PORTLAND STATE UNIVERSITY

# LAKE WISE

December 1996

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

## Lake Watch News

*by Mark Sytsma*

Well, its budget time again, and everyone who has been associated with the Lake Watch program for very long knows that spells - **DANGER**. This year, prospects are particularly bad. Despite the fact that the program is enjoying unrivaled interest and participation, the Department of Environmental Quality has cut the Citizen Lake Watch budget for next year 61 percent. For Lake Watch volunteers, it means that you will be seeing and hearing less from us next year. For those of us here at Lake Watch World Headquarters it means some painful decisions about staffing and support will have to be made.

While we are disappointed that our support will be cut, we still believe that local interest and input into management of Oregon's lake resources is critical. We hope that everone that participated in the program this year will continue to monitor the quality of their adopted lake. The data that volunteers collect on Oregon lakes is all that we have.

On the positive side, the Oregon Department of Agriculture has proposed an aquatic weed program to the Governor. The Governor has

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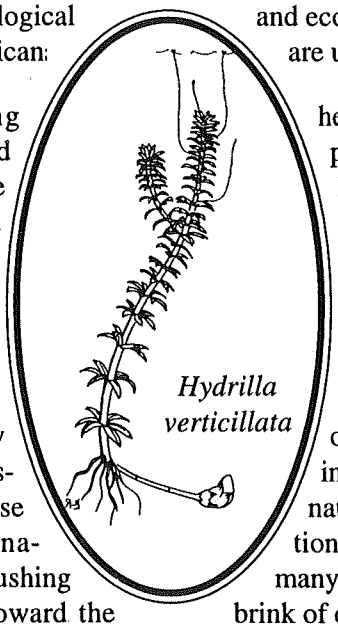
## Aliens Alter Earth's Ecology

### Nature Conservancy Report on Non-indigenous Species

According to a Nature Conservancy report titled, *America's Least Wanted*, an invasion is under way that is undermining our nation's economy and endangering our most precious natural treasures. The incursion comes not from foreign armies, political terrorists, or extraterrestrials. Instead, the stealthy invaders are alien species. Also known as exotic, non-native, introduced, or non-indigenous species, these are plants and animals that have been introduced- either intentionally or by accident- into areas outside their natural ranges. Yet despite the vast ecological and economic damage done by these aliens, most American are unaware of their presence.




The deteriorating health of our nation's ecosystems is gaining increased public concern. Water and air pollution, excessive harvesting and extraction of natural resources, and habitat destruction from poorly planned development all imperil our remaining native ecosystems. But these highly visible threats to the environment are only part of the problem. Biological pollution, in the form of exotic species, is now one of the leading threats to the ecological integrity of our forests, grasslands, and waterways. Surprisingly, these aliens often strike at the heart of those natural lands and waters that we most cherish-our national parks and nature preserves. They also are pushing many of our rarest plants and animals even further toward the brink of extinction.

The number of exotic species residing in the United States is not precisely known. About 4,000 species of non-indigenous plants occur outside cultivation, according to North Carolina Botanical Garden's Biota of North America Program. And at least 2,300 species of non-native animals inhabit the United States,

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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.

Big Creek Reservoirs: Susan Gage

Blue Lake : Koren Marthaller

Clear Lake: Elmer Waite

Cullaby Lake: Janette Goolsby

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

Diamond Lake: Ross Roberts, Chris Strahl

Fern Ridge Lake: Clarebeth Loprinzi Kassel, Joseph Kassel, Natasha Okonoji, Richard Locke, Cindy Thieman, James Bruvold, Marnee Comer, Lee Eggers, Randy Wilson

Fishhawk Lake: Jack Jenkins

Garrison Lake: Don Martin

H. Hagg Reservoir: Wally Otto

Hosmer Lake: Chuck Munson, Max Peel

Jubilee Lake: Paul Doucett

Lake of the Woods: Catherine Hayes, Katherine Kelly

Loon Lake: Richard Kaufmann, Steve Kaufmann

Mercer Lake: Ron Boehi

Morgan Lake: Yuji Matsumoto, Melinda McKibben, Dara Decker

Mt. Hood Lakes: Roy Iwai, Matthew Wood (PSU students)

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, Dennis Simmons, Dave and Linda Lauck, Paul Cornett, Ron Salat

Sunset (Neacoxie) Lake: Lee Smith

Tenmile Lake: Dean Anderson, Diane and John Barrett

Thornton Lake: Philip McFaden, Henry Pollak, Jack White

Timothy Lake: Jon Honea, Steve Mrazik (PSU students)

Woahink Lake: Bob Anderson

**Program notes continued from page 1.**

indicated support for the proposal and will include it in the budget he submits to the legislature for approval. The proposal is a modest one, however, it will permit some technical assistance on aquatic weed control measures and focus on mangement planning for species that have not established a substantial population in the state, e.g., hydrilla and spartina.

Lake Watch volunteers are encouraged to be advocates for their lake. It is important that volunteers let their representatives in Salem know what they think about lakes and Oregon's lake management program. We can do better. ◆

# CHEMetrics Offers Discount to Volunteers

CHEMetrics, a manufacturer of water quality test kits, has announced a 30 percent discount on all products for participants in volunteer monitoring programs, like Citizen Lake Watch. Some volunteers are already using the Dissolved Oxygen SAM, that is illustrated, and have indicated that ease of use and accuracy are major advantages over the titration-based kits. The discounted price of the meter and 30 tests is approximately $140. Test kit refills are $13 for a per test price of about $0.43 (after purchase of the meter). For additional information on price and ordering contact CHEMetrics at 800-356-3072; prodinfo@chemetrics.com; http://chemetrics.com.◆

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reports the Congressional Office of Technology Assessment (OTA).

These alien species arrive here in many ways. Some are the product of misguided efforts to correct other environmental problems. For instance, kudzu (*Pueraria lobata*), a fast-growing vine that now blankets large areas of the Southeast, originally was imported and promoted to combat soil erosion. Others, including many non-native fish species, were introduced for sport or recreation. Many more, however, end up here as accidental stowaways, having hitched a ride in mail, cargo, ballast water, or even by slithering into aircraft landing gear. With expanding global travel and trade, opportunities for such unwanted guests are only increasing.

***Picture a pollution spill in the waters of your region that simply won't go away. Government and industry teams work to disperse it with chemicals and mechanical barriers, but as soon as the treatments stop, the pollution resurges. Worse yet, the spill spreads and concentrates in connecting waterways, and is further seeded by unintentional transport overland. Municipalities, manufacturers, and agriculture experience degraded water supplies and higher operating costs. Shell fisheries and fin-fisheries permanently decline. This scenarios sounds like a nightmare, yet it closely approximates the result of unintentional releses of nonindigenous species, of "biological pollutantion", into U.S. waters.***

**Senator John Glenn**
**National Forum on Nonindigenous Species**
**in U.S. Marine and Fresh Waters**

Clearly, not all non-native species are undesirable; much of our economy and food supply relies on cultivating crops and raising livestock that originally came from elsewhere. We quickly would tire of eating only the handful of crops, such as cranberries, sunflowers, and jerusalem artichokes, that originated in the United States. But although we depend on certain introduced species to enhance our well-being, and others have little discernable negative impact, the OTA found that about 15 percent of non-native species do cause severe harm to our economy or ecology. This report, America's Least Wanted, focuses on those intruders that threaten our nation's rich natural heritage.

Moving species from one place to another is like playing biological roulette. Within their natural range, most plants and animals are kept in check by the powerful forces of competition, predation, and disease. If moved to new regions, however, species may be freed from their normal biological and physical constraints and spread unfettered. For most relocated plants and animals, their new environs usually have limitations that restrain the introduced species and prevent them from winning at this roulette game. But those species that have invasive tendencies and find themselves free from natural controls can win big, wreaking havoc on the local economy and ecology. Efforts to control alien pests cost the U.S. economy several billion dollars annually. In one year alone the European gypsy moth (*Lymantria dispar*), an introduced forest pest, caused an estimated $764 million in losses, according to the U.S. Department of Agriculture. The zebra mussel (*Dreissena polymorpha*), a relatively recent invader, may cause more than $5 billion in damages by the year 2002. Harmful alien species also threaten human health, as shown by the recent accidental introduction of the Asian tiger mosquito (*Aedes albopictus*). This insect is a vector for such serious diseases as dengue fever and several forms of encephalitis.

Non-indigenous species have been implicated in the decline of 42 percent of 958 U.S. species federally listed as threatened or endangered. For 18 percent of listed species, exotics represent the major factor leading to their endangerment. (Data sources: for species listed June 1991-September 1996. Nature Conservancy analysis of Federal Register notices; prior to June 1991-Environmental Defense Fund analysis for OTA.)

Even if we aren't always able to place precise dollar values on the damage, the impact of non-native species on our natural ecosystems is at least as costly as it is to our economy. The nation's biodiversity-comprising wild genes, species, and ecosystems-already is under siege, struggling against a wide range of insults. The continuing destruction and degradation of natural habitats cause more species to become endangered. They also reduce our ecosystems' ability to provide basic ecological services, such as flood control and crop pollination, on which humans depend. Against this backdrop of ecological deterioration, exotic species are emerging as one of the leading threats to our native species and ecosystems. Introduced species may compete directly with natives for food or space, may compete indirectly by changing the food web or physical environment, or may prey on or hybridize with native species. Those natives whose natural range and population size already are limited, or have declined for other reasons, are particularly vulnerable to aggressive

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exotics. This is especially acute in island environments such as Hawaii, where most species evolved in isolation-without continental competitors, predators, and pathogens-and lack defenses against these invaders.

The impact of aliens on most native species is unknown, reflecting the overall lack of knowledge about the basic biology and ecology of most species, even our most imperiled. Exotic species, however, have been implicated in the decline of 42 percent of those species listed as threatened or endangered by the U.S. Fish and Wildlife Service. Of 40 North American freshwater fishes that have become extinct over the past century, the American Fisheries Society has documented that introduced species were a contributing factor in 68 percent of these extinctions.

A team of Nature Conservancy scientists has just conducted an assessment of the leading threats to imperiled freshwater aquatic animals, which, as a group, are among the most endangered organisms in the continental United States. Their analysis suggests that interference from exotic species is one of three leading threats, and that "the combined effects of competition, predation, and hybridization appear to be widespread and increasing among the species sampled." These researchers found exotic species currently are limiting the recovery of 37 percent of imperiled fish species and 22 percent of imperiled mussel species.◆

## Help Stop the Spread of Aliens

- *Know your own backyard-learn to identify your region's most threatening pests. Find out whom to contact to report new invasions, or to receive guidance on controlling pests on your property. Landscape with native species or non-invasive ornamental plants appropriate to our region.*
- *Don't release pets or aquarium plants and fish into the environment.*
- * *Avoid disturbing natural areas-it increases their vulnerability to alien species invasions.*
- *Be careful not to send or receive potentially harmful plants or animals through the mail-use mail-order services wisely.*
- *Don't bring plants, fruits, soil, or animals into the country from abroad-or to Hawaii from the mainland-without having them inspected by quarantine officials; fill out agricultural declaration forms completely and honestly.*
- *Clean boats and boating equipment before transporting them from one water body to another to avoid spreading aquatic pests such as zebra mussels or hydrilla. Leave behind unused bait and bucket water.*
- *Clean your boots and camping gear before setting out for other regions or countries, and again before returning home. On horse-packing trips, make sure that feed is certified weed-free.*
- *Spread the word-educate yourself and others about the problem of alien species.*
- *Get involved-join volunteer efforts to remove invasive species in natural areas, such as local Conservancy preserves and state or national parks.*

**Visit the Nature Conservancy's web page for more information: http://www.tnc.org/science/library**

*Used with permission. From: Stein, B.A., and S.R. Flack. 1996. America's Least Wanted: Alien Species Invasions of U.S. Ecosystems. The Nature Conservancy, Arlington, VA. For a copy of the report contact Laurie Bullard, 1815 N. Lynn ST, Arlington, VA 22209; lbullard@tnc.org*

# Lakes and Trees

A recently published report (Christensen *et al.* 1996. *Ecological Applications* 6:1143-1149) found that the abundance of coarse woody debris (CWD = fallen trees) in lake littoral (shallow water) areas was negatively correlated with shoreline cabin density.

The abundance of CWD has been recognized as an important component of riverine ecosystems since the early 1980s. Current management strategies emphasize the importance of CWD in riparian corridors as part of ecosystem management in the Pacific Northwest.

Although CWD is known to provide important structure and habitat for fish and macroinvertebrates in lakes, its role in lake systems is poorly understood, and has not been incorporated into lake and lakeshore management plans .

The authors of the study suggest that loss of CWD from lake systems due to human activities and shoreline development may impact lake ecology, and estimate that it may take approximately 200 years to replace the deficit in CWD density in littoral zones adjacent to developed shorelines. Management of lakeshores to retain fallen trees in lakes, maintain riparian tree density, or reduce/limit cabin density could reduce future losses of CWD.◆

# New Recommendations for Grass Carp Stocking in Washington

The efficacy of grass carp for management of aquatic vegetation has been highly variable in Washington, according to a recently published study conducted by the Washington Department of Fish and Wildlife (Bonar, *et. al.* 1996, Research Report Number IF96-05).

A telephone survey of grass carp permit holders at 98 lakes and ponds stocked with grass carp between 1990 and 1995 indicated that noticeable effects of grass carp on macrophyte communities did not take place in most waters until two years after stocking. After two years, submersed macrophytes were either completely eradicated (39%) or not controlled (42%). Intermediate control of macrophytes occurred in 18 % of the lakes at a stocking rate of 24 fish per vegetated acre.

Turbidity was higher in lakes were complete eradication occurred than in lakes where no control or intermediate levels of control were obtained. Most of the increase in turbidity was due to abiotic materials – not phytoplankton. Chlorophyll *a* concentrations did not differ between lakes with different levels of control.

Most permit holders were satisfied with the results of the grass carp stocking, even when no control was obtained.

Several recommendation for grass carp management in the Northwest were proposed. Some of the recommendations include:

- Grass carp should not be used in lakes where complete eradication cannot be tolerated, unless a rotenone treatment can be performed if the lake is overstocked. Complete eradication of all submersed plants is a real possibility whenever grass carp are used.
- A stocking rate of 25 fish/ vegetated acre should be the maximum, with higher rates permitted on a case-by-case basis where rapid eradication is desirable, such as in irrigation canals and fire control ponds. Although incremental stocking is a popular technique, there are no examples where this approach has proven more effective than a single stocking. Existing stocking models should be used with caution.
- Where submersed plants provide important habitat for fish and wildlife grass carp should not be used.
- Because of their difficult removal, potential for eradication, and damage if large numbers escape, grass carp should rarely, if ever, be used in large lakes and never in rivers.◆

# Workshops on Environmental Compliance

Small Government Workshops were held in 7 locations throughout the State of Oregon this past year. The workshops, held in Hillsboro, Newport, Cottage Grove, Grants Pass, Baker City, and Bend, drew 171 participants from 80 different communities and 28 special districts. The workshops were well received and participants found the information particularly relevant and useful. Topics included an overview of public health and environmental requirements faced by small communities, review of drinking water and wastewater issues, financing options, and project management suggestions.

Because of the success of these workshops, additional workshops are scheduled for:

| | |
|---|---|
| March 13, 1997 | Bandon |
| March 18, 1997 | John Day |
| March 20, 1997 | Albany |

The workshops are particularly useful for Mayors, City Council members, City Administrators, Recorders, Commissioners, community leaders, public works employees, and special district representatives.

The workshops are free and, in addition, lunch is provided. Participants contribute the expense of their time and transportation to the workshop.

The workshops are an outgrowth of the DEQ's Environmental Partner-

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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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ships for Oregon Communities (EPOC) program. The EPOC program recognizes that small communities often have limited administrative, technical, and financial resources needed to meet and maintain compliance with the sometimes overwhelming number of public health and environmental requirements.

Communities recognize, however, that failure to comply with these requirements can lead to costly fines and pose risks to public health and the environment. In turn, non-compliance can affect the community's quality of life and its ability to sustain and expand the local economy. By forming a partnership with EPOC and various state agencies, communities find realistic solutions to compliance problems through a community-based cooperative approach.

In the spirit of this partnership idea, the Small Government Workshops provide an opportunity for local officials to gain valuable insight into public health and environmental compliance issues and to talk one-on-one with state and federal government representatives. In turn, federal and state agencies are able to better understand local problems and concerns.

For information and to register for the workshops, contact the Oregon Association of Water Utilities at (503) 873-8353.

If you would like further information on the Environmental Partnerships for Oregon Communities program, contact Alan Bogner (229-5449), Sharon Morgan (229-5590) or Pete Dalke (229-5588) at the DEQ NWR offices.◆

## Aquatic Plant Meeting in Seattle

The Western Aquatic Plant Management Society (WAPMS) will hold its 16th annual meeting in Seattle at the Crowne Plaze Hotel Hotel on March 27 and 28, 1997. The meeting will include presentations on the latest technologies in aquatic weed and algae control, aquatic plant biology, and aquatic ecology.

For meeting information and/or to make a presentation on any aspect of aquatic plants, contact Kathy Hamel, Program Chair (360-407-6562; kham461@ecy.wa.gov).◆

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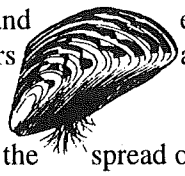
Grass carp cannot be introduced into any waterbody in Oregon without a approval by the Fish and Wildlife Commission. Grass carp in Devils Lake have eaten the weeds in the lake, but have also impacted the warmwater fish habitat and water quality. Bass, for example, are now larger, but stocks are declining. A reduced bass population may have reduced predation on juvenile salmon (coho and cutthroat), although the data are not sufficient to substantiate the link. So, in spite of the recreational and aesthetic benefit of the carp, the ecosystem impacts of this scaly vegetarian suggest we should not be overly en*Amur*ed of what it can do for us.

After hearing brief presentations by representatives of Oregon Departments of Forestry, Environmental Quality, Transportation, Marine Board, the Governors's Office, and EPA it became clear that a variety of agencies play a role in lake management.

At the end of the day it was apparent that OLA has been a catalyst for the development of skills and knowledge in a membership that is now heavily influenced by members of associations. These homegrown experts are the best avenue for lake improvement in Oregon. OLA will do what it can to alert people to the plight of our lakes, and will exert strong influence in growing up more expertise and more associations as the best defense of out lakes.◆

## Zebra Mussel Meeting at Portland State

The Western Zebra Mussel Task Force (WZMTF), will meet at Portland State University on March 10 and 11, 1997. The zebra mussel threatens a heavy economic and ecological toll on the Pacifc Northwest. It clogs water intakes, screens, and pipes that serve irrigators and water utlitities as well as alters aquatic ecosystem food webs.



The mission of the (WZMTF is to prevent or slow the spread of zebra mussels into western North America through the cooperative efforts of State, Provincial, Federal, local, and private interests.◆

# OREGON LAKES ASSOCIATION NEWS

## OLA Update

***by Andy Scheadel, President***

At the annual meeting in Lincoln City, I had a chance to outline some of the major focus areas for OLA for the next year. I have outlined these areas below and have included a contact if you are interested in helping out or providing your input. The board is currently developing a specific action plan for each of these areas and we will provide it to you after the beginning of the year. They will also be a topic of discussion in future newsletters.

Focus areas for 1997 include: 1) building membership and services for members (Andy Schaedel 503-229-6121), 2) improving Lake/Homeowner Outreach (Jack Jenkins (503-646-7807)/Stan Geiger (503-244-9966)), 3) development of an Aquatic Weed Management Program (Mark Sytsma (503-725-3833), and 4) finishing other "white papers" - State Lake Management Program and protection of high quality waters (Andy Schaedel (503-229-6121).

In trying to build membership (which includes maintaining current membership), the first question often asked is what has OLA done for me. On the right is a partial list of what OLA offers. I encourage readers to either join or renew their membership (if they have not done so already).

### OLA Activities

- Publish *Lake Wise* - now in cooperation with PSU.
- Annual conference and regional meetings to bring people together/ education/exchange ideas/develop positions. OLA tries to work in a 'Cooperative' vs confrontational fashion.
- Symposiums such as the recent one on Non-indigenous Species and Regional NALMS Conference in March 1996.
- Development and support of legislation (such as phosphorus detergent ban, aquatic weed program) including a recent tour regarding coastal aquatic weeds.
- Contact with agencies to influence budgets, direction, and develop contacts.
- Development of State of Oregon Lakes position papers.
- Education and outreach - Lake Resource Library, NW Science issue.

## Northwest Science Issue Available

OLA's special issue of *Northwest Science* on Oregon lakes (Volume 70, Issue 2) is available. Avis Newell, OLA Director, was Guest Editor on the special issue. Contents include:

Scientific and Management Issues in Oregon's Lake Ecoregions • Recent Paleolimnology of Devils Lake • Eutrophication of Mercer, Munsel, and Woahink Lakes, Oregon • Overview of the Limnology of Crater Lake • Diel Study of Lemolo Lake, Douglas County, Oregon • Processes Influencing Water Quality in a Subalpine Cascade Mountain Lake

Copies of the volume are available for $10 (OLA members) or $30 (nonmembers, includes $20 1997 membership). Send checks to Avis Newell, c/o OLA, PO Box 345, Portland, OR 97207-0345. Contact Avis (503-229-6018; Avis.Newell@state.or.us) for additional information.

## OLA Annual Meeting

***by Stan Geiger, President-elect***

This year's OLA Annual Meeting was held on October 19 at the Conference Center in Lincoln City. It was at the same location seven years ago that a small group of lake advocates/ enthusiasts/devotees founded the Oregon Lakes Association. Andy Schaedel, the current President, was also the first President of OLA.

Some 50-60 of the current membership of 150 attended the meeting, which included a morning session on grass carp effects on Devils Lake, a lunch with plenty of opportunities for talk , and recognition of Lake Watch volunteers. In the afternoon, we heard from DEQ Director Langdon Marsh and we discussed issues facing lake homeowner associations from all over the state and also from Washington (Silver Lake). The meeting concluded with talks by several people from agencies and the academic community involved in lake management.

Dave Wagner, past manager of the Devils Lake Water Improvement District, Kin Daley, ODFW fishery biologist, and Al Smith, long-time lake resident, provided insightful perspectives on the effectiveness of grass carp during the morning session.

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The Oregon Lakes Association is nonprofit organization dedicated 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**