

A Message from the President

Our front yard. Whether we live in a mansion or a cottage on Glen Lake, the Crystal River or Hatlem Creek; and our yard is fenced or unfenced we all share the same front yard...the waters of Glen Lake, the Crystal River or Hatlem Creek. Our property may be fenced on three sides but our waterfront cannot be fenced or contained to keep, protect or define our front yard. If we have a green, phosphorus drenched lawn down to the lake; use dishwashing soap laced with phosphorus; or do not maintain our septic system we affect not only our own "front yard" but the front yard of all others on the lake, river, or stream. When one riparian owner is shoveling wheelbarrow loads of cladophora out of the water on their lakeshore it may not be something they are doing to harm the lake, but the lack of stewardship of a resident many houses away from their property. They cannot "fence this action" out of their yard. If there is an abnormally high E.coli reading in Hatlem Creek we all share that water around the lake and river, not only with our fellow riparians but with all who use our waters for recreation. If water levels are low because of a drought and a seven year deficit in groundwater recharge we all share in different ways the problems the drought presents. (See article by Vik Theiss) We are all tied to each other by our front yards... we share this liquid asset and liquid responsibility.

The lake, river and stream reflect the change in seasons in beautiful ways providing views, moods and colors that we all love, as well as recreation and sustenance. We are approaching a season where the waters can rest and rejuvenate. Many of us spend a great deal of time, effort and money making our yards that surround our houses on three sides and that can be defined or fenced, a place of beauty, relaxation and recreation. We need to do the same for our liquid and shared front yards. I just wrote a check for \$130 to the Glen Lake Garden Club for daffodils I am planting which will greet me in the spring for a few weeks and then be gone! This is only one of the many flowers I will buy for the garden throughout the year. I am going

inside to write a check for at least \$250 to take care of my front yard...a small sum. I hope you will join me and do the same.

Sarah Litch
President, Glen Lake Association



Glen Lake at Low Lake Levels at Brooks Road Waterfront



Low Water Levels in Lake Michigan at Old Mission Point



The Glen Lake Association, Inc. is a non-profit organization dedicated to the protection, preservation and continued improvement of the beautiful Glen Lake area.

	A Message from the President	1
	Frequently Asked Questions	2-4
	Financial Restructuring Plan	4
Fall 2007	Stewardship Awards	5
	Check Your Stewardship	6
	Our Boat Wash Staff	6
	Mergansers	6
	Karner's Korner	7
	Jack Otto and Nan Martin	7

Low Water Levels in Glen Lake
by Vik Theiss
In collaboration with the Glen Lake Association
Science Resource Panel

Lake Michigan and Huron are about two feet below their long-term average levels. Superior about 20 inches, Lake Erie is down a couple of inches; and Ontario is seven inches below average levels. Our Mill Pond has dried up and a branch of Hatlem Creek has disappeared. The wetlands around Leelanau School cannot presently be used for student studies. Our GLA representatives to the technical committee and our Water Level Committee have worked diligently in the face of such conditions to provide the optimum level of water in Glen Lake and the Crystal River. Sarah Litch

- 1. Why was the water level so low in Glen Lake this summer and fall?** Primarily because of drought.... both short and longer term. During the prime recreational season from mid June to mid September of 2007, the Glen Lake – Crystal River Watershed had only 54% of normal rainfall, a deficit of about 4.5 inches. Since January 1 of 2007, the watershed received only 65% of normal precipitation, a deficit of about 8.5 inches. Since January 1 of 2005 the watershed had only 83% of normal precipitation, a deficit of about 16.2 inches.
- 2. Since 100% of the water that leaves Glen Lake goes over the dam and down the Crystal River, can't you just raise the dam and solve the low water problems in the lake?** Oh that it was that simple! In fact, during the recreational season from approximately mid June till mid September, only about 35-40% of the water that leaves Glen Lake goes over the dam. The remaining 60-65% leaves the lake due to evaporation, which is most severe as the lake warms during the summer, and through underground seepage to Lake Michigan. Therefore, to compensate for the evaporation and underground seepage necessary to maintain the lake level, the rate of flow down the Crystal River must be reduced by a much higher percentage than it would be if all the water that left Glen Lake flowed over the dam. As an example: Assume that evaporation plus underground seepage represented a loss to the lake of 2000 gallons per minute. Assume that water over the dam represented a loss to the lake of 1000 gallons per minute - total loss to the lake of 3000 gallons per minute. Assume that to maintain a satisfactory lake level, the rate of loss to the lake required a reduction of 500 total gallons per minute outflow. In order to maintain a satisfactory lake level, the rate of flow down the river would have to be reduced by 50% ($500/1000 = 50\%$). However, if all the water that left the lake flowed down the river - 3000 gallons per minute in this case, then to maintain a satisfactory lake level which required a reduction of 500 gallons per

minute, the flow in the river would have to be reduced by only 16.67% ($500/3000 = 16.67\%$).

- 3. Could the dam have been raised high enough this year to have maintained a minimum satisfactory water level in Glen Lake?** In order for the dam to hold back the amount of water from the river that would have been needed in Glen Lake during the 2007 recreational season to maintain a minimum desirable Glen Lake level of at least 596.60 feet, the flow in the Crystal River would have had to be reduced by at least 40% from its actual flow during the period (from roughly 30 cubic feet per second to 18 cubic feet per second). As one might expect, this would have a very negative impact on the biology of the Crystal River. Much of the river bed would have been left uncovered (20-30% in many places), and water temperatures would have risen significantly. The net result would be that the fish populations in the river would be greatly reduced in numbers as available living space would be in short supply. Larger fish (>1 ft in length) would be at greatest risk as the number and size of pools at least 1-2 ft deep shrink. The shallow water leads to more grounding of recreational boaters and an increase likelihood that people will walk in the river or along the shoreline, dragging boats. This contact can increase erosion, damage small gravel bars, destroy key vegetation patches, all of which can reduce the number of invertebrates in the river. The invertebrates are the main food supply for fish in the river as well as for other animals such as birds which come to the river to feed.
- 4. Doesn't the control of the dam protect Glen Lake from drought problems which the Great Lakes and many other inland lakes are having?** To be good stewards of our watershed, the dam must be used in a way that maintains the biological health of the entire system, above and below the dam, in both the short and long term - as well as equitably share the water for recreation and aesthetics. Many lakes in this region are suffering more than ours, for example Long Lake is down 1-2 feet, and Lake Michigan is projected to reach its all time low in a few months. At the present time, the dam is being used to optimize the probability of raising Glen Lake to a satisfactory level by next spring without significantly affecting the biological health of the river. As the air and water temperature drop this fall, evaporation on the lake will decline and the water levels will rise. If we have reasonable rain and snowfall going forward we can expect a satisfactory lake level this coming spring, and we will have spared the Crystal River the longer term biological damage which would have occurred by reducing its flow sufficiently to maintain the desired lake level this summer and fall.
- 5. Does a low water level in Glen Lake have a significant negative impact on the biology of the lake?**

Lower lake levels may not significantly affect the biota (more studies are needed) in that there will be less beach erosion and runoff. Less organic debris and nutrients (phosphorus) entering the lake will slow down eutrophication. However in some shallow shoals, low water levels will produce stagnant pools which can experience accumulated pollutants/pathogens that come from "loafing" water fowl which in turn, accumulate animal waste that add organic nutrients causing localized algal blooms. Strong onshore winds that bring in fresh lake water over these temporary pools will dilute the stagnant pools to counter these undesirable effects. When the rainfall/snowpack replenishes the lake and lake levels return to normal, these short term issues will subside or disappear.

6. Is it the Court Order which is causing the low water levels in Glen Lake? Not really, it is mainly the drought. In fact, the water sharing plan which has been approved by the Court would have resulted in a satisfactory lake level this summer-fall if the watershed had received anywhere near normal precipitation over the period as it did the previous summer season. The same plan was in effect this year as last year when the water levels were satisfactory. It is designed to protect the biology of the watershed, while providing satisfactory usage and enjoyment of the lakes and river.

7. Can the Court Order be changed to eliminate the low water levels in Glen Lake? The Court Order which is currently in place has been modified each year since its inception to fine tune the water sharing plan for our watershed. Each modification is thoroughly researched and tested, to achieve, and confirm with experience, the desired results. Every change has resulted in lower flows for the Crystal River. Our recommendation is also in process to modify the current Court Order for next year, again with lower flows for the Crystal River. The cumulative effect of all the changes to the Court Order since its inception has been a substantial reduction of flow to the Crystal River to provide adequate water to keep water levels satisfactory in both the river and the lake throughout the entire recreational season, except under the most severe drought conditions when the biological health of the system is at risk.

8. Is this low water problem going to go away next year? We certainly hope so. However that will depend on whether we have adequate rain and snow between now and then. We recommend that riparians place their boat hoists in line with potential low water and monitor lake levels throughout the summer, moving their hoists as necessary to insure that boats can be removed at the end of the season.

9. Can't we hold back more water in Glen Lake in the spring to eliminate the low water levels later in the season? We have changed the water sharing plan substantially over the last few years to do just that. Next years recommendation is to raise the lake to its

50 year historical level at "ice out" of about 596.85 inches. Experience has proved that without the higher spring lake levels, the likelihood of satisfactory levels later in the season, is significantly reduced.

10. Wouldn't the high lake levels like we had this spring substantially increase the likelihood of ice damage and or wind damage on my beach? The lake level this spring at "ice out" was 596.86 inches... right on the historical 50 year average. In the past, depending on wind conditions and ice conditions, there was some ice and wind related damage at the historic "ice out" level on some beaches sometimes. There does not seem to be a consistent pattern to this phenomenon. In fact some Lake Associations (like Crystal Lake) believe low water levels cause more ice damage than higher water levels. We believe the likelihood of satisfactory water levels during the summer and fall warrants the risk of higher water levels in the spring. Had we not run the risk of higher levels this past spring, think of how low the water levels would have been later in the season.

11. What can I do to protect my beach against erosion and other collateral damage from high spring water levels on the Lake? The beach can be contoured to present a low profile to the waves, and armored naturally with deep rooted plants. Moving shore stations and dock sections to high ground will protect them from ice damage. Stabilizing a shoreline from wind and ice damage is somewhat of a science. The Glen Lake Association has considerable experience with this and will be glad to help you design a good plan and recommend reliable contractors to do the job. Contact Rob Karner – cell phone 883-2776.

12. Water is pooling in front of my house due to low water levels, and green slime is growing in the pools. What can I do to eliminate the slime from growing if the water levels remain so low? If the green slime is in the form of filaments of algae, you could scoop up the algae with a rake or similar hand tool and place it in a wheel borrow and transport it to land. You could try and "sweep" it away by causing water to circulate in the pool, thereby diluting or mixing the stagnant water with new water. This should dilute the pool's accumulated nutrient levels and reduce or eliminate the green slime. You could also ignore it and when the rains come in the fall/spring, the lake levels will hopefully rise and the wind/wave action will "cleanse" your shoal. To inhibit the growth of algae it is extremely important to keep phosphorus out of the lake by not using fertilizer or using fertilizer with no phosphorus and dish washing soap with no phosphorus content.

13. Water levels were so low this summer and fall that we had trouble getting our boat off the hoist. What can we do to make sure our boat will float

off the hoist? There is no convenient remedy for this problem. The only sure solution is to move your boat to deeper water, or use a boat that floats at lower water levels. Marinas have floatation devices to assist in this regard, but this is obviously not a good solution for ongoing usage. Hopefully water levels will be satisfactory going forward, but the only sure ways we know of to solve the problem is deeper water or better floating boats. We recommend that boat owners monitor lake levels throughout the summer and move their hoists if warranted to insure they can remove boats from their hoists at the end of the season.

14. Little Glen Lake has a foam problem (like soap suds) which seems to be getting worse with the lower lake levels. Is the low water level causing the problem? It is not certain at this time that lake levels affect the foam that forms on the lake. Most of the foam is caused by the accumulation of organic molecules (surfactants) that come from dead plankton - specifically the abundance of *Microcystis* sp, a blue-green algae/bacteria. This organism is a dominant species in the plankton and will “bloom” in the fall as the water mixes with nutrients. This availability of nutrients causes the *Microcystis* to bloom and then die. As the *Microcystis* decomposes, the surfactants will accumulate at the surface and when the wind blows, these molecules find each other and produce foam. Perhaps the lower lake levels may have increased available nutrient which in turn cause bigger blooms, which in turn, cause more foam when they die.

15. Are low lake levels causing the stress with my trees? More than anything, a lack of periodic rain (drought) will cause stress on trees. A lower lake level usually means lower water tables. If tree roots that have been in soils that were once high moisture soils experience drier soils on a consistent basis over a short period of time, this will cause the tree to be “stressed”. Dramatic changes in soil moisture make it hard for a tree accustomed to moist soils to adapt to drier conditions.

Board Adopts Financial Restructuring Plan



The Glen Lake Association Board of Directors adopted a financial restructuring plan at its September meeting whereby the Preservation Fund as it currently exists will be eliminated and its assets distributed

to the General Fund and the Endowment Fund. Certain aspects of the plan affecting the Preservation Fund will require by-law changes to be approved by the general membership at its next annual meeting.

The Endowment Fund has a goal of accumulating assets of at least \$1 million in order to preserve and protect the Glen Lake / Crystal River watershed for future generations. These assets will come from the distribution of approximately \$200,000 in cash and pledges receivable from the Preservation Fund and \$800,000 from new pledges and contributions. The campaign to raise these funds will include a planned giving program to be formally announced next year by the Development Committee.

Endowment Fund support for the Association’s programs will be limited to 75% of the investment income earned on its assets. Previously both Preservation Fund investment income and the principal portion of donor contributions were used to finance Association programs. This enabled the Association to construct a new dam in 2002, provide legal defense in the Crystal River litigation during the period from 2001 to 2004 and in recent years to allow the Association to expand the scope and sophistication of its water quality programs throughout the watershed.

With the dam construction and litigation defense no longer demanding resources, the Association’s goal is to finance all other programs without relying on the Endowment Fund for annual subsidies other than sharing in its investment income. Achieving this goal will require careful management of expenditures and finding ways to increase revenues.

The current minimum annual dues of \$50 cover only 20-25% of annual program costs. Additional voluntary contributions from contributing and sustaining members cover another 20-25%. The Association will consider a nominal increase in minimum dues for 2008 consistent with keeping membership levels as high as possible. It will also continue to encourage those who are able to make additional annual contributions. If all members contributed at the sustaining level of \$250 per year, the Association could finance all of its programs without relying on any other source of income.

The Association will also seek to increase its other sources of revenue including township support, business contributions and grants from governmental organizations, foundations and individuals to help fund specific program costs. Further, because it will take several years before the Endowment Fund can produce sufficient levels of investment income to finance significant portions of annual program costs, the Preservation Fund will distribute its remaining assets to the General Fund in order to bridge the gap between General Fund annual revenues and ongoing program expenditures. The General Fund will have approximately \$200,000 in cash at the end of 2007 for use in this transition.

**The Glen Lake Association
PROUDLY ANNOUNCES
The First Annual
LAKE-FRIENDLY STEWARDSHIP AWARDS**



The Glen Lake area is growing. It is one of the most desirable places for Michiganders to retire and build their dream house. Big Glen, Little Glen, Big Fisher, Little Fisher, and the Crystal River are

feeling the pressure. Our concern is for how these house/landscaping designs fit in with the existing natural environment and if “lake-friendly” development and maintenance practices may or may not exist.

The Glen Lake Association wishes to publicly recognize homeowners, contractors and local units of government who have chosen to develop or redevelop their lakeshore or riverfront properties in full compliance with zoning ordinances and ecologically sustainable and sensitive principles. The hope is that through these awards, ecologically sensitive development along lakeshore and river bank will become the fashionable trend. The future health of Glen Lake-Crystal River Watershed depends on it.

The annual award for a LAKE-FRIENDLY PROTECTION STRATEGY is for a local unit of government that has created an ordinance, or regulatory code, or other initiative that officially seeks to preserve the environmental integrity of our lake and river systems. The Awards will be presented at the annual Glen Lake Association Meeting and receive recognition in the local print media.

The annual awards for LAKE-FRIENDLY HOME CONSTRUCTION are for homeowners or contractors whom have undertaken new home construction or major reconstruction or maintained an older cottage or home while preserving the environmental integrity of the natural lakeshore or river/stream setting. Awards will be presented at the annual Glen Lake Association Meeting and receive recognition in the local print media.

The annual awards for LAKESCAPING are for homeowners or contractors whom have used native vegetation and mostly natural materials to landscape their riparian property in a manner that not only complies with local zoning regulations, but goes even further to protect the shoreline’s environmental integrity in a way that can protect the shoreline environmental integrity

with techniques known to improve water quality. The 2008 Awards will be presented at the annual Glen Lake Association Meeting and receive recognition in the local print media.

Eligibility: projects on any riparian property (i.e. a lake, river or stream) in Empire, Kasson, and Glen Arbor townships in the Glen Lake-Crystal River Watershed. Applications will be accepted throughout the year from any homeowner, contractor, lake Association member, local government unit, developer, or other interested party. Neighbors, nonprofits and local units of government may know of some projects that merit recognition, and may nominate them for the award.

To request an application contact Rob Karner, c/o Glen Lake Association, 1 Old Homestead, Glen Arbor, MI 49636. Application materials may also be submitted electronically to rkarner@leelanau.org. Questions may be directed to Rob at 231/334-5831. Nominations should be received by June 25 of each year for recognition at the annual meeting and in the Fall newsletter, *Alligator and Inspiration*. Judges will be a panel representing the Glen Lake Association Board. Application can be downloaded from the GLA website. glenlakeassociation.com

Judging Criteria:

- Compliance with zoning standards for setbacks, vegetation maintenance, percent impervious surface, density, etc.
- Use of and degree of native vegetation and natural materials in plantings/landscaping, especially shoreline area (75% or more of property between home and the shoreline), but may include upland vegetation if applicable.
- Maintenance of aquatic vegetation
- Minimal impact solutions to problems encountered
- Other environmental factors such as, energy-efficient designs, minimization of light pollution, use of pervious pavement and earth-friendly materials like recycled materials or certified lumber.
- Glen Lake-Crystal River Homeowner’s Checklist used in construction, care, maintenance of property.
- Septic system inspected and/or pumped a minimum of every two years.
- Phosphate fertilizer, pesticides, and herbicides not used within 100 feet of the shoreline.

Check Your Stewardship



A riparian recently reported to the Glen Lake Association that a lawn care company who has been working in this area for some time has been telling customers that they are endorsed by the Glen Lake Association. We have not given any lawn care company an endorsement.

Consult your Glen Lake-Crystal River Stewardship Checklist, Page 5 & 6, Items 15 – 19. We do recommend that you do a soil test before considering fertilizing lawn or gardens; use a phosphorus-free-fertilizer (7-0-0) slow nitrogen release fertilizer; don't over fertilize; use no fertilizer within 100 feet of the lake, river, and/or stream; sweep or hose loose fertilizer back into the lawn and/or grass; and limit watering where you have fertilized to 0.2" after application and in subsequent waterings.

It is extremely important with the introduction of zebra mussels into our ecosystems that we keep phosphorus out of our lake, river, and streams to inhibit the growth of chlorodophora, spirogyra (an algae that looks like chlorodophora), and blue-green algae. These algae get more than enough fertilizer from zebra mussels and naturally occurring phosphorus runoff.

Mergansers

A few flocks of Mergansers have stopped at the Glen Lakes in their spring and fall migrations. The ones who have stayed have been captured, inoculated and released. If you spot migrating Mergansers this fall use a noisemaker (pan and spoon, drum, big bell, recordings with raptor sounds, loud music) to scare them away!!!

Help..Do you need to put your old computer, printer to use since you've gotten a new one?

The Glen Lake Association Office is in need of a computer for the office. It must be capable of running Windows XP or Vista operating system and Windows Office Professional (including access.) and have a 100 to 200 GB Hard Drive.

End of Summer Reflections from Our Boat Wash Staff

Sallyanne Morris I thoroughly enjoyed working for the GLA this summer on the Invasive Species Abatement Program. Our office is on a most beautiful site! For the most part everyone was very interested in the program and how it is doing. In general, most thought we were only looking for zebra mussels. Once we started talking, they were even more impressed with the program. I think entering your data on the computer was a great improvement, and hopefully helps you track results a little easier. I have had a least a dozen people ask about joining the GLA so I appreciate someone bringing the envelopes down to hand out. I enjoyed working for you and hope you'll have me back.

Hazel Flaska I loved working for GLA this summer. I am proud to be a part of this program. I loved my co-workers and working with the boaters. I find that peoples' responses have been supportive or surprised, but always interested. Personally I've never had a boater refuse, although occasionally they didn't seem too excited about it. The skeptics were usually fine when they realized how little time it takes and that it is a free service.



*Sallyanne Morris (head), Paul Hall, and Hazel Flaska
Our dedicated and competent boat surveying and boat
washing staff in the summer of 2007*

**Watershed Property Owners 2,004
Property Owners on Glen Lake 664
Glen Lake Association Members 511
as of September 27, 2007**



Karner's Korner
Rob Karner
Glen Lake-Crystal River
Watershed Biologist

To test or not to test for water quality in the Glen Lake-Crystal River Watershed certainly it is a fair question – the answer of which will be considered in this issue of the newsletter.

Perhaps the question begs other questions. What would be the result of not testing? If we do not test, then we can only make subjective conclusions about the health of Glen Lake. We could take our hands and gather the water into a cup and taste it and say it sure tastes fine to me. Or take a cup of water and smell it and say it does not smell at all or even smells good and conclude there is nothing wrong with the water. We could go to Inspiration Point on a Sunday drive and say I don't see any problems with the water. We could place our ears close to the water or listen to our neighbors talk about water quality and say I don't hear any bad things about water quality. In short, we could use all of our five senses and be led or misled into making conclusions that the water quality of Glen is good and there is no need for any further study or action.

But what if we...

- were to test the watershed with instruments that tell us a story that goes beyond our human senses?
- get hard facts and use them as benchmarks?
- combine our facts over a period of time and begin to see trends as we apply mathematical models to our data?
- were to test the ph, nitrogen, phosphorus, water clarity, conductivity, dissolved oxygen, chlorophyll a, E.coli, plankton, and aquatic plant shifts from the norms?

How would we...

- ever know how much shift occurred – good or bad, if we did not test?
- ever know if programs like septic inspections, and increasing the size and amounts of greenbelting improve water quality?

It seems to me that it would be a great step backwards to bury our heads in the sand and say there is no need to test because I do not really want to know (or care) what the numbers say about water quality. For me, I would rather base my conclusions on water quality that are based on objectivity. All we need to do is look in other parts of our life and be thankful that we can use DNA evidence to

convict the true killer. I am thankful that police use radar and can tell exactly how fast we drive over the speed limit so our highways are safer. I am glad that my doctor can measure my blood pressure in units of numbers that tell him if I am going to live or die. I am glad the Glen Lake



Andy Dupont and Bruce Lichter testing for phosphorus in the lake

Association is supportive of testing and monitoring the water quality so I can make clear and accurate statements about the health of the watershed. I am glad I can tell you what the numbers for each aspect of water quality were four years ago so when I need to sound the alarm, people will listen and know I am on target.



Jack Otto and Nan Martin are given honorary membership in the Glen Lake Association. A plaque with their name on it is placed on Memorial Rock at the Crystal River Dam after the August 2007 GLA Annual Meeting.

Glen Lake Web Sites

Dale Van Houzen has put together two web sites featuring Glen Lake area landmarks. The first site is <http://www.nwmichigan.com/glenlakebridge> which highlights the past and future development of the Glen Lake Bridge. The <http://www.nwmichigan.com/dfgc> site shows the history of the Day Forest Golf Club. Any information you can add is appreciated, e-mail Dale at dalevanh@comcast.net.



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Glen Lake Association Fall 2007

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