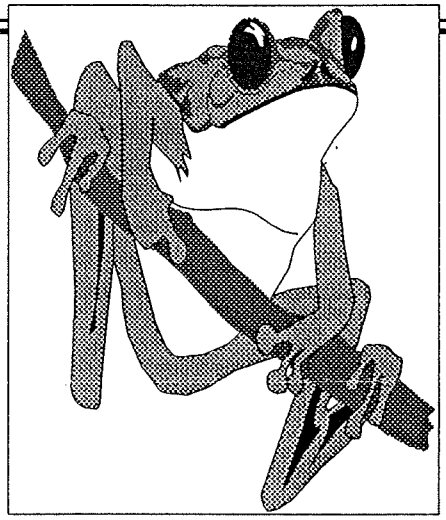
The Lake Watcher

Volume 1 Issue 2 Winter 1993-1994



◆ *Lake focus*

Woahink Lake

Woahink Lake is a large lake located on the central Oregon coast south of Florence and about three miles inland from the ocean. You may have seen the southern end of the lake which borders Hwy. 101 or you may have visited the lake at Honeyman State Park.

Woahink exhibits the branching shape that is characteristic of many coastal lakes. At the end of the last ice age, rising global temperatures caused a rise in sea levels, drowning Woahink's ancestral stream. Eventually, migrating sand dunes cut off the ocean outlets and created the lake.

Today, Woahink is bordered to the west by Hwy. 101 , the migrating sand dunes of the Oregon Dunes National Recreation Area (whose inevitable march into the lake was interrupted by the construction of the highway), and a large undeveloped section of Honeyman State Park. On the east side of the lake lie the foothills of the Coast Range. There has been extensive logging in the watershed and numerous houses ring the south and east shores. Honeyman State Park has an extensively developed area on the north shore which includes a large boat launch.

The lake is fed by three tributaries on the north and east

--- Continued on page 3 ---

◆ *Program information*

There are a number of notes of interest to volunteers including my (Steve Daggett) departure as coordinator of the Citizen Lake Watch Program, plans for the future of the program, and the completion of the 1993 Final Report.

After two years as coordinator of the Citizen Lake Watch program I am leaving to complete my masters thesis in Biology. Coordinating the program has been a great experience both professionally and personally.

--- Continued on page 4 ---

◆ *Aquatic plants*

Eurasian watermilfoil

Myriophyllum spicatum, better known as Eurasian watermilfoil is a non-native, or exotic, plant that is becoming a major problem in lakes around the state. The plant was recently tentatively identified as being present in Woahink Lake. Eurasian watermilfoil was the most prevalent aquatic weed present in Devils Lake near Lincoln City prior to the stocking of grass carp. It is also a major nuisance plant in Blue Lake near Portland.

The plant lives in water less than approximately fifteen feet in depth. If left alone, the plant forces out other aquatic plants and dominates a lake's aquatic vegetation. Shallow lake areas may become choked with dense stands of the plant which interfere with uses of the lake. In deeper lakes,

--- Continued on page 4 ---

Inside This Issue

◆◆◆

1993 Lake Watch Results

During 1993, thirty-six volunteers regularly monitored twenty-seven lakes around the state. Additionally, one volunteer visited forty-two lakes around the state, one time each, as part of his research for a book on swimming holes. The regularly monitored lakes were spread across four different ecoregions: Wallowa Lake in the Blue Mountain ecoregion, twelve Cascade Ecoregion lakes, twelve Coast Ecoregion lakes, and two Willamette Ecoregion lakes. Volunteers measured Secchi Disk depth, pH, air temperature, and water temperature; collected surface phyto-plankton samples; collected aquatic plants and mapped their distribution; and measured dissolved oxygen.

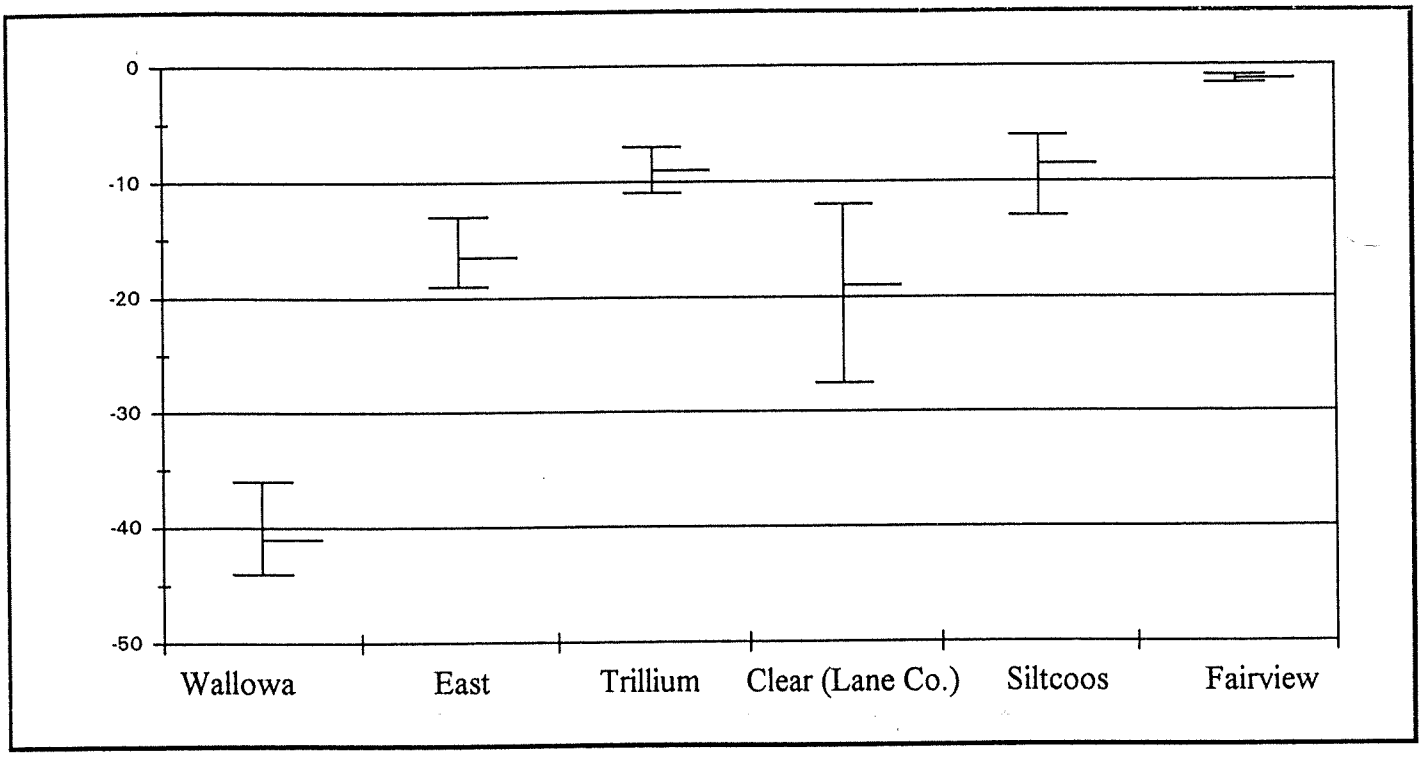
There is quite a wide range of Secchi Disk transparencies at lakes around the state as evidenced by the measurements shown on the graph. Among all the program lakes, Wallowa had the deepest single Secchi depth and the highest average Secchi depth. East Lake falls in the middle range of Cascade lakes while Trillium Lake had some of the shallowest Secchi depths for the Cascade lakes. On the coast, Woahink had the deepest Secchi measurements (see graph on following page) followed by Clear Lake near Florence. Siltcoos Lake falls in the middle of the Coast lakes. Fairview Lake in east Multnomah County had the single shallowest Secchi depth and the shallowest average Secchi depth of all the lakes in the Lake Watch program. As one might expect, the Cascade and Blue Mountain lakes are, in general, more transparent. However, Woahink, Munsel, and Clear Lakes, all near Florence, exhibit very high water transparency.

A number of the lakes in the program have now been monitored for several years successively. Most of these lakes show very little changes in Secchi Disk depth over time. For example, Garrison Lake was monitored in 1985, 1988, 1989, and 1991-1993. The Secchi depths recorded in 1993 are very comparable to values from previous years. Some exceptions are Blue, East, and Suttle Lakes in the Cascades and Munsel and Woahink Lakes on the coast. Blue Lake and East Lake have shown steady decreases in the maximum Secchi depth, while Munsel and Woahink have shown increases in the maximum Secchi depth. Measurements at Suttle Lake in 1993 are comparable to values from before 1991; during 1991 and 1992 the Secchi depths increased significantly. It is difficult to say what these changes mean. They may reflect changes in cultural impacts, algae populations, climatic conditions, or, as mentioned previously, they may reflect responses to patterns of which we are yet unaware.

At those lakes where transparency has decreased it will be important to determine the cause of the change to avoid any irreparable changes.

◆◆◆

Secchi Disk depths in selected Oregon lakes for 1993: maximum, minimum, and average depths in feet



Woahink Lake continued

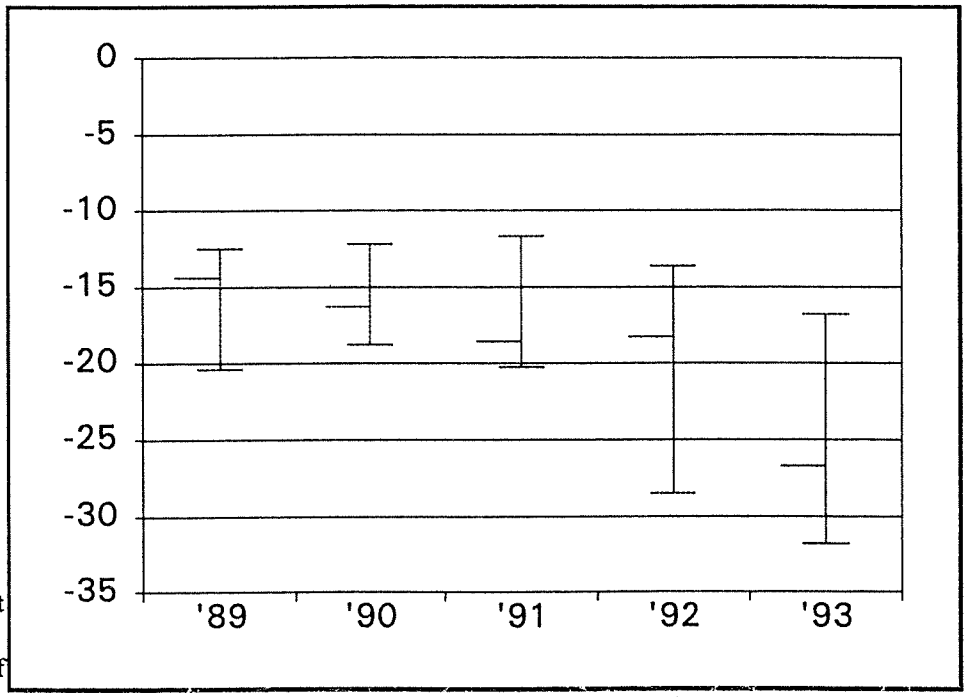
sides. The only outlet is Woahink Creek which drains into Siltcoos Lake.

Historically, the tributary on the east arm of the lake supported spawning populations of native coho salmon. It is unknown if any of this population survives today. Some anadromous fish may still enter the lake from Siltcoos Lake. At one time, Woahink was heavily stocked with kokanee salmon in an effort to establish a spawning population but the fish never reproduced in the lake. Currently, the lake supports a popular fishery for perch and is regularly stocked with rainbow trout.

It is no surprise that the lake has never supported any large populations of fish; the lake is one of most oligotrophic, or "poorly nourished", lakes on the coast. Human impacts on Woahink Lake are somewhat lessened because of its great depth, about 70 feet, and because of its above average mean depth, about 33 feet. However, its oligotrophic status and popularity with lake users make it vulnerable to human caused enrichment or "eutrophication". Recent construction activity has exposed unconsolidated material, much of which has eroded and washed into the water. One of the most common impacts on the water quality is a decrease over time in the transparency of the water. The Citizen Lake Watch Program exists to try to detect these changes.

Bob Anderson, a Citizen Lake Watch volunteer, has monitored the lake since 1988. Initially, he collected the basic Lake Watch measurements: Secchi Disk depth, pH, and air and water temperature. In 1992, he began measuring dissolved oxygen at selected depths and in 1993 he sampled and mapped aquatic plants around the lake. The results of the Secchi measurements are shown in the graph. Although I've just been suggesting that human impacts will decrease the transparency of the lake, you can see that in 1992 and 1993 the Secchi Disk depth increased substantially and that in 1993 the average Secchi depth was more than 10 feet greater than previous years. How to explain this apparent contradiction? In 1992, we thought the increase in transparency might be related to low rainfall levels providing fewer nutrients to algae in the lake, but 1993 was a more normal summer rainfall pattern. A possible explanation for 1993's increased transparency might be cloud cover. If the lake experienced long stretches of cloudy days, the algae may have been starved for sunlight and the algae populations may never have reached their normal densities. However, these are just guesses. Lakes are complex ecosystems and Woahink may be responding to some pattern in the environment of which we are yet unaware.

Secchi Disk depths in Woahink Lake 1989-1993: maximum, minimum, and average depths in feet



Bob's dissolved oxygen testing has revealed a pattern that has been documented in the lake historically. During the winter, the lake mixes regularly top to bottom while all of the water is the same temperature. In the spring, the surface water begins to warm as air temperatures increase. This temperature stratification traps a layer of colder water underneath the warmer surface water. Biological activity near the lake bottom, usually bacteria decomposing dead plant and animal material, uses oxygen dissolved in the water trapped in this lower layer. In some lakes, the biological activity exhausts the oxygen supply, however, this does not occur in Woahink Lake. As the summer progresses, the oxygen concentration continues to decrease until the autumn when the lake mixes once again. This fall mixing, or overturn, occurs when the air temperature cools the surface water to the same temperature as the trapped lower layer. At this time, the wind action once again mixes the lake top to bottom and the water is reoxygenated as it reaches the lake surface.

Woahink is a very unique lake. Please be sure to stop and visit the lake when you're near Florence.

Portions of this story were adapted from the Atlas of Oregon Lakes.

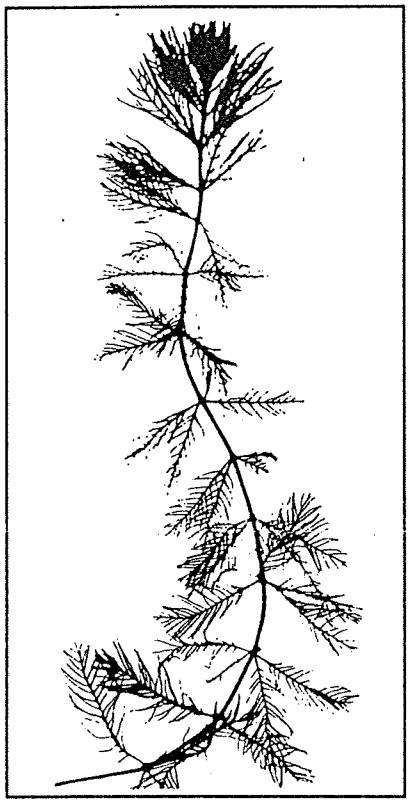
◆◆◆

◆ *Aquatic plants cont'd.*

such as Woahink, the spread of the plant could probably be limited to shoal areas ringing the lake. Even this limited distribution will probably interfere with lake uses such as fishing and swimming.

In other parts of the country, the plant has been the target of major eradication and containment efforts. Volunteers are trained to identify the plant, signs are posted reminding boaters to clean all plant materials from their boats and trailers prior to departing from a lake, and efforts are made to remove the plant. Forms of management include: pulling individual plants by hand while taking care to avoid leaving broken pieces that may root again, hiring divers to suck up individual plants, applying physical barriers on the lake bottom to stop the plants growth, or applying specific herbicides.

◆◆◆



Myriophyllum spicatum

◆ *Program notes cont'd*

Professionally, I've gotten some excellent experience managing a program, gathering and analyzing data, and learning lots of computer programs. Personally, I've had the pleasure of meeting all of the of very friendly and dedicated volunteers whom I would never have had the pleasure of getting to know otherwise. I will miss the job, except for those endless hours of entering all the data into the computer! A new coordinator has not yet been selected.

Andy Schaedel, the DEQ Surface Water Manager, has proposed that the Lake Watch Coordinator position be expanded to include more technical assistance to lake associations and contract management of Clean Lakes Projects around the state. A decision is due within the next several months.

The 1993 Final Report will be mailed within the next month.

◆◆◆

The Oregon Citizen Lake Watch Program is sponsored by the Department of Environmental Quality and coordinated by Portland State University. The program is funded under an EPA Lake Water Quality Assessment Grant. The goal of the program is to involve citizen volunteers in collecting reliable water quality data in an effort to monitor long-term trends in the water quality of Oregon lakes.
The **Lake Watcher** is published quarterly by Portland State University. For more information about the Lake Watch Program or the newsletter, please contact the Citizen Lake Watch coordinator at the return address listed or call 229-5279 or 725-4241.

Citizen Lake Watch Program
Oregon Department of Environmental Quality
Water Quality Division
811 SW 6th Ave.