PORTLAND STATE UNIVERSITY

LAKE WISE

August 1997

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

Lake Watch News

by Jody Oliver

By now all of you should have received your copy of the 1996 Citizen Lake Watch report – if you haven't please let me know. We were late in getting started this year, and once we did get going it has been challenging to keep up with all the active volunteers.

Mid-June, I sat down to develop a summer travel itinerary, with the intent of visiting every volunteer involved in the program for training and to get to know the concerns and problems at each lake. I began my travels with a trip to the northern Oregon Coast in late June and since then, haven't been home for more than three days in a row. This busy travel schedule has been successful though, as I have visited nearly all the Citizen Lake Watch volunteers. Siltcoos Lake and Hosmer Lake are still on my list and I plan to visit those lakes within the next couple of weeks.

As I think back over this busy

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Oregon Lakes Association
POB 345, Portland OR 97207
http://www.esr.pdx.edu/pub/ola/

Western Regional Panel Meets at PSU

Portland State University was the site of the initial meeting of the Western Regional Panel (WRP) called for by the National Invasive Species Act (NISA) on July 8 and 9, 1997. NISA authorizes funds for addressing aquatic nuisance species problems, such as aquatic weeds, green crabs, and zebra mussels. The WRP will implement NISA in the western U.S. The meeting was attended by representatives from tribes, 19 western states, four Canadian provinces, Guam, industry, state and federal agencies, and environmental groups. Over 90 people attended the meeting. Oregon was represented on the panel by Greg McMurray, from DEQ.

On the first day of the meeting, Representative Terry Thompson provided opening comments and welcomed the attendees to Oregon, and then invited speakers with international reputations provided background on aquatic non-indigenous species invasions, impacts, and management on the first day. John Chapman, Hatfield Marine Science Center, made a presentation on impacts of non-indigenous species on estuaries and Dennis Isaacson, Oregon Department of Agriculture, talked about *Spartina* impacts and management. On the second day the WRP was organized, a work plan developed, and officers nominated.

Federal, State, and At-large Co-chairs of the WRP will be elected by a mail-in ballot. Mark Sytsma, Portland State University, was nominated for At-large Co-chair of the WRP. Three committees were formed: Management/ Research, Policy/Legislation , and Education/Outreach. John Chapman and Scott Smith, Washington Department of Fish and Wildlife, were elected Co-chairs of the Management/Research Committee; Kathy Hamel, Washington Department of Ecology, and Jodi Cassel, California Sea Grant, were elected Co-chairs of the Education/Outreach Committee; and Jon Sjoberg, Nevada Division of Wildlife, was elected Chair of the Policy/Legislation Committee. Contact Mark Sytsma (503-725-3833) for additional information.

Inside this issue

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.

Blue Lake : Koren Marthaller

Clear Lake: Elmer Waite

Cullaby Lake: Janette Goolsby

Devils Lake: Barbara Hagerman, Al Rice, Bill and Lorretta Vaughan

Fern Ridge Lake: Natasha Okonoji, Richard Locke, Cindy Thieman, James Bruvold, Lee Eggers, Randy Wilson, Todd Yokum

Fishhawk Lake: Jack Jenkins

Garrison Lake: Don Martin

H. Hagg Reservoir: Wally Otto

Hosmer Lake: Max Peel

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: John Milandin and family

Penland Lake: Lee Bogle

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

Sunset (Neacoxie) Lake: Lee Smith

Tenmile Lake: William Emblen

Thornton Lake: Henry Pollak, Jack White

Woahink Lake: Bob Anderson

Lake Watch News continued from page 1

summer, I am reminded of so many wonderful visits. My first lake visit was with Lee Smith at Sunset Lake and we spent the entire morning together; after visiting the lake (and ironically, meeting someone from my very small hometown in Eastern Oregon), we toured the garden, drove on the beach, and talked for several hours over milk and cookies. When it was time for me to depart for my next meeting, with Janette Goolsby at nearby Cullaby Lake, I was surprised to walk outside into rain; Lee and I had been so busy talking, I hadn't noticed that it had begun to pour. Consequently, my meeting with Janette was a very short and very wet one. Luckily, that was the worst weather I saw for any of my visits, as I was blessed with beautiful weather for most of the others.

My next trip took me to several lakes near Portland. First, I toured Blue Lake with Koren Marthaller, then on to Hagg Reservoir where I was given a complete tour of reservoir and dam by the reservoir superintendent and CLW volunteer, Wally Otto. I climbed down some very long ladders to go inside the dam and then through a long, wet tunnel to wind up beneath the water. It was a unique visit and quite an adventure!

Another time, I drove to Fishhawk Lake to spend the afternoon with Jack Jenkins and his family. My tour of the lake included looking for pirates and alligators with his daughter. We then went back to the safety of the cabin and enjoyed barbecued chicken and an infamous batch of ginger-flavored beans.

My travels have taken me to the Florence/Reedsport area six times, so far, and I am beginning to think I could make that drive in my sleep. Once there, however, I have had some fabulous visits and lake tours: wildlife viewing with Frank Gray and Dan Jordan at North Tenmile, homemade cookies and a tour of the weed problems with Bill Emblen and John Kelsey at both Tenmile lakes, looking at examples of Roy Fisher's beautiful stained glass windows at Munsel, a windy ride around Mercer with Ron Boehi, and a very informative and fun tour of Woahink with Bob Anderson. Up the coast a bit, I visited Richard Kaufman and his dog at Loon Lake and Elmer Waite and the lakeside cat at Clear Lake. A few days later, I traveled back to Reedsport to attend a monthly meeting of the Siltcoos volunteers; what an organized and energetic group. I did venture from this area a few times to visit the Milandin family and eat blueberry pancakes at their resort on Odell Lake, to get a rowing lesson from Jack White at Thornton Lake, and to visit Don Martin at his unique coastal lake (where occasionally ocean waves

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Waldo Lake News

by Avis Newell, ODEQ

Waldo Lake has been the subject of increasing attention over the past year. Doug Larson and John Salinas have studied the lake for several years and in a report released in December, 1995, suggested that the lake is becoming more productive.

Many of you are volunteers who measure secchi depth in your local lake — as the lake becomes more cloudy with algae, the secchi depth decreases. That is one indication of increased productivity. Secchi disk depths have not decreased in Waldo Lake, but a more sensitive measure of productivity does suggest increased productivity. You may recall that plants use the sun's energy to make sugars from carbon dioxide and water. Scientists have a way to measure the uptake of carbon, and use this as an indication of primary production, or plant activity. The results of such carbon uptake study done in the early 1990's suggested that productivity increased 10-fold over what it was in the early 70's.

Waldo Lake is considered the "purest" Oregon lake. This is based on the clarity of the water, which is similar to Crater Lake, and to the very low dissolved solids, or salts in the lake water. Specific conductance is a way of measuring the total dissolved salts in water. Pure water will not conduct electricity, while sea water, high in dissolved sodium and chloride, conducts electricity relatively well. The purity of distilled water is often measured by conductance, and is usually considered acceptable for analytical use when it is below 1 microSieman. Waldo Lake conductance has been measured as low as 3 microSiemens, and is always below 10. In Contrast, Crater Lake conductance is about 110, brackish estuarine water is over 4000, and ocean water is even higher. More recently, other lakes in Oregon and across the US have been discovered to have extremely low conductivity as well, so Waldo Lake is not alone in this characteristic. However, by surface area, Waldo is the second largest lake (Upper Klamath Lake has greater surface area 61,543 acres compared to Waldo's 6298 acres), and it is the second deepest Oregon Lake (420 feet compared to the 1932 foot depth of Crater Lake). These characteristics, and its location adjacent to a wilderness area, make it a very important resource to protect.

In view of the Larson and Salinas' study results, the US Forest Service asked DEQ to review their management plan for Waldo Lake. The biggest change in Waldo Lake use between 1970 and the present time, has been the construction of a road along the eastern shore of the lake, with three high volume Forest Service campgrounds along the access road. Visitor use has increased from 18,700 in 1971 to 144,000 in 1992, nearly a ten-fold increase in human use of the lake for recreational purposes. The campgrounds' sanitary facilities consist of onsite systems, constructed in the early 1970's. The soils surrounding Waldo Lake are very porous, and likely allow nutrients to move quickly through the soils. The large increase in use can easily be suspected to deliver higher nutrient levels to the lake. In light of this probable cause, DEQ has made recommendations to test the onsite system function, and to replace the pit with vaulted toilets.

The US Forest Service is taking action on some of these suggestions right away, and is hoping for federal funds to execute a long-term management plan as well. The Forest Service is closing the campground and pit toilet on Rhododendron Island, closing pit toilets in the campgrounds until fall, when the other facilities will be closed, and closing the RV dump stations in the campgrounds. They are also implementing an education program this year, teaching campers and boaters to use lake-friendly practices. Future plans include a full evaluation of the on-site facilities (septic systems), replacing all pit toilets with vaulted toilets, and potentially replacing the onsite system with holding tanks so wastes would be periodically removed for treatment elsewhere. In addition, the Forest Service hopes to establish a long-term monitoring program for the lake.

Another issue in Waldo Lake has been the impact of fish stocking in the lake. Waldo Lake, originally fishless, has been stocked with salmonids most years between 1939 and 1990. As you can imagine, the high clarity and pure nature of Waldo's water make food a scarce commodity for fish, so stocking efforts have not resulted in large numbers of naturally reproducing fish. However, Brook and Rainbow trout and Kokanee salmon do have surviving populations in the lake. While numbers of these fish are low, the fish are in remarkably healthy condition.

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Threats To Water Resources From Climate Change

WASHINGTON, DC -- While climate change may have a wide range of adverse impacts on global water resources, a bigger threat to the future availability and use of water may come from other factors, such as population growth, technology, and economic, social and political conditions, according to a new issues brief published by Resources for the Future (RFF).

Authored by RFF's Kenneth Frederick, the issues brief, "Water Resources and Climate Change," is part of RFF's series of policy briefings on key issues in the debate over global climate change. It can be downloaded on the internet at http://www.rff.org/issues/home.htm ."Even in the absence of climate change, there is cause for concern today over the adequacy of our water supplies," Frederick says. "Demands are outpacing supplies, water costs are rising sharply, and current uses are depleting or contaminating some valued resources. Climate change has the potential to either aggravate or alleviate an area's water situation. On balance, however, the impacts are likely to be adverse because the existing water infrastructure and uses are based on an area's past climate and hydrology."

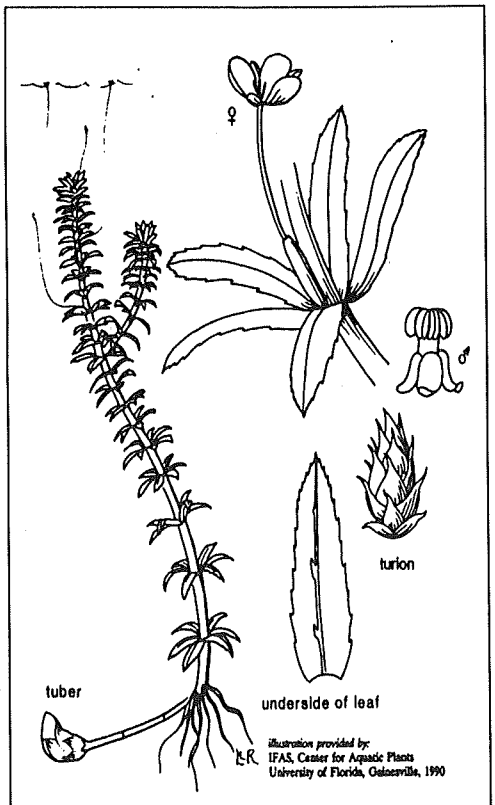
In his paper, Frederick outlines the possible impacts of climate on water supplies, including its implications for regional uncertainties, sea levels, and carbon dioxide effects. He starts by reviewing the most recent scientific assessment by the Intergovernmental Panel on Climate Change, which suggests that global warming will have a wide range of effects on water resources. These effects include: an increase in precipitation, especially in higher latitudes; higher rates of evapotranspiration (water which evaporates from the surface and is transpired from plants), which may lead to reduced runoff and a reduction in renewable water supplies in some areas; more intense precipitation events and heavy rainfall days; and more frequent and severe flooding and droughts in some areas.

"Uncertainties as to how the climate and hydrology of a region will change in response to a global greenhouse warming are enormous," Frederick says. He notes that one of the more likely impacts, however, is in areas such as the western United States where precipitation is largely in the form of winter snowfall and streamflow largely comes from spring and summer snowmelt. Gradual warming in areas like this would likely result in a distinct shift in the relative amounts of snow and rain and in the timing of snowmelt and runoff. The resulting changes in runoff patterns could greatly increase the likelihood of flooding and reduce the availability of water during the spring and summer periods of peak demand for irrigation water.

Frederick also discusses the possible impacts of climate change on the various demands for water. These include: irrigation; domestic uses (water used for showering, watering lawns and gardens, etc.); industrial uses (water used for processing, washing and cooling in facilities that manufacture products); thermoelectric power uses (water used for cooling to condense the steam that drives turbines in the generation of electric power with fossil fuels and nuclear or geothermal energy); and instream water uses (water used for hydroelectric power generation, navigation, recreation, and ecosystems).

As decision makers prepare for domestic policy debates and the ongoing international negotiations under the Framework Convention on Climate Change, RFF's climate issues briefs provide topical, timely, and non-technical information and analysis. They are intended to integrate the various aspects of climate change with critical reviews of existing literature and original research at RFF on climate policy, energy markets, agriculture, water and forest resource management, technological change, air pollution, and sustainable development.

For additional information contact Michael Tebo (202-328-5019/ tebo@rff.org) with Resources for the Future.



If you see this plant, please call the
Hydrilla Hotline:
(503-986-4621)

Where Have All the Frogs Gone?

According to a recent news release from the U.S. Geological Survey (USGS), U.S. and Canadian residents are being asked to report sightings of both normal and malformed frogs, toads, and salamanders that are encountered during hikes, fishing, and other outdoor activities. Deformities, such as misshapen, extra, or malformed limbs, have been reported with increasing frequency in the past few years. Amphibians may provide early warning signals for changes in the environment that may be important to human and ecosystem health. To assist scientists in collecting reports the USGS and the U.S. Environmental Protection Agency are funding the North American Reporting.

A worldwide decline in amphibian populations has raised concern. Causes of the decline are unknown, but some evidence suggests that parasites and u-v radiation are contributing to the problem. Relatively little is known about disease in wild populations of amphibians, however, environmental stress may reduce the ability of amphibians to resist disease. There are also suggestions that some amphibian diseases are being transmitted trans-continentally by movements of tropical fish and exotic animals for the pet trade.

Center for Amphibian Malformations (NARCAM), an Internet Website maintained by the USGS Northern Prairie Science Center in Jamestown, N.D. The Website <http://www.npsc.nbs.gov/narcam> provides background information on amphibians, photographs of deformed frogs, and sources of additional information.

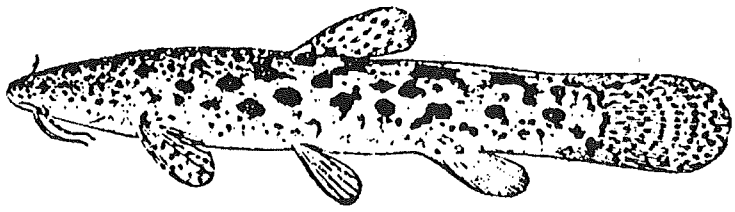
Exotic Fish Found

An unusual catfish, tentatively identified as *Nematogenys inermis*, has been found in the Burlington Bottoms area of the Multonmah Channel northeast of Portland. Oregon Department of Fish and Wildlife collected the fish in western pond turtle traps in the area. The tentative identification is based upon examination of one dead specimen, which had been partially consumed by scavengers.

N. eneris is native to rivers in Chile, and is in the *Trichomycteridae* family – the Parasitic Catfishes. The species is the only member of the genus, and is the most unspecialized member of the family. The body is elongate, with a strongly compressed caudal peduncle. The head is covered with soft skin. The eyes are very small. Three pairs of barbels are present. The dorsal fin is short-based, located in the middle of the body length above the ventral fins, and has no spine. The pectoral fin does have a spine. There is no adipose fin, and the caudal fin is short and rounded.

N. inermis is carnivorous and occupies the deep water of slow-moving rivers. The captured specimens were approximately 4 inches long.

The potential impact on native fish and mechanism of introduction is unknown at this time. Ballast water and the tropical fish trade have been suggested as possible modes of introduction.



Nematogenys inermis

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had a fun and unique experience at each lake and made many new friends. You are a very interesting and diverse group, with at least one common thread—concern for your lakes.

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The lake drawdown required for the rotenone treatment will require a permit from the Umpqua National Forest to allow ODFW to lower the lake level. The Forest Service will begin the environmental analysis called for under the National Environmental Policy Act in October. The analysis is expected to take one year.

GWEB Continues Funding for Watershed Projects

by Ian Sinks, J.D. White, Inc.

The Governor's Watershed Enhancement Board (GWEB) recently awarded almost $5.5 million of a $21 million budget to 104 projects aimed at restoring and enhancing Oregon's watersheds. Applications for this grant funding were submitted to GWEB this past February by local governments, watershed councils, conservation districts and private citizens. The approved projects comprise a variety of efforts from around the state including the development of watershed management plans, stream rehabilitation, watershed coordinator positions, educational material development and watershed guides.

GWEB was created in 1987 by the Oregon legislature in response to concerns over the continuing loss of water quality and quantity in Oregon's streams and degradation of fish habitat, forests and rangelands. The board, composed of ten state resource agencies and the Governor's Office, was initially tasked to promote watershed health by providing grants for demonstration projects. In 1995, the legislature expanded the GWEB program to, among other things, include elements of the Watershed Health Program and to recognize the importance of local citizen councils or watershed groups in accomplishing the objectives of watershed health. The emphasis of the Board is to foster ecosystem- and community-based watershed management by serving as a source of grant money for "projects that demonstrate both innovative and established restoration and enhancement techniques." Funding for GWEB-sponsored projects is made available from the state General Fund.

There are three primary functions which GWEB seeks to serve:

- To provide technical assistance for watershed enhancement projects.
- To administer grant funding for projects to demonstrate the benefits of watershed health.
- To promote public education and awareness about watershed enhancement and health.

GWEB is switching from a single application and award date per year to a biannual review schedule where applications can be submitted at any time. Applications require a detailed description of the proposed project. To be eligible for funding, a project must demonstrate sound principles of watershed management, utilize methods appropriate and adapted to local conditions, and all projects must comply with federal, state and local laws and land use planning goals. 1998 application packets should be available in September from the GWEB office in Salem or from any of the participating resource agencies. Criteria for evaluating grant applications are provided in the packet and are divided into the following project categories: watershed improvements, education, watershed assessment and action plans, and watershed monitoring.

A critical element for any application to GWEB is that projects have organized and committed support from a watershed group, an agency or organization, or from the individual landowner. Preference is given for projects that have matching funds available, but It is not necessary. Contributions of volunteer labor will greatly enhance the value of the project as GWEB seeks to involve as many people as possible in statewide watershed efforts. Watershed councils provide this long term involvement and present opportunities to bring together local stakeholders from a variety of interests. The partnerships these councils form are proving to be an effective means to address the expanding issues related to the protection and health of Oregon's watersheds. The use of local partnerships also ensures that long-term planning goals and monitoring efforts are established.

This year, the OLA annual meeting will provide participants with an opportunity to learn more about the GWEB program and to speak with GWEB staff. The hope is that this information can be utilized by OLA members to develop their own 1998 grant applications.

Information and application packets are available from the GWEB office: *255 Capital NE, Salem, Oregon 97310-0203, or phone (503) 378-3589.*

GWEB Funds Aquatic Weed Project

The Governor's Watershed Enhancement Board (GWEB) has funded a project that will aid local governments and lake association develop integrated management plans for aquatic weeds.

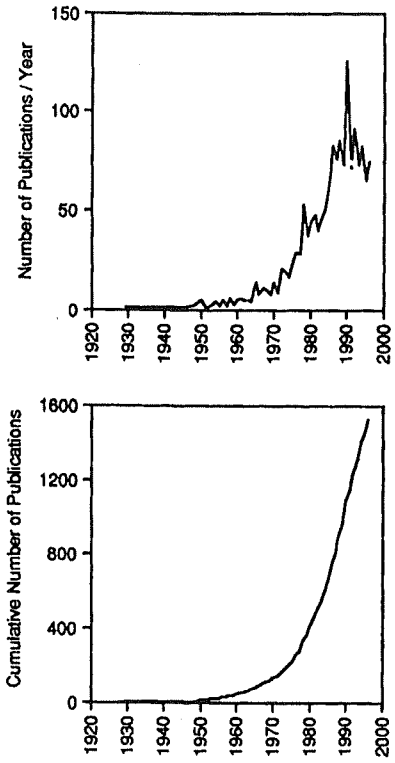
Dr. Mark Sytsma, at Portland State University, will develop a guide book that will provide step-by-step instructions on how to develop aquatic weed management plans. Dr. Sytsma will work with lake associations and watershed councils at Smith Lake, Cullaby Lake, and Tenmile Lakes to test and refine the guide book, which will then be distributed by OLA.

Bibliography of Fish Effects

Field surveys and experiments conducted over several decades have shown that fish can directly or indirectly affect virtually all biological and chemical components of lake ecosystems. Despite the publication of several excellent reviews and books on aspects of fish effects, a comprehensive bibliography has not been available.

Dr. Ray Drenner, a professor at Texas Christian University, has recently compiled and installed on his home page a 1500-reference bibliography on the effects of fish on lakes (http://www.bio.tcu.edu/bio/drenner.html). The bibliography covers a wide range of topics including: feeding behavior and selectivity of freshwater fish; factors controlling prey availability and fish feeding rates; niche partitioning and competition; effects of fish removal for renovation of fish communities; fish polyculture; effect of species introductions; biomanipulation; and direct and indirect effects of fish on physical, chemical, and biological components of lakes. The literature published on this ecologically important topic has grown rapidly since 1960 (see figure to the right). The bibliography is organized by year of publication, and then by author, to give users a sense of how the field has developed and changed through time. It is hoped that this bibliography will assist new researchers to find their way into this large literature.

From: Bulletin of the Ecological Society of America. Vol 78, No. 3 (July, 1997).



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wash over the sand and into Garrison Lake).

I have been very lucky in most of my trips. Though I was late a time or two due to construction, I only got lost once; would you believe that this Eastern Oregon girl made her way without a hitch to all the lakes, except the one closest to her hometown. I was supposed to meet Lee Bogle at his cabin on Penland Lake; he even sent me a map that was to take me to his front door. Though I did find this remote lake, I was never able to find his house and there were no phones to use or neighbors to ask. However, in driving around on every road but the correct one, I did see some beautiful scenery and several deer.

My next trip took me all the way down to the Klamath Falls area to visit Lake of the Woods. Catherine Hayes told me to come in the daylight, as it was not an easy lake to find; she had to talk Stephanie Weise in by cell phone on her visit last summer. Following her advice and being a bit timid by my getting lost at Penland Lake, I left Portland early. Fortunately, I found the lake and cabin with no problem. When I arrived, I learned that Catherine had recruited a new helper, Kathy Wallis. Later, the three of us, along with Catherine's husband, enjoyed a wonderful meal and conversation,while watching a beautiful pink sunset over the lake; this was followed by a two hour lightning storm. What a spectacular show! We awoke the next morning to a smooth and glassy lake upon which to do our tests. It couldn't have been more perfect.

I want to thank all the people I have met with this summer for their warm welcomes and friendly smiles. I

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Diamond Lake Assessment Begins

Fishing for rainbow trout in Diamond Lake has declined since the tui chub, was introduced into the lake from the Klamath Basin. The popular fishery at Diamond Lake depends upon annual stocking of trout.

The lake and surrounding area are managed by the U.S. Forest Service; the Oregon Department of Fish and Wildlife manages the fish populations in the lake. The Oregon Fish and Wildlife Commission has directed ODFW to restore fishing for rainbows in the lake by using rotenone, a fish-killing chemical, to remove all fish from the lake, including the tui chub. The treatment is expected to cost $1.1 million. The earliest anglers can expect a restored fishery in the lake is two years after treatment.

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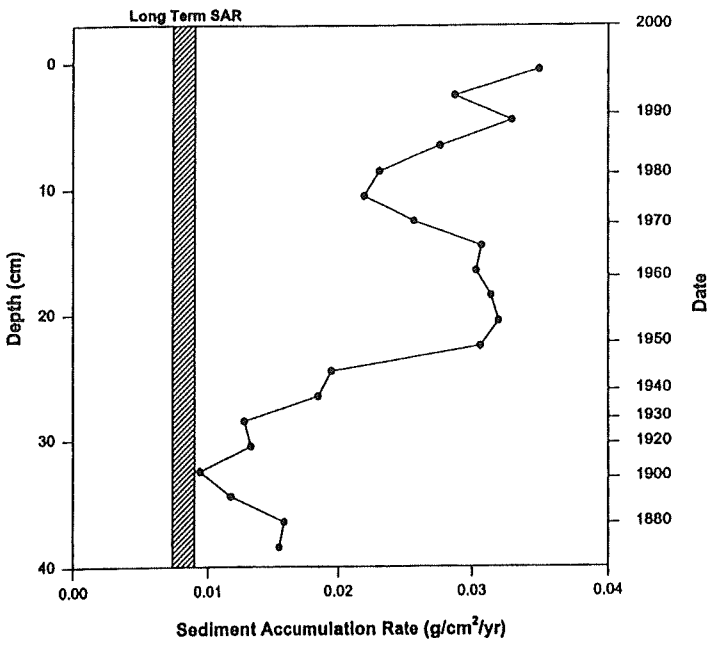
Probing the Past in Diamond Lake

by Joe Eilers, E&S Environmental Chemistry

Diamond Lake, located north of Crater Lake, is known by many as a premier vacation spot in the Oregon Cascades. For much of this century the 3000-acre lake has been one of the most productive trout fisheries in the state. Diamond Lake has an active history of fisheries management and recreation development throughout the 20th century. Most recently, the trout population has experienced a major decline as a consequence of the inadvertent reintroduction of the tui chub. The chub also were abundant in the lake in the 1940's and were finally poisoned with rotenone application in 1954. Currently, the Oregon Department of Fish and Wildlife is considering another rotenone treatment, along with other options for dealing with the declining trout population.

The Umpqua National Forest, the federal land manager for Diamond Lake, is attempting to develop a scientific basis for managing the lake. One of the first steps taken by the Forest Service was to compile information on previous studies of the lake and to establish a water quality monitoring program, which was conducted by John Salinas and Doug Larson. A second step was to reconstruct water quality changes in the lake by studying the composition of the sediment accumulated on the lake bottom over the past 130+ years. This sediment study, conducted by E&S Environmental Chemistry, Inc. of Corvallis, is nearing completion and is yielding some surprising results. By dating the sediment using a naturally-occurring lead isotope (^{210}Pb), the investigators were able to show that the rate of sediment accumulation in the lake is three to four times greater than the long term sediment accumulation rate (see Figure). The early increases in sediment accumulation from 1910 to 1950 were strongly linked to erosion from the watershed using titanium as an indicator of erosion. The most recent increases in sediment accumulation (1980-present) are more strongly linked to increases in lake productivity from algae and perhaps aquatic macrophytes.



Other analyses of the sediments reveal a general increase in lake fertility, or productivity. The results of the diatom (a class of algae with external silicon "shells" that are preserved in the sediments) analysis show that the lake became significantly more eutrophic - judging from a shift in the species of diatoms present. Some species such as *Fragilaria crotonensis*, which is indicative of eutrophic conditions, represented only 3% of the diatoms in 1905, but by 1929 *F. crotonensis* represented over half of the diatoms. The diatom species present are now overwhelmingly planktonic species, whereas at the turn of the century there were considerably more benthic species, suggesting that the lake was more transparent prior to development.

Although some of the nutrients can move through the sediments independent of their original rate of deposition, the overall pattern suggests that the carbon, nitrogen, and phosphorus deposition to the sediments also have increased greatly in the 20th century. The pattern in sediment accumulation rate and changes in water quality inferred from the diatoms coincides closely with the history of lake shore development. The lake was virtually undeveloped in 1900 and now supports a major resort, several hundred Forest Service campsites, and 102 private summer homes. Attempts to reduce the input of nutrients into the lake by collecting and diverting treated sewage outside the watershed have been partially successful. However, man-caused sources of nitrogen and phosphorus continue to enter Diamond Lake and are expected to contribute to an elevated rate of sediment accumulation. The role, if any, played by fisheries management in contributing to the changes in water quality in Diamond Lake remains a tantalizing question.

For further information on the Forest Service-sponsored research on Diamond Lake, please contact Mikeal Jones, Umpqua National Forest in Roseburg at 541-672-660, or the senior author of the sediment study, Joseph Eilers, E&S Environmental Chemistry, Inc. at 541-758-1330.

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In 1991, the Waldo Wilderness Council threatened to file suit that fish stocking was violating the Clean Water Act. They based the lawsuit on the premise that fish stocking was increasing nutrient concentrations in the lake, which in turn threatened the ultra-oligotrophic status of the lake. Fish have not been stocked in Waldo Lake since, and there are no future plans for fish stocking. Even if total nutrient inputs from fish stocking in Waldo Lake are minimal, nutrient availability may be very much affected by the fish in Waldo Lake. Efforts to remove existing fish from Waldo Lake are not considered feasible, so the lake will continue to have fish as long as the existing populations succeed.

In 1995 Waldo Lake was nominated for Outstanding Resource Water classification, a status that would provide Waldo with a greater level of protection than it currently has. In general, the waters of the state are not allowed to degrade beyond current water -quality standards. An outstanding resource water is not allowed to degrade below its current condition, which likely has far better water quality than the water quality standards require. No water bodies were accepted as outstanding resource waters in 1995, as the policy for nominating waters was not sufficiently developed. Since then a policy has been proposed and accepted, and we expect Waldo Lake to be nominated and accepted as an outstanding resource in the next go-round.

OREGON LAKES ASSOCIATION NEWS

News from members associations

Smith Lake Improvement, Inc.

Smith Lake Improvement surveyed members on whether the association should pursue sewering to protect and enhance Smith Lake, which is located in the Clatsop Plains south of Warrenton.

Only about 30 percent of the membership voted in support of sewers. Given the lack of support, the Board of Directors decided not to look further into a sewer system.

High water in Smith Lake as a result of unusually heavy rainfall was in part due to clogged culverts, a problem that has been corrected. The high water could be a problem for homeowners that depend on septic tank systems for waste disposal.

Preservation Association for Devils Lake (PADL)

PADL held its annual meeting on 26 July. New officers were announced: Dick Hatchard, Chair; James McFarlane, Vice-chair; Glen Pifari, Secretary; Daryl Shipley, Treasurer; Dave Wagner, Director; Bill Vaughan, Director; John Lazier, Don Sell, George Vaughan, De Sherwood, and Joe Isaac, Alternates.

Bob Storer, manager of the Devils Lake Water Improvement District, made a presentation on the lake and its watershed, and stressed the importance of erosion control in the watershed.

Discussion on the presence of grass carp, which were stocked in the lake about 10 years ago. The fish have eliminated all vegetation from the lake. Some vegetation is necessary for fish habitat and as a food for some waterfowl. People expressed surprise at the reduction in waterfowl on the lake that has resulted from the removal of the vegetation. Removing some of the grass carp from the lake was discussed. Community consensus, finding a place to hold the fish, and the logistics of capture must be developed for grass carp management.

OLA Annual Meeting Announced

The Oregon Lakes Association will hold its Annual Meeting on October 25, 1997 in the Bromley Room of the Florence Library.

The meeting will start at 9 AM, and will include discusssion of the role of the Governor's Watershed Enhancement Board in lake management in Oregon. After lunch, we will hear from an invited speaker and discuss the future of OLA and its role in lake protection and management in Oregon.

The Photo Contest should provide a fun element to the meeting (see page 10) – and it's a chance to take home a nice prize!

– ANNOUNCING –

The OLA Photo Contest

The Oregon Lakes Association is building a library of photos of Oregon Lakes, and needs your help. We are looking for photos of any and all subjects in and around Oregon lakes, so to kick-start our library collection, we are hosting a photo contest **at the Annual Meeting** in Florence (at the library), October 25, 1997. The rules:

1. Hard copies of the photos will become the property of OLA. These photos or copies may be used by OLA, or its members for educational purposes, without prior written permission from the photographer. No financial gain will be made from their use.

2. Submit as many photos as you like in color or black and white, in sizes ranging from 4" by 6" to 11" by 14". These copies will not be returned to photographers, but will become part of the OLA photo library. As such documentation of the date, location, photographer, and any other pertinent information should accompany the photo, but is not required for the contest.

3. Exciting prizes will be awarded for the following categories:

-most scenic
-best depiction of a lake-related problem (i.e., pollution, user conflict...)
-best depiction of a lake-friendly practice
-best action shot
-best flora and/or fauna shot

If you use your imagination any lake photo should fit into one of the above categories.

4. Judging will be done by popular vote at lunch at the annual meeting.

Contact Avis Newell for additional information at 503-229-6018.

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