

LAKE WISE

December
1998

NEWSLETTER OF THE PSU LAKES AND RESERVOIRS PROGRAM
AND THE OREGON LAKES ASSOCIATION



Lake Watch News

The 1998 Lake Watch Annual Report is in the making and all of the data that our volunteers have been collecting throughout the year will be included. In hopes of renewed funding we will be continuing to collect data into the next year for the 1999 report.

As of December, Kim Walker has taken the position of volunteer coordinator for the Oregon Lake Watch program. She is looking forward to working with all of the volunteers personally. Jodie Oliver, the previous coordinator, began teaching locally in November. Everyone in Oregon Lake Watch wishes her well.

Thanks to every volunteer involved in this program that has made it the success that it is. We are continuing to bring new volunteers into this program in hopes of a better understanding of our environment.

You can reach Kim, for personal notes or to send in Lake Watch data, at: walkerkd@psu4.pdx.edu

Best wishes for the New Year!

Kim Walker
Volunteer Coordinator
(503) 725-3833

OLA Annual Conference a Success

by Roger Edwards

The 1998 Oregon Lakes Association Annual Conference was held on October 24th at the Diamond Lake Resort in Southern Oregon. It was one of the best OLA conferences to date, with 50 registrants enjoying a variety of presentations. The scheduled topic of toxic algae in lakes ranked high in interest level for most attendees, and informative sessions on the status and management of Diamond, Klamath, and Waldo Lakes complemented this topic. Senator Veral Tarno, this year's keynote speaker, discussed how lakes fare in the Oregon Legislature; and overviews of OLA, NALMS and Citizen Lake Watch outlined several levels of possible involvement for participants. For those of you who could not attend, these are the notes from this very interesting meeting.

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Catherine Hayes: Volunteer of the Year

Catherine Hayes was awarded the Oregon Lake Watch Volunteer of the Year Award for 1998 at the Oregon Lakes Association meeting held at Diamond Lake. Catherine has been a Lake Watch volunteer since 1989 at Lake of the Woods in the Southern Oregon Cascades. Catherine is one of the Lake Watch Program's longest-serving volunteers. She has collected a body of data that is quite informative about the condition of Lake of the Woods.

Catherine measures Secchi transparency, temperature, and dissolved oxygen at a mid-lake station. Her data has shown that transparency of Lake of the Woods has undergone some significant changes over the years (see figure on page 2). From 1988 through 1993 her data showed that water transparency in the lake was declining. This raised concern about potential causes of the decline, such as summer cabins on the shoreline, logging, etc. Fortunately, however, her persistent monitoring has shown an increase in water clarity since 1993. Her data shows that the lake undergoes long-term changes in transparency that appear to be natural, perhaps related to climate variation.

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Lake Watch Volunteers

Citizen Lake Watch depends on dedicated volunteers, who measure basic water quality characteristics in Oregon lakes and reservoirs. Lake Watch provides training to measure water temperature, Secchi transparency, and dissolved oxygen. Volunteers in the Corps of Engineers, Fern Ridge monitoring program perform additional measurements. Volunteers also assist in the early detection of *Hydrilla*. Prospective volunteers may contact Mark Sytsma (503)725-3833 or Michael Parker (541) 552-6796.

Blue Lake: Koren Marthaller

Bradley Lake: Edward and Ruth Ziebell, John Mendonsa

Clear Lake: Elmer Waite

Cullaby Lake: Janette Goolsby

Diamond Lake: James Kerp

Devils Lake: Barbara Hagerman, Al Rice

Emigrant Lake: Christy Sinclair

Fairview Lake: Bettianne Goetz, Jim Graybill

Fern Ridge Lake: Natasha Okonoji, Richard Locke, James Bruvold, Randy Wilson, Todd Yokum

Fern Ridge Lake cont.: Lee Kincaid, Alycia McCord, Clover Wood, Ken Cluck

Garrison Lake: Don Martin

H. Hagg Reservoir: Wally Otto

Howard Prairie Reservoir: Chris Johnston

Hyatt Lake: Mike Hurger

Lake of the Woods: Catherine Hayes, Katherine Wallis

Loon Lake: Richard Kaufmann, Steve Kaufmann

Mercer Lake: Ron Boehi

Munsel Lake: Al Burhans, Roy Fisher

N. Tenmile Lake: Frank Gray, Dan Jordan, John Kelsey

Odell Lake: Vince and Paulette Jesse

Penland Lake: Lee Bogle

Siltcoos Lake: John and Julia Carlson, Paul Cornett, Elizabeth and Dean Kelly, Dave and Linda Lauck

South Twin Lake: Jude Fulghum

Sunset (Neacoxie) Lake: Lee Smith

Tenmile Lake: William Emblen

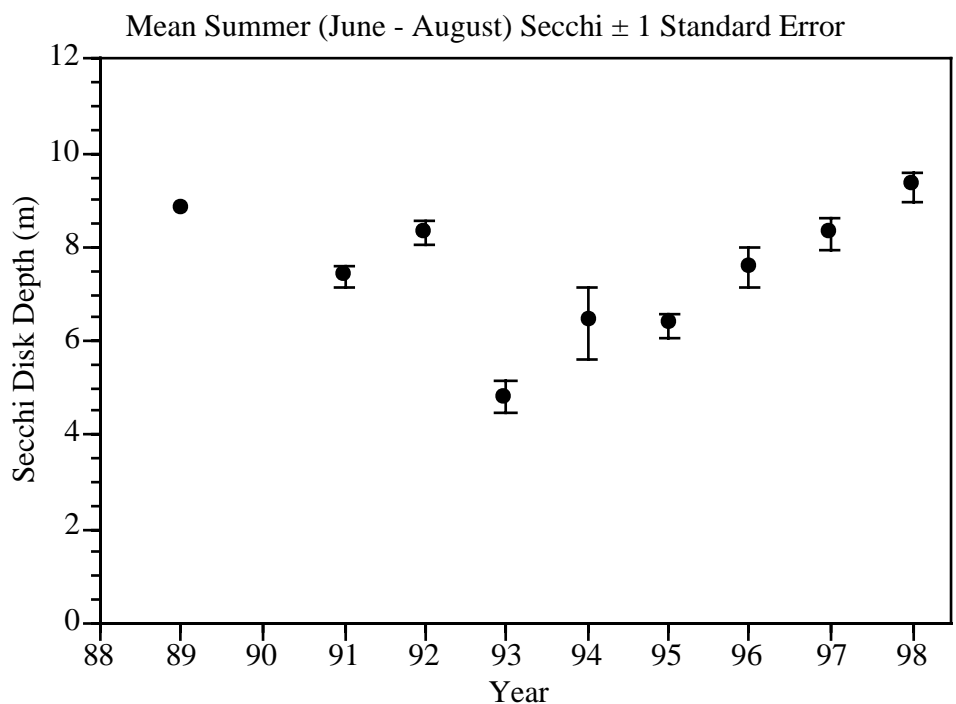
Thornton Lake: Henry Pollak, Jack White

Woahink Lake: Bob Anderson

Lake Watch Award continued from page 1

Development of such long-term data sets on Oregon lakes is one purpose of the Lake Watch Program. The data will allow better management of Oregon's lakes and prevent implementation of ill-advised management programs that are not needed. OLA and the Lake Watch Program appreciate the perseverance and dedication of Lake Watch volunteers like Catherine - a truly deserving recipient of the Volunteer of the Year Award! ♦

Catherine Hayes' Secchi transparency data from Lake of the Woods



OREGON LAKES ASSOCIATION NEWS



Notes From The President: OLA Conference

by Andy Schaedel, OLA Past President



Season's Greetings - here is hoping that you found 1998 to be a good year and that 1999 will be even a better year! I am wishing the same for OLA.

As far as 1998 goes, I believe that it was a good year for OLA. I think that the highlight of the year had to be the annual conference which was held at Diamond Lake on October 23 and 24. The setting was great - it is hard to beat having a conference on lakes at a location that has a great view of Diamond Lake from the conference room. The conference was quite informative and there was great informal interaction among the members. I would like to thank Cell Tech, who sponsored the conference, for their generous donation. In addition, I would like to thank numerous members including Bob Anderson, Jim Carpenter, Roger Edwards, Mark Sytsma and Allan Vogel for their time and energy in organizing and making sure that the conference went smoothly. (For the conference summary see page 1).

In 1998 we have made changes in how we are putting together our newsletter and in our web site. Susanna Breiling is now doing both of these under contract to OLA. I think that you will find the same high quality in both of these efforts. This also saves some of the wear and tear that Mark Sytsma - our long time, volunteer newsletter editor has experienced over the past several years. I do appreciate the energy and the quality that Mark put into the newsletter that made OLA's newsletter one of the best.

I think that it is exciting to have a number of new members coming on to

the Board. I would also like to recognize the work and contributions of several long time Board members who will be moving off of the Board. These members have been long time contributors to OLA - hopefully they will stay active in one form or another (please note - the accomplishments that are listed below are not intended to be exhaustive but just some that come readily to mind for our newer members):

* **Mark Sytsma** - is no longer Past President as I have moved into that position. Mark has been active as Director, President Elect, President and Past President (for several terms) and has been the force for our aquatic weed management white paper, newsletter, conferences and many other contributions. I know that Mark will continue to be active given legislative interest in a statewide weed program;

* **Anjala Ehelbe** has been a long time Director and the most recent Treasurer. She is starting a new business that requires most of her energy now but has been an original member who helped host OLA in its formative stages, helped with several conferences (our long time registration person), has been a great one for word-smithing the By-laws and other documents, and recently kept the IRS off of our backs.

* **Dave Wagner** was a two term Treasurer and one term director and has been active in OLA since coming to Oregon when he was the lake manager at Devils Lake. Dave was instrumental in hosting conferences at Lincoln City and is looking forward to time with family, working on his land and pursuing many other interests.

* **Avis Newell** was a two term Director and filled in as Secretary for a while. She took on the development and editing of the Northwest Science issue on lakes, contributed to many conferences and helped me keep sane during my time as OLA president by providing considerable advise.

* **Allan Vogel** stepped up and volunteered as a Director during the time when we were urgently looking for volunteers and has offered his insights and help in coordinating the last conference.

Work plan for 1999

Areas on which we will be focusing and members that you can contact if you want to be involved include:

- Improve membership and membership services (Andy Schaedel 503-229-6121)
- 1999 Annual Conference (Jake Kann, 541-482-1575; Michael Parker, 541-552-6796)
- Continued improvement of the web site and newsletter (John Kelsey, 541-759-3724)
- Develop an Oregon Lake and Reservoir Program (Mark Sytsma, 503-725-3833)
- Develop a Lake Appreciation Week in Oregon as part of a national effort (Bob Storer, 503-636-1422)
- Develop a Lake Report Card (Andy Schaedel, 503-229-6121)

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A Legislative Perspective on Lakes

State Senator Veral Tarno, Chair of the Interim Agriculture and Natural Resources Committee, was the keynote speaker at the annual conference. Senator Tarno acknowledged that the legislature has focused more on Oregon's streams and rivers than on lakes. He pointed out the value of looking at water problems on a basin basis, and suggested that relating lake problems to basin health would present a compelling case for funding. He described the task of the legislature as establishing priorities for allocating state funds. He encouraged OLA to develop a lake and reservoir management proposal for the legislature's consideration. OLA has produced such a proposal (see page 7).

Toxic Algae in Oregon Lakes

Dr. Michael Crayton, professor of Biology at Pacific Lutheran University, described his work with toxic cyanobacteria to an attentive audience. When notified of a possible bloom site, he asks his informant if the offending algae can be collected by the handful. If so, then it is unlikely the bloom is cyanobacteria, which are single cells often joined in a gelatinous matrix. Their blooms are quick to appear and can disappear just as quickly. They can also be very spotty in their presence, often appearing in just portions of a bloom. A warm surface temperature is a common characteristic of lakes experiencing blooms, but need not always be present. Treating blooms with copper sulfate should be done with caution as the application can rupture the alga cells and release their toxins. Copper will also accumulate in bottom sediments.

Dr. Crayton investigates blooms by

collecting as much algae as possible in clean, cool, containers. Samples are filtered to isolate the algal cells, which can then be examined microscopically, and tested for toxins. He uses a simple mouse assay for toxicity determinations rather than the more sensitive instrumental analyses. Mice injected with disrupted cells are watched to see if they can survive this treatment. This assay is quick, but has a high threshold of detection, and does not characterize the nature of the toxin as can be done with HPLC. The species producing toxic blooms in the greater Northwest are *Microcystis aeruginosa* and *Anabaena sp.* *Microcystis* is seen as an amorphous accumulation of coccoid cells that produce a hemolytic toxin. When ingested, it creates leaks in hepatic capillaries, which in turn produces weakness, abdominal pain, jaundice, and can cause death by hypovolemic shock. *Anabaena* forms filaments of coccoid cells that produce a neurotoxin. This toxin prolongs nervous stimulation of muscle cells by replacing acetylcholine at the nerve/muscle synapse. Like acetylcholine, the toxin will facilitate stimulation of the muscle, but will not signal for the release of cholinesterase to end this stimulation. The muscle then goes into a state of tetanus and the poison victim develops a progressive paralysis which can lead to death. The severity of these reactions makes it prudent to minimize contact with all cyanobacteria blooms until they can be assayed.

Dr. Jacob Kann described his monitoring of Ten Mile Lake following the identification of toxic *Microcystis* there in 1997. This alga appeared in June, peaked in July, and generated a smaller peak in September, but did not reach the concentrations reported in the previous year. He suggested that the warmer temperature and lower lake level in 1997 might have been more conducive to a bloom than this year's conditions.

Duncan Gilroy, from the Oregon Health Department discussed the health advisory that was issued for Ten Mile Lake in October of 1997. He acknowledged that there was incomplete understanding of the extent of the problem, but the concern for people who draw their drinking water from the lake led to the decision to issue the advisory. The 1 ppb limit cited in the advisory was taken from a World Health Organization recommendation.

Klamath: Opportunities on Oregon's Largest Lake

Jim Carpenter introduced a panel of Klamath Lake stakeholders, who presented their divergent perspectives of the Lake, and in so doing, demonstrated the working of a watershed council charged with developing an ecosystem recovery program. This requirement was the result of finding *Microcystis* amidst the *Aphanizomenon flos-aquae* that is commercially harvested there. The Klamath Indian tribes want to see the historical biodiversity restored in the lake. They have funded water quality monitoring to define the problems impeding this objective, and have concluded that there is a need to restore habitat upstream of the lake. To achieve this goal, they have traded part of their rights to lake water for habitat improvements.

The State Department of Agriculture is working on a legislative requirement to establish a voluntary agriculture plan that will minimize agricultural waste product input to the lake. The Watershed Council is prioritizing the uses of lake water in the hope of minimizing withdrawals. They too have concluded the need to address quality and quantity problems on a watershed basis, and are working to restore upstream wetlands. The Federal Bureau

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of Reclamation is charged with allocating lake water to legitimate users. Agriculture, the Klamath Indians, native and endangered species, wildlife refuges, and downstream fisheries all have rights to the dwindling supplies. The OSU Extension Service recommends crops to local farmers and they cite the number of farm workers, the taxes they generate, and the total sales of farm products as a measure of the local importance of agriculture. Nevertheless, farmers are limited in the water made available to them, and must make decisions on what crops to grow before they are informed of water volumes available. The State Department of Environmental Quality is trying to establish total maximum daily load (TMDL) limits for constituents coming into the lake that impact the high pH, high chlorophyll a, and low dissolved oxygen that have placed the lake on the list of lakes exceeding water quality standards.

Lake Watch

During the Conference luncheon, Dr. Mark Sytsma presented a summary of the Citizen's Lake Watch activities in the past year. The assistance of Michael Parker at Southern Oregon University has proven to be a great help in looking after lakes in this program. Keri and Brian Thorp have worked out of SOU to perform monthly profiling for pH, Dissolved Oxygen, temperature, conductivity, and Secchi depth at five different lakes. Some algae samples were also collected at these lakes. They conducted field trials of some pH kits and selected the LaMott kit for further trials with the Lake Watch volunteers. In the northern part of the state, Dr. Richard Petersen and Jody Oliver (the 1998 Lake Watch volunteer coordinator) discovered some anoxic lake bottoms

during their profiling. A check on reading Secchi disk depths gave good agreement between volunteers and coordinators. Jody presented Secchi depth summaries from June, July, and August for the Lake Watch lakes and noted decreases from past years in Diamond and Odell Lakes. Lake Watch volunteers were rewarded with T-shirts for their work, and Katherine Hayes from Lake-of-the-Woods was named volunteer of the year.

Diamond Lake

Joe Eilers began the Diamond Lake discussion by describing his analysis of a 40 cm core taken from the center of the Lake. He concluded that the core dated back to about 1870, and that sediment deposits are mostly from primary production. The peak sediment accumulation rate occurred in the late 1940's, which coincided with the previous rise in tui chub population. As efficient predators of zooplankton, the chub reduced grazing on phytoplankton, which in turn led to an increased sediment accumulation.

The Oregon Fish and Wildlife Service management plan for Diamond Lake has been consistent since 1910, when the decision was made to stock the lake with 400,000 rainbow fingerling. This addition is made in June, and by the opening of trout season the following April, these fish will have grown to 12". They are not able to reproduce in the lake so the June stocking is an annual event. Tui chub are able to out compete the young rainbow for food so when chub populations are high, the rainbows don't survive. This problem last occurred in the early 1950's and the lake was poisoned with rotenone in 1954 (see September LakeWise for details).

Tui chub are again flourishing in Diamond Lake, and the USFS is charged with preparing the Environmental Impact Statement for the proposed application of rotenone. Most objections to this action can be satisfactorily addressed. The prolonged toxicity experience in Lake Davis, CA is unlikely as a different formulation of rotenone is planned, and the 1954 application demonstrated no such problem. Lakeshore erosion during drawdown prior to the treatment, and the potential threat to breeding amphibians are considered minimal based on the 1954 experience. Secondary poisoning of animals feeding on chub carcasses is unlikely as rotenone interrupts respiration at the cellular level but does not accumulate in tissues. Fish are also far more sensitive to rotenone than are birds and mammals. Trapping the chub is not considered to be an effective solution. The one problem that has yet to be resolved is the downstream nutrient loading from decaying chub carcasses. The 1954 poisoning yielded about 32 million chub, making the idea of collecting the dead fish a formidable undertaking.

The drastic decline in the rainbow fishery is a severe economic hardship for the Diamond Lake Resort facility. Not only are there no fishermen, there are also fewer midge hatches, frogs, and diving birds.

The US Fish and Wildlife Service became involved in the plan to poison Diamond Lake when they were asked to help fund the action. The estimated cost of just the rotenone for this prescription is \$1 million. They will complete the Final Environmental Impact Statement in the Fall of 1999 and decide on the preferred alternative in January of 2000.

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Waldo Lake Status and Protection

Al Johnson of the USFS described Waldo Lake as an ultra oligotrophic lake occupying a third of its total basin. It has a maximum depth of 420 feet and commonly produces Secchi disk readings in the range of 100-125 feet. Water clarity is great enough to permit the growth of filamentous mats of cyanobacteria on much of the lake bottom.

Roads and campgrounds were established at Waldo Lake in the late 1960's, and recreation is the chief attraction for visitors. There was an intense wild fire that burned down to the north shore of the lake in 1996. Regeneration is slow in this area, and about 50 dispersed camping sites around the lake and on its islands have helped create some local revegetation. Brook trout are well established, but the kokanee and rainbow populations are declining. There is no plan to stock more fish in the lake.

A team of 20 stakeholders is in the process of developing a comprehensive management plan for the lake. Implementation of the plan is scheduled for the summer of 1999. Some features likely to be included in this plan is the trial introduction of composting toilets in the campgrounds, banning north shore and island camping, removing the Rhododendron Island pit toilet, and expanding visitor education efforts.

Outstanding Water Resources

Andy Schaedel reported on the status of the program to protect Outstanding Water Resources. This program began with the federal Clean Water Act, which

directs that high quality waters constituting an outstanding resource should be protected. Oregon adopted this provision and made it the responsibility of the Environmental Quality Commission to identify high quality waters which are outstanding state or national resources, designate them as outstanding water resources, and protect the water quality parameters that are vital to their unique characters. Rulemaking to administer this program is still ongoing. Nominations for candidate lakes will not be accepted until administrative rules are in place.

Other Lake Issues

An invitation to report news of interest generated an assortment of summaries from the audience as follows:

- Fairview Lake is expecting to see 400 new homes around its perimeter. This shallow lake is a flood control reservoir, and low water clarity to limits the growth of plants.
- Taylor Lake, near Mosier, is setting up an aeration system.
- Homeowners at Woahink Lake, near Florence, are wondering if they should be concerned about boaters using the lake to rinse their boats after use in the ocean.
- The Division of State Lands has acknowledged responsibility for weed control in "meandered" lakes.
- The use of grass carp to control weeds in irrigation canals, private ponds, and lakes less than 10 acres has been approved as a

control option. The fish must be sterile and disease free, and a means of removing them must be in place for this option to be approved.

- Secchi measurements recorded over the July 4th holiday in Ten Mile Lake demonstrated a significant decrease in water clarity in shallow areas of the lake.

Andy Schaedel closed the meeting with thanks to all for attending, and to Cell Tech for their generous help with the conference. Feedback on the conference or other OLA activities is always welcome via letter, phone call, or e-mail. ♦

President's Notes continued from page 3

- Have all Board Positions filled (Contact any Board Member)

Please let us know if you want to be involved - it is only through the energy of our members that we can accomplish something for lakes.

Lastly, our **Board meetings occur monthly** by way of a conference call on the third Tuesday from 12-1. If you are interested in participating, let me know (503-229-6121). We also do a great deal of business, brainstorming and other communication by E-mail. I will be expanding the E-mail contact list from the membership forms that you have filled out but if you are interested in getting messages sooner, please let me know of your E-mail address. I can be reached at andrew.l.schaedel@deq.state.or.us

I expect 1999 will be a great year for OLA especially with your continued involvement and support. Happy New Year! ♦

The Oregon Lakes Association is a nonprofit organization dedicated to lake protection and management in Oregon. For additional information on OLA, to get involved, or to obtain a membership application form write to:

OLA, PO Box 345, Portland, OR 97207 or visit our web site at <http://www.esr.pdx.edu/pub/ola/index.html>

Sources of Lake Pollution

Much of water sediment and nutrients that pollute lakes comes from actions people take in their homes, cities and farms. Some potential sources of pollutants include:

- Improper or illegal toxic waste sites and leaking septic tanks foul both surface and underground water resources.
- Heavy logging of forested areas and access roads produces massive soil erosion that damages rivers and streams.
- Building sites, highway construction, and other large and small-scale projects erode the soil and produce sediment pollution.
- Toxic metals and acids from mill tailings.
- Sediments from eroded cropland including agricultural fertilizers and pesticides.
- Bacteria and parasites from animal waste (including pets and wterfowl).
- Polluted stormwater from city streets and parking lots.
- Residential lawn fertilizers, herbicides, and pesticides. ♦

Lake and Reservoir Management Bill Advances

The Senate Agriculture and Natural Resources Interim Committee, under the leadership of Senator Tarno, voted unanimously to introduce a committee bill in the next legislative session to establish a lake and reservoir management program.

The Oregon Lakes Association developed the program proposal at the request of Senator Tarno. The legislation would establish a state-wide Lake and Reservoir Management Program. The program would be administered by a Center for Lakes and Reservoirs (CLR) to be established at Portland State University (PSU).

The goal of the CLR would be to enhance the efficacy of lake and reservoir management in Oregon. The program would coordinate a volunteer monitoring program, conduct detailed water quality

assessments, work with local watershed councils to develop lake management plans, and conduct management activities and research on Oregon lakes and reservoirs.

The creation of the CLR would result in better management of lakes in Oregon by identifying incipient water quality problems and assuring that these problems are dealt with in an integrated manner.

OLA encourages interested persons to contact their senator and representative on this legislation. Lake Wise will keep you updated on the progress of the legislation, however, the bill will likely be introduced early in the legislative session and prompt action is necessary. For additional information on the legislation contact Mark Sytsma (503-725-3833/ sytsmam@pdx.edu).

Lake Event Calendar

Chinese Mitten Crab Workshop.

March 23, 1999, Radison Hotel, Sacramento, Ca. The workshop will provide a presentation of life, history and biology, as well as the latest information on control efforts and research projects. For more information contact the San Francisco Estuary Project (<http://www.abag.ca.gov/bayarea/sfep/>).

Western Aquatic Plant Management Society Annual Meeting

March 24-25, 1999, Peppermill Hotel and Casino, Reno, NV (Single room rate is \$57 + tax per night). Contact Pat Thalken (916) 324-4876.

Washington Lake Protection Association Conference

April 8-10, 1999, Spokane, WA. Contact WALPA for additional information (1-800-607-5498)



Seen Any Deformed Frogs Lately?

Adapted by Susanna Breiling from the DAPTF and NARCAM Web Sites

Deformed frogs are not a new phenomenon, reports of malformed frogs date back to the 1700's; occasional, infrequent occurrences of malformations are normal. But in the last 50 years, many species of amphibians (frogs, toads, salamanders and newts) throughout the world have declined markedly in numbers. Some species have become extinct. Since 1995, reports have become increasingly common, and a number of scientists — herpetologists, developmental biologists, aquatic toxicologists, and parasitologists — are looking for the cause(s). Hypotheses abound as to the causes of abnormal amphibian development in the wild. Although amphibian populations fluctuate naturally — they depend on widely varying climatic conditions such as rainfall — several human-induced causes are also likely culprits and exacerbate the natural fluctuations. These causes operate at the local, regional, and global levels.

In many cases the declines are a direct response to the impact of human activities (such as habitat destruction or pollution) acting at a local level. However, towards the late 1980s, biologists from many parts of the world reported declines in amphibian populations in apparently pristine habitats, such as national parks and nature reserves, where local effects could not be implicated. This led to the suggestion that there may be one or more global factors that are adversely affecting amphibians.

Possible candidates for the causes of these declines and malformations:

1) An increase in ionizing radiation (UV-B) resulting from ozone layer depletion. (Field experiments, in lakes in the Cascade Mountains of Oregon, have

revealed that the eggs of Cascades frogs and Western toads are being damaged by UV-B. The depletion of ozone in the upper atmosphere is allowing more UV-B to reach the earth's surface, and this may well explain the decline of these two species).

2) Chemical contamination: the oestrogenic effects of pesticides, acid precipitation, or the effects of fertilizers, insecticides, herbicides and manufacturing byproducts added to the environ-



ment by humans. (Biologists in Quebec have found a higher rate of malformed amphibians in areas with a history of pesticide use compared to sites not known to be exposed to pesticides. And studies have found that some insecticides mimic a growth hormone that may cause amphibian embryos and larvae to develop abnormally.) However, other scientists argue against the chemical hypothesis, maintaining that no new pesticides, herbicides, or fertilizers have been introduced extensively in the past two years, when malformation reports suddenly increased.

3) Introduction of exotic competitors and predators.

Bullfrogs are voracious predators

on native frogs and other amphibians. Aquatic weed infestations can alter water quality and degrade habitat.

4) Pathogens. Some amphibian populations are being adversely affected by disease. Relatively little is known about disease in wild populations of amphibians. However, it seems likely that environmental stress may reduce the ability of amphibians to resist disease. There are also suggestions that some amphibian diseases are being transmitted trans-continently by movements of tropical fish and exotic animals for the pet trade. This hypothesis needs further investigation. In addition, there is evidence that a naturally occurring parasite can alter limb development in amphibians

Separating out the potential causes is difficult, since the factors may interact and the potential causes are many. The possibility that malformed amphibians indicate a greater environmental problem is currently a real concern. Without understanding all possible causes of malformed amphibians in the wild, we do not know for certain whether human health is also at risk. Currently, there are few solid data on the causes of amphibian malformations, and even the extent of the problem (e.g., the rates of malformations and the full geographic range) is not well understood. Although several biologists in North America are focusing their research on the amphibian malformation phenomenon, the lack of long-term data hinders their ability to detect trends and draw sound conclusions. Furthermore, common themes among sites where malformations occur may not be apparent without samples that cover a wide area of the continent. Therefore a Reporting Center has been designed to

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help overcome these problems.

The North American Reporting Center for Amphibian Malformations (a project of the Northern Prairie Wildlife Research Center of the U.S.G.S.) is a web designed for people to report sightings of amphibian malformations in North America. If you have observed malformed amphibians, or if you have handled a number of wild amphibians but not noted any abnormalities, we urge you to report your sightings by going to <http://www.npwrc.usgs.gov/narcam>. The data gathered at this Web site will help inform the public, offer a resource to scientists investigating malformations, and provide key information to land managers.

This web site has an amphibian identification guide, shows you what the malformations look like, where they have been reported, the species affected in your area, and how to submit your own report.

The effectiveness of compiling these data depends on accurate reports — reports of both malformed and normal amphibians. If you would like more information about amphibians, malformations, or if you have seen any deformed frogs in your area, visit this website. If appropriate, they will inform a herpetologist or wildlife biologist in your area who could do a follow-up survey and collect additional data at the site you visited. ♦

Species that have been reported with malformations

Northern leopard frogs, wood frogs, bullfrogs, green frogs, mink frogs, gray treefrogs, Pacific treefrogs, spring peepers, American toads, long-toed salamanders, tiger salamanders, and spotted salamanders.



The Declining Amphibian Populations Task Force (DAPTF) has written a Code of Practice, guidelines for use by anyone conducting fieldwork at amphibian breeding sites or in other aquatic habitats. Amphibian pathogens and parasites can be carried in a variety of ways between habitats (on the hands, footwear or equipment of fieldworkers). Therefore, it is important for those involved in amphibian research (and other types of wetland/pond studies) to take steps to minimize the spread of disease agents and parasites between study sites. For the fieldwork code of practice or further information see the DAPTF Web Site: http://www.open.ac.uk/OU/Academic/Biology/J_Baker/JBtxt.htm or email DAPTF@open.ac.uk

Aquatic Plant Scholarship Announcement

The Western Aquatic Plant Management Society (WAPMS) has initiated a scholarship program to support students in their pursuit of a degree in aquatic sciences. WAPMS is a professional and scientific society of western aquatic plant managers and scientists. Members include research scientists, aquatic vegetation managers, agency personnel, and industry interested in all aspects of aquatic plant biology, ecology, and management.

We would appreciate your help in alerting students to this scholarship program. WAPMS will present one \$500-scholarship in 1999. Scholarship funds may be used by the recipient to

cover costs associated with education and/or research expenses. Eligible applicants must be enrolled as a full-time undergraduate or graduate student in an accredited college or university in the western United States. Course work or research in an area related to the biology, ecology, or management of aquatic plants in the West is also required. The guidelines for applying are described below.

All scholarship applicants will receive a one-year membership in WAPMS and a waiver of registration fees for the 1999 meeting in Reno. The scholarship recipient will be invited to make a presentation at the annual meeting in 2000.

All application materials must be received by the WAPMS Scholarship Program Chair by January 31, 1998. Announcement of the scholarship winner will be at the WAPMS annual meeting in March 1999. For the application procedure see the September Lake Wise issue or contact:

Dr. Mark D. Sytsma,
Environmental
Sciences and
Resources,
Portland State
University,
Portland,
OR 97207-0751
Phone: 503-725-3833
email: sytsmam@pdx.edu ♦



New Year's Resolution: Let's Clean Up Our Water

*Adapted from the Natural Resources Defense Council (NRDC) WebPage
<http://www.nrdc.org/howto/wasave.html>*

New Year's Resolutions are forming in our minds, and as we think of how we want to better our lives, let's think about the little things that we can do that mean a lot to our environment. Much has been done in the past twenty-five years to clean up our waters, but there is much more still to do.

Cleaning up contaminated waters is expensive and, in some cases, extremely difficult. Preventing pollution problems is much less expensive. The good news is there are many things you can do -right now in your own home and backyard- to help reduce contaminated runoff... and clean up and conserve our waters.

10 simple actions to help stem the tide of polluted runoff.

IN YOUR HOME...

1. Wash with phosphate-free, low-phosphate, or biodegradable soaps, detergents, and shampoo. Phosphates stimulate the growth of algae, which can suffocate fish and other wildlife in lakes and waterways. If your local store does not carry phosphate-free products, ask them to do so.

2. Keep paints, used oil, solvents, and other household chemicals out of drains, sinks, and toilets. Ask your local government where household hazardous wastes can be disposed of safely. If a local collection service for household hazardous wastes is not available, ask for one.



3. Recycle and

dispose of all trash properly. Never flush non-degradable products -- such as disposable diapers or plastic tampon applicators -- down the toilet. These products can damage the sewage treatment process and end up littering beaches and waters.

4. Use nontoxic household products where available, and ask your local stores to carry them where they are not. Read labels carefully before you buy.

5. Use efficient plumbing fixtures. A whopping 40 percent of the pure water you use in your home is flushed down the toilet. Toilet dams or just adding bricks to your toilet tank can save an average family four gallons of water per flush -- and up to 13,000 gallons per year! And low-flow toilets use a fraction of the water used by conventional toilets. Showers account for 32 percent of home water use. Install a low-flow shower head and you'll save water and money on your hot water bill.

6. Repair leaking and dripping faucets as soon as possible. A dripping faucet can waste up to 20 gallons of water per day; a leaking toilet up to 200 gallons per day.



IN YOUR YARD...

7. Test your soil to determine how much fertilizer is necessary for your yard, garden, or farm. Use lawn fertilizers sparingly, and only when needed. Avoid using toxic pesticides and herbicides on your lawn and garden -- these chemicals can pollute rivers, lakes, and groundwater. Use natural fertilizers, such as compost or

manure. Ask your local hardware and garden stores to stock them.

8. Recycle used motor oil. A single quart of motor oil poured onto the ground can seep into groundwater and pollute 250,000 gallons of drinking water. Do not pour oil or other chemicals down storm drains, where they often flush directly into your



favorite river, lake, or bay. Many communities offer places to recycle used motor oil. If you don't have a place to recycle used motor oil in your community, ask your local government to create one.

9. Improve drainage around your home and in your yard, to keep runoff out of storm drains by filtering slowly into the soil. Avoid landscaping with hard surfaces, such as concrete. Instead, select vegetation, gravel, or other porous materials. Redirect rain gutters to your lawn...or to collection barrels for watering your garden.

10. Maintain septic systems properly. Monitoring and cleaning your system regularly protects your groundwater and surface water, and saves money by prolonging the life of the system. Help stem the tide of water pollution. ♦

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Fresh Water, by C.E. Pielou. 1998. University of Chicago Press, Chicago. 275 pp. ISBN 0-226-66815-0. Price: US\$24.00. Order through the university of Chicago Press. Fax: (773) 702-9756. <http://www.press.uchicago.edu/>

Fresh Water describes the "natural history" of water. In twelve chapters this book follows the water cycle and all its stages. Rivers, lakes, underground and soil water, water in plants, frozen water, and water in wetlands, are all subjects covered in this book.



A Guide to the Restoration of Nutrient-Enriched Shallow Lakes, by B. Moss, J. Madgwick and G. Phillips. 1996. 180 pp. Order over the internet from Natural History Book Service (England): <http://www.nhbs.co.uk/index.html>. ISBN #: 0-948119-29-2. Paperback. About US\$30.

This is an instruction book whose purpose is to present real-world and reliable step-by-step accounts of how to restore shallow eutrophic lakes. It emphasizes successful experiences in the UK, Denmark, The Netherlands and Sweden. If you want a guide to restore severely damaged shallow lakes try this well-organized guide.



Books to Swim Into

Bull Run - A World Treasure is a compilation of articles about a unique treasure in Oregon - the Bull Run and Little Sandy watershed near Portland. These rivers and their ecosystems may be unique in the world today because for many years they had protection from human entry by the federal 1904 Bull Run Trespass Act. Federal laws are now forming that will lead to contamination of this pure water source. The articles in this report inform the readers about the past, present and possible futures of Bull Run. Inform yourself about the history of this supply of drinking water for the City of Portland. To order a copy (\$15 contribution) write to: Bull Run Interest Group, 2006 S.W. Sunset Blvd., Portland, OR 97201.



A new report, "**Nonpoint Pollution of Surface Waters with Phosphorus and Nitrogen**", presents a look at the problems caused by nonpoint pollution and the possible solutions. The report is the third in the Ecological Society of America's "Issues in Ecology" series. To order copies, contact esahq@esa.org, or download either a summary or the complete version for free from <http://esa.sdsc.edu>.

This report discusses the biggest contributors of nonpoint source pollution. It focuses on the effects of excess phosphorus and nitrogen on aquatic life and it lays out several steps that can be taken to help ease



nonpoint source pollution in both rural and urban settings.



Oregon's Living Landscape: Strategies and Opportunities to Conserve Biodiversity. OSU Press. \$29.95 + shipping. Call OSU Press at (541) 737-3166 or Defenders of Wildlife at (503) 697-3222 to order a copy.

This 232-page full color atlas and narrative is the centerpiece of a four-year effort by the Oregon Biodiversity Project. It is a mix of geography and conservation biology, technical analysis and common sense recommendations. Written for non-technical readers, Oregon's Living Landscape is a comprehensive overview of historic habitat changes and current conservation challenges.



Stewardship Incentives: Conservation Strategies for Oregon's Working Landscape. \$10 (including shipping). Order from Defenders of Wildlife (503) 697-3222.

This 138-page report addresses a broad range of incentive options for private landowners, public land managers, educators, policy-makers and conservationists. It also provides management guidelines for all of Oregon's major land uses - agriculture, forestry, developed lands, recreation lands, roads, utility corridors, and others. ♦

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Lake Wise is available in alternate format (e.g., large type or braille) by contacting PSU Environmental Sciences and Resources.



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PSU Lakes and Reservoirs Program
May 1999 be a wonderful year for all!



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Do you have any funny anecdotes, poems or ruminations about lakes? Are there concerns about your lake that you would like to see printed in the newsletter? Maybe you would like your lake featured in Lake Wise.

If so, please contact Susanna Breiling at (503) 525-0037, or via email: breiling@worldnet.att.net. I would love to hear all your concerns, ideas, suggestions and lake stories! The deadline for the next newsletter is February.

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