

# LAKE WISE

PORTLAND STATE  
UNIVERSITY

SPRING 1996

NEWSLETTER OF THE PSU LAKES AND RESERVOIRS PROGRAM

## Changes in *Lake Wise*

Past readers of *Lake Wise* will recognize some changes in the newsletter beginning with this issue. Until now the Oregon Lakes Association (OLA) has published *Lake Wise* and supported the Lakes and Reservoirs program at Portland State University (PSU) by producing and distributing *Citizen Lake Watch News*. The Citizen Lake Watch program is coordinated by PSU with funding from the Department of Environmental Quality.

Now, thanks to an effort by PSU to consolidate faculty expertise and interest in research relevant to lakes and reservoirs, PSU will support OLA's educational mission by publishing *Lake Wise* with the assistance of OLA. The PSU Lakes and Reservoirs program is part of PSU's Environmental Sciences and Resources program.

Other than changes in the masthead, you are not likely to notice many substantive changes in *Lake Wise*. Our focus will continue to be on education and on providing connections for those who want to be actively involved in sustainably managing lakes and reservoirs.



– Stephanie Weise –  
New Volunteer Coordinator

## Citizen Lake Watch program notes

The Citizen Lake Watch program is alive and kicking. E.P.A.'s 1996 budget was passed, providing funding for the program, and Lake Watch received full funding. What will happen next year is anybody's guess.

Oregon's Department of Environmental Quality (DEQ) supports the Lake Watch program (DEQ Director Langdon Marsh received a personal tour of Woahink Lake from Lake Watch volunteer Bob Anderson last year and saw the value of the program first hand).

All volunteers should by now have been contacted by Stephanie Weise, the Lake Watch Volunteer Coordinator. Stephanie will handle the blue data cards (now that she has been properly swamped with them she is actively searching for a better way for volunteers to communicate their monitoring results to us), and she will

be visiting volunteers this summer. Stephanie is earning her Bachelor's Degree in Business Administration at Portland State University (PSU). She is interested in natural resource management, and has an eclectic mix of experience – from wholesale nursery management to real estate sales.

Mark Sytsma will continue to coordinate the PSU Lakes and Reservoirs program, which in addition to Citizen Lake Watch includes providing technical assistance on lake management issues, and lake and aquatic plant management program development.

(See Page 3 for related news.)

## Deren Ash wins award for research

Deren Ash, a student at Lake Oswego High School, was awarded \$200 and a plaque by the North American Lake Management Society for his research on water quality measurement, which he presented at the Society's 15th International Symposium last



Deren Ash

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P.O. Box 751, Portland, Oregon 97207-0751; telephone: (503)725-4980; email: [envir@sbii.sb2.pdx.edu](mailto:envir@sbii.sb2.pdx.edu)

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# NORTHWEST NEWS

## Joint WAPMS, NALMS, and OLA meeting attracts over 170

Over 170 people attended a joint meeting of the Western Aquatic Plant Management Society (WAPMS) and the North American Lake Management Society (NALMS) held at Portland State University in late March. NALMS chapter representatives from Oregon (OLA), Washington and California met and participants came from as far away as Georgia and Alaska. Proceedings will be available in July or soon after.

The presidents of NALMS and the Aquatic Plant Management Society (APMS), Lisa Conley and Terry McNabb, respectively, attended the meeting and each gave a presentation on the activities of their organization. (APMS is the parent organization of WAPMS),

The conference began with a Symposium on Non-indigenous Species

in Western Aquatic Ecosystems. Invited speakers presented information on a number of invasive species currently in or threatening to invade the Northwest. *Spartina alterniflora* (smooth cordgrass), *Hydrilla verticillata*, and *Lythrum salicaria* (purple loosestrife) were the featured plant species. Zebra mussels, spiny waterflea, and various fish species were also discussed.

Twenty-seven papers were presented in six sessions, on a variety of lake and aquatic vegetation management subjects. These included paleolimnology; lake management and public education programs; and control of aquatic weeds using herbicides, biological agents, and mechanical techniques. The papers were consistently high quality and well presented.

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## Wagner resigns as DLWID Manager

Dave Wagner, manager of the Devils Lake Water Improvement District (DLWID) since November 1991, has resigned his position effective June 30, 1996. Wagner is also the Treasurer of Oregon Lakes Association (OLA) and has been active in efforts to reduce nonpoint source pollution to protect lakes throughout the state.

Wagner cited personal reasons for his resignation, especially the desire to spend more time with his children. He is not certain of his future plans, and indicated that he would like to remain active in OLA and continue working on watershed and erosion-control issues.

As DLWID Manager, Wagner has raised awareness of problems in the Devils Lake watershed, including sediment and nutrient inputs. Over the past year he developed an erosion control ordinance for protection of the lake, and prepared a slide show on erosion problems in the watershed to document the need for an ordinance.

The proposed ordinance was criticized by contractors and former city attorney Joan Chambers during a public hearing before the Lincoln City Council, and will not be adopted by the Council. Wagner made his decision to resign prior to defeat of the ordinance, postponing his announcement until after the vote.

## PSU team evaluates threats to Blue and Fairview Lakes

The Friends of Blue and Fairview Lakes have asked researchers at Portland State University (PSU) to evaluate the potential for degradation of the two lakes by contaminated groundwater in East Multnomah County. Chris Noble and Jane Graybill, project sponsors for the Friends group, secured a grant from the Environmental Protection Agency

for the study. Of principal concern are two solvents, trichloroethylene (TCE) and perchloroethylene (PCE), known to be in groundwater south of the two Troutdale lakes after a decade of groundwater studies of local industrial sites owned by Boeing of Portland and Cascade Corporation.

*Continued on Page 8, Column 3*

## Landslides impact lake water quality

Record rainfall in Oregon this year resulted in a substantial increase in sediment loading to Oregon lakes. Many tons of sediment deposited in Oswego Lake during flooding of the Tualatin River in February are currently being dredged from the lake. In Devils Lake a plume of turbid water from Rock Creek was clearly visible this spring, and Hagg Lake still has extremely high

turbidity as a result of a landslide into one of its tributary streams. These are just a few examples.

A survey recently conducted for the Pacific Rivers Council suggested that landslides in Cascade and Coast Range watersheds are correlated with logging activity. The survey identified 651 landslides in 82 Oregon and Washington watersheds; 71 percent of

the slides occurred in clear-cut areas within the past 15 years, and 23 percent in older clear-cuts. Only 6 percent were found in uncut areas.

U.S. Forest Service officials criticized the report, citing difficulties in spotting slides in uncut areas, and the importance of ground-truthing results of aerial surveys. Ground-truthing was not conducted in the study funded by Pacific Rivers Council.

## Sediment accumulation rates in Tenmile Lakes show effects of human activities

A study of sediments in Tenmile and North Tenmile lakes indicates that heavy erosion occurred during periods of logging in the surrounding area, and that coho salmon population in the lakes has been adversely affected by the introduction of non-native fish species.

E&S Environmental Chemistry, a Corvallis firm, recently completed the paleolimnological analysis of the two lakes for the City of Lakeside, Oregon. Bathymetric mapping was also done. The City wanted to reconstruct the modern history of the lakes as part of their process of developing a scientific basis for managing them.

Four sediment cores were collected from each lake in May 1995. The ages of sediment layers were determined using isotopes of lead. These results

showed significant increases in the rates of sediment accumulation in this century, compared to the rate prior to 1900, considered background level.

The maximum rate of increase was about 10-fold in Tenmile Lake and South Tenmile Lake, peaking in the 1940s through 1950s. After 1950, sediment accumulation in Tenmile Lake dropped to three times the background level by 1978, and then began rising again. A second peak, of 8 times the background rate, occurred in 1993. The rate of sediment accumulation in North Tenmile Lake has dropped to about 3 or 4 times the background level since the 1950s.

The times when sediment accumulation rates have been highest appear to correspond most closely with

logging activities, particularly the most recent logging in Tenmile Lake watershed. The study notes that contributions to accelerated watershed erosion also may have resulted from agriculture and lakeshore development, although these activities do not correlate as well with the years when the rate of sediment accumulation was highest.

Although the study of sediments did not reveal a biological marker for changing salmon populations, the two major recorded declines in coho salmon runs correspond closely to the introduction of non-native fish.

*The source for this article is the 1996 report, "Recent Paleolimnological Analysis of Tenmile Lake and North Tenmile Lake, Coos County, Oregon," by J.M. Eilers, C.P. Gubala, and E.A. CoBabe*

## Ash wins award

*Continued from Page 1, Column 3*

November in Toronto, Ontario. (A summary was published in the February 1996 issue of *LakeWise*.) The award was one of only two given for best student paper.

Already Ash is working on a new research project related to this year's flooding. His interest is in the impact of the Tualatin River on Lake Oswego. Ash hopes to present his research at the next North American Lake Management Society symposium in Denver, Colorado.

Ash will be working for the Lake Oswego Corporation this summer.

## CITIZEN LAKE WATCH

### Corps of Engineers begins volunteer monitoring of Fern Ridge Lake

The United States Army Corps of Engineers (COE) recently initiated a volunteer monitoring program for Fern Ridge Lake. Over 20 people attended an informational meeting in January, evidence of intense interest in the Fern Ridge watershed.

Those who have volunteered to participate in the program include Clarebeth Loprinzi Kassel, Joseph Kassel, Natasha Okonoji, Richard Locke, Cindy Thieman, James Bruvold, Marnee Comer, and Lee Eggers.

The program at Fern Ridge is an ambitious one. The volunteers collect

samples for total dissolved solids, chlorophylla, pH, dissolved oxygen, and total phosphorus analyses. They also measure Secchi transparency and monitor temperature. In addition to lake monitoring, volunteers are collecting information on inflowing streams. COE staff James Beal and Melanie Ryan assist the volunteers.

The Fern Ridge watershed is a large one and additional volunteers are needed for stream sampling. Anyone who would like to volunteer may contact James Beal (541-688-8147).

## Citizen Lake Watch volunteers monitor lakes

Thirty-five volunteers are measuring key water quality characteristics in about 20 Oregon lakes and reservoirs as part of the Citizen Lake Watch program. As of June 1996, they are:

**Big Creek Reservoirs**  
(upper and lower)

Susan Gage

**Blue Lake (Willamette)**

Koren Marthaller

**Clear Lake**

Elmer Waite

**Cullaby Lake**

Janette Goolsby

**Devils Lake**

Barbara Hagerman, Al Rice, and Bill Vaughn

*Continued on Page 4, Column 1*

## Volunteers monitoring

*Continued from Page 3, Column 3*

### Fern Ridge Lake

James Bruvold, Marnee Comer, Lee Eggers, Clarebeth Loprinzi, Kassel, Joseph Kassel, Richard Locke, Natasha Okonoji, and Cindy Thieman

### Fishhawk Lake

Jack Jenkins

### Garrison Lake

Don Martin

### Hagg Lake

Wally Otto

### Hosmer Lake

Max Peel

### Lake of the Woods

Catherine Hayes

### Loon Lake

Richard Kaufmann and Steve Kaufmann

### Mercer Lake

Ron Boehi

### Munsel Lake

Al Burhans and Roy Fisher

### Sunset(Neacoxie) Lake

Lee Smith

### Tenmile Lakes

Dean Anderson, Diane Barrett, John Barrett, Robert Edwards, Franklin Gray, Dan Jordan, John Kelsey, and Edward Lopez

### Woahink Lake

Bob Anderson

New volunteers are welcome, especially if they can monitor a lake not yet included in the program. Citizen Lake Watch provides training to measure water temperature, Secchi transparency, and dissolved oxygen. Volunteers are also expected to be on the lookout for *Hydrilla* (described in an article on Page 7). Prospective volunteers may contact Stephanie Weise, the Volunteer Coordinator, by leaving a message at (503)725-3833.



## OREGON LAKES ASSOCIATION

a chapter of the North American Lake Management Society

### President and Secretary resign

At the June 19 Oregon Lakes Association board meeting, the resignations of Bill Wall, President, and Cynthia Price, Secretary, were accepted. Wall is moving to Sweden and Price has moved to Alaska.

President-elect Andy Schaedel will fulfill the duties of President for the remainder of Wall's term. Secretarial

duties will rotate among other board members until the October election of officers.

Current officers and directors of the Association are listed below.

### Oregon Lakes Association Officers and Directors

#### President-elect (and acting President)

Andy Schaedel (503)229-6121

#### Past-president

Mark Sytsma (503)725-3833

#### Secretary (vacant)

#### Treasurer

Dave Wagner (503)994-5330

#### Director 1

Anjala Ehelebe (503)945-7474

#### Director 2

Allan Vogel (503)645-1676

#### Director 3

Jack Jenkins (503)646-7807

#### Director 4

Stan Geiger (503)274-9000

### Nominations open

Nominations for 1997 officers of the Oregon Lakes Association are now being accepted. The positions that are open include:

President-elect

Treasurer

Secretary

Directors 1 and 2

Association members with nominations to offer, and those who would like information about duties and responsibilities of officers, should contact President-elect Andy Schaedel ((503)229-6121). Self-nominations are welcome.

### Annual Meeting planned for October

The Oregon Lakes Association (OLA) will hold its annual meeting in Lincoln City on October 19, 1996. President-elect Andy Schaedel, Program Chair for the meeting, is currently

developing the agenda and would like to hear suggestions from OLA members for speakers and issues they would like to have included on the agenda.

### Volunteers are needed at Fort Stevens

Macy Yates, the Visiting Staff Program Coordinator for Fort Stevens State Park, is recruiting volunteers to conduct presentations, slide shows, demonstrations, children's activities, field observation, and other educational activities at the park this summer. Volunteers join the park staff for one to three days.

Fort Stevens State Park is located 10 miles west of Astoria, Oregon, off of

US 101. It has 595 campsites, more than any other park in the United States. Volunteers can camp free of charge for one to three days. The 3,700-acre park has wetlands, estuaries, fresh water lakes, beaches and dunes, and several types of forests.

Prospective volunteers should call Yates as soon as possible, at (503)861-3170.

# PLANTS & ANIMALS

## All about algae

This article, presented in two parts, is based on "Identifying Algae" by Carole A. Lembi, Ph.D., Professor of Botany and Plant Pathology, Purdue University. Dr. Lembi's article appeared in the May 1996 issue of The Michigan Riparian; it includes more information on marine algae. Part 2 of this article will appear in the summer issue of Lake Wise.

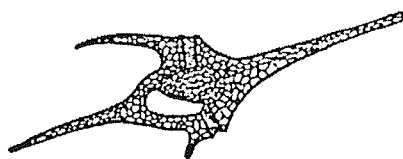
The term algae describes a diverse group of plants that range from microscopic unicellular forms to 300 foot seaweeds. Algae are thallophytes, which means they lack roots, stems, and leaves. They also lack a sterile covering of cells around their reproductive structures, so that fertilized spores are usually released directly into the water. The third defining characteristic of algae is that chlorophyll *a* is their primary photosynthetic pigment.

Since algae do not have tissues that conduct water and food, all cells of each organism must be exposed to water and nutrients in order to live. (This also means that for an algicide to be effective it must come in contact with all the cells of an algae organism.)

Biologists divide algae species into 9 major groups, named primarily for the dominant color of algae in each group. This does not mean they can always be identified by color; for example, some "Blue-green" algae are red, and some "Red" algae are green. The most common algae groups found in freshwater are blue-greens (*Cyanobacteria*), greens (*Chlorophyta*), euglenoids (*Euglenophyta*), golden-browns and diatoms (*Chrysophyta*), and dinoflagellates (*Pyrrophyta*).

### Dinoflagellates (Pyrrophyta)

Freshwater dinoflagellates are usually unicellular, and golden-brown in color. They are seldom a problem, although the marine species, known as "red tide," is toxic to humans and other warm-blooded animals. Dinoflagellates are found in plankton, and sometimes bloom in sufficient quantities to produce the appearance of a brown stain in the



*Ceratium*, a dinoflagellate algae

water. *Ceratium* is a common one. It is easy to identify with a microscope because of its large, unusual shape and characteristic golden-brown color. It swims in plankton.

### Blue-green Algae (*Cyanobacteria*)

Blue-green algae are closely related to bacteria. They are generally considered to be the most noxious of all the algal growths because some microscopic blue-green algae species produce dense blooms in nutrient-enriched water. Their major harmful effect is the depletion of oxygen that occurs when the blooms die and decompose. Cycles of bloom production and crashing can result in loss of all oxygen in lake-bottom water. Other types of blue-greens form mats on the bottom sediments that float to the surface as black, slimy blobs. Some blue-green strains

are toxic to fish and warm-blooded animals.

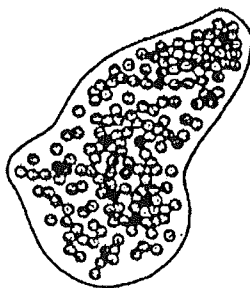
All of the blue-greens have extremely small cells that are usually aggregated into colonies or filaments, often encased in a thick slime sheath. The relatively large size of these colonies plus the slime helps them avoid becoming the prey of zooplankton. Single cells of blue-green algae are seldom found floating freely in the water.

Another characteristic feature of blue-greens is the presence of pigments other than chlorophyll *a*. All have blue and red pigments, and the sheaths may have metallic compounds or debris that affect the color. The intensity and combination of these pigments results in a range of color from black to purple to light green found in blue-green algae.

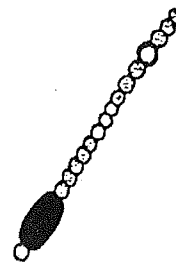
### Microscopic blue-greens.

Blooms of the most common species (*Anabaena*, *Aphanizomenon*, and *Microcystis*) usually give the water a pea-green to yellow-green color. Scums form at the water surface under calm conditions, due to internal gas vacuoles that make the cells extremely buoyant. Under a microscope, light bouncing off the gas vacuoles gives them a dark brown or black appearance. While only blue-green algae have gas vacuoles,

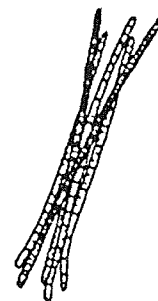
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*Microcystis*



*Anabaena*



*Aphanizomenon*

Blue-green algae that bloom

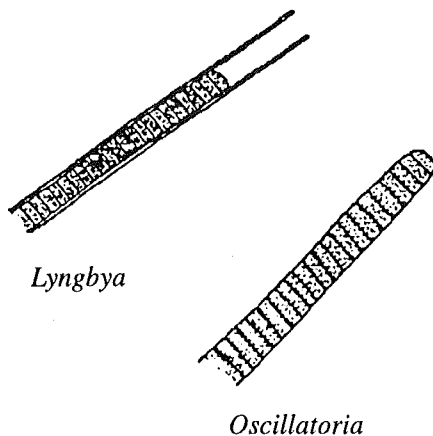
## About algae

*Continued from Page 5*

many blue-greens species do not; the majority of mat-formers, and some planktonics, do not have them.

### Mat-forming blue-greens.

*Oscillatoria* and *Lyngbya* are the two genera of blue-green algae that form mats. The mats are usually very slimy and appear as a dark blue-green to black or brown. They nearly always grow on the bottom of lakes and float to the surface only temporarily, when dislodged by wind, wave, or animal activity. Viewed under a microscope, these two mat-formers look similar, except that *Lyngbya* has long cell wall structures that extend beyond the filament, and the filaments of *Oscillatoria* often oscillate, visibly swaying back and forth.



Blue-green algae that form mats

Green algae, euglenoids, and golden-browns and diatoms will be described in the second part of this article, which will appear in the summer issue of *Lake Wise*.

## Joint OLA meeting

*Continued from Page 2, Column 2*

The U.S. Fish and Wildlife Service, the U.S. Bureau of Reclamation, WAPMS, and NALMS co-sponsored the Symposium. Corporate sponsors were SePRO, KCM, Aquatics Unlimited, SRI/Shapiro, and Resource Management.

The conference also included a meeting of the Northwest Zebra Mussel Working Group; workshops on fish stocking in wilderness lakes and on algae control; and a nontechnical session for lake residents on lake ecology, weed management, and toxic cyanobacteria.

Jean Jacoby coordinated the NALMS section of the meeting. Debra Bouchard and Harry Gibbons assisted with exhibitor registration. Program Chair for the conference was Mark Sytsma.

## Waters

A rock drops in a bucket;  
quick fierce  
waves exhaust themselves  
against the tin circle.

A rock in a pool;  
a fast  
splash, and ripples move out  
interrupted by weeds.

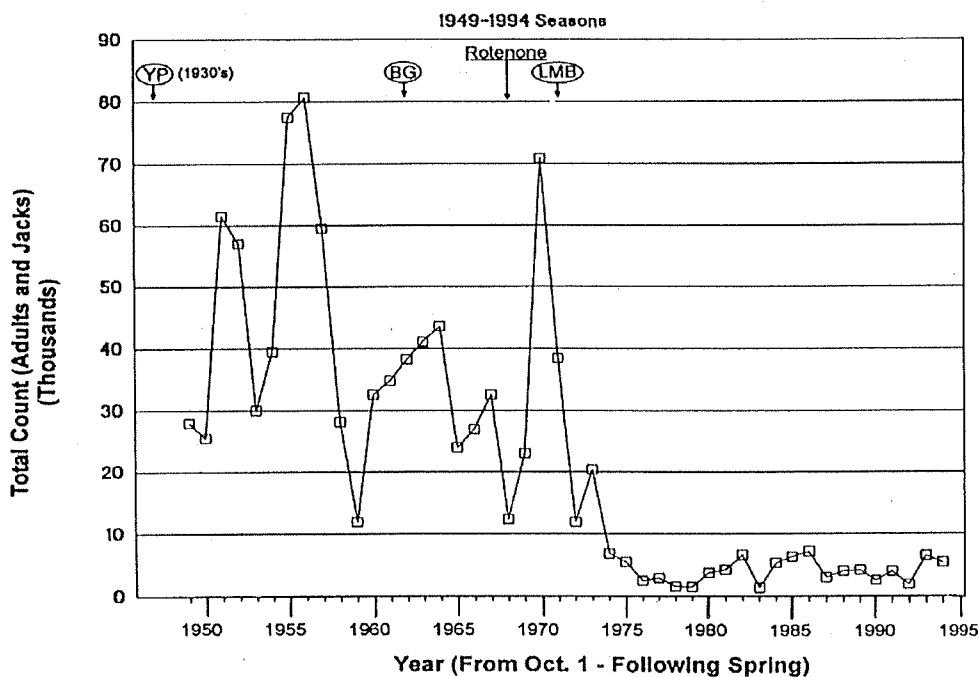
The lake enormous and calm;  
a stone falls;  
for an hour the surface  
moves, holding to itself the frail

shudders of its skin. Stones  
on the dark bottom make the lake calm,  
the life worth living.

Donald Hall  
*Old and New Poems*

## Salmon decline in Tenmile Lake

The two major recorded declines in coho salmon runs entering Tenmile Lake appear to be closely related to the times when non-native fish species were introduced there.



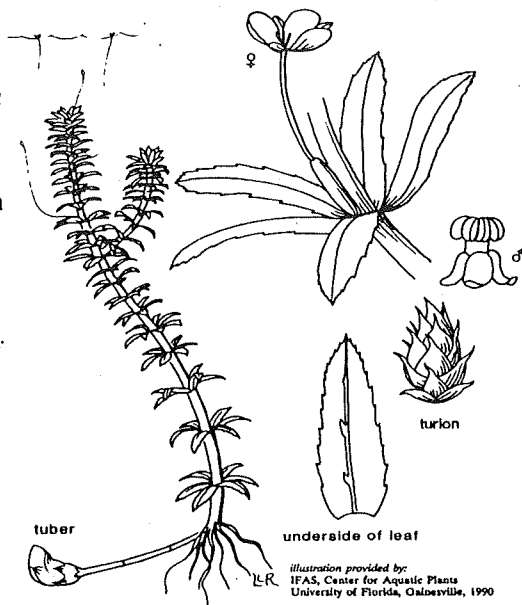
Key: YP = yellow perch, BG = bluegill, LMB = largemouth bass  
(dates of introduction)

**Estimated Coho Salmon Population Entering Tenmile Lake, 1949-1994**  
(Source: E&S Environmental Chemistry, Inc. 1996. Recent Paleolimnological Analysis of Tenmile Lake and North Tenmile Lake, Coos County, Oregon.)

## Washington State fights *Hydrilla* infestations

Recent surveys of Pipe and Lucerne Lakes in King County, Washington, found sprouting *Hydrilla* tubers. The lakes were treated with fluridone, a system aquatic herbicide last year after the *Hydrilla* infestation was discovered. Although the treatment was effective, tubers produced prior to the treatment survived in the lake and are reestablishing the population.

Tubers are dormant, peanut-sized, potato-like structures that are produced in abundance by *Hydrilla*. The "tuber bank" is resistant to herbicide and nearly every other treatment available for control of aquatic weeds. The only effective way to remove the tubers from lake sediment is by dredging the tuber-containing sediments from the lake. This approach is very expensive, and for



*Hydrilla*

**If you see this plant, please call the  
Hydrilla Hotline:  
(503-725-3833)**

best results requires drawdown of the lake.

Pipe and Lucerne Lakes are natural lakes so drawdown would require pumping the water from the lakes -- not a practical alternative.

In 1995 King County spent approximately \$100,000 on managing the hydrilla infestation, and expects to spend \$161,000 in 1996 and 1997 to continue the battle against *Hydrilla*.

Oregon has a draft plan for responding to a *Hydrilla* infestation. However, no source of funding is available for aquatic weed management that would support the level of effort required to control an established *Hydrilla* population.

*Hydrilla* has not been found in Oregon. Prevention, early detection, and rapid response are essential for effective control of this pest in Oregon.

## NATIONAL NEWS

### Zebras on the Oregon Trail

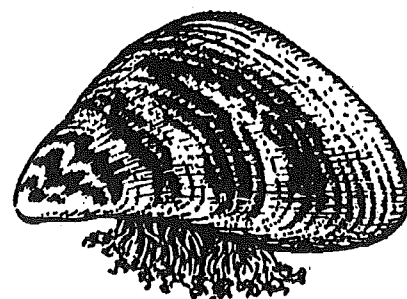
The zebra mussel is not indigenous to North America. The species was introduced here from Europe in 1986, via ballast water discharged into Lake St. Clair, near Detroit. Since then zebra mussels have spread rapidly east to the Hudson River, south as far as New Orleans and west into Minnesota in the Mississippi River system, and into the Arkansas River in Oklahoma. They have also been detected on boats entering California at border checks.

The zebra mussel gets its name from the stiped, zebra pattern on its shell. It is the only freshwater mussel that grows attached to surfaces. They form dense colonies (30,000 - 70,000/ square yard in Lake Erie) on any submerged object. Their ability to colonize and cover almost any type of surface has led to serious problems. The mussels have blocked fish screens, trash racks, small-diameter intake pipes,

powerplant cooling systems, wet wells, water treatment facilities, and water delivery systems. They also attach to boat hulls, motors, docks, mooring lines, etcetera. Utilities in the Eastern U.S. spend an average of \$200,000 annually to control zebra mussels.

Ecological impacts of zebra mussels in the U.S. are not fully understood. Zebra mussels alter the trophic structure of an ecosystem by filtering phytoplankton and zooplankton from the water, removing these food organisms' availability for fish and other aquatic life. Changes in the Great Lakes since zebra mussel invasion include increased water transparency, aquatic macrophyte and attached algal growth, and changed bottom fauna. How these changes will affect fisheries is unknown.

Zebra mussels are expected to spread into Western U.S. freshwater systems. The Western Zebra Mussel



**The Zebra Mussel, *Dreissena polymorpha***

Task Force was established by western states and provinces and federal agencies to coordinate prevention and control measures in the West. Monitoring and prevention programs are being developed to slow the spread of zebra mussels, which will save millions of dollars in control measures. Al Smith is the Oregon contact for the program. He can be reached at (503)872-5252, extension 5426.

## Churches enter debate on endangered species

The National Council of Churches (NCC) recently initiated a campaign in support of the Endangered Species Act (ESA), which may provide some protection for salmon.

According to the NCC, the Endangered Species Act has been an important way that we as nation "exercise our God-given responsibility to serve as guardians and protectors of God's creation." In Oregon, the effort is being led by the Interfaith Network for Earth Concerns (INEC).

The campaign was initiated because some members of Congress are seeking to undermine the ESA. Earlier this year several ESA reauthorization bills were introduced. The most prominent was the H.R. 2275, introduced by

Representatives Don Young (R-AK), Chair of the Resources Committee, and Richard Pombo (R-CA). The bill was widely criticized by environmentalists, Democrats, and moderate Republicans

In response to the involvement of a variety of organizations, including the INEC, Congress is reconsidering proposed changes to the ESA. In a two-part interview with *Greenwire*, an environmental news daily, House Speaker Newt Gingrich discussed many of the environmental issues facing Congress. The Speaker confirmed for the first time that he will not let the Endangered Species Reauthorization bill authored by Young and Pombo come to the floor for a vote. Instead, Gingrich says, he will work to have a "compro-

mise" bill be the vehicle for ESA reauthorization, perhaps the bill currently being written by Representatives Jim Saxton (R-NJ) and Wayne Gilchrest (R-MD).

Gingrich concluded that "it's very possible that we'll be able to come up with a significant ESA before the year's up, and that's my hope." In the Senate, a proposal by Senator Dirk Kempthorne (R-ID) is so far the major vehicle for ESA Reauthorization. This bill is similar to the Young/Pombo proposal and has faced equal criticism. So far, there has been no definitive word that a compromise proposal, similar to the possible Saxton/Gilchrest bill, is in the works.

## URLs

Internet users with graphical browsers such as Netscape, Mosaic, or Chameleon, can directly access graphical "home pages", databases, and other information including thousands of government agencies, universities, corporations and individuals. Navigating the Internet using graphical home pages is easier than using text-only "gophers". To access a home page, users must have its address, called a Universal Resource Locator (URL). Some URLs that may be of interest to *Lake Wise* readers are:

### Oregon Lakes Association

<http://clas.www.pdx.edu/~perkins/oregonlakes/map.html>  
(A volunteer is needed to update this web page. Contact Mark Sytsma (503)725-3833.)

### PSU Environmental Programs

<http://www.esr.pdx.edu/e>

### Tree of Life

<http://phylogeny.arizona.edu/tree/phylogeny.html>

### Demographic Viewer:

<http://sedac.ciesin.org/plue/ddviewer/>

### Clean Lakes Program

<http://www.epa.gov/owow/lakes/>

### Aquatic Ecology Page

<http://www2.netdoor.com/~pinkyl/aquatic.htm#plantlinks>

### Government Information Locator Service

<http://info.er.usgs.gov/gils/index.html>

## Solvents threaten lakes

*Continued from Page 2, Column 2*

The prior studies have shown that TCE and PCE are linked to elevated cancer risks in humans and that groundwater from the contaminated plume may enter Blue and Fairview Lakes and also the Columbia Slough. Groundwater in the area is used by communities at Blue Lake and Fairview Lake. Additionally, the City of Portland's emergency wells lie between the contaminated sites and the Columbia River.

Scott Wells, Civil Engineering, is leading PSU's team which is evaluating previous studies of the contaminated groundwater. Also on the team are Shuguang Li, Civil Engineering; geologists Marvin Beeson and Michael Cummings; Dick Pratt, Environmental Sciences and Resources; and Karann Brandt of David Brown and Associates. They expect to report their findings by mid-summer.

Their report will focus on the geology of the local strata in which the groundwater is moving, the rate of spread of the contaminated groundwater plume, and the risks of the contamination to humans and the environment in the Blue and Fairview Lakes area.

## EDITOR'S MESSAGE

A transition in programs, explained on Page 1, has delayed this issue. However, the transition means we now have more staff support to produce *Lake Wise*. As the new editor, I invite your comments, contributions, ideas, and letters. Please write to me at the address shown on Page 1, or leave a message for me at (503)725-8337 and I'll be pleased to get in touch with you.

*Beth*

Beth Woodward



## Symposium held at Diamond Lake

The Umpqua National Forest hosted a symposium on Diamond Lake on June 14, 1996, at Diamond Lake Lodge. The informal, one-day conference included presentations on a variety of subjects including hydrology, water quality, and biology of lakes. U.S.

Forest Service and Oregon Department of Fish and Wildlife managers and scientists were the speakers.

For additional information contact Mikeal Jones, Umpqua National Forest; PO Box 1008; Roseburg, OR 97470. (541)957-3356.

## NEW PUBLICATIONS

### *Freshwater Algae, Their Microscopic World Explored*

H. Canter-Lund and J.W.G. Lund

This science book might also sell as a "coffee table" art book; the subject is fascinating and the photographs are captivating. The large format book introduces all the major freshwater algal groups, parasitic fungi, protozoans, and other invertebrate predators. The text is very readable and more than half of the book's 640 high quality photographs are in color. They are delightful proof of the diversity of the microscopic, aquatic world. Published by Biopress Ltd., The Orchard, Clange Road, Bristol BS3 2JX, England.

### *Restoration of Stream Ecosystems – An Integrated Catchment Approach*

Edited by M. Eiseltova and J. Briggs

This is an anthology of case studies intended for use by those responsible for stream restoration projects, such as ecologists, engineers, and planners. These studies on river restoration in Central and Eastern Europe would also be useful for agricultural, forestry, and other related resource management. Contact Natural History Book Service, 2-3 Wills Rd., Totnes, TQ9 5XN, Devon, U.K.

### *Aquaculture in the United States, A Historical Survey*

R.R. Stickney

Stickney goes into detail about early fish culturists and the development of the fish culture industry, as well as touching on current issues: "hatchery bashing", protecting species versus protecting stocks, etc. Published by John Wiley and Sons, 800-225-5945.

### *Principles and Practice of Plant Conservation*

D.R. Given

This comprehensive handbook is for practicing conservationists. It explains the concepts and principles underlying successful plant conservation. It includes chapters on how plants become threatened or extinct, plant population management, managing protected natural areas, conservation in botanic gardens, ethics, education, legislation, and economics of plant conservation. Contact Timber Press, 503-227-2878.

### *"The Toxicity of Diquat, Endothall, and Fluridone to Early Life Stages of Fish,"*

Eric, A. Paul, Howard A. Simonin, and John Symula. *Journal of Freshwater Ecology*. 9: 229-239.

This report on a technical study describes toxicity tests on walleye, largemouth bass, and smallmouth bass. The study concluded that maximum label concentrations of fluridone and endothall were at least one order of magnitude greater than concentrations found to be toxic. Potential toxic concentrations of diquat, however, may occur if label application directions are followed. The authors suggest that diquat applications rates should be reduced in shallow water (less than 1 meter) and that diquat be applied as a dilute spray, instead of pouring undiluted diquat from its container into a lake. In addition, the authors concluded that application of diquat should be discouraged in lakes containing sensitive fish species at times when early life stages are present.

## ON THE CALENDAR

### July 14-17, 1996

Aquatic Plant Management Society Conference on the latest developments in aquatic plant science and management. Burlington, VT. (904)429-4119.

### July 25-26, 1996

TMDL Issues: The Good, The Bad, and The Ugly. Conference on water quality standards for Oregon streams. Government, industry, tribal, and other water quality managers will speak. Sponsored by Oregon Water Resources Research Institute at OSU, and Association of Clean Water Agencies. Bend, OR. (541)737-4022

### August 1-4, 1996

Northwest Environmental History Symposium. Designed for teachers. Washington State University; Pullman, WA. (800)942-4978; wsuconf@mail.wsu.edu.

### September 26-28, 1996

Washington Lake Protection Association. Technical and nontechnical sessions for lake residents and managers. Spokane, WA. Contact Dave Lamb (509)536-9676.

### October 7-8, 1996

2nd Annual Pacific Northwest Water Issues Conference. Portland, OR. Contact Oregon Water Resources Institute (541)737-4022; owrri@css.orst.edu.

### October 19, 1996

Oregon Lakes Association. Lincoln City, OR. Contact Andy Schaedel (503)229-6121.

### November 13-16, 1996

North American Lake Management Society. People, Lakes & Land: Puzzling Relationships. Bloomington, MN. Contact NALMS, POB 101294, Denver, CO 80250.

## R A N D O M T H O U G H T S

On a clear, sunny day, the Potamogetae, flourishing at a great depth amid the transparent waters, animated by numerous members of the insect and finny races present a delightful spectacle, and long stems of the white and yellow water lilies may be traced from their floating flowers to the roots...One feels in such a place estranged for a time from the cares and vicissitudes of the world and the charms of nature penetrate, with their refining influences, the deepest recesses of the heart, denying to human language the power to give them full expression.

W. Gardiner  
*The Flora of Forfarshire* (1848)

Although the desire to control nature may be censured by the purist as an attitude of mind conceived in arrogance, it unquestionably reflects a contemporary economic and agricultural necessity. If resources of land and water are to be efficiently exploited in the provision of food, other natural products, power, and communications, an effort must clearly be made to resist and, if possible, eliminate biological factors which would otherwise quickly thwart this aim. To acknowledge this need is not to condone such clumsy and

short-sighted attempts to control weeds and pests as have in recent years evoked proper public outrage at the use of certain herbicides and insecticides.

C. Duncan Sculthorpe  
*The Biology of Aquatic Vascular Plants*

A Weed: A plant that interferes with management objectives for a given area of land at a given point in time.

J.M Torell  
from *Weeds of the West*

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*Contributed by Mark Sytsma*

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Andy Schaedel  
ODEQ  
811 SW 6th Ave.  
Portland, OR 97204