation
- General

## II.9 Swimming

- Maintenance of Swimming Areas
- Segregation of Activities
- Floats and Rafts

## 11.10. Enforcement

## II.11. Communication

## II.12. General Satisfaction with Management

NOTE: In the format which follows, introductory statements to the various issues/topics are in normal type; questions and responses taken from the survey are in *italicized type*; and, summary comments, if included, are in normal type.

**II. Introduction:** Thagards Lake is very important to lake residents for water-based recreation. Of the 71 Thagards Lake respondents, 92% (65/71) use Village lakes for water-based recreation. Thagards Lake residents also take advantage of the Village lake parks. Of 70 respondents, 63% (44/70) indicated that they use the parks, with 5 respondents indicating they use the Spring Valley Lake parks, and the rest indicating they use Thagards Lake parks.

Thagards Lake is also an important resource for Village residents who do not live on the lake. Of the 245 off-lake residents who responded to the Questionnaire, 113 (46%) indicated that they use Village lakes for water-based recreation, and 53% (60/113) of these include Thagards Lake among the lakes used. Thagards Lake parks are also important to off-lake residents. Of the 245 who responded to the Questionnaire, 105 (43%) indicated that they use Village Parks, and of those, more than half indicated they used Thagards Lake parks.

**II.1.Lake Infrastructure**

Village residents consider lake infrastructure to be extremely important. Respondents to the 2006 Citizen Survey of Land Development and Use overwhelmingly expressed that it is extremely important for the Village to maintain or improve dams. Respondents also expressed a strong expectation for maintaining and improving access to Village lakes.

**II.1.1. Dam/Spillway**

A safe and well-functioning dam and spillway is critical to the life of Thagards Lake and property values of lakefront lots. The Thagards Lake dam, though revealing no apparent problems in recent inspections, has a history of breaching and upkeep is complicated by the ownership of a portion of the dam by Carolina Water Services. The village has a responsibility to preserve our property values and our resources and must keep a close watch on the dam, through a scheduled maintenance program, for any changes, especially cracks, ground movements, or changes in seepage rate or color.

**II.1.2. Access**

Other than via lakeside residences, access to Thagards Lake is via the boat launch and the parks. Access to the launch and parks is considered adequate (Only 3% of Thagards Lake residents considered the parks seriously inadequate; while 16% of the non-lake residents found a serious problem.)

No Problem → Big Problem

<i>Adequacy of parks and access areas</i>	<i>Live ON TL</i>	32	13	17	1	1
	<i>Live OFF TL</i>	32	36	16	10	6

Thagards Lake residents consider access for boat launching to be satisfactory (97%).

Highly Unsatisfactory → Highly Satisfactory

*Access for boat launching.*

1 1 9 40 14

### II.1.3. Docks and Retaining Walls

Docks and retaining walls are a typical amenity for lakefront residents. Lakefront residents tended to agree with the effectiveness of construction and maintenance management.

Strongly Disagree → Strongly Agree

*Construction and maintenance of private docks and*

1 9 23 25 7

*bulkheads are effectively monitored and controlled.*

Overall, Thagards Lake residents maintain their docks and bulkheads in good condition, though there are exceptions that are in disrepair. There is a permitting process for the construction of new docks (village, state, and COE) and bulkheads (village), but there are inadequate standards and enforcement for the maintenance of existing docks and bulkheads. Periodic wintertime drawdown (once every two to three years) would assist in providing opportunities for residents to perform maintenance on their docks and piers.

## **II.2. Watershed Activities and Effects**

Thagards Lake residents indicated that sedimentation (75%) and septic tank inflows (63%) were of concern as factors affecting water quality of the lake. In selection of the factor of greatest concern in water quality, sedimentation (36%) ranked higher than all other concerns.

### II.2.1. Watershed Disturbance



### II.2.3. Dredging

Siltation has progressed to the point that dredging is needed to deepen areas of Thagards Lake (85% of residents agreed/strongly agreed that the Village should dredge). This priority has been consistently affirmed by those residents in attendance at the Thagards Lake forums conducted since the Lake Management Survey.

Strongly Disagree→Strongly Agree

The *Village should dredge areas where siltation has occurred.*            2   1   9   24   27

In an effort led by Councilwoman Florence Kieth, Resident Dick Rogers, and Public Works Director Gene Opdyke, the Village completed a Dredging Feasibility Study in April 2003. The purpose of that study was to determine the approximate amount of dredging required and the cost to reopen access boating canals in Little River and the (then) six major lakes in Whispering Pines. In estimating the ‘size of the problem,’ the study focused primarily on Thagards Lake and Little River, which the study suggested had the most pressing depth problems due to the amount of sand and silt carried down the Little River. The study concluded that approximately 20,000 cubic yards should be removed from Thagards Lake and another 18,000 cubic yards from Little River. In a rough estimate of the volume of sediment to be removed from the other five lakes (Spring Valley, Pine, Shadow, Whisper and Fly Rod Lakes), the study suggested a rough estimate would be an additional 25,000 cubic yards. In looking at a variety of options to deal with the approximately 63,000 cubic yards of silt and sediment to be removed, the study’s cost estimates ranged from \$223,000 to one option costing more than \$ 1 million. For a variety of reasons, though cost estimates likely a major one, the study generated no follow on action by the Village to address the dredging issue.

Dredging, as an issue, lay more or less dormant until the summer of 2007. The summer drought caused interested Village residents again to discuss the need for dredging. The Council liaison to the Lakes and Watershed Board, along with the Thagards Lake Representative and Spring Valley Lake Representative, began a series of informal discussions regarding the continued sedimentation/siltation problem. These discussions led to a meeting with the US Army Corps of Engineers Regulatory Specialist responsible for Moore County in September 2007 during which a broad range of topics related to dredging were discussed, including: regulations applicable to lakes versus Little River, wetlands definition, storm-water runoff measures, stump removal, development concerns, and the Corps of Engineers’ permitting processes. While this meeting was primarily informative in nature, the COE representative offered a recommendation

regarding an overall approach to the Village dredging issue that was subsequently adopted. She suggested that, instead of trying to deal with a multitude of stand alone dredging projects, the Village should develop a single, comprehensive plan with the entire Village identified as the project area. The plan should identify the range of purposes to which the dredging would be applied, such as boating, fishing, and other recreational access, and extend out over a sufficient period to allow the Village to address all of its dredging requirements. She suggested that the Village then use that comprehensive plan to obtain one single (individual) permit with a ten year expiration date from the Corps of Engineers. The Thagards Lake representative has agreed to take the lead in writing the comprehensive dredging plan for the Village. In the interim, however, the Village purchased in July 2008 a mini-dredge that is capable of handling the smaller dredging situations and the COE has agreed to accept a limited number of dredging permit applications for these smaller projects pending the submission of the comprehensive plan. The initial operational test of the mini-dredge was conducted in Cape Ray's Cove, Thagards Lake, August 31, 2008.

While a detailed description of the dredging required in Thagards Lake is not yet available, in general the dredging plan for Thagards Lake will address restoration of a thirty foot wide, six foot deep, channel the length of Little River, with an extension of the channel from Thunder Bridge to deeper water in the vicinity of Thagards Island. The dredging plan will also address restoration of the boat access channel fronting lakeshore residences in naturally shallow locations, as well as dredging of selected 'collection' points where the contour of the lake bottom favors build up of sediment, 'muck,' and other debris. The dredging plan will have to also address proposed locations to deposit the spoil and, given the volume of spoil involved (38-40,000 cu yds), will most likely include a consideration of the creation of a second Thagards Lake island.

#### II.2.4. Water Withdrawals

Water withdrawals occur both for Golf Course irrigation and for residential use. Both user groups need to be conservative during periods of drought, and both subject to similar conservation measures. It should be noted, however, that residents generally do not perceive water withdrawal on their part as a problem, with only 11% disagreeing that irrigation systems are being effectively managed.

Strongly Disagree → Strongly Agree

*Residential irrigation systems drawing from the lakes are managed effectively by the Village.*      4   3   31   20   8

Not addressed in the lake management survey, but evident during herbicide application to control aquatic weeds, residential irrigation systems should be required to have an identified “shut off” mechanism, thereby enabling protection of lawns and shrubs in case the resident is not present when the herbicidal spraying takes place (rather than discontinuing spraying, as is the current practice.)

**II.3. Water Quality**

The overwhelming majority of Thagards Lake residents are concerned about water quality (96%), reinforcing the results obtained Village-wide in the WP Land Development and Use Survey where 93% of the respondents felt that it was important for the Village to maintain water quality.

*Data from the Whispering Pines General Survey showed that maintaining water quality, which is affected by a variety of factors, is a high priority for residents.*

*I am concerned about lake water quality. 68*

*I have no concerns about lake water quality. 3*

While 96% of Thagards Lake residents are concerned about water quality, as indicated above, a much lesser percentage, 30%, considered overall water quality to be a problem. A similar percentage, 31%, felt that there was little to no water quality problem. This compares with 55% of non lake residents who considered there to be little or no problem.

No Problem → Big Problem

*Overall water quality.*

*Live ON TL 6 13 26 8 12*

*Live OFF TL 23 33 29 12 4*

**II.3.1. Water Clarity**

Almost half of the Thagards Lake residents considered water clarity to be unsatisfactory (47%), and water clarity is perceived to have declined over the past 10 years.

Highly Unsatisfactory → Highly Satisfactory

*Water clarity.*

*9 23 13 22 1*

Though Thagards Lake water is naturally dark, the situation is compounded significantly during

periods of storm water runoff. The Thagards Lake representative has requested the Village authorize purchase of a turbidity meter in order to gain a more factual understanding of the degree of natural water clarity and how much additional loss of clarity can be attributed to storm water runoff. Particular focus must be given to turbidity levels of the Little River in order to confirm or deny anecdotal concerns regarding the negative impact of upstream development.

II.3.2. Pollution sources.

Pollution sources with which Thagards Lake residents indicated concern were septic tank leakage (63%), runoff of pesticides and herbicides from lawns (45%), fecal coliform levels (44%), and animal wastes (31%). Some concern was expressed for trash, grass clippings, and gas/oil from boats with outboard motors. Nevertheless, the situation for trash and debris was generally perceived as slightly satisfactory (58%).

If concerned, CHECK all that apply.

<i>( ) Septic tank leakage</i>	<i>45</i>
<i>( ) Lawn runoff [pesticides/herbicides]</i>	<i>32</i>
<i>( ) Fecal coliform levels</i>	<i>31</i>
<i>( ) Animal wastes</i>	<i>22</i>

Then CIRCLE your highest concern:

<i>( ) Septic tank leakage</i>	<i>14</i>
<i>( ) Lawn runoff [pesticides/herbicides]</i>	<i>32</i>
<i>( ) Fecal coliform levels</i>	<i>31</i>
<i>( ) Animal wastes</i>	<i>22</i>

Highly Unsatisfactory → Highly Satisfactory

*Trash and debris in the lakes.*

9 12 9 33 4

There are natural debris collection points on Thagards Lake where, depending on wind and current, tons of lake debris can accumulate. While a certain amount of debris clean-up is part and parcel of owning lakefront property, the Village should assist those few property owners who reside in one of the natural collection points with periodic debris clean up.

While septic system leakage was not considered the pollution source of greatest concern, 28% indicated it was a big problem.

No Problem → Big Problem

*Lake pollution due to faulty/substandard septic systems*      7 17 19 8 9

Thagards Lake residents' perceptions of the adequacy of septic contamination monitoring by the Village was slightly negative.

Strongly Disagree → Strongly Agree

*Monitoring for septic contamination in Village lakes is adequate.*      7 13 29 10 4

Although runoff from lawns was considered of lesser concern than septic tank leakage, Thagards Lake residents tended to feel that use of lawn herbicides should be restricted (56%).

Strongly Disagree → Strongly Agree

*Use of lawn herbicides near shorelines should be restricted.*      5 8 15 25 11

The Village, the Lakes and Watershed Board in particular, could significantly improve their public education/outreach to inform residents and their lawn care services regarding the hazards from fertilizing close to the lake's edge and the desirability of retaining a buffer zone.

People should be made aware of what chemicals do to the water quality when runoff from their property occurs. Thagards Lake residents broadly feel that they should be provided with better information on practices to minimize pollution (87%).

Strongly Disagree→Strongly Agree

*The Village should provide residents with technical information on watershed and lake management “best practices.”* 0 3 6 40 18

In addition to the residents’ concerns for the impact of herbicides, fertilizers, septic systems etc, attention must be paid to external sources of pollution, such as animal waste runoff from the horse farm north of the lake’s east end and particularly the contaminants that may be washing downstream via the Little River.

### II.3.3. General Water Quality Monitoring

Thagards Lake residents feel strongly, and unanimously, that monitoring programs should be put into place to track water quality status and changes.

Strongly Disagree→Strongly Agree

*Periodic monitoring of lake water quality should be conducted.* 0 0 0 20 49

To establish status and detect trends, each lake should have a monitoring kit with tests capable of being done by volunteers (established by the lake representative). Sampling should be done at fixed stations on a regular basis and the results maintained in a log. Some tests will have to be done in a lab. Attributes to be monitored need to be identified and frequency of sampling established.

Thagards Lake residents also in almost complete agreement (90%) that they should be informed of the results of water quality monitoring.

Strongly Disagree→Strongly Agree

*The water quality and fishery testing program for our lakes should be formalized and results published.* 0 0 7 33 28

Results of these tests should be maintained in an easily accessible link to the Lakes and Watershed Board’s page on the Village website.

**II.4. Aquatic Vegetation**

Algae and aquatic weeds are not much of a problem for some residents, but considered very problematic where they occur. Not surprisingly, since the shallowness of Thagards Lake makes it susceptible to aquatic weed infestation, a greater percentage of Thagards Lake residents (46%) felt weeds were a problem than did those Village residents not living on a lake (30%). Almost two out of three (64%) of Thagards Lake residents feel the aquatic weed situation is unsatisfactory.

No Problem → Big Problem

<i>Algae/aquatic weed growth</i>	<i>Live ON TL</i>	3	11	17	15	21
	<i>Live OFF TL</i>	8	40	22	20	10

Highly Unsatisfactory → Highly Satisfactory

<i>Aquatic weeds.</i>	23	20	9	13	3
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Residents similarly felt that monitoring and control of aquatic weeds was inadequate.

Strongly Disagree → Strongly Agree

<i>Aquatic vegetation in the lakes is adequately monitored.</i>	18	21	12	14	3
<i>Aquatic weeds are being adequately controlled.</i>	18	22	12	12	2

Some residents have expressed their views that they favor natural weed control (drawdown of the lake during winter freeze periods) rather than chemical control. Occasional winter draw downs, in addition to providing opportunity for dock and bulkhead repair, would likely assist greatly in keeping most weeds under control, particularly the shoreline submergents which residents tend to dislike the most. Draw downs are unlikely to provide a complete solution; however, they would enable the Village to keep use of chemical herbicides to a bare minimum and only to control nuisance/invasive species. In terms of the lake at large, it is important to maintain a balance in addressing weed control. While eradication is required at certain times, and at certain locations, weeds serve a critical function in maintaining a healthy fish habitat. As

in many other areas, the key is finding and maintaining the proper balance between competing uses of the lake, in this case, boating and aesthetics on one hand, and fishing on the other.

Aquatic vegetation is an important habitat for waterfowl, which use the lake as year-round residents and as migrants. Thagards Lake residents are moderately satisfied (few strongly disagreed or strongly agreed) with adequacy of waterfowl management.

Strongly Disagree → Strongly Agree

*The management of the lakes as habitat for waterfowl is adequate.*      4   13   17   30   2

Nevertheless, if the question had been directed solely to Canada geese, the responses likely would have been very different. If there is a single species of waterfowl that raises displeasure with the residents, it is the Canada geese. Those residents consider the combination of the resident and migratory bird flocks, drawn like magnets to the nearby golf courses, an imposing proposition. Generally, and based solely on anecdotal commentary, Thagards Lake residents appear to favor passive goose control measures and have been almost uniformly receptive to the egg addling program.

## **II. 5. Winter Water Level Drawdown**

Though Thagards Lake has not undergone a winter drawdown for some years, there appears to be support (63%) for this management practice.

Strongly Disagree → Strongly Agree

*Water levels should be drawn down periodically.*      6   7   12   30   13

While drawdown would provide residents and the Village the opportunity to inspect/repair bulkheads and docks, to clean-up waterfront areas, and do any lake/dam maintenance while lake levels are low, as well as help considerably in the control of shoreline aquatic weeds, the Village needs to be more proactive in explaining the benefits of periodic draw downs in order to bolster support from the residents for this management technique.

## **II.6. Boating**

Pleasure boating is the highest recreational use of Thagards Lake, involving 62% of the Thagards Lake survey respondents. (Fishing followed at 46%, swimming at 44%, canoeing and kayaking at 39%, and water skiing at 27%.)

### II.6.1. Regulations.

Most residents (69%) agree with current boating regulations, though fewer (56%) feel that boating regulations are adequately posted and easily understood.

Strongly Disagree → Strongly Agree

<i>Boating regulations are appropriate as currently written.</i>	4	8	10	31	17
<i>Boating regulations are posted where required and are easily understandable.</i>	2	8	18	26	10

Almost two out of three Thagards Lake residents (63%) support modification of the Village ordinance restricting night-time boating. A considerable minority (25%) strongly disagree, however.

Strongly Disagree → Strongly Agree

<i>After-dark use of watercraft should be extended provided that proper safety lights are displayed.</i>	17	6	2	23	20
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Relative to hours of operation, the percentages would suggest revision of the present ordinance restricting nighttime use by boaters on Thagards Lake. However, it must be noted that, as it pertains to Thagards Lake, any proposed change to the ordinance would likely engender significant opposition from a minority of lake residents. The major issue for those opposed is noise. Because of the size and shoreline contour of Thagards Lake, sounds carry almost unabated across the length and breadth of the lake. Thagards Lake is the only lake on which gasoline-powered engines are authorized; accordingly, most residents use gasoline-powered engines and electric engines (other than the small trolling motors used by some fishermen) are a rarity. The sound produced by a gasoline-powered engine will be heard across almost the entire lake, including the newer, quieter, four stroke outboard engines. Of those favoring nighttime use, the residents with perhaps the strongest desire to see a change are fishermen (the second highest recreational use of the lake.) A possible compromise that would satisfy most of those desiring removal of the restriction on nighttime use while recognizing the concerns of those opposed would be a policy that authorized nighttime use on Thagards Lake if



<i>Fishing.</i>	3	9	12	35	4
<i>Fishing areas (shoreline/parks)</i>	2	3	17	35	5

However, concern exists for fishing in the proximity of swimming areas, especially the presence of rusty hooks and lines which pose safety hazards. Restriction of shoreline fishing away from swimming areas should be implemented.

Residents slightly disagreed that fish monitoring is adequate, however, they firmly believe (90%) that monitoring results should be publicized.

Strongly Disagree → Strongly Agree

<i>Status of fish populations is adequately monitored.</i>	7	9	35	9	3
<i>The water quality and fishery testing program for our lakes should be formalized and results published.</i>	0	0	7	33	28

Two of three Thagards Lake residents (66%) support supplemental fish stocking as a management tool for Thagards Lake. Only a handful (4%) object to tailoring fish management programs to the individual lake.

Strongly Disagree → Strongly Agree

<i>The Village should stock the lakes for fishing when needed.</i>	2	4	16	25	18
<i>Fish management programs should be tailored to individual lakes.</i>	1	2	20	32	13

Thagards Lake has a long and storied history as a fishing location. And, though stories of “it isn’t like the good old days” persist, it is encouraging to find the generally high level of current satisfaction. It is believed, nevertheless, that there is room for improvement in the Lake’s fisheries management. The 2004 Village fisheries survey recommended regular monitoring of the Thagards Lake parameters and the conduct of an electroshock survey in 2007 to update survey results. To date, neither the regular monitoring nor the updated survey has been accomplished. The 2004 survey recommended stocking of 750 lbs of bluegill each year for the next two years. That, likewise, was not accomplished. Stocking, when done, will need to be

based on updated survey data and should be done in conjunction with other management, e.g., habitat management and harvest strategies. Fisheries management in Thagards Lake, perhaps more than in any other Village lake, should be cautious in its approach, allowing nature to take care of as much of the need as possible.

**II.8. Parks**

There are three Thagards Lake parks: The largest, commonly referred to as “Thagards’ Park” (though recorded by deed as “Cascade Park”), is located on the southeast shoreline, near the dam. On the north shoreline, there is a park commonly known as either the “swimming park” or the “North Park” (and recorded by deed as “Beech Park.”) The third is the park at Thagards Island. Use of Thagards Lake parks by Thagards Lake residents is considerable (62%). They, as well as off-lake users, were quite satisfied with the adequacy of parks (86% for Thagards residents, 70% for off-lake residents).

No Problem → Big Problem

<i>Adequacy of parks and access areas</i>	<i>Live ON TL</i>	32	13	17	1	1
	<i>Live OFF TL</i>	32	36	16	10	6

Regarding most park issues, Thagards Lake residents expressed satisfaction (55-83%), with size of the parks receiving the least displeasure and swimming areas the most displeasure.

Highly Unsatisfactory → Highly Satisfactory

<i>Size of parks</i>	0	0	11	46	6
<i>Number of parks</i>	0	8	18	33	4
<i>Parking areas</i>	2	5	17	36	4
<i>Swimming areas</i>	4	12	13	31	4
<i>Picnic areas</i>	0	11	10	34	9
<i>Fishing areas</i>	2	3	17	35	5
<i>Safety</i>	1	3	14	38	5

In addition, both lake and off-lake residents were generally satisfied (86% and 80%) with noise

levels at parks.

No Problem → Big Problem

Noise levels at parks and access areas

Live ON TL 44 11 6 2 1

Live OFF TL 49 31 4 12 2

Some Thagards Lake residents found non-resident use of the parks problematic (27%) as did off-lake residents of WP (30%.)

No Problem → Big Problem

Non- resident use of parks and access areas

Live ON TL 24 16 7 8 9

Live OFF TL 29 27 14 14 16

Of the many areas covered in the Village's lakes survey, parks represented the topic of highest general satisfaction for Thagards Lake residents. Thagards' Park, as the largest of the Village parks and the one used for most Village-wide outdoor events, is undoubtedly a major contributor to the overall level of satisfaction. Nevertheless, upkeep of the park has been sporadic and occasionally lacking. The current group of residents, under the general supervision of an accepted park coordinator, has done an excellent job in upgrading the care and maintenance of Thagards' Park. In addition, many residents have voiced a desire for bathroom facilities at Thagards' Park, with a clear preference for a permanent, attractive facility. Another oft-expressed desire is for restoration of the children's swimming area at the park. The Thagards Island Park is in the early stages of a volunteer effort to renovate the park and improve the island as a natural plant and wildlife habitat.

#### II.8.1. Parking/Boat Storage

Despite general satisfaction with parking, adequate space for parking cars and storing boats will require monitoring and may require attention in the future.

#### II.8.2. Swimming Areas

See separate section on Swimming (II.9)

#### II.8.3. Picnic Areas

Though not specifically addressed in the Lakes Survey, the need for a covered picnic area in Thagards' Park prompted the Village to program monies in the 2008/2009 budget to build a pavilion at the park. The pavilion will provide a covered picnic area that will provide shade from the sun and temporary shelter during rainstorms.

#### II.8.4. Pets

Thagards Lake residents were generally accepting of pet policies at the parks, with only 14% judging them unsatisfactory.

Highly Unsatisfactory → Highly Satisfactory

*Pet policies*

1 8 22 29 3

Although the Village leash law pertains to the parks, concerns are regularly expressed about dogs running loose, especially in swim areas. Some residents would like to see pets prohibited from the parks.

#### II.8.5. Sanitation

Some Thagards Lake residents were dissatisfied (24%) with sanitary facilities at the parks, as noted above.

Highly Unsatisfactory → Highly Satisfactory

*Sanitary facilities*

3 12 20 25 2

The degree to which Thagards Lake residents find sanitary facilities generally satisfactory is attributed to the policy of placing a porta-john in Thagards' Park during the summer months.

#### II.8.6. Parks—General

A recurring comment from residents is that park signs are old, unsightly, and hard to read. New signs are needed at all Village parks.

#### II.9. Swimming

Like boating and fishing, swimming is a popular activity for Thagards Lake residents with 44% of the survey respondents listing swimming among their recreational uses of the lake. Swimming in Thagards Lake involves various locations—lakefront lots, parks, access areas, boats, and inflatable rafts. Issues related to swimming are largely those of safety. Thagards Lake residents were somewhat satisfied (53%) with the park swimming areas.

Unsatisfactory → Highly Satisfactory

*Swimming areas*

4 12 13 31 4



No Problem → Big Problem

<i>Presence of semi-permanent floats</i>	<i>Live ON TL</i>	36	12	10	0	5
	<i>Live OFF TL</i>	28	28	13	4	4

Attitudes toward large, inflatable floats, anchored temporarily in open water, were less favorable. While 40% of Thagards Lake residents agree that such floats should be allowed, 36% disagree. If allowed, there was agreement, however, that the floats should be restricted in size and distance from shore (64% and 67%.)

Strongly Disagree → Strongly Agree

<i>Offshore anchoring of large inflatable floats should be allowed.</i>	9	15	16	21	6
<i>If so, floats should be restricted in size.</i>	4	3	16	26	15
<i>If allowed, distance offshore should be restricted.</i>	3	3	14	27	14

Suggested distances for offshore anchoring of floats ranged from 0 to 100 feet from the shoreline. Comments included that the floats should be removed or moved shoreward to the shoreline/dock at night and that, wherever placed, they should not interfere with boat traffic.

**II.10. Enforcement**

Only 18% of Thagards Lake residents expressed concerns that there with problems regarding inadequate enforcement of Village lake ordinances, a slightly higher percentage than for off-lake users (10%).

No Problem → Big Problem

<i>Enforcement of current lake ordinances</i>	<i>Live ON TL</i>	20	11	20	7	4
	<i>Live OFF TL</i>	37	27	25	6	4

Thagards Lake respondents to the survey question that combined both enforcement and patrolling yielded significantly different results – 30% disagreed that the lakes were adequately patrolled and regulations enforced.

Strongly Disagree → Strongly Agree

<i>Village lakes are adequately patrolled and regulations enforced.</i>	7	14	16	22	9
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Most Thagards Lake residents and off-lake users judge the overall quality of the lake to have changed little over the past 5 years (52-79%). Nevertheless, respondents more often judged the overall quality to have declined than to have improved.

*Over the past five years, would you say the overall quality of this lake is: (check one)*

	<i>Getting better</i>	<i>About the same</i>	<i>Getting worse</i>
<i>Live ON TL</i>	5	32	27
<i>Live OFF TL</i>	9	79	13

Thagards Lake residents feel strongly (99%) that effective management is important.

[Strongly Disagree](#) → [Strongly Agree](#)

*Effective management of Village lakes is important to maintaining a high quality of life for Village residents.*      0   0   1   24   43

In providing an assessment of lake management efforts, however, the kindest way to characterize their responses is to say that the residents were neither strongly satisfied nor strongly dissatisfied with current management.

[Strongly Disagree](#) → [Strongly Agree](#)

*Overall, I am satisfied with the current management of Village lakes.*      5   17   16   20   6

*The overall quality of the Village lakes is adequately maintained.*      5   22   17   23   2

The message from the responses regarding lake management should be clear – we’re not there yet, and in fact, have quite a way to go. Hopefully, this plan will assist in moving us in that direction.

The 2007 Lakes Survey Questionnaire also included a section, with eight questions, specific to Thagards Lake. While in some respects redundant, because respondents from all over the Village were given an opportunity to comment on specifically Thagards Lake, the responses are

enlightening. The results below are broken up into three categories: Thagards Lake residents; other lake residents; and, non-lake residents.

While a small, but vocal, minority of residents are not in favor of continued water skiing on Thagards Lake, Thagards Lake residents overwhelming are (84%.) By smaller percentages, the rest of the Village generally agrees (67% of other lake residents, 75% of non-lake residents.)

*Should water skiing continue to be allowed on Thagards Lake?*

	<i>Yes</i>	<i>No</i>
Thagards Lake Residents	<i>61</i>	<i>10</i>
Other Lake Residents	<i>50</i>	<i>25</i>
Non-lake Residents	<i>97</i>	<i>32</i>

There is nothing envisioned in this plan that would discontinue water skiing on Thagards Lake.

Regarding the need for dredging of Thagards Lake, this is something that Thagards Lake residents identify as a pressing need. While 82% of the Thagards Lake residents see a need for dredging, only 66% of other lake residents and 54% of non-lake residents see a similar need.

<i>Do navigable channels need to be dredged?</i>	<i>Yes</i>	<i>No</i>
Thagards Lake Residents	<i>53</i>	<i>12</i>
Other Lake Residents	<i>33</i>	<i>17</i>
Non-lake residents	<i>48</i>	<i>41</i>

If nothing else, the Thagards Lake community apparently needs to provide a clearer picture of its dredging needs to the rest of the community. Given the Village resources that will have to be applied to the effort, Village-wide support and cooperation in dredging Thagards Lake will be required.

Almost four of five Thagards Lake residents (79%) are comfortable with the placement of buoys designating water skiing areas. The rest of the Village agrees by even larger percentages.

*Are buoys marking water skiing areas adequately planned and maintained?*

<i>Yes</i>	<i>No</i>
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Thagards Lake Residents	53	14
Other Lake Residents	36	4
Non-lake Residents	64	15

Buoy markers are known to drift. The Thagards Lake representative has responded to several resident telephone calls and relocated buoys to their proper location.

It is not surprising that 90% of the Thagards Lake residents favor continued use of gasoline engines. The rest of the Village seems to be in agreement that Thagards should continue to be one lake in the Village where use of gasoline engines is authorized.

*Should the current policy of allowing use of gasoline engines on Thagards Lake continue?*

	Yes	No
Thagards Lake Residents	61	7
Other Lake Residents	49	12
Non-lake Residents	92	21

The drought of 2007 raised considerable questions about the safety of water skiing given the lower levels of Thagards Lake. While 70% of the Thagards Lake residents considered water skiing to still be a safe sport, the rest of the Village was more concerned, with half of the other lake residents feeling it was no longer safe.

*Since areas of Thagards Lake are filling in with sediment and now requires warning buoys for safety, is water skiing a safe sport to allow on the lake?*

	Yes	No
Thagards Lake Residents	46	20
Other Lake Residents	28	28
Non-lake Residents	60	47

The accepted standard for safe depths for water skiing is at least five or six feet of obstacle free water in order to insure that skiers don't hit bottom or underwater obstacles during a fall or drag their skies during starts. While almost all of the area of Thagards Lake within the marker

buoys is considerably deeper than five or six feet, the western most boundary, where the lake begins to become shallow, is an area that requires attention.

When asked specifically about the need to dredge the north side of the lake (Cape Ray's Cove), favorable responses were greater than when asked about dredging generally. The trend, however, is the same, with a greater percentage of Thagards residents appreciating the need for dredging (92% for Thagards residents, 84% for other lake residents, and 72% for non-lake residents.)

*Should navigable channels be dredged at the north end of the lake because of the sedimentation and overall filling in of Thagards Lake?*

	<i>Yes</i>	<i>No</i>
Thagards Lake Residents	58	5
Other Lake Residents	51	10
Non-lake Residents	70	27

The objective of the dredging that is required on the north side of Thagards Lake will be to restore the boat access channel that was created when the lakefront lots were first platted. There are similar situations in other locations of the lake, notably the southwest corner.

Thagards Lake residents generally favor increased police presence during high use periods (60%) as do other Village residents (76% of other lake residents, 63% of non-lake residents.)

*During times of busy use, should the police or the enforcement officer increase time spent of Thagards Lake enforcing regulations?*

	<i>Yes</i>	<i>No</i>
Thagards Lake Residents	40	27
Other Lake Residents	47	15
Non-lake Residents	71	42

Thagards Island, approximately 2 ¾ acres, was created in 1964 from spoil that resulted from the boat access channel dredged for lakefront lots that fronted naturally shallow areas of the lake. While the original intent for the island is somewhat obscure, at one time the island had a causeway that connected it with the northern shore, had a concrete retaining wall built around

the perimeter, had electricity and lighting installed and a flag pole erected, and had ornamental camellia and azalea bushes planted. Whatever the original intent, it never materialized. In 1969, the Village sold the island to Campbell University. In 2002, the Village repurchased the island from Campbell University. As a result of almost no maintenance or care over the last 40 years, the electricity ceased to function and most of the light fixtures were broken and rusted, most of the original understory plantings were lost, a thick stand of loblolly pines became established, the retaining wall is in disrepair and the flag pole is severely rusted.

*The Village re-acquired Thagards Island a few years ago from Campbell University. Should the Village make use of the island?*

	<i>Yes</i>	<i>No</i>
Thagards Lake Residents	36	28
Other Lake Residents	32	20
Non-lake Residents	63	48

By a small margin, 56% for Thagards Lake residents, 58% village-wide, responses favored making use of the island.

*If yes, what uses would you recommend?* While responses ranged from “sell it,” and “nothing,” to a “developed park for all Village residents to use,” the most consistent theme of the responses was to restore the island as a “nature park.”

The Thagards Lake representative has begun efforts to organize interested residents in island restoration activities. Comments provided by a professional arborist after visiting the island May, 2008, indicated that “what has been created through no forest management over the past years is a pine desert.” He recommended that “your first priority should be to remove the co-dominant stems of loblolly pine ... and all stems that are infected with fusiform rust.” He added, “Your wish to make the island a better habitat for wildlife and native plants species speaks well of you and your community. You have an excellent opportunity to make this small piece of land a show place for others in your community and state to emulate.” Village resident Susan Campbell has prepared a proposal that will serve as the blueprint for island restoration. A near term objective for the Thagards Island is to have a park that can be certified as a National Wildlife Federation Backyard Wildlife Habitat, as well as providing a peaceful respite for Thagards Lake residents.

### **III.—Thagards Lake ACTION PLAN**

The strategic purpose of this first Thagards Lake Management Plan is: In 20-25 years, leave to the next generation of Thagards Lake residents a lake that is at least of the same quality, condition, and natural beauty as the current Lake – or better.

This strategic aim of the plan recognizes that, when the Village purchased the original five lakes from Whispering Pines, Inc, in 1983, the three stated purposes for which the lakes, along with the dams and access properties, had been established were:

- “(a) to provide a water utility for the purpose of irrigation of properties within the village;
- (b) to provide a source of water for fire-fighting; and
- (c) to provide water recreation facilities for the Village taxpayers.”

Those three original purposes notwithstanding, there is a fourth purpose which is now recognized:

- (d) to provide under Village management water resources which are integral to the character and essential to the natural beauty of the Village of Whispering Pines.

In 2008, and for purposes of this Thagards Lake Management Plan, the order of priorities identified above is: (d), (c), (b) and (a).

Regarding the purpose of providing water recreation facilities for the Village taxpayers, this objective presents unique challenges for Thagards Lake. As the largest of the Village lakes, and the only one authorizing use of gasoline powered engines, as well as being the ‘community lake’ for most non-lake Village residents, the Thagards Lake situation is one of competing, and sometimes conflicting, recreational uses as well as competing recreational uses vis a vis the maintenance of the lake’s natural aesthetics. Whether the interest is pleasure boating, canoeing/kayaking, fishing, swimming, fishing, water skiing or tubing, or simply enjoying the natural beauty of the lake, maximizing the focus on any one single interest will in all cases adversely affect others. The Thagards Lake Management Plan recognizes this situation. The plan does not focus on a single interest as a priority in an attempt to create an ideal situation for that interest – rather it attempts to reasonably support all interests. No interests are excluded. In a word, management of Thagards Lake requires a balanced approach to the objective of providing water recreation opportunities.

The Action Plan identifies three broad goals, with supporting actions, to support the Lake Management Plan’s strategic purpose:

Goal 1. To maintain and enhance the water quality, ecology, and natural health of the lake.

Action 1.1 Develop and maintain a thorough and reliable data base upon which to base lake management decisions.

Priority: High

Cost: Medium

Timeline: Near Term

Responsibility: Village Staff, LWB, Thagards Lake Representative, Volunteers

Comment: At a minimum, a current and accurate database of water quality parameters should be maintained and available to all Village residents via the Village website. Physical parameters should include sedimentation rate estimates, temperature and transparency (water clarity,); chemical parameters should include dissolved oxygen and nutrients; and, biological parameters should include algal biomass (chlorophyll-*a*.) The database should include results of seasonal testing for fecal coliform. Turbidity testing should be conducted at Thagards Lake sampling location T9 (and possibly others) at least monthly, and during peak clarity and at peak turbidity conditions. Turbidity testing results should be included in the data base. Sampling locations, schedule, and explanatory notes where advisable also should be made available.

Action 1.2 Develop and implement a community based group of volunteers to conduct periodic water quality sampling.

Priority: High

Cost: Low

Time Line: Near Term

Responsibility: Thagards Lake Representative, Volunteers

Comment: For many of the testing parameters, monthly sampling is recommended. The others are seasonal. Turbidity testing along Little River will require a sub-set of volunteers to assist in data collection. This action item assumes successful construction of the database (action item 1.1) to be populated.

Action 1.3 Develop, implement, and execute a dredging plan for Thagards Lake and Little River.

Priority: High

Cost: High

Time Line: Near term for plan, long term for implementation/execution

Responsibility: Thagards Lake Representative, LWB, Village

Comment: The Thagards Lake/Little River dredging plan will be part of the Village's comprehensive dredging plan to be drafted by the Thagards Lake Representative with assistance from the other LWB lake representatives. The primary focus of the plan will be restoration dredging: restore

a navigable channel , 30' wide and 6' deep, from Rays Bridge Road to Thunder Bridge; restore a navigable channel, 30' wide and 6' deep, from Thunder Bridge to deeper ( 6' ) water in vicinity of the Island, generally following the course of the original riverbed; restore the boat access channel (20' wide and 4' deep) fronting lakefront properties in shallow portions of the lake; spot dredge to remove shallow areas (<5'to6') in the buoy-marked waterskiing area; and, spot dredge to restore deeper holes that are natural collection points for silt/muck/lake debris.

Action 1.4 Develop and implement a plan to establish/construct effective sediment containment devices at all entry points to Thagards Lake (except Little River.)

Priority: High

Cost: Medium

Time Line: Near Term for plan, long term for implementation

Responsibility: Thagards Lake Representative, LWB, Village

Comment: There are more than 30 separate locations of storm water runoff and intermittent stream flow into Thagards Lake. The sedimentation control measures at these sites range from somewhat effective to non-existent. The 2008/2009 Village budget provides the \$4000 requested by the Thagards Lake Representative for Thagards Lake sedimentation control devices and will be used to improve the situation in the NW corner of Cape Rays Cove (between 121 and 127 Lakeview Drive.) This first "band-aid" should be incorporated into a long range plan that will systematically improve each of the inflow sites.

Action 1.5 Develop and implement a plan for a second island in Thagards Lake.

Priority: High

Cost: Medium

Time Line: Mid Range

Responsibility: Thagards Lake Representative, Volunteers, Village

Comment: The challenge in all dredging projects is what to do with the spoil, and the same will apply to dredging described in Action Item 1.3. There is an estimated 35-40,000 cu yds of spoil that will be generated. As was done when the boat access channels were created in 1964, and a method often employed by the COE, the least expensive solution will be the creation of a second island in Thagards Lake. A two acre island, with an average depth of 6' of spoil, would accommodate approximately 20,000 cu yds of spoil. An island of that size would entail the loss of less than 1% of the lake's surface area, but would not alter the acre-feet capacity of the lake. Given the contour of the lake bed, current, winds, and residential locations, the location proposed is immediately offshore (100'-120') the currently undeveloped lots at 5 and 8 Thagards Lane. Description and proposed use of the island is described in Action Item 2.3 below.

Action 1.6 Update the Lake's Assessment Study conducted by Buck Engineering, Inc, in 2001.

Priority: High

Cost: Medium

Time Line: Mid Range

Responsibility: Village, LWB, Thagards Lake Representative

Comment: Within the next three years, 2008-2011, a thorough, professional assessment of Thagards Lake should be accomplished. The 2001 Lake's Assessment Study has served the Village well, but is becoming outdated and is lacking in certain areas, such as lake bed condition/presence of pollutants.

Action 1.7 Develop, implement, and enforce a Village soil erosion control program

Priority: High

Cost: Medium

Time Line: Near Term

Responsibility: Village, LWB, P&Z, Thagards Lake Representative

Comment: A draft soil erosion control ordinance has been drafted and, assuming council adoption, should be available for implementation of a Village soil erosion control program by the end of 2008. Enforcement of the provisions of the soil erosion control ordinance will significantly reduce sedimentation problems within the Village. The Village should keep on retainer an attorney with experience in water quality enforcement litigation.

Action 1.8 Research the desirability/feasibility of establishing a volunteer based Little River/Thagards Lake Watch program, and establish the Watch program if advisable.

Priority: High

Cost: Low

Timeline: Near Term

Responsibility: Thagards Lake Representative, Volunteers, Village

Comment: While enactment of an ordinance to control soil erosion control within the Village will be a significant step in reducing sedimentation problems in Village Lakes, Thagards Lake is uniquely at the mercy of upstream sedimentation and pollution flowing down the Little River. An organization such as the Little River/Thagards Lake Watch could mobilize a group to work with Moore County and state officials, as well as owners and property developers, to address identified sources of upstream

sedimentation and pollution. As a first step, the Watch should develop a survey of potential upstream contributors to river sedimentation and pollution.

Goal 2. To maintain and enhance the esthetic values and recreational opportunities of Thagards Lake, including its parks.

Action 2.1 Continue improvements to Thagards Park

Priority: High

Cost: Medium

Timeline: Mid to long term

Responsibility: Thagards Lake Representative, LWB, Village, Volunteers

Comment: The recent improvements in the care and maintenance of Thagards Park initiated by the park coordinator and local residents have been recognized. Their work led directly to the 2008/2009 Village budget decision to fund construction of a covered pavilion at the park. With the recent Village acquisition of approximately three acres of land along the river immediately adjacent to Thagards Park, there is an excellent opportunity to incorporate a "river walk" and scenic overlook on the east side of the Park. A longer term major improvement to be undertaken is the construction of permanent bathroom facilities. Though generally supported in the survey's comments, this improvement will likely meet vocal opposition from some residents, and will have to be discussed and agreed upon.

Action 2.2 Restore Thagards Island as a natural park and wildlife habitat.

Priority: High

Cost: Low

Timeline: Ongoing

Responsibility: Thagards Lake Representative, Volunteers, Village

Comment: The next steps in island renovation will involve thinning the current stand of loblolly pines and the introduction of native drought tolerant trees, shrubs and herbaceous ground cover. Given an objective to have the island certified as a National Wildlife Federation Backyard Wildlife Habitat, other projects such as erecting bird boxes, creating an interpretative trail, and installing benches for wildlife viewing will be considered.

Action 2.3 Develop a comprehensive plan for a second Thagards Lake island.

Priority: High

Cost: Low

Timeline: Mid Term

Responsibility: Thagards Lake Representative, LWB, Village, Volunteers

Comment: IF the village approves and funds the ten year dredging plan, the potential use of a second island for Thagards Lake will need to be addressed. There is a planning approach that would likely reduce the overall dredging costs to the Village. Costs for construction of the island, even when employing less expensive methodologies, will not be insignificant. While creating an island with the Thagards Lake/Little River spoil will likely be the cheapest of any of the spoil disposition alternatives, the plan for use of the island may further reduce costs. Those costs could be mitigated if the intended use of the island was as a bird and fish habitat, thus qualifying the project for funding assistance, in the form of grants, available from numerous environmental and wildlife organizations. Moore County is experiencing a decrease in habitat for grass-nesting birds. Planting the island with native grasses and keeping it tree and shrub free would provide an excellent bird habitat. Creating a 4'-5' shelf around the island, planted with beneficial aquatic plants, and containing numerous gravel spawning beds, should significantly improve the aquatic environment for the lake's largemouth bass and other fish population. Design of an island to qualify for grant funding assistance would be of obvious advantage to the Village, as well as contributing significantly to the overall quality of the lake.

Action 2.4 Amend the boating rules for Thagards Lake.

Priority: Medium

Cost: Low

Timeline: Near Term

Responsibility: Thagards Lake Representative

Comment: An amendment to the boating rules for Thagards Lake that would make those areas outside the marker buoys for the waterskiing area a 5MPH 'no wake zone' would assist in delineating appropriate zones on the lake for competing recreational uses. With the amendment, recreational use of the eastern half of the lake would remain essentially unchanged. With the western half and shoreline areas designated a 'no wake zone' however, the use of those portions of the lake by kayakers, canoers, and fishermen would be markedly enhanced.

Action 2.4 Reduce dependence on chemical control of aquatic weeds via use of periodic lake drawdowns.

Priority: Medium

Cost: Low

Timeline: Near Term

Responsibility: Thagards Lake Representative, LWB, Village

Comment: The current aquatic weed control program has two primary objectives: maintaining a balanced (between fishermen and boaters) surface weed colony and, for aesthetics and other reasons, reduction of surface and submergent aquatic weeds along residential shorelines. Periodic drawdowns of the lake of approximately 3' to 3 ½' would expose most residential shorelines and, if the drawdown is conducted during periods of winter freeze, will serve to significantly reduce the shoreline colonies of both surface and submergent aquatic weeds. The drawdowns would also provide opportunities for residents to conduct shoreline debris removal and perform dock and bulkhead maintenance. Drawdowns should be conducted, at a minimum, every three years.

Action 2.5 Increase boat storage capacity at Thagards Lake parks.

Priority: Medium

Cost: Low

Timeline: Mid Term

Responsibility: Thagards Lake Representative, LWB, Village

Comment: Both Thagards Park and the North Park would benefit from an additional boat storage rack for non-lakefront residents' canoes and kayaks.

Action 2.6 Amend Village boating rules to authorize nighttime boating (with electric motors only.)

Priority: Low

Cost: Low

Timeline: Mid Term

Responsibility: Thagards Lake Representative, LWB, Village

Comment: After dark use, provided proper safety lights are displayed, is favored by most Thagards Lake residents. Nevertheless, there is a significant minority of residents who strongly disagree, primarily because of noise concerns. The population with perhaps the most legitimate interest in after dark use is our fishermen, many of whom already employ electric trolling motors.

Action 2.7 Construct an osprey platform in Cape Rays Cove.

Priority: Medium

Cost: Low

Timeline: Near to Mid Term

Responsibility: Thagards Lake Representative, Volunteers

Comment: The survey did not pose any specific questions relating to wildlife, nor were there any comments provided (though occasional concerns have been expressed regarding the abundant population of Canada geese.) Nevertheless, there is an opportunity to enhance both the aesthetics of the Lake, as well as enhance wildlife habitat, through the construction of an osprey platform in Cape Rays Cove. The cove has been frequented by osprey the last few years as the osprey have expanded their territory inland from the coast. They are now believed to be nesting in Moore County. There is the possibility of attracting a nesting pair of osprey, given their attraction to Cape Rays Cove, with the construction of an osprey platform. A platform would not be difficult or expensive to construct, and there are suitable locations, in very shallow water, in the cove.

#### Action 2.8 Update the 2004 Thagards Lake fisheries assessment

Priority: Medium

Cost: Medium

Timeline: MidTerm

Responsibility: Thagards Lake Representative, LWB, Village

Comment: The 2004 survey recommended a follow-up electroshock survey of all of the Village Lakes, less Flyrod. To date, the follow-up survey has not been planned, programmed or budgeted.

#### Action 2.9 Develop a fisheries management strategy for Thagards Lake.

Priority: Medium

Cost: Low

Timeline: Near Term

Responsibility: Thagards Lake Representative, Volunteers

Comment: Fisheries management in the Village, historically, has amounted to little more than periodic lake board discussions of how best to divide up the lake stocking budget. Fisheries management, however, includes much more than a plan for stocking. Thagards Lake presents both opportunities and challenges in an ecosystem that is both complex and interconnected and begs for a focused strategy that is specifically tailored to the lake and that will provide ecologically sound recommendations that are within financial constraints.

Goal 3. To effectively communicate needs and actions (among residents, lake representatives, LWB, and the Village) and create a high level of community awareness regarding lake issues.

Action 3.1: Develop and implement procedures to communicate with residents regarding the Village's dam safety program.

Priority: High

Cost: Low

Timeline: Near Term

Responsibility: Village, LWB

Comment: The Village has in place an effective dam safety program; however, communicating the status, maintenance actions, near, mid, and long range planning objectives of the dam safety program have been inconsistent. The status of the Village's dams is of such import, that extra effort must be made to insure all Village residents are kept informed.

Action 3.2 Update signage and place bulletin boards at each of the parks.

Priority: High

Cost: Low

Timeline: Near Term

Responsibility: Thagards Lake Representative, LWB, Village

Comment: Each Thagards Lake Park needs a trailhead style bulletin board on which updated signage and appropriate cautions can be posted. The standard Village rules sign is not user friendly and is difficult to read, there is no sign incorporating a map of the lake (depicting skiing areas, counterclockwise flow around the island, etc.), and there are no place to place seasonal cautions or other public information (such as herbicidal spraying schedule.)

Action 3.3 Create a community outreach, public education program for lakes-related issues.

Priority: High

Cost: Low

Timeline: Near Term

Responsibility: LWB

Comment: This is an area where the Lakes and Watershed Board could make major improvement. Of all the Thagards Lake respondents to the 2007 Lakes Survey, not one disagreed that the Village should be providing technical information on the watershed and on lake management "best practices." To date, there has been almost nothing. Presentations on pertinent topics are available from the county extension service, organizations such as DENR, and academic institutions such as NC State – none have been scheduled for village residents or even the LWB. Channel 18 should provide at minimum twice monthly updates on lake and watershed related technical information and best management practices – nothing has appeared. Periodic meetings by Lake Representatives with lake

residents are useful and informative, but they are not a substitute for a public outreach/education program.