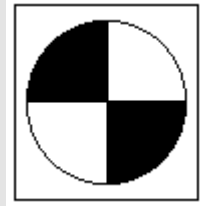


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Editor:  
Roger Edwards

# LAKE WISE

A Voice for Quiet Waters



The Oregon Lakes Association Newsletter

## Zebra Mussels Move To and Beyond Lake Mead

The introduction of zebra mussels into Michigan's Lake St. Clair during 1985-86 led to major disruptions there and elsewhere as these Caspian Sea natives spread through the Great Lakes, into the provinces of Ontario and Quebec, and 21 eastern and Midwestern states by 2000. By attaching to any hard surface, these bivalve mollusks occlude water inlet and outlet piping, foul boat hulls and pilings, and clog canals. The effort and expense required to deal with just these problems produced interest in limiting the spread of the mussels west of the Continental Divide. By 1998, the 100<sup>th</sup> Meridian Initiative had secured the cooperation of state, provincial, and federal agencies to prevent the westward spread of zebra mussels and other aquatic nuisance species. The strategy of this Initiative included creating information resources and educational materials to increase awareness about these threats, organizing voluntary boat inspection stations and boater surveys, making certain commercial haulers understand how nuisance species could be moved beyond areas of infestations, watching for the appearance of invasive species at new locations, having plans and personnel ready to respond to new sightings, and seeking additional ideas that would help with the goals of the effort. The Initiative has produced several instances where infested boats have been stopped from launching, but the on-going surveillance has also documented the movement of zebra mussels into new waters.

On January 6<sup>th</sup> of this year, a diver at the Las Vegas Boat Harbor on Lake Mead, Nevada discovered zebra mussels. Subsequent searches have found them at several locations in the downstream portions of Lake Mead including at Hoover Dam, on both sides of Lake Mohave, which is downstream of Lake Mead on the Colorado River, and at Lake Havasu, which is the inlet for the Colorado Aqueduct carrying water to southern California. One of the Lake Mead discoveries was at the fish hatchery there. Recent fish stocking from this hatchery may have put much of Nevada at risk for zebra mussels. Wild Horse Lake on the East Fork of the Owyhee River has been stocked from the Lake Mead hatchery so concern has spread to the Owyhee, Snake, and Columbia Rivers.

The news related to these discoveries is not all awful. By January 11<sup>th</sup>, the original specimens from Lake Mead had been identified as *Dreissena bugensis* or quagga mussels rather than *Dreissena polymorpha*, the archetypical zebra mussel. While this distinction is slight, the important difference between these two related species is that the quagga prefers cooler, better oxygenated water and so is generally found at greater depths. Temperature seems to have limited the spread of zebra mussels in the southeastern states, where water temperatures can exceed their tolerance zone of <30°C. Heat intolerance may provide a way to keep the quagga mussels from becoming established in the southwest as well. Furthermore, as might be expected for a fast growing bivalve mollusk that reaches a shell length of 5 cm, these mussels have a calcium requirement. Dr. Thom Whittier at the OSU Dept. of Fisheries and Wildlife has found that zebra mussel invasions are unlikely in waters with calcium concentrations <28 mg/L. Malheur Lake and Malheur Reservoir are the only water bodies listed in the *Atlas of Oregon Lakes* with calcium concentrations above this level. The value listed for Lake

Owyhee is 12.6 mg/L. Dr. Whittier has agreed to present further discussion of his research at the OLA Diamond Lake Conference on September 21-22. By then it may well be a very interesting topic.

## Woahink – A Lake in the Balance?

By Mark Chandler and John Stead

Dunes City Water Quality Control Committee and the Woahink Lake Association

Woahink Lake is an 820-acre dunal lake located on the central Oregon coast, 3 miles south of Florence. Most of it is located within the 3-¼ square mile area of Dunes City. Its 14 miles of shoreline is 85 percent privately owned, with Honeyman State Park fronting on the balance.<sup>1</sup> Lake water is used for domestic, livestock, recreational, wildlife, fish life,<sup>2</sup> municipal, and park purposes.<sup>3</sup>

Water Availability In 1992, new water availability standards became effective,<sup>4</sup> limiting Woahink Lake water use to human consumption<sup>5</sup> during April, and June through November<sup>6</sup> for existing water right permit holders and all new permit applicants. These new standards discouraged out-of-compliance residents from requesting authorization to use water and delayed watershed urbanization. Ten years later, a citizen complained to the Oregon Water Resources Department (OWRD) of unauthorized water use in Dunes City. This problem was solved when OWRD agreed that the municipality could sub-allocate its 1968 water right permit to out-of-compliance residents.<sup>7</sup> This solution also made water available for new residential development, and between May and August of 2005 Dunes City, with a population of fewer than 1,400 residents, received six applications for a total of 87 new lots.

Urbanization and Water Quality Urbanization will continue to impair Woahink Lake's water quality. The *Coastal Lakes Watershed Analysis* (1999) stated, "Woahink Lake is probably more susceptible to changes in water quality than any other lake in the watershed," and, "The most pressing threat to water quality is the amount of development occurring around the lake."<sup>8</sup> *Oregon Lake Watch* (2000) cautioned that Woahink's continued high sediment loading and input from septic tank drain fields will lead to the degradation of water quality.<sup>9</sup> Oregon's Department of Land Conservation and Development and its Department of Environmental Quality jointly stated in 2000, "It is no longer possible to ignore the connection between urban development and degraded water quality."<sup>10</sup> Well-known limnologist, Douglas Larson, has been expressing his concern for increasing impacts to Woahink Lake for over 30 years.

The Monitoring Process Adequate monitoring is essential in order to quantify these concerns in a meaningful way. The first regular monitoring of Woahink was done by Bob Anderson under the Lake Watch program

<sup>1</sup> Oregon Lakes Association, Woahink Lake ([www.oregonlakes.org/gallery](http://www.oregonlakes.org/gallery)).

<sup>2</sup> OAR 690-518-0010(1)(a).

<sup>3</sup> OAR 690-518-0020(1).

<sup>4</sup> OAR 690-400-0010(11)(b).

<sup>5</sup> "Human consumption" means the use of water for the purposes of drinking, cooking, & sanitation. OAR 690-300-0100(24).

<sup>6</sup> *Detailed Report of the Water Availability Calculation*, Woahink Ck > Siltcoos R at mouth, Watershed ID# 517, Exceed. Lvl.: 80.

<sup>7</sup> "Oregon Water Rights, DSL Easements, & Woahink Lake" *Lake Wise*, March 2006, pg 3.

<sup>8</sup> *Coastal Lakes Watershed Analysis*, prepared by Siuslaw National Forest staff, Mapleton, 1999, pgs 46-47.

<sup>9</sup> Sytsma, Mark & Carrie Haag, *Oregon Lake Watch 2000 Final Report*, pg 10.

<sup>10</sup> Oreg. Dept. of Land Conservation & Development, and Oreg. DEQ, *Water Quality Model Code & Guidebook*, 2000, pg 1.1.

through Portland State University beginning in 1989. Bob recorded Secchi readings, temperature, and dissolved oxygen levels until he left the area in 2003.

At about this time, amid rising concern and involvement of residents, Dunes City followed up on a Comprehensive Plan mandate to form a Water Quality Control Committee. This committee has addressed a number of issues including securing a limited budget from the city to carry out an enhanced volunteer monitoring program that includes both Woahink and Siltcoos Lakes. Siltcoos Lake is immediately downstream of Woahink and is on the DEQ 303(d) list of water bodies that do not meet water quality standards because of the presence of weeds and algae. With support from the Oregon DEQ Volunteer Monitoring Program, testing for pH, nutrients, chlorophyll-a and limited sampling for bacteria levels were added to the monitoring parameters.

As new data was accumulated and correlated with intermittent data from previous studies, a trend of rising nutrient levels was indicated. The increasing phosphorus levels are of particular concern, as this nutrient is the limiting factor in the proliferation of algae and aquatic weeds.<sup>11</sup>

The U.S. Environmental Protection Agency has developed a set of reference criteria for nutrients. These criteria refer to levels that indicate lakes “minimally impacted by human activities and protective of aquatic life and recreational uses.”<sup>12</sup> For lakes of Western Oregon the level is 7.1 micrograms per liter for total phosphorus. Woahink Lake has not had a reading below that level since 2001, and averages 13.4 from the 17 samples obtained since then. The 2006 average was 16.0 based on 6 samples. These concentrations are much higher than the 0.004 mg/L of total phosphorus listed for Woahink Lake in the *Atlas of Oregon Lakes* (1985), and so justifies the specific recognition of Woahink Lake in the Estuaries and Clean Water Act (2000).<sup>13</sup>

As if right on cue, unprecedented and troublesome algal blooms occurred during the springs of 2005 and 2006 in Woahink Lake. While toxic species have not been detected, many residents supplemented their drinking water during these periods since the odor and taste could not be adequately removed by filtration or other treatment.

Watchful Waiting is Not a Satisfactory Option Needless to say, these algal blooms brought on a greater concern among residents and precipitated the adoption of a 120-day moratorium on the acceptance of new applications for development during the summer of 2006.<sup>14</sup> Since that time the city has established relations with government agencies dealing with land use issues, identified areas of existing local code needing revision, created and implemented an ordinance requiring regular inspections of septic systems,<sup>15</sup> and is developing ordinances to address phosphorus inputs from cleaning products and fertilizers, as well as more rigorous erosion control, and storm water management.

The warning signs for the cultural eutrophication of Woahink Lake have been sounding loud and clear. A tireless group of volunteer residents and city officials are now in the “catch up” mode, struggling with the predicted impacts of increasing development and a history of a lack of enforcement of local code. Time will tell whether these efforts will be rewarded.

<sup>11</sup> Experimental Lakes Area Research Unit, Univ. Manitoba, [www.umanitoba.ca/institutes/fisheries/eutro](http://www.umanitoba.ca/institutes/fisheries/eutro).

<sup>12</sup> US EPA, Ambient Water Quality Criteria Recommendations, Ecoregion II, 2000, pgs 19 & v.

<sup>13</sup> ECWA of 2000, SEC. 702 DEMONSTRATION PROGRAM, Title VII – Clean Lakes, Section 314(d) of the Federal Water Pollution Control Act (33 USC 1324d) is amended – (1) in paragraph (2) by inserting ... Woahink Lake, Oregon; ...

<sup>14</sup> Dunes City ([www.dunescity.com](http://www.dunescity.com)) City Business, Ordinance 181 & Moratorium Findings of Fact.

<sup>15</sup> Dunes City ([www.dunescity.com](http://www.dunescity.com)) City Business, Ordinance 173.

## Seeking Serenity for Waldo Lake

In December of last year, the US Forest Service published an Environmental Assessment (EA) for Managing Recreation Use at Waldo Lake. This was the latest opportunity for public involvement in the decision making process for the management of Waldo Lake and the surrounding area in the Middle Fork Ranger District of the Willamette National Forest. Comments regarding the use of motorized boats on Waldo Lake have been some of the concerns most frequently expressed by the public related to recreational use of the lake in recent years.

Human influences on the lake are known to have occurred in the late 1800's. Attempts to produce hydropower and irrigation water from the lake failed in the early 1900's. The Oregon Department of Fish and Wildlife stocked the lake with fish in most years between 1938 and 1990. While there has been no further fish stocking since then, a naturally reproducing fish population, primarily brook trout, persists in the lake. By the mid-1950's, preservation of the area for recreation and wilderness began to take hold. In 1969 a paved road from Hwy 58 was opened to provide access to the east shore of the lake. Three developed campgrounds and boat ramps along this road were in place by 1971. The Oregon Marine Board set a 10 mph speed limit over the entire lake in 1973 and a no wake zone along the shoreline was added in 1986. The State Legislature placed Waldo Lake and the North Fork of the Middle Fork of the Willamette River in the Oregon Scenic Waterway System in 1983. In the following year the newly formed Waldo Lake Wilderness Area came close to the shoreline on the north, west, and south sides of the lake. The Willamette National Forest Plan of 1990 designated the lakeshore as a dispersed, non-motorized recreation area, with exceptions at the developed campgrounds on the eastern shore. A forest fire burned down to the shore on the north side of the lake in 1996.

Protecting the fragile environment and recreation experience available at Waldo Lake has been a management focus for years. In 1997, the Willamette National Forest completed a Waldo Lake Water Quality Strategy Report discussing ways to protect the outstanding water quality of the lake. This was followed by a conference at the University of Oregon entitled, *Waldo Lake: Science, Management and the Future*, which focused on limnological research and management issues. The Willamette National Forest conducted recreation use surveys at the lake in 1997-1998. In 2000 a subcommittee of the Willamette Province Advisory Council (PAC) presented their management recommendations to the Forest Service and the Willamette PAC after deliberations lasting over a year.

An earlier EA that focused on recreational use at Waldo Lake was distributed for a 30-day comment period in August 2001 and was followed by a decision notice released in December 2001. That decision was retracted when challenged and work began to better document visitor attitudes toward recreation issues at the lake. A new survey designed at the University of Florida and Pennsylvania State University was conducted in 2003 and produced 430 responses from lake visitors. Articles describing the planning process were published in Oregon newspapers serving the major cities of the Willamette Valley and Bend in 2004, and generated more input from people and organizations who had not submitted comments previously. The current EA was fashioned from this new information along with the cumulative studies of recent decades.

There are five Alternatives in the December 2006 EA. The first is a No Action Alternative that would retain the present lake surface designation of a Roaded Natural setting. Under this alternative all motor types could be used on the lake under the existing speed restrictions, floatplanes would have lake access, and generators and chainsaws could be used at the dispersed campsites.

Alternative 2 would end the use of 2-stroke boat motors after a two-year transition period, but continue to permit floatplane access and generator and chainsaw use at dispersed campsites. Electric and 4-stroke internal combustion boat motors would be allowed on the lake.

Alternative 3 would begin a two-year transition to prohibit the use of internal combustion boat motors from July 15<sup>th</sup> until the first Monday after Labor Day. Outside of this period, 4-stroke motors would be permitted on the lake. Electric motor use would not be restricted. Generator and chainsaw use would be prohibited at the dispersed campsites during the closure period for internal combustion boat motors, and floatplanes would be denied lake access year round. Administrative use of internal combustion boat motors, generators, and chain saws would require the written authorization of the Forest Supervisor under this Alternative and the following two alternatives as well.

Alternative 4 is the Proposed Action. It would start a two-year transition period to ban internal combustion boat motors year round, but permit electric motors under the existing speed restrictions. Floatplanes would not have lake access, and generators and chainsaw use at the dispersed campsites would not be allowed.

Alternative 5 would ban the use of internal combustion and electric boat motors year round, beginning the first summer after the decision is finalized. Floatplanes would be prohibited and generators and chainsaws could not be used at the dispersed campsites.

The rationale used to assemble these Alternatives responded to the large majority of lake visitors, who stated they were attracted to a semi-primitive experience at an easily accessible large lake. The speed restrictions and relatively small fish population in the clear, dilute, ultraoligotrophic waters of Waldo Lake have limited the appeal for traditional motor boating. Waldo Lake is the 13<sup>th</sup> largest water body in Oregon by area and so it is possible to get a sense of remoteness at the 51 dispersed campsites along the more than 20 miles of shoreline beyond the boat ramps. The sights and sounds of other parties seeking this same experience however were noted as a distraction to this tranquility. Giving the lake surface the same recreation designation as most of its shoreline minimizes this conflict. The reluctance to allow the use of 2 or 4-stroke motors on the lake is due to the noise they produce and the fact that noise travels so well over water. Floatplanes were addressed because they draw the attention of nearly everyone at the lake. Partitioning the recreation season around mid July recognizes the heavier use the lake receives after this date, and acknowledges that trail maintenance after the winter storms requires this time for completion.

The comment period for this proposal has ended and the decision notice is expected as early as March of this year. Further details about this action are available at [www.fs.fed.us/r6/willamette](http://www.fs.fed.us/r6/willamette).

## **A Look at Conflict Resolution in the Klamath Basin**

The promise contained on the cover of Stephen Most's book, "River of Renewal; Myth and History in the Klamath Basin", is not completely fulfilled in its following pages. He essentially recounts the oral history of the several Indian groups who were established in the Basin. Much of the book deals with those tribes on the lower reaches of the Klamath River. The interaction between the ancient Indian cultures and the increasing incursions of Americans carrying out their Manifest Destiny is not particularly inspirational, but it does set the scene for the

on-going debates that continue to address land use within the Basin. The book dwells on the Indian losses and provides little discussion of how the lands were subsequently altered. By permitting this oversight, the usefulness of the book is limited because only those readers with knowledge of the region as it exists today can fully appreciate the arguments presented.

Stephen Most is a Northwest historian and playwright who has also been recognized for his contributions to several documentaries. He was attracted to the controversies of the Klamath Basin by the scheduled, May 7, 2001 bucket brigade to defy federal rulings withholding irrigation water from farmers in order to achieve the protections required by the Endangered Species Act. Because water shortages and conflicting uses of available water supplies promises to become increasingly prominent among growing populations world wide, the bucket brigade presented a focused way to characterize this issue. He quickly realized however that the civil disobedience being waged in Klamath Falls was too complex to capture within the format of a documentary film. He obtained the support of the Oregon Historical Society and the University of Washington Press and continued work on this project, which was published as a 295 page, footnoted and indexed text, in late 2006.

The premise of the book is that the Klamath Basin was a paradise for countless generations of indigenous peoples. The abundant resources of the region provided a comfortable life for communities that were content to follow a subsistence level lifestyle. Satisfaction of their immediate needs could be readily achieved with leisure time still available for rituals celebrating their good fortune. When westward expansion in America brought outside scrutiny to the region, control was wrested from the Indians and speculation of their relinquished natural resources created imbalances that now threaten the productive potential of the Basin. Recognition of these excesses and a renewed appreciation of simpler times have raised questions about whether current or former priorities should dominate land use practices there. In these discussions, the former positions of the natives and the settlers have reversed so it is now the settlers who are faced with the loss of their land and livelihoods. To the credit of both sides, the battles that have been mounted in this conflict rely on legal opinions and persuasion rather than the harsher methods employed a century ago. Nevertheless, the book points out how almost all citizens are just a single change of a Federal policy away from joining a chorus of strangers singing "We Shall Overcome" to a line of grim-faced marshals somewhere close to home where a former way of life is disappearing.

In presenting this history, Mr. Most observes that the Klamath Basin is large enough that it is seldom appreciated as a whole. There are 16,400 square miles within the Klamath River watershed, and this area is crisscrossed with cultural, political, and administrative boundaries. The Upper Basin, extending from the slopes of Crater Lake National Park to Upper Klamath Lake, is typically forest and ranchland but also includes the extensive wetlands of Aspen Lake, and the Sycan and Klamath Marshes. The area from Upper Klamath Lake to the Iron Gate Dam is a complex of drained lakes, dams, reservoirs, pumps, and canals moving water as needed for irrigation and hydropower. The Lower Basin is mostly free-flowing rivers in mostly forested timberlands. Curiously, the disagreements about land use practices are not on an urban/rural divide. The Basin is some distance from the population centers of both Oregon and California, and Klamath Falls, the largest city of the region, is deeply invested in the forestry, farming, and fishing that sustains the local economy. These are all land-based industries so there is a high level of environmental awareness throughout the controversy, which developed when Congressional action and targeted lawsuits changed the priority for water allocation in the Basin. The common interest in environmental stewardship presents an opportunity that the continuing debate may somehow stretch the finite water quantities in the Basin by improving their quality and thereby serving the interests of both sides of the issue.

The top billing given to “Myth” in the book’s title is a conscious decision. Mythology is described as a means of “illuminating the world in which people feel themselves to be living”. So while myths are instructive about the people who hold them dear, they actually have limited applicability because they “lack roots in real soil, drawing nourishment instead from the stuff of dreams”. Long held beliefs that have developed within a narrow perspective are not just found in ancient cultures. Wherever they appear, they can impede progress to consensus decisions. It is difficult to craft an analytical resolution by simply bringing the passionate stakeholders together. By the book’s end, the stakeholders of this particular conflict are at work learning more about one another and the varied aspects of the Basin that any solution must take into account.

The book is well written, although it does not follow the practice of numbering its footnotes. The histories it recites may not be widely known and so could be of special interest to scholars of the area. Its examination in historical perspective of the events of our times can be enlightening. And it produces some interesting questions that could spur the reader to further research. But most of these topics are not lake related and so have limited relevance here. The book is paperback with a meandering river photo on the cover. It costs \$22.50 at local bookstores.

### **Healing By Water**

by Maureen Beezhold, Coordinator at Corvallis NW Earth Institute, [www.nwei.org/corvallis/](http://www.nwei.org/corvallis/).

The phone call was the one every parent dreads, “Now don’t worry. Emily was in a bike accident but she is going to be okay.” Within a few hours we were flying to Los Angeles and everything else seemed unimportant. Our four-day stay turned into a week of living at the hospital. Emily’s head injury, caused by flying over the handlebars while going down a steep hill, began healing. Milestones were celebrated with special dances improvised by her friend Sheila, including the “memory dance” as Emily’s short-term memory returned. We sang songs as we helped her to walk again.

We delighted in the return of water to her life. Initially not allowed to eat or drink, the first glass of water was an exquisite gift that arrived the third day post accident. The fourth day brought a welcome shower. We continued the water theme on our journey back to Oregon with Emily and her dog, Elsa. Fountains in the Mexican restaurant we ate in that night seemed magical to Emily. Our second day of traveling she was able to walk down to the river at the city park in Dunsmuir; “A healing place,” she said as the color was coming back into her face.

Seven weeks later we celebrated her rapid progress with a hike in the Cascades. We chose Clear Lake because her dog Elsa was now the one limited in movement while she awaited surgery for torn ligaments in her knee. Thinking to rent a boat and soak in the mountain ambiance, we arrived to find the fishing hot and the boats all gone. Changing our plan, Em’s dad nobly volunteered to sit with Elsa while Emily and I hiked the 5-mile loop. We began with a brisk pace promising to return in 2 hours.

The mountains, weather and fall foliage combined to make this hike celebratory and magical. The chill of the old growth trees we hiked through contrasted with the other side; full sun tossing sparkles on the lake and the red and gold vine maples reflecting in the water. We went over the south end bridge and took in the rush of the McKenzie River and its chill. Reaching the east side of the lake we soaked in the sun off the lava beds and repeatedly stopped to absorb the blazing autumn colors of the vine maples nestled in the cracks.

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**The Oregon Lakes Association**  
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**OLA Mission:** The Oregon Lakes Association, a non-profit organization founded in 1988, promotes understanding, protection, and thoughtful management of lake and watershed ecosystems in Oregon. For additional information on OLA, write to the address above, or visit our website.

OLA welcomes submissions of material that furthers our goals of education and thoughtful lake management in Oregon, and is grateful for the corporate support that helps sustain the organization. Corporate members are offered a one-time opportunity to describe their product or service to Lake Wise readers. These descriptions are not endorsements, and opinions appearing in Lake Wise are not OLA policy statements.

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We reached Great Springs, where 38-degree water rushes from underground challenging the hardy to put their feet in for a short but invigorating soak. The pool, when reached by the sun, is a wonderful shade of turquoise green, and is the birthplace for a 300-foot long river that flows to Clear Lake. Mindful of our promise to return in two hours we hastened back into the old growth to complete our loop and return to the waiting dad and dog.

The autumnal trek around Clear Lake was the high point of the two-month recovery that Emily carried as nourishment back to Los Angeles; a journey begun in the Intensive Care Unit and healed by the miracle of the real world.

### **Center for Lakes and Reservoirs Takes On Another Task**

In 2004, the Center for Lakes and Reservoirs at Portland State University joined the Environmental Research Center, a research arm of the Smithsonian Institute, to create the Aquatic Bioinvasion Research and Policy Institute. The goal of this new entity is to study the bioinvasion process and develop ways to accommodate the globalization of trade and travel in a manner that also protects local habitats from unintended introductions of foreign plants and animals. This work requires close attention to known sites where immigrant species have become established. These invasions are tracked by the US Geological Survey on their “nonindigenous aquatic species” database at <http://nas.er.usgs.gov>. Under an agreement reached in February, the CLR will take over the maintenance of the plant section of this database. This change is a natural extension of the CLR’s existing responsibilities, that frees the USGS to concentrate on invasive animal species, and keeps this important information resource at a single website. The Smithsonian Environmental Research Center maintains a similar database for marine invaders at <http://invasions.si.edu/nemesis>.