

Shadow Lake Management Plan

February, 2009

INTRODUCTION

In 2007, the Lakes and Watershed Board (LWB) of the Village of Whispering Pines (WP) initiated a planning effort for all its lakes. The purpose of this planning is, in part, to fulfill a component of the WP Land Development Plan. The specific purpose of each lake plan is to ascertain current status of each lake, perceptions of WP 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:

Built in 1967, Shadow Lake is 28 acres in area. It is 312 feet above sea level and the height of the dam is 30 feet, 650 feet long and 25 feet wide at the top. Shadow Lake is classified as Low Hazard. The average depth ranges from 4 feet to 6 feet with the deepest about 15.7 feet. Water contained to crest is 1,000 acre-feet with a drainage area of 785 acres.

The spillway was replaced in 1997. A number of trees were removed from the dam before the spillway repair and the stumps were never removed. There are still a number of large trees growing on the dam close to the water's edge.

February 2006 dam inspection indicated minor seepage at base of the dam, soil erosion of the right abutment in storm drain ditch, and recommended repairs and grass cover. Maintenance recommendations included removal of trees less than six inches and thick undergrowth and remove all trees from the emergency spillway.

Inflow is primarily from springs and Pine Lake upstream. Significant sedimentation has occurred at one inflow site. Outflow is a single culvert on the lower end of the lake at the dam.

There are 47 lake front property owners. Only 7 vacant sites remain, some of which are unsuited for home building. Access to Shadow Lake is via an earthen ramp at the east end of the dam from Shadow Drive. Several boat storage racks are available at the access point.

Water quality of Shadow Lake is good, as indicated by the 2001 Buck Survey (Appendix 1) and the 2004 Foster Lake Survey (Appendix 2). The lake has an olive brown appearance due to a lack of planktonic activity in the water column. A natural seep entering the lake from the Niagara-Carthage Road end of the lake, rust orange in color, is caused by the oxidation of iron that is abundant in the soil. This is a naturally occurring phenomenon.

Water testing for coliform bacteria has been conducted annually. No adverse levels have been detected recently.

The WP LWB has recently obtained equipment and supplies for conducting basic water quality management, and has trained lake representatives in doing water quality sampling.

At the time of the 2004 Foster evaluation, a small amount of bladderwort and spikerush were the dominant species of aquatic vegetation. Patches of floating-hearts and fragrant white water-lilies occur in coves near the west end of the lake.

The Foster survey indicated five different types of fish species: largemouth bass, bluegill, shellcracker (red ear sunfish), redbreast sunfish and black crappie.

Of the 30 Shadow resident respondents to the LWB lake questionnaire, twenty three indicated that they use Village lakes for recreation. The uses include fishing, swimming, boating, and kayak/canoeing.

The Shadow Lake representative to the LWB is the principal conduit for information transfer. Lake representatives are identified in the Village website, and contact information provided.

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

II. PERCEPTIONS:

In response to the 2007 LWB questionnaire, 30 residents of Shadow Lake (noted as “residents” or “ON” in data presented”) provided inputs to the plan. In addition, 5 WP residents who do not live on a lake chose to complete a 12-question lake-specific survey for Shadow Lake. Respondents also provided comments, which, in addition to those of the LWB lake representative, contributed to perceptions of the status and management of Shadow Lake.

II.1.Lake Infrastructure

II.1.1. Dam/Spillway

February 2006 dam inspection indicate minor seepage at base of the dam, soil erosion of the right abutment in storm drain ditch, and recommend repairs and grass cover. Maintenance recommendations include remove trees less than six inches and thick undergrowth and remove all trees from emergency spillway. Response to these recommendations is needed. A number of trees were removed from the dam before the spillway repair and the stumps never removed. There are still a number of large trees growing on the dam close to the water's edge. The effect of these stumps and trees on the integrity of the dam and spillway should be determined.

II.1.2. Access

Lake residents and off-lake residents generally are satisfied with access to Shadow Lake.

(5.) Adequacy of parks and access areas

	No Problem → Big Problem					
	ON	13	7	4	1	0
	OFF	0	2	0	1	0

(17.) Access for boat launching.

	Highly Unsatisfactory → Highly Satisfactory					
		0	0	4	21	4

II.1.3. Docks and Retaining Walls

Some Shadow residents feel that there should be better control over construction of docks and bulkheads.

(34.) Construction and maintenance of private docks and bulkheads are effectively monitored and controlled.

	Strongly Disagree → Strongly Agree					
		1	4	7	12	2

II.2. Watershed Activities and Effects

II.2.1. Watershed Disturbance

Shadow residents expressed concern that watershed activities are harming the lake, and that more control is needed to reduce watershed impacts.

(44.) New construction in the watershed is being effectively supervised in terms of controlling silt and sediment runoff.

	Strongly Disagree → Strongly Agree					
		6	7	10	5	1

(52.) Storm water run off is not effectively controlled and is harming the lakes

		1	6	16	5	1
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II.2.2. Sedimentation

Strong concern exists for siltation of Shadow Lake. Silt and sedimentation buildup, which have reduced water depths in coves, should be more closely monitored.

(15.) Siltation of cove areas.

	Highly Unsatisfactory → Highly Satisfactory					
		4	11	9	3	1

II.2.3. Dredging

Dredging of silted inlet coves should be conducted.

Strongly Disagree → Strongly Agree

(53.) The Village should dredge areas where siltation has occurred. 2 0 6 17 3

II.2.4. Water Withdrawals

Shadow residents have no particular concern about use of lake water for residential irrigation.

Strongly Disagree → Strongly Agree

(51.) Residential irrigation systems drawing from the lakes are managed effectively by the Village. 1 0 6 17 3

II.3. Water Quality

Shadow residents indicated that they are concerned about water quality. Residents were highly divided on their perceptions of water quality problems in Shadow Lake.

(10.) The WP Land Development and Use survey indicated high importance for maintaining water quality, which is affected by a variety of factors.

- () I am concerned about lake water quality. 27
- () I have no concerns about water quality 3
in WP lakes.

(1.) Water quality

No Problem → Big Problem

ON	4	6	7	6	4
OFF	0	1	4	0	0

II.3.1. Water Clarity

Some residents wish Shadow Lake was clearer.

Highly Unsatisfactory → Highly Satisfactory

(18.) Water clarity. 4 10 5 10 0

II.3.2. Pollution Sources

Most residents were concerned with water quality. Individuals indicated concern for most potential pollution sources, including fecal coliform levels was considered of highest concern, and need for better monitoring of septic system contamination was noted.

- (11.) If concerned, CHECK all that apply.
- () Septic tank leakage 16
 - () Fecal coliform levels 19
 - () Stormwater inflow 10
 - () Lawn runoff [pesticides/herbicides] 14
 - () Animal wastes 11
 - () Sedimentation 20

Highly Unsatisfactory → Highly Satisfactory

(13.) Trash and debris in the lakes. 0 3 2 20 3

(2.) Lake pollution due to faulty/substandard septic systems

	No Problem → Big Problem				
ON	4	2	5	4	1
OFF	0	0	3	0	0

(40.) Monitoring for septic contamination in Village lakes is adequate.

	Strongly Disagree → Strongly Agree				
	2	6	10	9	1

Residents expressed concern about the impacts of lawn herbicides and felt that their use should be restricted. Better information on best management practices are desired.

(46.) Use of lawn herbicides near shorelines should be restricted.

	Strongly Disagree → Strongly Agree				
	1	4	7	13	3

(54.) The Village should provide residents with technical information on watershed and lake management “best practices.”

	Strongly Disagree → Strongly Agree				
	1	0	1	24	3

II.3.3. General Water Quality Monitoring

A system of regular water quality monitoring is needed and results should be made available to residents.

(39.) Periodic monitoring of lake water quality should be conducted.

	Strongly Disagree → Strongly Agree				
	0	0	0	8	21

(43.) The water quality and fishery testing program for our lakes should be formalized and results published.

	Strongly Disagree → Strongly Agree				
	0	2	2	16	9

II.4. Aquatic Vegetation

Although aquatic plants are important to the health of the lake, aquatic weeds have been a problem in the recent in the past. Some feel that too much spraying is done to kill plants. However, weeds have become a real problem in coves and must be sprayed.

(3.) Algae/aquatic weed growth

	No Problem → Big Problem				
ON	4	0	9	8	5
OFF	0	1	3	1	0

(14.) Aquatic weeds.

	Highly Unsatisfactory → Highly Satisfactory				
	3	16	1	8	2

(41.) Aquatic vegetation in the lakes is adequately monitored.

	Strongly Disagree → Strongly Agree				
	4	9	6	7	2

(45.) Aquatic weeds are being adequately controlled.

	6	12	3	6	2
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Those interested in fishing realize that some aquatic vegetation is valuable as fish habitat, so control should be limited.

Shadow residents fell the management of waterfowl is adequate.

(47.) The management of the lakes as habitat for waterfowl is adequate.

	Strongly Disagree → Strongly Agree				
	2	6	7	12	1

II. 5. Winter Water Level Drawdown

Winter drawdown of Shadow Lake would benefit weed control and fisheries, while providing opportunity for maintenance of docks and bulkheads. Strong sympathy was expressed for drawdown.

(49.) Water levels should be drawn down periodically. Strongly Disagree→Strongly Agree
2 2 2 17 5

II.6. Boating

Shadow residents are satisfied with the boating situation and boating regulations; but are divided on changing after-dark boating regulations. Emphasis on enforcement of decals is strongly supported. Regulations should be posted.

(29.) Boating regulations are appropriate as currently written. Strongly Disagree→Strongly Agree
0 4 3 14 8
(30.) Boating regulations are posted where required and are easily understandable. 0 6 9 8 5

(9) Boats without current lake stickers. No Problem→ Big Problem
ON 12 2 4 3 2
OFF 1 1 2 0 1

(33.) After-dark use of watercraft should be extended provided that proper safety lights are displayed. Strongly Disagree→Strongly Agree
6 5 7 6 4

(32.) Fees for boat decals are reasonable and should be collected. Strongly Disagree→Strongly Agree
1 2 6 16 4

(31.) Current decals for all watercraft should be stringently enforced by the Village. Strongly Disagree→Strongly Agree
1 2 6 14 6

II.7. Fisheries

Respondents to the questionnaire were divided on the quality of fishing in Shadow Lake. Comments indicated that fish quality is improving slightly, but the populations remain unbalanced. Strong interest was expressed for better monitoring and communication of results.

(16.) Fishing. Highly Unsatisfactory→Highly Satisfactory
1 4 8 15 1

(42.) Status of fish populations is adequately monitored. Strongly Disagree→Strongly Agree
3 6 12 5 1
(43.) The water quality and fishery testing program for our lakes should be formalized and results published. 0 2 2 16 9

Management of fisheries, including stocking as needed, should be conducted specific to Shadow Lake.

(48.) The Village should stock the lakes for fishing when needed. Strongly Disagree→Strongly Agree
0 0 8 19 5
(50.) Fish management programs should be tailored to individual lakes. 0 0 8 18 2

II.8. Parks

Shadow Lake has no park. There are no requests for a park on Shadow Lake.

II.9. Swimming

There is no public swimming area; swimming is limited to those areas at homeowners' docks and bulkheads. Floats are okay when in use, not permanently.

	No Problem → Big Problem					
(8.) Presence of semi-permanent floats.	ON	13	7	2	2	1
	OFF	1	2	0	2	0
	Strongly Disagree → Strongly Agree					
(35.) Offshore anchoring of large inflatable floats should be allowed.		3	6	4	12	2
(36.) If so, floats should be restricted in size.		3	2	8	10	3
(37.) If allowed, distance offshore should be restricted.		2	3	6	9	4

II.10. Enforcement

Despite specific needs for enforcement noted in earlier responses in this questionnaire, respondents indicated that they were generally satisfied with enforcement.

	Strongly Disagree → Strongly Agree					
(57.) Village lakes are adequately patrolled and regulations enforced.		2	7	10	9	1
	No Problem → Big Problem					
(4.) Enforcement of current lake ordinances.	ON	7	4	9	5	0
	OFF	0	1	1	2	0

II. 11. Communication

Shadow residents feel strongly that higher levels of communication are needed to assist them in understanding the lake and practices to maintain its quality.

	Strongly Disagree → Strongly Agree					
(43.) The water quality and fishery testing program for our lakes should be formalized and results published.		0	2	2	16	9
(54.) The Village should provide residents with technical information on watershed and lake management "best practices."		1	0	1	24	3

II.12. General Satisfaction with Lake Management

Lake management is important to residents of Shadow Lake, and they are quite satisfied.

	Strongly Disagree → Strongly Agree					
(56.) Effective management of Village lakes is important to maintaining a high quality of life for Village residents.		0	0	0	9	19
(58.) Overall, I am satisfied with the current management of Village lakes.		1	5	6	13	1

(55.) The overall quality of the Village lakes is adequately maintained.

1 6 7 14 2

Most respondents consider the overall quality to the lake to be unchanged over the past 5 years.

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

ON	(1)	Getting better	(18)	About the same	(5)	Getting worse
OFF	(0)		(1)		(2)	

II.13. Other

There is concern that Shadow Lake ecosystem be managed properly and not like a “swimming pool”.

III. ACTION PLAN:

Goal 1. To maintain and enhance the esthetic values and recreational opportunities of Shadow Lake.

Objectives:

1. Standardized rule signs posted at the boat launch site.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	High
Timeline (Short/Long)	Immediate
Responsibility:	Village

2. Define plans for possible dredging.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	High
Timeline (Short/Long)	Immediate
Responsibility:	Village

3. Comply with state regulations regarding dam maintenance. Dams/spillway/retaining walls must be monitored and regularly maintained.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	High
Timeline (Short/Long)	Immediate
Responsibility:	Village

4. Implement annual drawdown for control of aquatic vegetation (thereby reducing the use of herbicides), improvement of fisheries, and opportunity to conduct maintenance on docks and bulkheads.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	Low
Timeline (Short/Long)	Short
Responsibility:	Village

5. Increase fish populations through culling nuisance fish and stocking.

Action:

Priority (High/Med/Low)	Medium
Cost (High/Med/Low)	Medium
Timeline (Short/Long)	Short
Responsibility:	Village

6. Strictly enforce all Village ordinances.

- use of silt barriers for construction activities in the watershed
- construction and maintenance of docks and bulkheads
- boat decals

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	Low
Timeline (Short/Long)	Short
Responsibility:	Village

Goal 2. To base management on a thorough and reliable data base.

Objectives:

1. Monitor sedimentation of cove areas.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	Low
Timeline (Short/Long)	Short
Responsibility:	Lake Rep

2. Conduct water quality monitoring at fixed sites on a regular schedule. The last year of data (Appendix 1 & 2) is from 2004. We should look into an annual monitoring program that you can track the data from year to year.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	Low
Timeline (Short/Long)	Short
Responsibility:	Lake Rep

3. Conduct periodic fish surveys at 5-year intervals.

Action:

Priority (High/Med/Low)	Med
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Cost (High/Med/Low)	Med
Timeline (Short/Long)	Long
Responsibility:	LWB; Village

Goal 3. To effectively communicate needs and actions (among residents, lake representatives, LWB, and the Village.

Objectives:

The village must commit to an education and monitoring campaign, especially since the village has a number of lakes that have a huge draw for residential location decisions and the charm of the community. If the lakes are not managed, people will find it less attractive to live here. The biggest priority should be educating the residents about runoff impacts.

1. Provide residents with information on Best Management Practices, to include use of chemicals (herbicides, pesticides, fertilizers) and disposition of lawn wastes.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	Low
Timeline (Short/Long)	Short
Responsibility:	Lake Rep; LWB; Village

2. To communicate annually on status of lake management plan implementation and obtain inputs of lake users on management impacts and needs.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	Low
Timeline (Short/Long)	Ongoing
Responsibility:	Lake Rep; LWB; Village

3. To use all avenues of communication available to keep lake users apprised of lake status, LWB actions, and management activities.

Action:

Priority (High/Med/Low)	High
Cost (High/Med/Low)	Low
Timeline (Short/Long)	Short
Responsibility:	Lake Rep; LWB; Village

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APPENDIX 1. Water quality data was provided by Buck Engineering, July, 2001.

Trophic State: Mesotrophic

Average Surface Conditions: (mg/l)

Total N: <0.5 NH3: <0.05 NO2+NO3: <0.05

TKN: <0.5 Total P: <0.02 PO4: <0.01
Total TDS: 50 Total TSS: <5.0
pH: 6.95 Sp. Conductivity: 75 *umhos* Chl. a: 2.08 *ug/l*
Alkalinity: (not reported)
Secchi Disk Clarity: 5.6 ft
Stratification Depth: 10 ft

APPENDIX 2. Water quality data provided by Foster Lake and Pond Management in October, 2004.

Hardness - 30 ppm;
Alkalinity - 24 ppm;
pH - 6.5 ppm;
Dissolved Oxygen -- 6.7 mg/L – 9.6 mg/L (5 foot depth and up);
Visibility - >36 inches.
