

Sabbathday Lake News

June 2007

Calendar of Events

Annual Meeting

Wednesday July 11, 2007

At the Grange
Potluck Dinner
6:30 to 7 p.m.

BYO utensils and pot luck.
Provided: beverages & dessert

After Dinner
Business Meeting
Election of Officers

August Meeting

Saturday, August 18, 2007

Coffee and Donuts

At the Grange 9 am - 11 am
Speakers

Susan M. Gallo Wildlife
Biologist

"The State of Maine's
Loons"

and
Rex Turner

Director of Education
Maine Lakes Conservancy
Institute

for more on the speakers, see page 7

In My View Mike Cloutier, President Sabbathday Lake Association

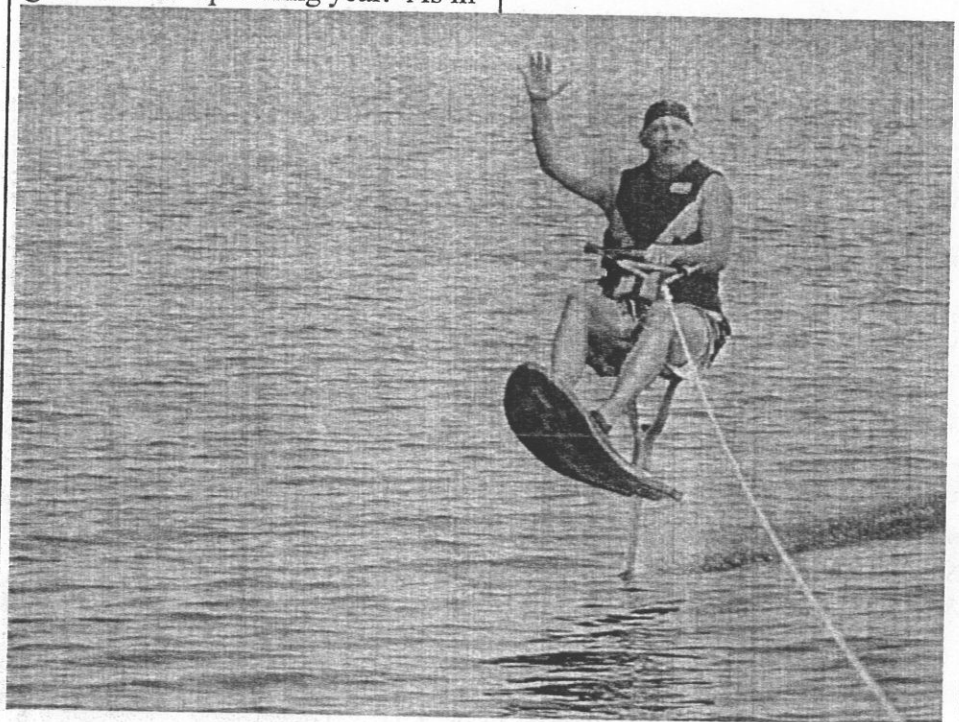
Hello to the members of the Sabbathday Lake Association. After a slow start to the winter months it seems that spring is taking its time showing up as well. This past winter provided some nice days for being out on the ice with skis as well as snowshoes. Hopefully the ice will leave soon and we can all start to enjoy the open water.

The Board of Directors has been meeting since January setting our goals for the upcoming year. As in

past years the main objective is not just to maintain but to improve the water quality of Sabbathday Lake. With the help of volunteers, the Town of New Gloucester and you, we can all do our part to protect this irreplaceable natural resource that we have all come to love and enjoy. After all, it is our responsibility to make sure that future generations will get to enjoy it as much as we have.

The Board has also approved the plan for submitting for another Watershed Survey of Sabbathday Lake. We were turned down by the state last year; however, we feel we have a better chance this year of approval. The last survey was

(cont. on p. 2 **In My View**)



As usual, Carl says "hi."

Photo by Jennifer Elizabeth

In My View (cont. from p. 1)

done 10 years ago and many of the problem areas were worked on. However, much has changed in the area over the past 10 years and another survey will help us focus on new areas that need to be addressed. Many sites that have been corrected in the past need will also need to be revisited. If we are approved we will be looking for volunteers to help with the one day survey.

The milfoil summit that was held at the University of Southern Maine Lewiston/Auburn campus was a wonderful opportunity to see what measures are being taken through the state to prevent the spread of Invasive Aquatic Plants. It was noted that 2 additional infestations were identified in Maine in 2006. And with more and more boats coming here to avoid this menace in their own states it is even more imperative for us to be ever vigilant in what gets put into Sabbathday Lake. Our milfoil committee chair, Lillian Nayder, is coordinating the milfoil inspections again this year at Outlet Beach. We all should call Lillian (926-5233) and volunteer to monitor that site. Remember, once invasive plants are in the lake, there is NO proven method that will eradicate them. We must work together to prevent this from happening. As for the milfoil stickers, here is how the money breaks down, 19% goes to Monitoring, 24% goes to Education, 30% goes to Inspections and 27% goes to Plant control.

The Sabbathday Lake 2006 Water Quality Report was completed last fall by F.B. Environmental Associates. I will give a brief synopsis of that report.

In 2006, water quality for Sabbathday Lake was similar to the long term average for the lake, although the water was slightly less clear than it has been in recent years. Despite this slight decline in water clarity, the 2006 Secchi Disk Test average was still near the long term average for the lake. Some of the lowest readings recorded in 2006 may have been due to weather conditions such as high winds or heavy rains combined with somewhat increased algal growth. The concentration of total phosphorus in the water was the same as in 2005, and was the same concentration as the historical average for the lake. Due to the combination of a slight decline in water clarity and an increase in chlorophyll-levels, it is important to

continue to closely monitor the water quality in the lake. Dissolved oxygen loss in the "deep hole" of the lake was similar to previous years. One possible result of oxygen depletion is the potential release of biologically available phosphorus from bottom sediments. For this reason, it is important to minimize any additional sediment inputs to Sabbathday Lake. The full report will be available at our summer meetings.

As this study clearly indicates, we need to continue to locate and correct sources of nutrient runoff into the lake.

How Landowners can help Improve Water Quality,

- Plant a 250 ft. wide buffer on the shorefront
- Vegetate and mulch bare soil
- Terrace and vegetate steep slopes
- Create meandering foot paths to slow flow of runoff
- Reshape & resurface eroding driveways
- Line eroding ditches with rock
- Help form a road association
- Use phosphorus free fertilizer
- Pump your septic every 2-3 years
- Join the Sabbathday Lake Association
- Educate neighbors about lake science

I am including some very helpful web sites that provide a wealth of information regarding the above suggestions.

- ◆ Be LakeSmart with YardScaping and learn about lawns and landscapes that need less pesticides, fertilizer and water at www.yardscaping.org.
- ◆ Vegetated Buffer Strips, what they are and why do I need them, at www.umext.maine.edu/onlinepubs/htmlpubs/2500.htm

(In My View cont. on p. 8)

Aquatic Invasive Plant Prevention Update by Lillian Nayder

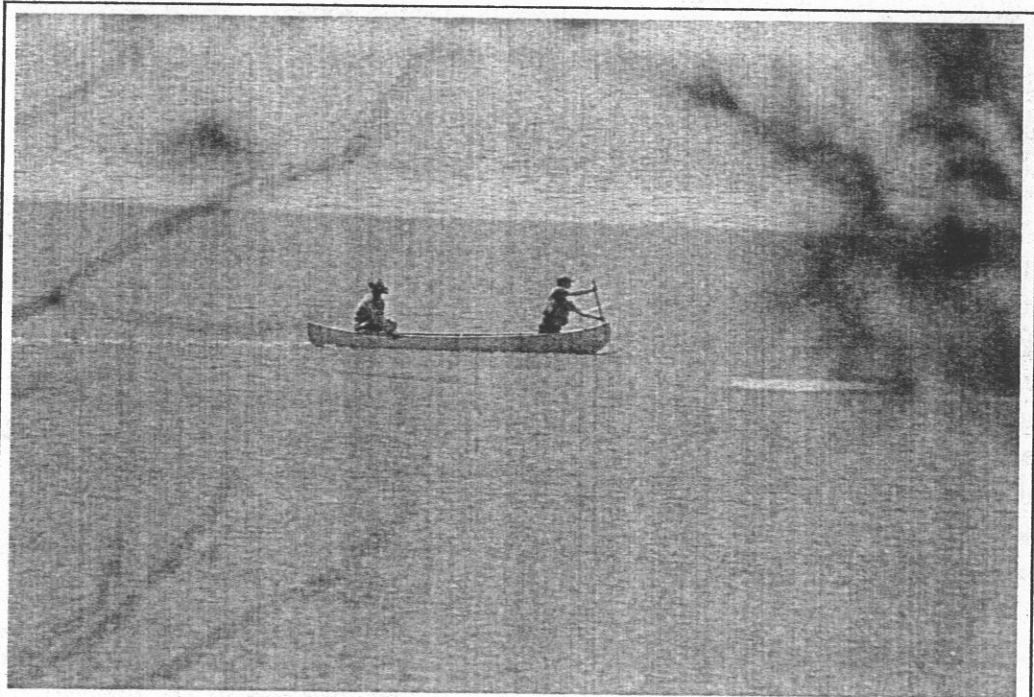
The Sabbathday Lake Association has once again received a grant from the Lakes Environmental Association to participate in Maine's courtesy boat inspection program, established in 2001. A total of 52 lake associations, conservation alliances and municipalities received funding for 2007. The grant will help fund courtesy boat inspections at the Outlet Beach ramp in our ongoing attempt to educate boaters about the dangers of invasive aquatic plants, show them how to inspect their boating and fishing equipment for plant material, and prevent its introduction into Sabbathday Lake.

In the state of Maine in 2006, more than 40,000 courtesy boat inspections were performed (in more than 22,000 boat inspection hours) at 95 launch sites on 74 lakes. Fourteen of those lakes are infested with variable-leaf milfoil, including Sebago and Little Sebago. Last year, a total of 1,114 plants were found on boats in Maine during courtesy inspections and 426 of those were invasive species. Of the 426 plants, 17 were found on boats entering lakes and 409 on boats exiting. For those interested, here are some specifics from the 2006 Courtesy Boat Inspection Summary Report:

"1) Eurasian Milfoil (*Myriophyllum spicatum*) was found on a boat from Massachusetts entering Mousam Lake; 2) Eurasian Milfoil (*Myriophyllum spicatum*) was found on a boat

entering Great East Lake; 3) Variable-leaf Milfoil (*Myriophyllum heterophyllum*) was found on a boat entering East Pond; 4) Variable-leaf Milfoil (*Myriophyllum heterophyllum*) was found on two different boats entering Sebago Lake's Raymond Beach launch; and 5) Variable-leaf milfoil was found on a boat exiting Woodbury Pond (a.k.a. Tacoma Lakes) in Litchfield though there is no known infestation in any of the five Tacoma Lakes."

At the Outlet Beach ramp in 2006, 155 boat inspections were performed, with thanks going to Becky Delaney, Aaron Ricardi, and Fran and Cathy Cruz. No plants were found on any boats, whether entering or exiting from the lake. However, continued vigilance is necessary, particularly since a number of lakes in our vicinity are infested. If you are interested in volunteering to help with boat inspections or in constructing a sandwich-style sign for use when there is no inspector on duty, please call Lillian Nayder at 926-5233.



Ice breaking on Sabbathday Lake

Photo by Norm Chamberlain

TROUBLE DOWN BELOW

by Chris Ricardi

One of the primary reasons why I decided to buy property on Sabbathday Lake is that I had heard that this lake had very good water quality. The water was clear and clean, and the lake supported healthy fish populations. I could enjoy swimming, snorkeling, and fishing in my own backyard. But I was somewhat shocked when I first heard that Sabbathday Lake has a problem during the summer months with loss of oxygen in the deeper areas of the lake. How could this possibly be happening on Sabbathday Lake?

Like most deep lakes in Maine, Sabbathday Lake becomes stratified during the summer with a layer of warm water called the epilimnion on the surface and colder water in deeper sections called the hypolimnion. The cold water is more dense than the warm water and it sinks to the bottom. The division between these two layers where the water density abruptly changes is called the metalimnion. This metalimnion acts almost like a barrier separating the two layers and it is characterized by a relatively short space called the thermocline where water temperature drops rapidly. On the surface of the lake oxygen dissolves freely from the air and the surface is rich in oxygen. But during the summer there is very little mixing between the epilimnion and the hypolimnion

because of the density barrier. The cold water sections of the lake go through a period from July through September where little new oxygen is added to the water. Each spring and fall the lake "turns over" as water temperatures become uniform throughout the lake, and the two layers mix together. After the turn over, oxygen rich water is again found throughout the lake.

The Sabbathday Lake Association, in cooperation with the Town of New Gloucester, measures dissolved oxygen concentrations during the summer months. In the past decade we have observed a very troubling loss of oxygen in the deep sections of the Lake. See the dissolved oxygen profile of Sabbathday Lake from the testing done in 2006. This phenomenon is called *hypolimnion oxygen depletion*, and to some degree it happens on all lakes in the Northeast. But the severity of the oxygen loss increases as a lake's water quality decreases. That is why we measure the dissolved oxygen in the

lake in the summer; it is a good indicator of the

overall water quality of the lake. Understanding how this hypolimnion oxygen depletion occurs is the key to understanding why it is

very important to protect the watershed of our lake.

A lake is like a living organism in a way. Like all animals that breathe air and use oxygen to live, lakes also breathe. This process is called respiration. Lake respiration occurs when living organisms in the lake use oxygen. This includes fish and other aquatic organisms, and microscopic life such as plankton and bacteria. During the summer there is an annual bloom of plankton and algae in the warm upper layer of the lake. This bloom is microscopic and it is only visible to the human eye as a haze in the water that decreases water clarity.

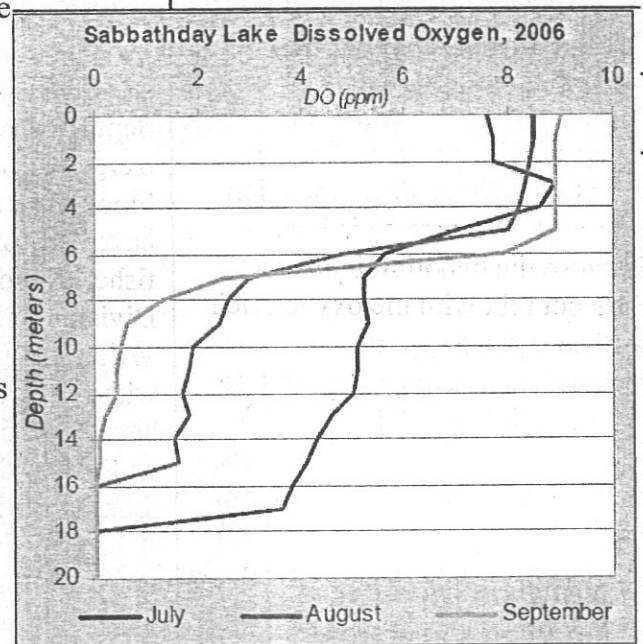


Figure 5. (extracted from FB Environmental Associates 2006 Water Quality Report) In September of 2006, DO levels dropped from 9 ppm at the surface to less than 1 below 8 meters. This means that the lower third of the lake had very little oxygen available for plants and animals. One possible result of oxygen depletion is the potential release of biologically-available phosphorus from bottom sediments.

In our water testing program we also test for chlorophyll to try to get an idea of the magnitude of the bloom. To a certain extent this bloom is a good thing because it forms the basis of a food chain starting with plankton which are fed on by small invertebrates, which are fed on by smelt, which are fed on by trout and bass, which are fed on by loons and so on. However, a serious problem can occur with dissolved oxygen if this process becomes overly enriched with nutrients. The major culprit is phosphorus. This nutrient is a limiting factor for algae growth. Phosphorus enters our lake primarily from soil erosion, septic waste, or through careless use of fertilizer on land surrounding the lake. It can enter the lake from direct run off from lake shore property or via the Lake's tributaries. Once in the Lake, it can stimulate growth of algae. During an algae bloom the cells quickly age and an algal die off begins. The dead cells sink to the bottom and are decomposed by bacteria, which use a considerable amount of oxygen in the process. If algae growth increases, decomposition increases, and oxygen is lost. Because the hypolimnion layer does not mix with the oxygen rich surface layer, oxygen is not replenished and the concentration begins to fall. As the oxygen disappears in the deepest sections, the basic water chemistry changes. Elements that are normally bound to sediment can become soluble. These include elements like iron, manganese, and phosphorus. Newly released phosphorus can diffuse up into the epilimnion and stimulate more algae growth and

create a cycle that further increases the oxygen loss.

When oxygen is lost in the hypolimnion, species that live in the lower sections of the lake are stressed and they often move up into the epilimnion to survive. This can include bottom dwelling organisms, insects, and fish. Fish need oxygen concentrations of approximately 5 mg/L and they cannot survive for long in water with oxygen less than 3 mg/L. By August and September 2006 only the top 20 to 25 feet had oxygen levels above 3 mg/L. There was literally no oxygen below 45 feet. The Lake has a maximum depth of about 70 feet, so the bottom 25 feet was anoxic. When this happens, cold water fish like trout and smelt are in danger. They cannot simply swim into the warm surface water where there is more oxygen. Some trout species are more sensitive than others. On Sabbathday Lake the brown trout and smelt have continued to thrive, indicating that they can survive in the metalimnion during the period from July through September when the greatest oxygen loss occurs. However, brook trout are more sensitive. I have had conversations with fisheries biologists in the Maine Division of Inland Fisheries and Wildlife (IFW) about problems with brook trout survival. They have done fin clip and creel surveys on Sabbathday Lake and have found no evidence that brook trout stocked in the fall or spring are surviving through the summer. They continue to stock brook trout in the spring and fall to supplement the sport fishing, but their data indicate that there is little if any year round survival. This may be

happening for a variety of reasons such as predation, angler fishing pressure, or stress from competition with other fish. But the most likely explanation for this would be mortality during the summer period when oxygen declines. The IFW has seen this impediment to brook trout survival in many other lakes in Maine that go through hypolimnion oxygen depletion. Because of this problem they have switched to stocking brown trout and rainbow trout because they can tolerate higher water temperatures and lower oxygen levels.

Over the past 20 years the Sabbathday Lake Association and its partners have taken steps to prevent soil erosion that carries phosphorus into the watershed and educate home owners about what they can do to help prevent phosphorus from entering the lake. We continue to ask everyone who lives on the Lake to help by maintaining vegetative buffers or designing landscapes along the shoreline that can slow and filter rain water runoff, to repair areas where erosion may be occurring on their properties, and to limit or stop using phosphorous containing fertilizers near the shoreline or in areas where run off can occur. There are alternative fertilizers that contain no phosphorus for use in lake watersheds. If we all try to do our part as lake shore owners our lake water will remain clear and clean, and the lake will breathe more easily in the future.



Does Earlier Average Ice-Out Reflect Global Warming?

By Rick Fortier

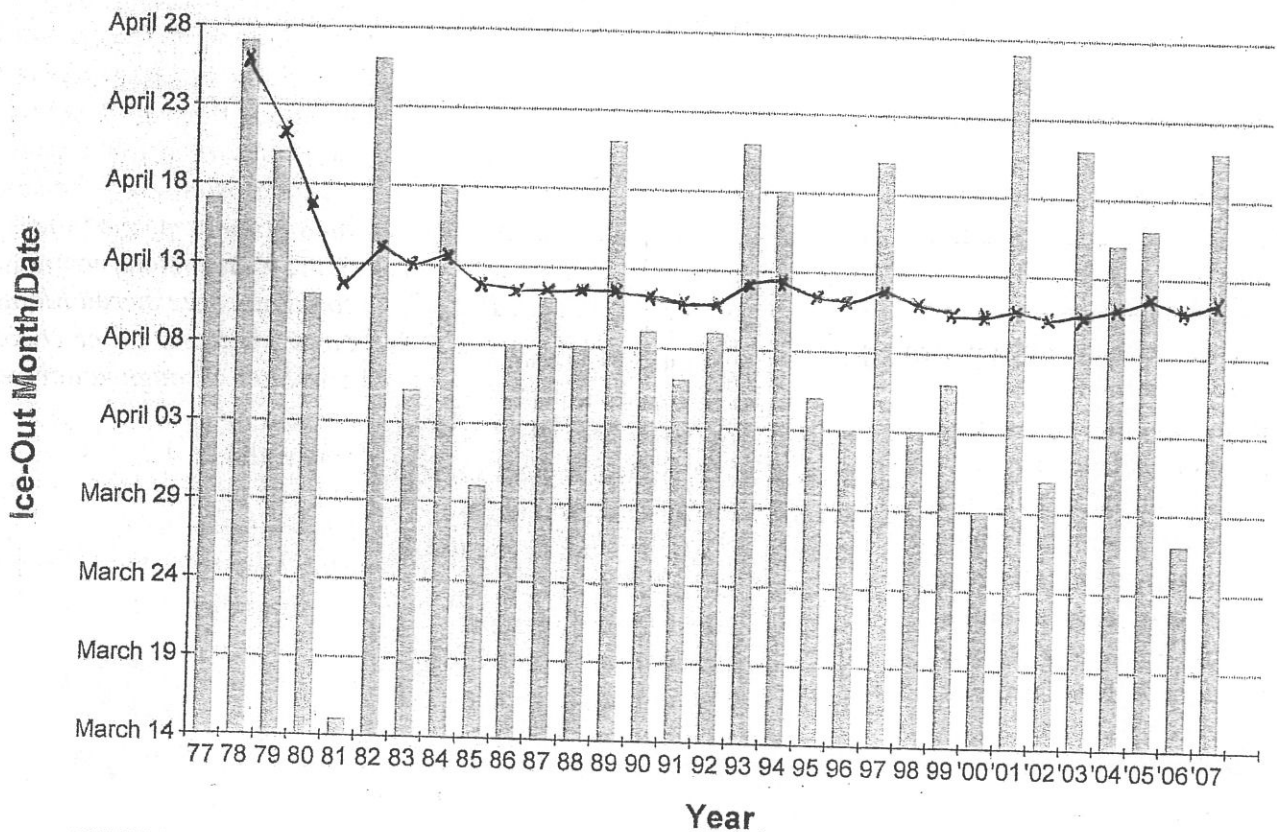
Most of the surface of Sabbathday Lake was still liquid on the morning of January 18, 2007. Was the lake doing its part to convince us of the progression of global warming? During 30 winters on the lake I could recall only two New Year's Days not being awakened at dawn by the power augurs of ice fishermen. Our lake nearly always ices over between Christmas and New Year; though I recall ice skating on a glassy surface that reflected the pink and orange winter sunset on Christmas Eve in 2002.

I must rely on my imperfect memory about ice-over; but for the last 30 years I have kept records of ice-out day which, as a sign of spring, is much more anticipated and enjoyed than ice-over. There is some subjectivity in the designation of ice-out day,

but data based on consistently applied criteria of measurement are better than no data. Ice-out criteria are as follows: the day on which the ice breaks up allowing free canoe passage on 90% of the lake surface, and ice can no longer be seen looking south from the north shore. The ice is more likely to "break up" if it is a warm, sunny, windy day; but some years it just dissolves in the gray still fog and drizzle. In average years the ice lasts two weeks after

It turns dark. Once the ice breaks up it is usually gone within 24 to 48 hours. Would ice-out records confirm a possible trend toward earlier thaws? The data is presented in a table and also with a bar graph of ice-out days. The running average ice-out is plotted with a superimposed line graph.

Sabbathday Lake Ice-Out Day
1977 to 2007



(Ice-Out continued) As can be seen from the records and graphs, the ice usually goes out in early to mid April. The range of dates is wide, from March 15 (believe it or not) to April 27. The median or middle date of this range is April 6. In the last 30 years the ice has never lasted into May. Discarding the running mean of the first five years (which is skewed by so few data points), the ice on Sabbathday Lake is gone on average between April 11 and April 14.

Has average ice-out been earlier and earlier, which we might expect with global warming? To my eye the line graph since 1985 is pretty flat, implying little if any change. Yet in absolute terms, average ice-out in 1982 was April 14. Average ice-out in 2007 is April 11. Is the ice melting earlier, and is Sabbathday Lake reflecting the global warming trend? You decide.

Ice Out Dates

1977 ----- 4/17	1988 -----4/08	1999 - 4/06
1978 ----- 4/27	1989 ----- 4/21	2000 ----- 3/29
1979 ----- 4/20	1990 ----- 4/09	2001 ----- 4/27
1980 ----- 4/11	1991 ----- 4/06	2002 ----- 3/31
1981 ----- 3/15	1992 ----- 4/09	2003 ----- 4/21
1982 ----- 4/26	1993 ----- 4/21	2004 ----- 4/15
1983 ----- 4/05	1994 ----- 4/18	2005 ----- 4/16
1984 ----- 4/18	1995 ----- 4/05	2006 ----- 3/27
1985 ----- 3/30	1996 ----- 4/03	2007 ----- 4/21
1986 ----- 4/08	1997 ----- 4/20	
1987 ----- 4/11	1998 ----- 4/3	

Madeline Alice Morin

Sad word reaches us that we have lost a faithful summer lake resident. Madeline Alice Morin, nee Rousseau, daughter of Joseph and Josephine Berube Rousseau, passed gently to the Lord on Jan. 23. She was born in Lewiston on July 21, 1923, and was the wife for 65 years of Omer Morin. She and her husband looked forward to and enjoyed their yearly trips from Maine to Florida, starting in 1960, always stopping along the way to visit relatives and friends. She will be greatly missed!

Speakers for August 18th Meeting at 9 a.m.

Susan Gallo, who will speak about "The State of Maine's Loons" is a wildlife biologist with over ten years experience in wildlife monitoring, forestry and land management. Her education includes a B.S. in Natural Resources from Cornell University, and an M.S. in Organismal Biology and Ecology from the University of Montana. Most recently, her experience has expanded to include the assessment of economic impacts of land management and the economic value of conservation land. Currently she is a wildlife biologist with Maine Audubon, and the director of the Maine Loon Project. Recent projects include a Lead Tackle Exchange Program for the state of Maine, coordination of the Maine Amphibian Monitoring Program, creation of an owl survey protocol for volunteer monitoring, initiation of an "Important Bird Area" program for Maine, and outreach with land trusts on the economic impacts of land conservation.

* * * *

Rex Turner is Director of Education for the Maine Lakes Conservancy Institute. He has worked as a researcher and, later, an interpretative ranger at Acadia National Park, an historic interpreter at Old Fort Western in Augusta, an environmental educator, and an Earth science teacher. Since 2004, Rex has been a contributing outdoor columnist for the Kennebec Journal and the Waterville Morning Sentinel. In addition to being a Registered Maine Guide, Rex also is an active member of the National Association for Interpretation, through which he is a Certified Interpretive Trainer.

The Maine Lakes Conservancy Institute (MLCI) is a nonprofit educational organization dedicated to understanding, protecting and sustaining the health and values of Maine's lakes and the communities dependent upon them.

Sabbathday Lake Paddlers and Pedalers

Mark your calendars!

Join your neighbors for a Saturday morning excursion biking around the lake or paddling along the shore line. This will be an opportunity to see your lake at a gentle pace. Biking will begin at the Grange Hall and head toward Snow Hill Road looping into Black Point Road and Sunset Shores along the way. Kayaking will begin at Outlet Beach and paddle along the west shore. Feel free to join the group anywhere along the route. For more information contact Anne Maurice (926-4732) or Paula Gauthier (926-5853)

Event	Dates	Time	Meeting Place
Biking	July 14	8:00 AM	Grange Hall
Kayaking	July 21	8:00 AM	Outlet beach
Biking	August 11	8:00 AM	Grange Hall
Kayaking	August 25	8:00 AM	Outlet Beach

In My View (continued from p. 2)

- ◆ How to protect Maine's streams, lakes and coastal waters at Bayscaper, www.thinkfirstspraylast.org/bayscaper.
- ◆ The Newspaper of Maine Congress of Lake Associations is a terrific site for all that's happening in and around our lakes info@mainecola.org.
- ◆ LEA (Lakes Environmental Association) Lake News a great site for all types of lake environmental news and current issues facing Maine lakes, Exc. Director Peter Lowell, www.mainelakes.org.
- ◆ Maine Volunteer Lake Monitoring Program news and issues at vlmp@mainevlmp.org.

These sites can be excellent resources for all of us as we work to prevent a further decline in the water quality of Sabbathday Lake. Please do your part; we all have too much at stake to do nothing! The directors and I would love to hear your thoughts and ideas on how we can preserve this beautiful resource for now and future generations. I look forward to seeing at up coming meetings and on the lake. Have a terrific summer!



Sabbathday Lake Tee Shirts for Sale

For the last two summers the Lake Association sold beautiful white tee shirts with a loon floating on the lake in the sunset. We are going to be selling the tee shirts again. They will be available at the Shaker Store.

Sabbathday Lake Association Annual Membership Dues 2007

AMOUNT: \$15

Additional donations welcome!

Please send annual dues to: MEMBERSHIP, PO BOX 375
NEW GLOUCESTER, ME 04260

MAKE CHECKS PAYABLE TO: SABBATHDAY LAKE ASSOCIATION

NAME _____

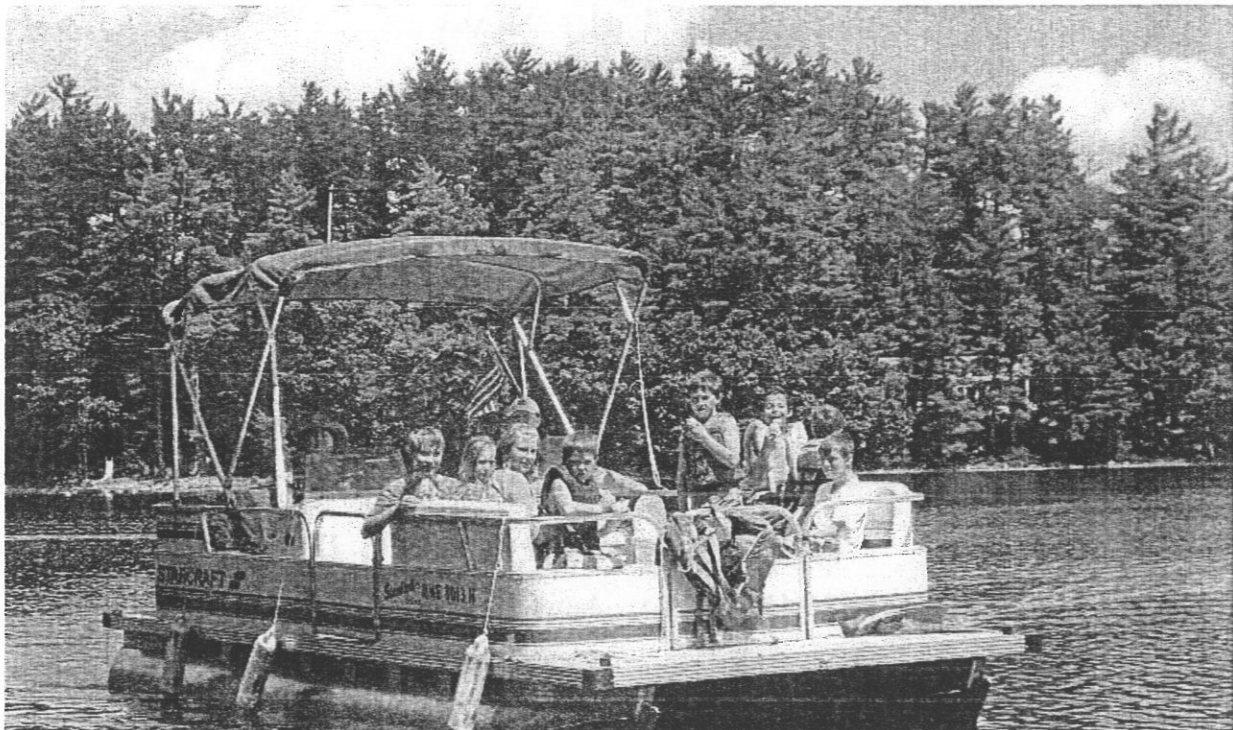
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Benefits of belonging to the Association:

- ◆ News about what's happening around the lake
- ◆ Social gatherings to meet your neighbors
- ◆ Water quality testing
- ◆ Environmental Improvement Activities
- ◆ Web Site: <http://www.sabbathdaylakeassoc.org/>



The children in the party boat belong to Dave and Beth Steele, 12 West Shore; Tom and Sue Wilson (Brother-in Law) 14 West Shore. The girls are the granddaughters of Dick and Bev Ouelette, 18 West Shore visiting from North Carolina. The boys are cousins and grandchildren visiting from Yarmouth, ME, West Newton, Mass and Franklin, Tennessee. Sue Wilson drives the party boat just returning from ice cream at Bare Foot beach. Also on the boat was Sue's daughter Deborah Miller. Photo by Beth Steele.

Sabbathday Lake News

NEWSLETTER, PO BOX 375, NEW GLOUCESTER, ME 04260



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Sabbathday Lake News

The Newsletter of the
Sabbathday Lake Association

Please send your lake-related news contributions to the Editor
by E-mail to Cheryl Fortier, cfortier@maine.rr.com

SABBATHDAY LAKE ASSOCIATION

Board of Directors 2006 - 2007

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