

# LAKE WISE

## Newsletter of the Oregon Lakes Association

February 1996



Deren Ash collects water quality data on Oswego Lake. See story on page 6.

## Borax Lake Update

By Karen Backstrom

Borax lake, a geothermal lake owned by The Nature Conservancy, was the center of controversy at a series of public meeting held in November. (See the November 1995 issue of *Lake Wise* for a description of the Borax Lake ecosystem)

Anadarko Petroleum Corporation proposes to construct a closed-system, binary geothermal power plant near Borax Lake. In a binary geothermal plant, power is generated by extracting geothermal water, which is used to heat isobutane, a hydrocarbon fluid. The vaporized isobutane drives the turbines that generate electricity, cools, and condenses back into a liquid that is recycled. The geothermal water is injected back into the geothermal groundwater aquifer.

To date, Anadarko has drilled three test wells. Preliminary data from these test wells indicates that Borax Lake's hot

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## Fire in the Lake

### A New Way to Look at the Spread and Management of Aquatic Weeds

Spread and control of wildfires and weeds have much in common, including impacts and management. Indeed, invasive weeds have been described as a raging biological wildfire - out of control and spreading rapidly. The devastation of these alien plants includes enormous economic losses to agriculture and irreparable ecological damage to wildlands and water resources. The ecological integrity and beneficial uses of thousands of acres of Oregon's lakes, streams, rivers, and wetlands has been destroyed by an uncontrolled aquatic weed spread.

#### Impact

Just as an unwanted wildfire can drastically alter wildlands, noxious aquatic weeds have severe negative impacts on aquatic plant and animal communities, water quality, and recreation. Unlike the temporary negative impacts of wildfire, however, ecological damage from extensive noxious weed infestation is often permanent. Land impacted by wildfire is self-healing, many plants and animals have evolved with, and adapted to, the effects of fire. Land and water resources invaded by noxious weeds, however, do not return naturally to their pre-invasion condition. Weeds continue to spread and the damage worsens. In the long-term, invasion by aggressive, non-indigenous noxious weeds is far more damaging than any wildfire.

#### Spread

Weed infestations enlarge and spread much like wildfires, beginning small, then expanding to cover huge areas if not controlled quickly. Aquatic weed seeds, tubers, turions, and fragments can be carried long distances by water, waterfowl, and people. The resulting new "spot" infestations grow and merge, much like spot fires ahead of advancing fire front.

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**Fire in the Lake**

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**Management**

Modern wildfire management is based on elements of Prevention, Detection, Suppression (Control), and Revegetation. These are also the fundamental elements of effective weed management. A balance of all four components is essential for effective management of wildfires or weeds.

**Prevention**

Prevention is the first line of defense against wildfires, and the same should be true for aquatic weeds. The old adage "an ounce of prevention is worth a pound of cure" applies perfectly to both. Weed prevention means placing a priority on preserving and protecting water resources not presently infested.

Wildfire prevention depends on widespread public awareness and concern, which is achieved through a balance of education and regulation. Fire prevention messages appear in a variety of forms and places to remind people of the critical role everyone plays in this effort. Regulations such as campfire restrictions contribute significantly to wildfire prevention.

Education and prevention are also key ingredients needed to raise public awareness and gain greater support for weed prevention. More water resource managers and users need to recognize the adverse effects of aquatic weeds and become involved in efforts to reduce spread. Informed lakefront residents, boaters, anglers, and other recreationalists could also do much to prevent the spread of aquatic weeds. A significant portion of every lake management budget should be devoted to awareness education and to other forms of aquatic weed prevention.

**Detection**

Early detection of wildfires makes rapid and complete control much more likely. The same is true for weeds. Wildfire detection is the primary duty of assigned individuals, but all field personnel within land management agencies are expected to watch for and report wildfires. Similarly, weed detection requires field surveys and accurate mapping by designated weed management personnel. As with fire detection, other field personnel should be trained to recognize and report targeted weeds.

The public plays a significant role in fire detection and reporting. In Oregon, Lake Watch volunteers are expected to watch their lake for hydrilla. Other volunteer and recreational groups, such as angling and boating clubs, must become more involved in aquatic weed detection efforts.

**Suppression (Control)**

The third element of weed and wildfire management is control. Wildfire control activity is called suppression. Fire fighters follow a proven step-wise process of (1) rapid response, (2) size-up, (3) containment, and (4) mop-up. Suppression efforts may fail if all four steps are not completed in proper sequence.

Adoption of a similar four-step approach to noxious weed control could increase the effectiveness and efficiency of almost any weed program.

**Rapid Response**

Controlling wildfires that are small reduces costs and minimizes resource losses. An initial-attack fire crew is usually dispatched within minutes of a fire report, and control begins before most wildfires exceed 0.1 acre in size. In contrast, control of noxious weeds is often postponed until infestations have covered hundreds or thousands of acres and are beyond hope of eradication. Adopting a rapid response attitude about new noxious weed infestations is vital to successful control.

**Size-up**

Developing the best plan of attack against each wildfire requires information on size, direction and rate of spread, location and value of threatened resources, and control constraints (terrain, accessibility, safety, method restrictions, budget, etc.). Gathering and incorporating this information into a plan is called size-up, and must take place before control actions begin. Similar factors must be addressed when developing a weed control plan. Bypassing the size-up step in weed management is an invitation to inefficiency and possible failure.

**Contain/Confine**

The first objective in wildfire suppression is always containment - protecting unburned areas by stopping further spread. Efforts are focused on the fire's advancing perimeter, not on the core. If full containment is not practical, the goal is to stop the spread on one or two sides to save the most valuable resources. Spot fires outside of a containment zone always receive highest control priority.

The same strategy should be applied to weed management - stop the advancing perimeter before controlling the interior of an extensive infestation. Sometimes weed managers may be tempted to direct most or all control efforts at the core of large weed problems, ignoring the need for perimeter containment and control of isolated hotspots. This approach is

## Meet in Portland in March

OLA will join the Western Aquatic Plant Management Society (WAPMS) and other western chapters of the North American Lake Management Society (NALMS) in cosponsoring a symposium on nonnative aquatic pest species next month in Portland. The symposium, set for 27 March at Portland State University, will feature invited speakers who will provide updates on the biology, impacts, and management of aquatic pest species currently present in, or threatening to invade, the Northwest.

Symposium speakers include:

**Lars Anderson.** Invasive and Competitive Characteristics of *Hydrilla verticillata*.

**Curtis Daehler.** *Spartina* Invasions in Pacific Estuaries: Biology, Impact, and Management.

**Debra Eberts.** Purple Loosestrife in the West.

**Fred Nibling.** Zebra Mussels: A Threat to Western Aquatic Systems.

**John Lehman.** A Case Study of Species Invasion by the Invertebrate Predator *Bythotrephes* (Crustacea: Cladocera) and Associated Biological Effects in the Great Lakes.

**Robert Behnke.** Fish Culture and Nonindigenous Organisms.

**Doug Jensen.** Effective Exotic Species Boater Education: Where's The Best Bang For The Buck?

**Hiram Li.** Creatures of Light and Darkness: Management with Exotics.

**Jay Troxel.** Federal Response to Nonindigenous Aquatic Nuisance Species.

**Linda Drees.** The Western Zebra Mussel Task Force.

Following the one-day symposium, WAPMS will hold its annual meeting, which will focus on aquatic weed biology and management. Presentations will include:

Troublesome Exotic Aquatic Plants in Washington  
Water Quantity and Quality: Achieving a Balance in the Management of Aquatic Vegetation

Distribution and Impacts of Milfoil Species in Lake Tahoe  
Two Case Studies of Blue-green Algal Toxicity: American and Steilacoom Lakes, Pierce County, WA

Milfoil and Periphyton Control in Seattle's Lake Youngs Reservoir

Response of Periphyton to Nonpoint Pollution in an Oligotrophic Lake

Hydrilla Eradication in California

Hydrilla Eradication on Two King County Lakes

Ecological Effects of the Exotic Cordgrass, *Spartina alterniflora*, on the Benthic Invertebrates of Willapa Bay, WA

Aerial and Ground Application of Rodeo Herbicide to Control *Spartina alterniflora* in Alameda County, California

A Practical Perspective on the Human Health Safety of Fluridone

Long Lake Milfoil Eradication Project

In-lake Restoration Effort at Sacheen Lake (Pend Oreille County, Washington): Whole Lake Application of SONAR® (fluridone) for Control of *Myriophyllum spicatum*.

Restoring Habitats Impacted with Eurasian Milfoil, Hydrilla, and Purple Loosestrife Using Chemical Control Technologies

Response of Eurasian watermilfoil and the native aquatic plant community to a triclopyr application in Lake Minnetonka, MN: One year posttreatment

Control of *Myriophyllum* Species with Garlon 3A

Herbicide Use on Oregon Coast Removes European Beachgrass *Ammophila arenaria* (L.) and Enhances Snowy Plover, *Charadrius alexandrinus* (L.), Nesting Habitat

Update on Aquathol and Hydrothol Herbicide Label Changes  
Dilute Acetic Acid Exposure Enhances Electrolyte Leakage by *Hydrilla verticillata* and *Potamogeton pectinatus* Tubers

Crary Weedroller Pilot Project

The Devils Lake Experiment: Ten Years of Grass Carp

Biological Control of Purple loosestrife, *Lythrum salicaria*, in Oregon

Highland Lake Phosphorus Loading Study: Terrain and Water Quality Analysis Through a Geographic Information System and Empirical Models

King County's Lake Stewardship Program

Educating Aquatic Plant Wholesalers and Retailers About Prohibited Species

*Egeria densa* Decline and Response to Drawdown, Alum, and Harvesting

On Friday, March 29, OLA and other western chapters of NALMS will host a nontechnical session that will include presentations on

- Liability Issues and Lake Associations
- Understanding Lake Ecology
- Aquatic Weed Identification and Management
- Toxic Algae in Lakes

In addition, on Thursday, the 28th, there will be a meeting of the Northwest Zebra Mussel Working Group, a workshop to discuss fish stocking in National Forest lakes, and an Algae Control Workshop.

Contact Mark Sytsma (503-725-3833), Program Chair, for additional information.

**Fire in the Lake**

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like dropping fire fighters into the center of a huge wildfire and ignoring the expanding fire front. Spread continues, as if nothing had been done.

**Mop-up**

The final step in fire suppression is called mop-up. It involves hours of tedious labor to find and extinguish every live ember inside a containment area. Until mop-up is completed, a fire is not considered controlled and may flare up and escape.

In weed control terms, mop-up means total eradication. It involves killing every weed and exhausting the soil of all seeds and propagules of the noxious plant. Years of dedication and persistence are required. The effort needed for eradication may be justified only on relatively small patches or along containment edges of larger infestations. Failure to fully mop-up a weed infestation, however, essentially guarantees weed reestablishment and spread.

**Revegetation**

The fourth fundamental of wildfire management is revegetation. Often revegetation occurs naturally, but sometimes it must be assisted. Weed managers also should place emphasis on revegetation following control. Healthy, desirable, native plant communities protect sites from re-invasion by noxious weeds.

**A Model for Hydrilla**

Essentially every aspect of wildfire management has close weed management parallels, making it an excellent example or pattern from which to develop more effective weed control strategies and programs. Thinking of weeds as a slow-moving wildfire can provide a valuable perspective when developing and implementing weed management plans. The Oregon Department of Agriculture is using the fire fighting model in developing its plan for dealing with an invasion of Oregon's water resources by hydrilla. California and Washington are currently fighting a slow-burning hydrilla wildfire in their lakes, streams, and reservoirs. It is likely that hydrilla could jump the firelines and start spot infestations in Oregon. All Oregonians can join the Lake Watch Volunteers and aid in the fight against hydrilla by being a "Hydrilla Spotter". Be aware of the threat, take note of the plants you see in all waterbodies, and report suspicious looking aquatic plants on the Hydrilla Hotline (503) 725-3833 (see drawing on page 8).

*Adopted from a brochure by Steven Dewey  
Utah State University Extension*

**303(d) List Released**

Under Section 303(d) of the Clean Water Act, each state is required by the U.S. Environmental Protection Agency (EPA) to identify streams, rivers, and lakes that do not meet water quality standards – even after the best available technology is applied to wastewater discharges. These waters are referred to as "water quality limited". The Oregon Department of Environmental Quality (DEQ) recently completed updating Oregon's "303(d) list".

The list includes many of Oregon's lakes. Lakes are listed, for example, because aquatic weed infestations interfere with recreation and aesthetics; and/or pH, dissolved oxygen, and turbidity standard violations.

No lakes are currently on the priority list for grant funding to develop Total Maximum Daily Loads (TMDLs), which limit the pollutant inputs allowed to a waterbody. DEQ intends to work with an advisory committee to develop criteria for re-prioritizing the list, and is seeking input from the public on these criteria. Factors that influence priority listing include: consent decree requirements; watershed council interest or local interest or other tribal, federal, state, or local activity; significance or severity of pollution; waterbodies with completed studies indicating the nature and sources of contaminants, such as through watershed analysis; key watersheds/riparian areas/aquatic diversity areas; and presence of threatened and endangered species or species proposed for listing.

DEQ is soliciting written comments from interested parties on the proposed list until the close of business (5 PM) on February 29, 1996. The DEQ is seeking comments and information that would help DEQ determine whether or not to modify the list and/or the parameters listed for a waterbody, and input on criteria for re-prioritizing the list in the near future. For further information contact Andy Schaedel, DEQ, 811 SW 6th Ave., Portland, OR 97204.

**– PSU –****Lake Management Seminars**

**Response of algal migration and trophic state to alum in Green Lake** – February 29, 1996. Dr. Jean Jacoby, Seattle University.

**Lake restoration** – March 14, 1996. Dr. Harry Gibbons, KCM, Inc.

All seminars at 4 pm, Room 246, Science Bldg II. Contact J.R. (Dick) Pratt (503-725-8038) for more information.



# Citizen Lake Watch News

Winter 1996

## Program Notes

*The future's uncertain and the end is always near.*

—J. Morrison (*Roadhouse Blues*)

Once again, the **Citizen Lake Watch Program** is on the cutting block. As of printing time, Congress and the President had yet to agree on the budget for the **Environmental Protection Agency (EPA)** for fiscal year 1996, which began in October 1995. The EPA funds the Lake Watch Program through a grant to the **Oregon Department of Environmental Quality (DEQ)**. DEQ, in turn, contracts with **Portland State University** to coordinate volunteers, write this newsletter, and to summarize volunteer-collected data. Failure to fund the program will halt activities at Portland State.

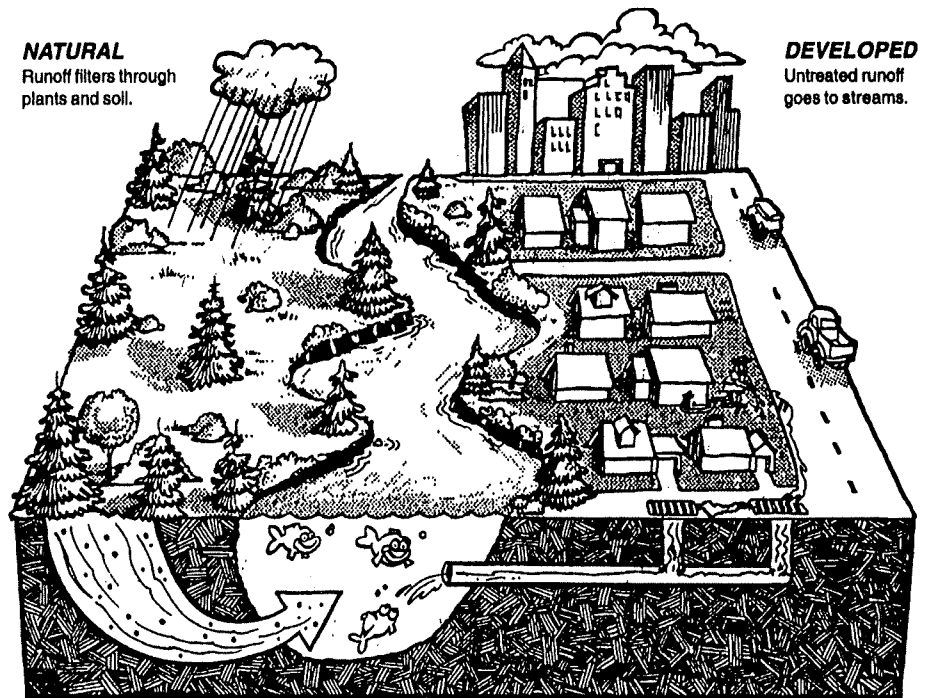
The Citizen Lake Watch Program is the only program in Oregon that systematically collects information about water quality in Oregon lakes. In 1995, Congress and the President eliminated the Clean Lakes Program, which cut the budget for the Lake Watch Program by 62 percent. Thanks to the support from the **U.S. Army Corps of Engineers** for a citizen monitoring program at Fern Ridge Reservoir; the **Oregon Department of Agriculture** and the **State Weed Board**, which recognize the value of Lake Watch volunteers in surveillance for hydrilla; and the **Oregon Lakes Association (OLA)**,

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## Corps Supports Volunteer Monitoring

Support of citizen monitoring of water quality is part of a new pilot study at the Portland District, U.S. Army Corps of Engineers. This spring, the Corps will launch a citizen monitoring group at Fern Ridge reservoir. The Corps will equip volunteers to measure water temperature, pH, dissolved oxygen, suspended solids, total phosphorous, Secchi disk transparency, and phytoplankton

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From Partners for Clean Water

## Urbanization and Water Pollution

Urbanization has a profound impact on water bodies – and the pollutants that wash off dirty streets and from smoggy air are only part of the story. Asphalt, concrete, and other impervious surfaces also cause severe changes in watershed hydrology.

### Impervious Surfaces

Urbanization of a watershed results in an increase in impervious surfaces - roads, sidewalks, driveways, parking lots, rooftops, and other surfaces - that prevent rainfall from entering the soil and increase runoff. It has been estimated that runoff from one-inch of rain on a one-acre meadow would fill an average

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## Lake Watch Volunteer Roster

Jack Jenkins ..... Fishhawk  
 Bob Anderson ..... Woahink  
 Janette Goolsby ..... Cullaby  
 Koren Marthaller ..... Blue (Willamette)  
 Elmer Waite ..... Clear  
 Gary Lovegren ..... Blue (Cascade)  
 Barbara Hagerman ..... Devils  
 Warren Phillips ..... Devils  
 Bill Vaughan ..... Devils  
 Al Rice ..... Devils  
 Robert Johnson ..... Fairview  
 Don Martin ..... Garrison  
 Max Peel ..... Hosmer  
 Catherine Hayes ..... Lake of the Woods  
 John and Janet Milandin ..... Odell  
 Ron Boehi ..... Mercer  
 Al Burhans ..... Munsel  
 Roy Fisher ..... Munsel  
 Fred Barstad ..... Wallowa

Richard Hiersche ..... Lytle  
 Richard Kaufmann ..... Loon  
 Steve Kaufmann ..... Loon  
 John Richter ..... Vernonia  
 Stephanie Harte ..... Lawrence, Lost  
 Kristi Hickox ..... Rock Creek Reservoir  
 Ryan Nieman ..... Trillium, Cast, Mirror  
 Paula Curry ..... Trillium, Cast, Mirror  
 Sally Thomas ..... Tenmile Lakes  
 Edward Lopez ..... Tenmile Lakes  
 John Kelsey ..... Tenmile Lakes  
 Hazel Freeland ..... Tenmile Lakes  
 Ken Freeland ..... Tenmile Lakes  
 Dan Jordan ..... Tenmile Lakes  
 Dean Anderson ..... Tenmile Lakes  
 Franklin Gray ..... Tenmile Lakes  
 Lake Oswego Corp. .... Lake Oswego  
 Wally Otto ..... Hagg Lake  
 Kathy Arndt ..... Neacoxie Lake  
 Susan Gage ..... Big Creek Reservoir

### Urbanization

#### Continued from page 1

office to a depth of about two feet; but if that meadow were paved, the runoff from the same storm would completely fill **three** offices.

In urban areas, 40 to 80 percent of the land area is covered by paved surfaces and rooftops. The high percentage of impervious area not only increases the volume of runoff; it also increases the velocity of the runoff. Peak stormwater discharge after development can be two to five times higher than prior to development, and the water reaches the stream in half the time.

#### Changes in Watershed Hydrology

In response to this onslaught, stream morphology changes. The channel gets wider and the banks are undercut. Sediment eroded from the widening streambanks covers the streambed, and pool and riffles areas are lost.

Increased runoff volume means floods are higher and more frequent. In addition, because less water soaks into the ground to replenish groundwater, stream flow is reduced during dry weather periods; the stream may even run dry.

The water also warms. In areas with high paved area, local air and ground temperature can be 10 to 12 degrees

warmer than if the area were in a natural state. Loss of streamside vegetation and shade and low summer flows also contribute to higher stream temperatures.

#### Pollution

The above effects would occur even if the runoff were perfectly clean - but of course it is not. Rain falling through the air above a city starts picking up pollutants before it hits the ground, then collects more as it flows over rooftops, streets, and parking lots. Some of the most important pollutants in urban runoff, and their major sources, are:

- Sediment (construction sites)
- Nutrients (fertilizer, phosphorus attached to sediments)
- Bacteria (pet wastes, sanitary sewer overflows)
- Toxic substances, including
  - Pesticides (lawn and garden care)
  - Metals ( vehicle brake pads and tires, building materials)

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## Landscaping

### *10 Tips for Clean Water*

Many gardeners are beginning to get spring fever and are planning their garden right now. Simple activities in the yard and around the home can pollute water. Your landscaping and how you care for it can help or harm the watershed. Here are ten tips for landscaping to protect the watershed where you live.

#### *Plan and Plant With Care*

Be aware of the needs and benefits of plant types. Trees and shrubs have good root systems that help prevent erosion. Ground cover needs less water and work than a lawn. Placing plants with similar needs together saves water, work, fertilizer, etc.

#### *Go Native*

Native plants need less water, fertilizer, and pesticides than nonnative plants. Wildlife prefers native plants too. Just a few examples of native flowering shrubs: Indian Plum, Pacific Ninebark, Townberry, Snowberry, Oregon Grape, Mock Orange, and Salal.

#### *Great Ground Cover*

Ground covers choke out weeds and prevent erosion. They are attractive and need little care once they are established. Avoid use of landscaping plastic because it prevents water from soaking into the ground, causing runoff and erosion.

#### *Less Lawn, Less Work*

Lawns need lots of water, work, fertilizer, weed killer, and so on. Consider more natural landscaping like trees, shrubs and ground covers. You might have more time to enjoy your beautiful yard.

#### *Bark Dust Manners*

Keep bark dust where it belongs. Avoid using bark dust near paving, ditches, storm drains, and on steep slopes where it is likely to wash away. Bark dust clogs storm drains and can cause flooding.

#### *Fertilize Nature's Way*

A compost pile provides a steady supply of fertilizer and mulch. Use only clean organic matter that is free of chemicals. Keep the pile away from ditches, storm drains, and streams.

#### *Water With Restraint*

Water only as much as the ground can absorb. Water running down your driveway and into the street or ditch is water wasted. Mulch with compost or grass clipping, especially around plants that need lots of water.

#### *Careful With Chemicals*

Chemicals that kill insects, weeds, moss, and rodents can also injure the plants and animals you want. Follow the label with care. Keep chemicals, including fertilizer, off pavement so they don't wash into storm drains and into streams.

#### *Do You Overkill?*

Use the least toxic method of pest control. Pull a weed, pick a bug off a leaf. Make sure the pesticide is appropriate for the pest, and that the pests are around before using chemical control. Accept a little plant damage instead of resorting to costly chemicals.

#### *Be Responsible for Proper Disposal*

Buy only the chemicals you can use or share with a neighbor. Follow package instructions for disposal of leftovers and the container. **Don't pour them down the drain or dump on the ground.**

These 10 tips for landscaping were adopted from a brochure developed by Partners for Clean Water in the Tualatin Watershed.





## Urbanization

Continued from page 2

- Hydrocarbons (vehicles)
- Industrial and household chemical (paint, cleaning products)

Sediment, nutrients, pesticides, and bacteria are "conventional" pollutants that often cause problems in rural as well as urban watersheds. Metals, hydrocarbons, and industrial pollutants are more typically found in urban runoff.

For most people, the words "toxic runoff" conjure up images of a giant factory discharging vile, corrosive liquids from a pipe into a stream or river. Actually, clogged freeways, or a block of green, weed- and bug-free lawns are closer to the mark. Industrial discharges have been strictly regulated over the past 20 years, and most of the worst problems have been cleaned up. Now, the everyday activities of John and Jane Q. Public contribute the greatest share of urban runoff pollution.

Vehicles are probably the greatest cause of problems. They are major sources of copper, cadmium, lead, and chromium. Because brake pads and tires wear directly onto roads, the metals and other contaminants that they deposit readily enter runoff.

Vehicles are also the leading source of hydrocarbons in urban runoff. Leaked and spilled oil and fuel, along with illegal dumping and accidental spilling of motor oil from do-it-yourself oil changes contributes more than 10 times the amount spilled by the Exxon Valdez.

Lush lawns and gardens may be attractive, but what is less visible are the excess nutrients (fertilizers) and pesticides (herbicides and insecticides) that are washed off with rain or watering. In fact, urban gardeners use up to 10 times more pollutants per acre than farmers.

## Solutions

The best way to reduce urban water pollution is to change people's behavior. Often, these changes entail low or no costs,

sometimes the changes would even save money. Simple things, like not spilling oil and washing your car on the lawn instead of the driveway (nutrient in detergents fertilize your lawn and don't runoff into streams); and avoiding over-watering, -fertilization, and using pesticides correctly on your lawn and garden will reduce the pollutant load in runoff.

Though changing behavior is often not an easy task, there are success stories that indicate it can be done. Think about how recycling has become an integral part of our life. Twenty years ago hardly anyone recycled newsprint - now nearly everyone does. After all, hardly anyone wants or intends to pollute water; in many cases, people just are not aware that their actions cause pollution. Once educated, they are often willing to change. Lake Watch volunteers can set an example. If you want additional information on how you be part of the solution and not part of the problem, contact your regional DEQ office.

Adopted from an article by Eleanor Ely published in *The Volunteer Monitor*, volume 7 (2): 6-7, 1995.

## Corps Supports Volunteers

Continued from page 1

at 8 sites on the reservoir and on the Long Tom River below the reservoir. The Corps hopes to involve citizen monitors to detect early infestations of invasive plant species, such as hydrilla. The Corps will expand the pilot study to Cougar Reservoir in 1997. Call Carie Fox (503- 326-6104) for more information on the Corps' involvement..

## Program Notes

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which prints and distributes this newsletter, the Program survived through 1995. The Oregon Department of Agriculture, the Corps of Engineers, and OLA, however, cannot fund the entire Lake Watch Program in 1996.

DEQ is currently searching for federal funds to continue the Lake Watch Program in 1996. The continued funding problems suggest that, if a growing and effective volunteer monitoring program for lake water quality is to continue in Oregon, an alternative funding mechanism is required.

*The Citizen Lake Watch Program is coordinated by Portland State University under a grant from the Oregon Department of Environmental Quality and the U.S. Environmental Protection Agency. The goal of the program is to involve citizens in the collection of reliable water quality data in an effort to identify long-term trends in the water quality of Oregon's lakes, and to involve citizens in identifying and reducing nonpoint pollution. For more information about the Citizen Lake Watch Program or Lake Watch News, contact Citizen Lake Watch, ODEQ, Water Quality Division, 811 SW 6th Avenue, Portland, OR 97204 (1-800-452-4011), or the Citizens Lake Watch Coordinator at Portland State University at 725-3833.*

*Lake Watch News is available in alternate format (e.g., braille or large type) by contacting DEQ Public Affairs at 229-5766 or toll-free in Oregon 1-800-452-4011. People with hearing impairments can also contact DEQ's TDD at 503-229-6993.*



**Borax Lake**

Continued from page 1

springs are distinct from the underground waters Anadarko would tap. Anadarko maintains that the data obtained from these three test wells suggests that little or no environmental impact would be made on Borax Lake by the geothermal power plant. Anadarko also proposes that the Borax lake site would provide new jobs to an area that is depressed economically, and would provide electricity to 90,000 households.

Before construction of a geothermal power plant occurs, an Environmental Impact Statement (EIS) must be completed. MHA, an environmental consulting firm from the San Francisco Bay area, has been contracted by the Bureau of Land Management (BLM) to conduct the study. The EIS will be based on scientific analysis completed by a professional team that includes biologists, geologists, hydrologists, geophysicists, and engineers. The final EIS will be reviewed by the BLM. BLM's decision to approve or disapprove the project at Borax Lake will depend upon the level of environmental impact the power plant will have on the lake and its surroundings.

The EIS will take up to 24 months to complete. The EIS process began in the first week of November with four scoping meetings held throughout Oregon. At the meetings, MHA heard the concerns of representatives from federal, state, and local agencies; special interest groups, and the general public.

Many serious concerns about the power plant were raised. A few of the concerns centered on the fact that geothermal developments have been known to impact nearby geothermal surface features. Extraction and reinjection of the geothermal fluids may disrupt flow patterns in the aquifer, alter the temperature and quantity of water entering Borax Lake, and induce seismic activity in the area. Seismic activity could alter flow in the geothermal aquifer, or could collapse the geologic structure on which the lake is situated. MHA must address all these concerns in the EIS.

The Nature Conservancy of Oregon owns Borax Lake and currently manages the ecosystem to preserve the unique biological features of the system. The Nature Conservancy is concerned that geothermal fluid extraction and re-injection required for the power plant will destroy Borax Lake. The flow patterns in the geothermal aquifers in the Alford desert are deeply hidden and may be impossible to map and understand fully. That leaves the critical question: How big is the gamble of siting a geothermal power plant so close to Borax Lake? Maybe the answer will be found in the EIS produced by MHA in two years – maybe not.

**\$48,000,000**

What is a lake worth? It is difficult to put a value on fish and wildlife habitat and the aesthetic values of Oregon lakes; however, a Lane County real estate developer figures that Clear Lake waterfront is worth \$48,000,000 (including attorney's fees). Clear Lake is the drinking water supply for the Heceta Water District, north of Florence, and is one of the cleanest lakes in Oregon. Among the lakes monitored in the Citizen Lake Watch Program, Clear Lake is second only to Wallowa Lake in clarity.

The Oregon Department of Environmental Quality instituted a moratorium on building in the Clear Lake watershed, to protect water quality. DEQ and the Heceta Water District have been sued because the moratorium limits the developers ability to build houses in the watershed, which would be on septic tanks and may result in degradation of water quality. (See related article on page 8)

\$48,000,000 – about \$3800 per foot of shoreline. Multiply that by the shoreline length of lakes in Oregon and you may get some idea of the value of our lakes. Oregon has no program to manage this valuable resource.

**My Missteak**

In the last issue of *Lake Wise*, E & S Environmental Chemistry was inadvertently left off the list of OLA's corporate sponsors. E&S Environmental Chemistry is a long and reliable supporter of OLA and the editor apologizes for the omission.

**1996 CORPORATE SPONSORS**

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 Aquarius Systems (414-392-2162)  
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 The Cascade Research Group (503-758-1330)  
 E&S Environmental Chemistry (503-758-1330)  
 Herrera Environmental Consultants (206-441-9080)

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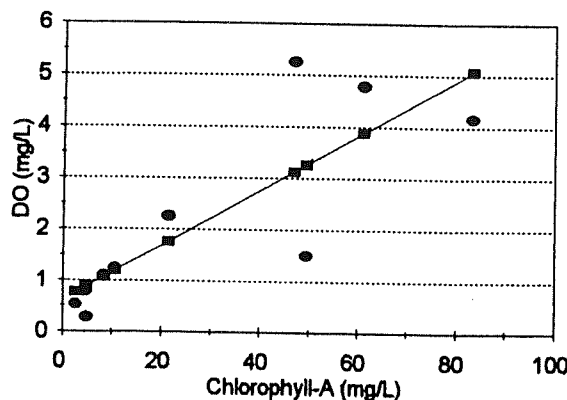
## Student Makes Presentation at International Symposium

Deren Ash, a 15 year-old student at Lake Oswego High School, presented a paper at the 15th International Symposium of the North American Lake Management Society in Toronto, Ontario in November 1995. The title of Deren's presentation was "Diurnal Changes in pH and Dissolved Oxygen: A Measure of Water Quality." Deren's research was conducted in Oswego Lake, a 169 ha lake with a maximum depth of 16.5 m (54 ft.). Oswego Lake is a privately-owned, eutrophic lake located in Lake Oswego, Oregon that is used for recreation and power generation.

The purpose of Deren's work was to devise a method of measuring algae abundance with limited equipment availability. He measured Secchi disk transparency, pH, dissolved oxygen, chlorophyll *a* concentration, and algal cell density at regular intervals over a 24-hour period.

Deren found that microscopic counts of cell density were not well-correlated with chlorophyll *a* concentration, however, diurnal variation in dissolved oxygen concentration was correlated with chlorophyll *a*. Deren concluded that diurnal

change in dissolved oxygen is a useful measure of water quality in Oswego Lake and suggested that it may be useful in other lakes as well. Good job Deren!



Relationship between chlorophyll *a* and dissolved oxygen concentration (DO) in Oswego Lake. Data collected by Deren Ash.

*Nature to be commanded, must be obeyed.*

— Francis Bacon, *Novum Organum*

## NEW PUBLICATIONS

***The Conservation of Plant Diversity***, by Otto H. Frankel and Anthony H.D. Brown, and Jeremy J. Burdon, examines how best to conserve plant diversity at each level of organization — gene, species, and community. Contact Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211.

***Viable Populations for Conservation***, edited by Michael E. Soule, determines acceptable minimum populations for various species. Contact Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211.

***Earthscapes in Time: The See-through Satellite Atlas***, by Now What Software, is a new CD-ROM for viewing Earth's changes over time. The software displays natural fluctuations and human-made changes on a global scale, over two decades, using satellite images from NASA, Landsat, NOAA, and recently declassified images from the CIA. Contact Now What Software, 2303 Sacramento St., San Francisco, CA 94115. (800) 322-1954.

## Assistance in Groundwater Protection Available

Groundwater inflow is important in the hydrology of many Oregon lakes and is a primary source of drinking water for many Oregonians. Protection of groundwater quality is necessary for healthy lakes and safe drinking water. The Homestead Assessment System (Home\*A\*Syst), available through OSU Extension Service, can help rural residents evaluate the potential for groundwater contamination at their homesite, and recommend solution.

The System consists of a packet of material that includes Fact Sheets on a variety of potential sources of groundwater pollution that may exist on farmsteads, background information, a glossary, and a risk assessment worksheet. The packets are available from Publication Orders, Agricultural Communications, OSU Administrative Services A422, Corvallis, OR 97331-2119 for \$12.00.

The Program also offers training for local professionals and volunteers interested in serving as Home\*A\*Syst Groundwater Safety Leaders. Trained leaders can conduct local workshops on how to use the materials and serve as a contact for people that need help in identifying or finding a remedy for high-risk situations. To arrange a Home\*A\*Syst Leaders Training in your area contact Gail Glick, Extension Water Quality Educator, Bioresource Engineering, Gilmore Hall 116, Corvallis, OR 97331-3906 or (541) 737-6294.

## Washington Battles Aquatic Weeds

The Washington Department of Ecology recently offered local government cooperators grants totalling nearly \$431,000 for aquatic weed control efforts. In 1995, more organizations requested more funds, and more funds were distributed, than ever before. The grants will be used to control or complete eradication of nonnative aquatic weeds on 11 separate projects including:

- \$25,000 to control milfoil on Silver Lake in Everett,
- \$53,244 to control purple loosestrife on the Mid-Columbia,
- \$29,062 to develop an integrated aquatic plant management plan for milfoil on Lake Wilderness,
- \$45,686 to eradicate milfoil on Lake Twelve,
- \$35,000 for aquatic plant mapping and water quality monitoring of Duck Lake,
- \$16,594 to control purple loosestrife in Okanogan County,
- \$47,062 for planning of the eradication of Brazilian elodea from Big Lake,
- \$27,938 to control milfoil on Lake McMurry,
- \$75,000 to eradicate milfoil from the little Pend Oreille Chain of Lakes,
- \$73,121 for a research project on biocontrol of milfoil, and
- \$2,900 for purple loosestrife control in Whatcom County.

**Oregon has no aquatic weed management program.**

## SePRO Hires Herbicide Helper

Bob Brenton has joined SePRO, manufacturers of SONAR aquatic herbicide, as an Aquatic Specialist. Based in Sacramento, Bob is responsible for sales, service, and support for SePRO products in Oregon and several other western states. Bob has eight years experience in vegetation and habitat management, and holds a Master's degree in Agronomy from Clemson University. Bob can provide information on SONAR and its efficacy on a particular plant and site. He can be contacted at (916) 372-9533.

## Aquatic Plant Management Council Proposed

The Oregon Department of Transportation (ODOT) Salmon Recovery Task Force has endorsed a recommendation by David Humphrey, ODOT Vegetation Management Coordinator, for the formation of an Oregon Aquatic Plant Management Council. The Council will be comprised of representatives of agencies involved in developing a Salmon Recovery Plan. An Aquatic Plant Management Council is necessary because lack of agency coordination has led to serious aquatic weed problems in many of our water resources. The weeds have seriously degraded habitat for salmon and other aquatic organisms. ODOT's recommendation supports the Oregon Department of Agriculture's (ODA) goal of multiple agency participation in developing a plan for dealing with hydrilla invasion of Oregon. More agency coordination in aquatic weed and lake management, which an Aquatic Plant Management Council will facilitate, was also recommended in OLA's 1995 State of the Lakes whitepaper on aquatic vegetation management in Oregon. The efforts of ODOT and ODA will result in better management of Oregon's lakes – a critical element in any salmon recovery plan.

### URLs = Information

Users of the Internet that have graphical browsers (Netscape, Mosaic, Chameleon, etc.) are able to directly access graphical "home pages", databases, and other information of thousands of government agencies, universities, corporations, and individuals. Graphical home pages make it much easier to navigate the Internet than text only "gophers". To access a home page users must have its address, called a URL (Universal Resource Locator). Below are some interesting URLs. You will find thousands more as you begin to look around. Get a computer, modem, and Internet account and explore!

Aquatic Plants: <http://aquat1.ifas.ufl.edu/>

Water Web: <http://www.waterweb.com>

Biodiversity and Ecosystems Network:  
<http://straylight.tamu.edu/bene/bene.html>

US Fish and Wildlife Reference Database:  
<http://www.fws.gov/htdocs/fwrefser.html>

Oregon Lakes Association (we're still working on this):  
<http://clas.www.pdx.edu/~perkins/oregonlakes/map.html>

# Oregon Lakes Association

## Officers and Directors

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Andy Schaedel ..... President-elect  
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Mark Sytsma ..... Past-president  
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Cynthia Price ..... Secretary  
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274-9000

# Association News

## H<sub>2</sub>O POWR

William Gates, President of H<sub>2</sub>O POWR, recently commented on the \$48,000,000 lawsuit filed against the Heceta Water District and Oregon DEQ over the moratorium on development in the Clear Lake watershed. Gates characterized a recently negotiated mediation plan as little more than a development plan.

According to a news release by H<sub>2</sub>O POWR, DEQ attorney, Denise Fjordbeck, stated, "We are not going to lift the moratorium until sewers are in place, that's the bottom line, unless we are forced by the Court to do it." If DEQ were to lift the moratorium before sewers or some other system were in place, Fjordbeck said, "There would be no reason why they couldn't waltz into Lane County, get a building permit and a septic permit, and build tomorrow, and that's not acceptable, and it's not going to happen."

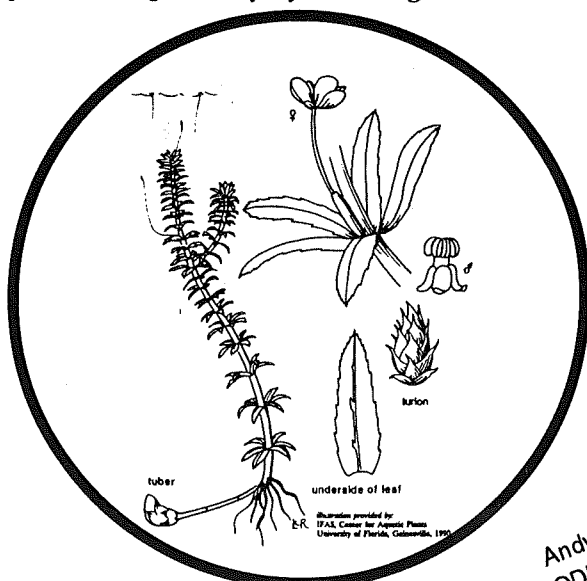
Gates expressed concern about the "goings on" at Lane County. According to Gates, "the County is going to try to railroad through a change in the Lane County Land Use Plan and get the regulations (which will allow septic tanks around Clear Lake) approved before the lawsuit can come to trial in July, 1996." H<sub>2</sub>O POWR questions the wisdom of Lane County's "fast track" approach to development of Clear Lake, their drinking-water supply. Gates said, "We think allowing septic tanks around our drinking-water supply is unwise, to say the least, and that is exactly what Lane County's fast track regulations will do."

Send news of your association to:

LakeWise Editor, PO Box 586, Portland, OR 97207.

**Associations! Help! Ask Your Members to Join OLA.**

*The Oregon Lakes Association is a nonprofit organization dedicated to the protection and enhancement of Oregon's lake resources and is a chapter of the North American Lake Management Society. Lake Wise is published quarterly by the Oregon Lakes Association, PO Box 586, Portland, OR 97207.*



IF YOU SEE THIS PLANT CALL THE

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(503-725-3833)

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