

Raymond Waterways Newsletter

Published by Raymond Waterways Protective Association

"To protect and improve pond and lake water quality and foster watershed stewardship"

Summer 2007

Invasive Plant Patrol and Remediation Projects



RWPA Lake Rangers inspect Thomas Pond for invasive plants. Join our plant patrol team by attending the training on July 10th (see back page for more details).



Volunteers load invasive Variable milfoil removed from Bay View Estates canal. To learn more about invasive plants visit the Maine Center for Invasive Aquatic Plants website: MCIAP.org.

Watershed Protection Projects



In 2007 RWPA will assist Panther Pond Association with completing the Panther Pond Conservation Project — Phase I and work with Raymond Pond residents to begin the Raymond Pond Conservation Project. Both projects offer free technical assistance and financial assistance to fix erosion problems. Possible projects include infiltration steps on paths, rubber blade diverters on driveways (right photo), crowning and ditching on camp roads, rain gardens (left photo), or planting shoreline vegetation. For more information on both conservation projects see page 6 and 7.

RWPA Annual Meeting - August 19th, 5-7pm @ Camp Wohelo on Sebago Lake

Dear Friends of Raymond Waterways

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Our Annual Meeting... This year we will hold our Annual Meeting & BBQ, Saturday, August 19th from 5-7 pm at Camp Wohelo on Sebago Lake. We will provide the burgers, hot dogs, and soda. Bring salad or dessert to share. Please RSVP so we can order the correct amount of food. To get to Camp Wohelo take the Cape Road from route 302. Go approximately three miles until you see the sign on the right for Sebago Wohelo. There are two main entrances and we are at the first one (older girls camp). We hope you can join us!

A special thanks to our donors... RWPA would like to thank all of our friends who have contributed nearly 16,000 toward our 2007 efforts. Your donations continue to be essential to the success of our remediation efforts, lake ranger program, and watershed projects. Thank you for your support. RWPA is a 501(c)3 non-profit and your donations are tax deductible.

Invasive plant news... Take a look at the results of our 2006 season to the right. Not only did we increase the number of boat inspections, we were able to catch 23 outgoing and 2 incoming invasive Variable milfoil fragments on boats at Sebago. We can be thankful that these plants were not transported to any of the surrounding lakes. We are off to a great start with four new inspectors this year and we have a busy season of remediation projects ahead of us.

Invasive plant survey training... Please consider attending the invasive plant patrol training on July 10th and July 14th (page 8). More details on the training are provided in the June issue of the Road Runner: http://www.raymondmaine.org/events_news/roadrunner/. The more trained eyes we have on our lakes, the better we can protect them from an infestation. Early detection is key to combating a potential infestation by any of the 11 invasive plants.

If you need advice for how to control runoff... Give us a call and we will come over and offer recommendations for what might be done. We will provide you with a short written plan outlining the steps you can take to improve your property and protect our lakes.

Spring storms cause severe damage to private roads... As you look to repair the damage on your roads caused by the Patriots Day storm, please consider consulting with an engineer who can provide you with recommendations for repairing your roads properly so that when the next large storm comes, your road will be better able to handle the large volume of rain. It is a worthwhile investment in your road. RWPA works with several local engineers so please give us a call and we can provide you with contact information.

Conservation projects provide free technical and financial assistance... RWPA is in its third season of managing the Panther Pond Conservation Project (page 7) and we began a new project on Raymond Pond this season (page 6). Both of these federally funded projects (Clean Water Act - 319 funds) offer matching funds to help pay for construction work to fix eroding camp roads, ditches, driveways, and paths and increase shoreline vegetation (buffers).

More than just secchi disk readings...

Water clarity is not the only testing we do to monitor our lakes health. We also measure the amount of dissolved oxygen over the course of the summer. Take a look at page 5 to learn about dissolved oxygen levels and lake turnover.

Don't forget to mark your calendars for our August 19th Annual Meeting. Until then, we hope many of you are getting out to enjoy the summer on Raymond's lakes and ponds.



Protecting Our Lakes
For Present and Future Generations

2006 Ramp Inspections and Ranger Program Results

In 2006 we continued to run a very active boat inspection program at the four launch locations, expanded our remediation efforts at several locations on Sebago and completed plant surveys on all of Raymond's lakes.

Inspections 2006

- A total of 787 hours were spent at four launch sites to inspect 3836 boats, an increase of 886 inspections compared to the 2005 season.
- Removed 23 invasive plant fragments (Variable milfoil) from boats exiting Raymond Beach.
- Removed two Variable milfoil plants from boats entering Sebago Lake at Raymond Beach. Both boats had previously exited from other locations on Sebago Lake (Sebago Lake State Park & Jordan Bay Marina).

SUMMER 2006 INSPECTION SURVEY TOTALS			
Lake	# Inspections	Plants Found	# Inspection Hours
Sebago Lake	3023	29 (25*)	443
Crescent Lake	757	11	240.5
Panther Pond	29	0	67.25
Thomas Pond	27	1	36.5
TOTALS	3836	41	787.25
*23 Invasive plants found on outgoing Sebago boats. *2 Invasive Variable milfoil on ingoing Sebago boats.			

Remediation Efforts 2006

- Hired divers and organized volunteers to remove 35 yards (~12 dump trucks) of invasive variable milfoil from Dingley Brook, Bay View Estates I and II, and the Jordan River.
- Assisted Jordan River Marina Condo Ass'n with applying for state grant funds and organizing divers to control plants along their shoreline.
- Volunteers placed benthic tarps in thickly infested areas of Dingley Brook and began removing tarps at Bay View Estates.
- High water levels in the fall prevented non-diver remediation efforts at Panther Run near the dam.

Lake Plant Surveys 2006

- Completed shoreline plant surveys of all Raymond lakes.
- No invasive plants were found.**

- Surveyed several sections of Sebago Lake. Documented colony locations.

Lakes Ranger Program & Milfoil Remediation 2007

Boat Inspections

This year we have four new rangers on board to educate boaters at the ramps - Shaughn Allen, Tom Cave, Jared Marcinuk, and Mark Willis. Shaughn just completed his first year at the University of Maine in Orono. He is majoring in Environmental Science and will be studying abroad in England in the fall. Tom, a junior in high school at Gray New Gloucester, has an avid interest in fishing and the outdoors. Jared, entering his senior year at Windham High School, enjoys hunting and fishing. Mark is a student at USM who will be graduating this year with a major in Environmental Safety and Health. In his free time he enjoys fishing, playing golf, and his guitar. If you see them at the ramps be sure to thank them!

We are always in need of volunteers at the ramps.

Your commitment can be a few hours a week or one day a summer. Please remember, our rangers are not always on duty, so ***please be sure to inspect your boat before and after you float! Remove ANY and ALL plants.***

Remediation Projects

RWPA will continue remediation efforts at Dingley Brook, Bay View Estates I & II, sections of the Jordan River, and Port Harbor

Marine. Work at Dingley Brook will involve the use of benthic tarps as well as divers. This area has seen a huge improvement since we began working in the brook. Bay View Estates will focus on removing tarps and monitoring the tarped areas for any growth. We are in great need of strong volunteers to assist with tarp removal and are looking for suggestions. Additionally, RWPA assisted the Jordan River Marina Condo Ass'n (JRMCA) with applying for another state grant to assist them with managing the infestation in their area of the Jordan River. Lastly, we plan to organize volunteers in the fall to conduct a plant removal in the Panther Run area below the dam.

Lake Plant Surveys

We will organize our lake plant surveys in August to ensure Raymond's lakes are clear of Maine's 11 banned invasive plants. RWPA will be hosting two plant identification courses this summer— the basic Invasive Plant Patrol on Tuesday, July 10th and an on-the-water training on Saturday, July 14th. We are always in need of volunteers. We hope you can attend the training and assist us in surveying Raymond's lakes. Early detection is essential to preventing an infestation.

Great thanks to the volunteers and staff for their dedication and hard work at the boat ramps and on the lakes.



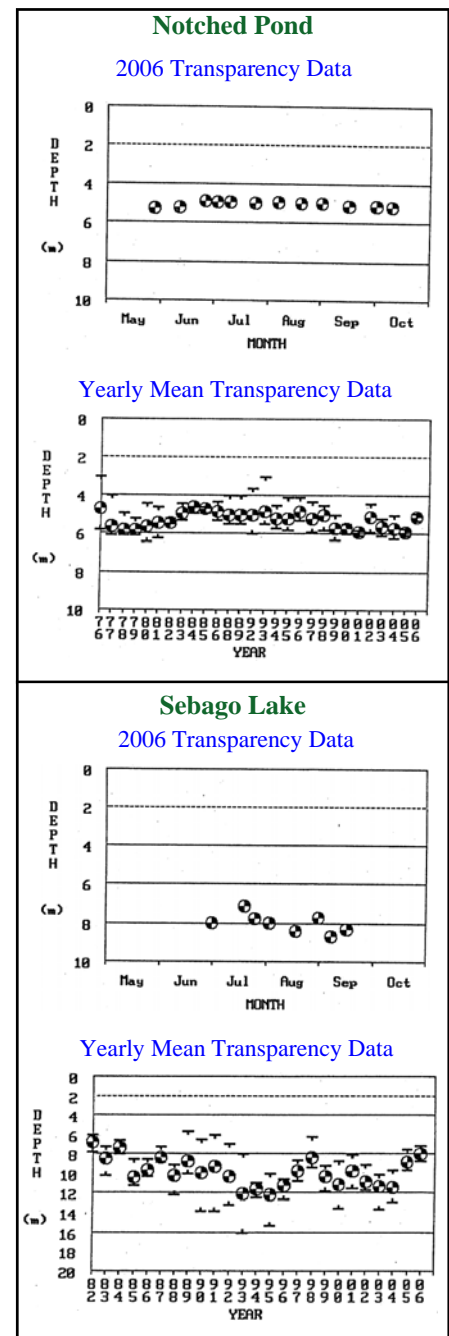
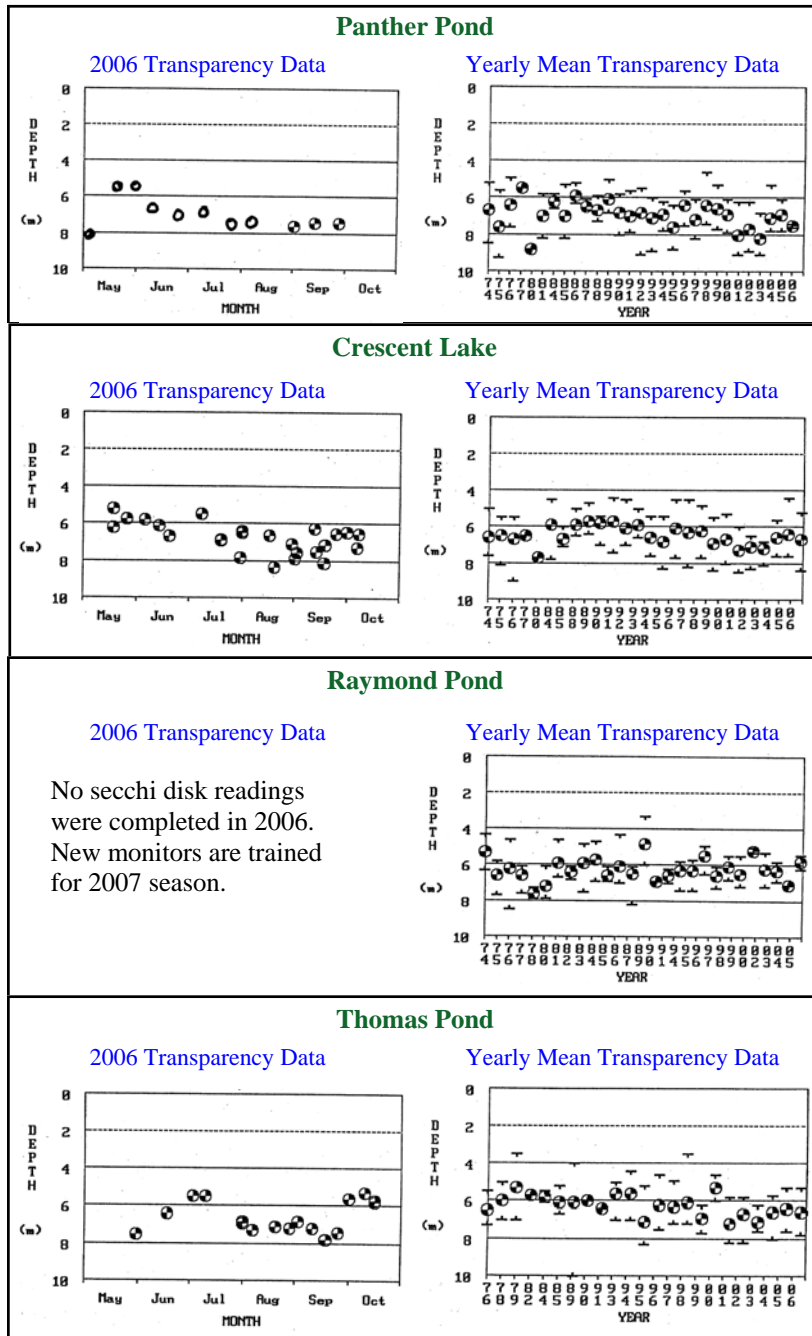
2007 Lakes Ranger, Shaughn Allen, Inspects a Trailer at Raymond Beach

Our Lakes Health– Water Quality Monitoring Results

Here's a close look at our secchi disk charts. Please remember that the lower a disk appears on the chart, the better, as it means the disk could be lowered deeper in the water before going out of sight, hence clearer. Water clarity is an important indicator of lake health.

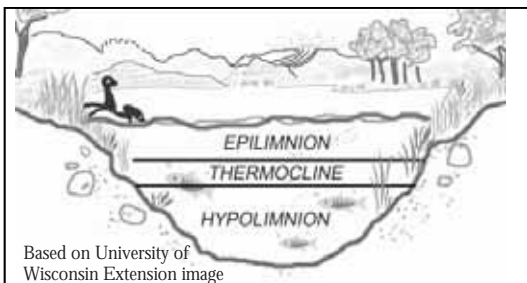
These charts have been meticulously assembled from data obtained from many people's dedicated efforts. RWPA would like to thank the water quality monitors on each of Raymond's lakes for their dedication to obtaining accurate data that allows us to track trends in water quality. The chart to the left shows our current monitors and the number of years of service to our lakes.

Lake	Monitor	# Years
Crescent Lake	Elden Lingwood	2
	Waldo Preble	7
Notched Pond	Gary Bucklin	4
Panther Pond	Charlie Turner	31
Raymond Pond	Bev Daniels	0
	Susan Moore	0
Sebago Lake	Joseph Potts	18
Thomas Pond	Mark Mattson	14



A Typical Year in the Life of Raymond Lakes

The concentration of **dissolved oxygen** (DO) is another critical indicator of the health and quality of lakes and ponds. An adequate supply of DO is essential to fish and other aquatic life. Take a good look at the six graphs here. DO is represented by the dotted line and temperature is the solid black line. When the testing begins in May (Fig. 1) note that there are uniform DO concentrations from the surface to the bottom. This is because the lake has recently undergone spring **turn-over**, when mixing from top to bottom takes place. The almost horizontal part of the temperature line indicates that surface water has already begun warming up, creating the thermocline. The thermocline (middle layer) physically isolates the deep, cold bottom water from the surface water, preventing oxygen replacement from the air. June (Fig. 2) shows that DO is already starting to decline at lower depths. July (Fig. 3) represents more of the same, with fish being forced up from the deepest depths because DO levels are too low to sustain them - fish need around 3-5 parts per million (ppm). Fisherman take note. August (Fig. 4) indicates that almost all the DO has been consumed by bottom sediments and surface temperatures have leveled off. September (Fig. 5) shows us that DO has all but vanished from lower levels, forcing fish into even shallower depths. Lastly, October (Fig. 6) diagrams a sinking thermocline, brought on by cooler temperatures, and



Thermal Stratification

As lake water is warmed in the summer the water in deeper lakes is layered into three levels:

- 1) warmer (less dense) epilimnion layer at the surface
- 2) the thin thermocline (transition) layer
- 3) the cold, deep (high density- heavy) hypolimnion

Note, not all lakes experience thermal stratification, it depends on depth and weather influence.

Information courtesy of the Volunteer Lake Monitoring Program

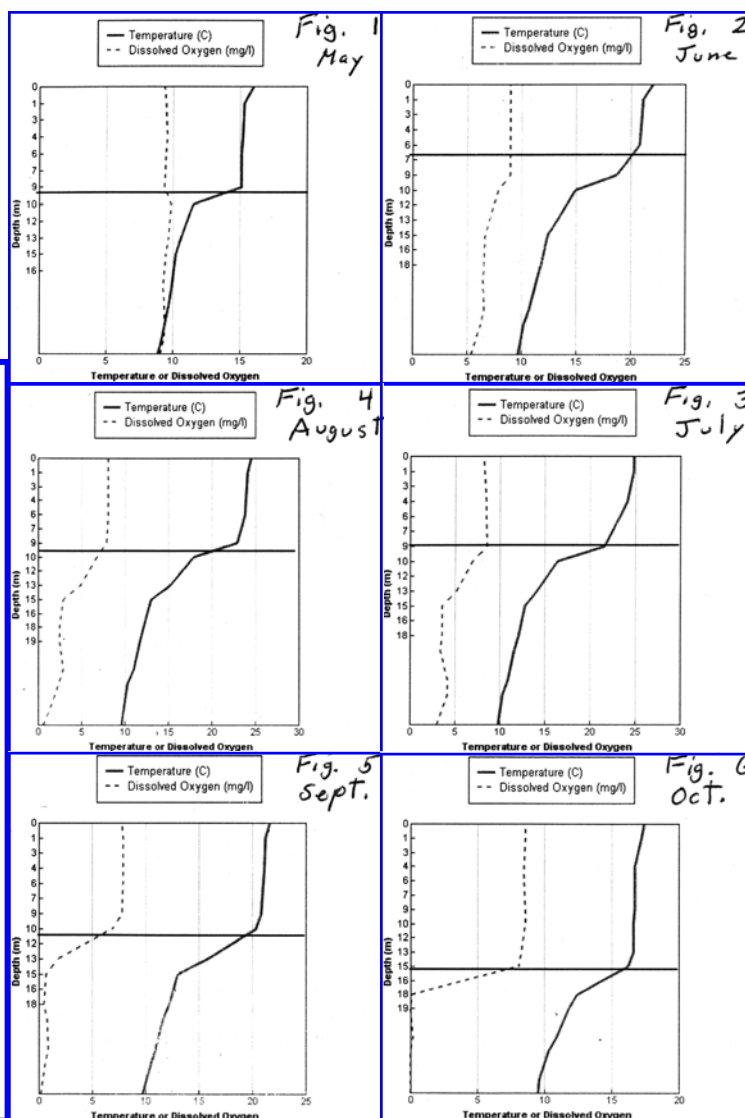
complete collapse of DO below 18 meters. Soon, DO near the bottom will be replenished (fall turnover), usually just before ice formation. No wonder loons like to stay so late into the fall. Please note that temperatures at the lake bottom have varied by less than 4 degrees for the entire year. Through all this, be reminded that waters' greatest density is at 39 degrees F (~ 4 degrees C) - refer to "lake turnover" definition below to understand how water density influences lake turnover. So there it

is, a year in the life of a lake, which is anything but a simple repository for water. So you can see that our lakes have many, many variables that affect their "lives."

Graphs courtesy of Roy Bouchard, DEP.

Dissolved Oxygen (DO) - the amount of oxygen dissolved in the water. DO concentration is affected by water temperature, water quality, and other factors.

Lake Turnover - The process of mixing that occurs in many lakes and ponds in the spring and fall. Turnover takes place when the water temperature is uniform from surface to bottom. Water is most dense (heaviest) at 39° F (4° C) and as temperature increases or decreases from 39° F, it becomes increasingly less dense (lighter). In summer and winter, lakes are maintained by climate in what is called a stratified condition- less dense water is at the surface and more dense water is near the bottom. During late summer and autumn, air temperatures cool the surface water causing its density to increase. The heavier water sinks, forcing the lighter, less dense water to the surface. This continues until the water temperature at all depths reaches approximately 39° F. Because there is very little difference in density at this stage, the waters are easily mixed by the wind. The sinking action and mixing of the water by the wind results in the exchange of surface and bottom waters which is called "turnover." During the spring, the process reverses itself. This time ice melts, and surface waters warm and sink until the water temperature at all depths reaches approximately 39° F. The sinking combined with wind mixing causes spring "turnover."



Raymond Pond Receives Grant for Two Year Conservation Project

A new grant has been awarded to RWPA and the Town of Raymond to fix erosion problems contributing pollutants to Raymond Pond. The \$95,603 grant will help to pay for construction work on private and public property to fix eroding camp roads, ditches, and driveways and install simple conservation measures on paths and shorefronts. The grant will also provide matching funds to qualified residences, free technical assistance and education programs to protect the lake.

Did the recent heavy rains wash out your road or driveway? Could your shoreline be enhanced with additional plants? Over the next two summers, watershed residents can get help with reducing the chances of algae blooms and property value decline. Free technical assistance is available to all interested watershed residents. Conservation matching grants

(up to \$300) will be offered to 9 sites and erosion control projects will be completed at 21 additional road and residential sites. Workshops will also be offered to help citizens learn conservation techniques to use on their own property.

Sediment is the number one type of pollution affecting Maine's waterbodies. Erosion causes soil particles to enter our lakes. Soil carries the nutrient phosphorus, essentially "fertilizing" the pond and decreasing water quality. Excess phosphorus can harm fish habitat and lead to nuisance algae blooms – a mat of green scum. Studies show that as water quality decreases, property values also drop.

If you are interested in this free technical assistance and matching grant opportunity or would like to be contacted when workshops are scheduled, call or e-mail RWPA today.

Project Highlights
Free Technical Assistance
21 Erosion Remediation Projects
9 Small Grant Projects
Workshops
Educational Tours
For more information or free technical assistance contact us at 207-671-3329 or lakes@raymondmaine.org

Casco & Raymond Community Watershed Forum

On June 2nd, residents from Casco and Raymond lakes came together to attend the Casco & Raymond Community Watershed Forum. The goal of the forum was to "create an action plan for increasing awareness and generating participation in future improvement of Casco and Raymond lakes and streams." Key Note speaker, Maggie Shannon, Executive Director of the Maine Coalition of Lake Associations (COLA), discussed the role individuals and lake associations can have in protecting our lakes and ponds. Participants joined in small group discussions to outline the biggest impacts to our lakes. They prioritized these impacts and generated possible solutions to combat them and protect our lakes. Ideas generated ranged from ways to increase stewardship to ways to lessen impacts of development on lakes.

Participants volunteered to serve on action committees to work on implementing the ideas generated at the forum.



How much water over the dam??

Owing to the recent heavy rain storm and resulting high lake levels, we started thinking about how much water was accumulated (and lost) in our respective lakes. So, here is a little chart to give you an idea of how much water was involved. Bear in mind the following; there are 27,161 gallons of water in an acre 1 inch in depth. Knowing how many acres each lake has, we came up with some

Lake	Size (acres)	# gallons in 1" depth
Panther Pond	1411	38,323, 509
Crescent Lake	717	19,474,437
Thomas Pond	497	13,499,017
Raymond Pond	346	9,397,706
Notched Pond	72	1,955,592

interesting figures. If you assume a 1 inch drop in lake levels each day (a reasonable average) then the chart shows how many gallons of water went over your dam or spillway every day during the a 1 inch/day drawdown. We thought you might be impressed. Of course, one must add the numbers of Panther and Crescent because they are connected.

Panther Pond Conservation Project - Phase I - Third Season

Over the past two years, Panther Pond residents have had the opportunity to participate in the project grant to reduce erosion problems. During our first two seasons we completed 24 projects and developed designs for an additional 10 sites. The goal of the project is to fix 42 of the 84 erosion sites identified in the Panther Pond Watershed Survey.

If you did not have a chance to participate in the project last year, it's not too late! There is funding available for four remediation projects (various funding amounts) and nine Small Matching Grants (\$100). Landowners and road associations are eligible to receive free technical assistance and 50% cost sharing to fix erosion and runoff problems. Inexpensive conservation practices are practical, affordable, easy to install, and can make a big difference in water quality.

Grant funds can be used toward the purchase of native plants for vegetative buffers or for erosion control materials (erosion control mulch for path or bank stabilization, water diverters, crushed stone for infiltration) or road repair (culverts, ditching, crowning). ***If you have an erosion or runoff problem on your property or are interested in enhancing your shorefront vegetation please contact us today to schedule a time for us to visit your property.***

PPA Annual Meeting - Tuesday, July 24th

You are cordially invited to the PPA Annual Meeting at the Raymond Public Safety Building at Main Street and

Upcoming Events

**PPA Annual Meeting-
July 24, 7-9pm**

**Project Site Tour-
July 28, 4:30pm**

**PPA 3rd Annual Picnic
July 28, 6-8pm**

Workshops, TBA

Rt. 302 on Tuesday, July 24th from 7-9 PM. There will be a presentation highlighting showcasing completed projects around the lake as well as a discussion of what the next steps might be for PPA and individuals in protecting Panther Pond.

3rd Annual Project Site Tour and Picnic - Saturday, July 28th

This year, the Board has chosen a walking tour of Betty's Neck to view a variety of strikingly different types of

improvements that can be showcased and are within easy walking distance. Come join us to see what can be done when people work together.

We are pleased to announce that Polly and John Adourian have graciously agreed to host the PPA picnic from 6-8pm. We will provide hamburgers, hot dogs, lemonade and soft drinks; we will rely on those attending to bring a pot luck salad or dessert and other beverages desired. Can't make the tour? Join us at the picnic to mix with your Panther Pond Neighbors.

Panther Pond Association and RWPA would like to thank all the landowners and volunteers who are helping to make this project a success. If you are interested in receiving technical assistance, matching grants, or would like to attend any of the workshops or the project site tour please contact PPA at ppa@raymondmaine.org or contact Noralee at 207-671-3329 or lakes@raymondmaine.org.



Panther Pond Cruise the Buffers - residents took a ride around the lake to see the completed projects in 2006. This year we will take a walking tour of Betty's Neck on Saturday, July 28th to view the rain garden, rubber blade diverter, infiltration steps and more.



The Crilly's stabilized a bare soil bank with erosion control mulch and blueberries and stabilized the path with crushed rock and infiltration steps. Water from the driveway above (not shown) is now diverted into adjacent vegetation and away from the lake.

2007 RWPA Membership Form



Thank you to our members who have already contributed in 2007. If you have not yet contributed please help us reach our 2007 goal of \$30,000. Here is the form to fill out. Thank you!



I am glad to be a member: Again_____ For the first time_____

My lake/watershed is (please circle one): Crescent Raymond Thomas Panther Sebago Notched Nubble

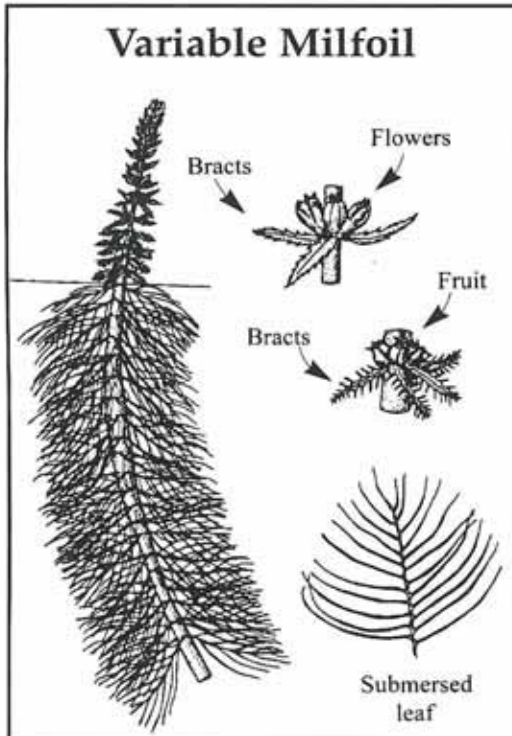
Enclosed is (please circle) \$2500 \$1000 \$500 \$300 \$150 \$100 \$75 \$50 \$25 Other_____

Name_____ Phone Number_____ E-mail_____

Mailing Address_____

Raymond Address (if different)_____ Raymond Phone_____

RWPA is a 501(C)3 Non-profit. Your donation is tax deductible.



RWPA ANNUAL MEETING & BBQ

Sunday, August 19th, 5-7pm

Camp Wohelo, Sebago Lake

Please RSVP so we have enough food.

Thanks and hope to see you there!

INVASIVE PLANT PATROL TRAINING

Tuesday, July 10th, 3:30-9pm

Raymond Public Safety Building

INVASIVE PLANT FIELD TRAINING

Saturday, July 14th, 8am-noon

Thomas Pond Public Launch - Rte 302

Contact RWPA to sign up for any of the above events.

Raymond Waterways Protective Association

To protect and improve pond and
lake water quality and foster
watershed stewardship

RWPA
PO Box 1243
Raymond, Maine 04071

Phone: 207-671-3329

Email: lakes@raymondmaine.org

Updates will be posted on the Town of Raymond website:
www.raymondmaine.org/committees/waterways/default.htm

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