

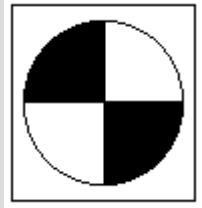
November

2009

Editor: Roger Edwards

LAKE WISE

A Voice for Quiet Waters



The Oregon Lakes Association Newsletter

Some Highlights from the Lincoln City Conference

Rotating the site of OLA's annual conference to different regions of Oregon each year provides attendees the chance to move beyond areas of their normal travels. Wherever the destination happens to be, the meeting produces serious discussions of lake topics, and the opportunity to greet old friends and meet new ones in a low key setting. This expectation was achieved again at Lincoln City last September.

We were made to feel very welcome in Lincoln City, on the very first time OLA has met there. The resources we needed were conveniently near-by and handily served our purpose. Holding a lake meeting just steps away from a lake was a real bonus. Some of the vendors were demonstrating their instruments outside of the exhibit hall, where views of Devils Lake diverted attention from the sound of pounding surf from across Hwy 101.

Inside, the full agenda of posters and presentations was divided between lake researchers, regulators, and enthusiasts, more-or-less paralleling the makeup of those in attendance. Everyone likely had a different impression of the day's events, but the Board was universally pleased with this year's Conference. It attracted well over a dozen new members, who will take our viewpoints to new locations, and who may seek a future position on the OLA Board. Some of these new members have affiliations with Oregon State University and extending our membership network there is a welcome development. It was also an honor to have Wayne Carmichael, Professor Emeritus from Wright State University in attendance. Dr. Carmichael is now working out of Seaside and discussions are underway about how OLA might help him with a workshop on Harmful Algae Blooms.

Richard Lycan, Professor Emeritus of Portland State University announced the availability of a CD holding the complete, six volume, *Lakes of Oregon* series produced by the USGS back in the 1970's. The series profiled the majority of lakes and reservoirs in Benton, Clackamas, Clatsop, Columbia, Douglas, Hood River, Lincoln, Marian, Multnomah, Polk, Tillamook, Washington, and Yamhill Counties. The series looked at a total of 417 water bodies, and for those still in existence, it can be a useful record to have a profile from 30 years ago. The CD has been updated to include a present day image of the lakes, when viewed on computers with an internet connection. Both the *Lakes of Oregon* CD, and the previously scanned *Atlas of Oregon Lakes* CD can be acquired through OLA for \$10 apiece.

The annual election is always a minor part of the Conference, but it has some consequence for the organization. The outcome this year saw Karen Williams move to the Presidency, Roger Edwards becomes the Past President, Ben Johnson takes over as Secretary, and Al Johnson, Jesse Ford, Paul Robertson, and Steve Wille were all re-elected to another two year term as Directors. OLA founder Andy Schaedel and PSU student Kit Rouhe were also elected as Directors. Former President and webmaster Mark Rosenkranz ended his work with the Board, having earned the gratitude and best wishes from his co-workers there for service that goes back to 2001. The

Board is grateful too for the support of OLA sponsors and exhibitors Stoel-Rives, LLP; Clean Lakes, Inc.; Hach Hydromet; the Devils Lake Water Improvement District; *In-Situ Inc.*; and Electronic Data Solutions.

There's Been a Lot of Cyanobacteria News in 2009

Project Coordinator Laura Boswell described Oregon's Harmful Algae Bloom Surveillance program at the Lincoln City Conference. Since then, she has been promoted to Program Manager within the State's Environmental Public Health offices, and Jennifer Ketterman will take over as coordinator for the HABS Program. A record 21 cyanobacteria advisories were issued this year including one at the mouth of Elk Creek on the Umpqua River, where four dog deaths were linked to cyanobacteria toxins. The number have advisories per year has been increasing, but there were just 14 last year. The 2009 lake postings included repeated advisories for Hills Creek Reservoir, Lost Creek Lake, Crane Prairie Reservoir, and Wickiup Reservoir; but only at Wickiup does it appear the original posting might have been lifted prematurely. Greater public awareness of the threat of cyanobacteria toxins has to be among the reasons for this year's increase in advisories, and increasing public awareness is a key objective of the HABS program.

The on-going advisory at Portland's Laurelhurst Pond is not included in the listings for this year. Over the last two years, the depth of the pond has increased by an average of 22" through the use of a microbial digestion process that works on the bottom sludge. This improvement has led to the decision to excavate the remaining sediments and the pond has been drawn down in preparation for this next phase of this remediation effort.

2009 Cyanobacteria Advisories to Avoid Water

Contact

<u>WATERBODY</u>	<u>COUNTY</u>	<u>POSTED</u>	<u>LIFTED</u>	<u>WATERBODY</u>	<u>COUNTY</u>	<u>POSTED</u>	<u>LIFTED</u>
Hills Creek Reservoir	Lane	21-May	16-Jun	Wickiup Reservoir	Deschutes	12-Aug	31-Aug
		30-Jul	28-Aug			2-Sep	25-Sep
Lost Creek Lake	Jackson	15-Jun	29-Jun	Dexter Reservoir	Lane	13-Aug	28-Sep
		18-Sep	13-Oct	Dorena Lake	Lane	13-Aug	23-Oct
Crane Prairie Reservoir	Deschutes	18-Jun	9-Jul	Paulina Lake	Deschutes	27-Aug	21-Sep
		31-Jul	12-Aug	Elk Ck. @ Umpqua R.	Douglas	4-Sep	22-Sep
Odell Lake	Klamath	22-Jul	12-Aug	Sru Lake	Coos	9-Sep	
Whetstone Pond	Jackson	23-Jul	9-Sep	Willow Creek Reservoir	Morrow	11-Sep	19-Oct
Lemolo Lake	Douglas	23-Jul	18-Aug	Haystack Reservoir	Jefferson	18-Sep	2-Nov
Devils Lake	Lincoln	31-Jul	8-Sep	Tenmile Lake	Coos	18-Sep	
				Blue Lake	Multnomah	14-Oct	6-Nov

The advisories at Sru Lake and Tenmile Lake were still in effect as *Lake Wise* went to press. Sru Lake is the end of the road, 2 acre lake in the SF Coquille River basin that was formerly known as Squaw Lake.

Were Cyanotoxins a Problem on the Oregon Trail?

The Douglas County dog deaths deserve some added attention. The key feature of these two related incidents is that three of the four dogs died in convulsions within minutes of contacting the tainted water. Subsequent testing established a link between the deaths and the cyanotoxin anatoxin-a, a known neurotoxin. The rapid death of a seemingly healthy animal within moments of drinking from a suspect water source brings up memories of Oregon Trail lore, which held that livestock drinking from alkali pools were also subject to sudden death. Could cyanotoxins have had a part in these deaths as well? Alkali pools were readily identified as partially full depressions, ringed with a white crusted powder, and perhaps the bones of previous victims. The powder deposits left as the pools evaporated could have been the sun dried cells of an algal bloom just as easy as any variety of alkali salts. Water bodies experiencing an algal bloom become more alkaline as carbon dioxide is drawn out of solution to become incorporated into the algal cells through photosynthesis. Water in the pH range of 8-9 can feel slimy to the touch, an observation that would not have been lost on the Oregon pioneers. There is the question too of what common combination of alkali salts can kill on contact?

A review of wagon train journals at the Oregon Historical Society casts doubt on the premise that cyanotoxins were involved. The accounts do verify significant livestock deaths and exposure to alkali minerals, but the association of these two observations is largely circumstantial. A typical journal entry reads, "Passing Independence Rock, counted 27 dead oxen since yesterday morning caused by their drinking the water." Pools are described as having a variety of colors and temperatures. An observer at Big Soda Springs noted, "The appearance is first indicated by the flat mounds of a lime or cherry color. Great number of these springs in this vicinity of different tastes and temperatures, some cold some warm." Descriptions of recognizable cyanobacteria scum are lacking, and mention of animals dying moments after drinking at any water hole are limited. A narrative from before 1850 states, "Cholera tapered off after Fort Laramie but the stock died rapidly from drinking alkali." Another from 1853 reads, "Cattle dying – they have opened some and their melts [spleen] is rotten – some of them bleeds at the nose and dies in a few minutes after working through the day."

If a connection between thirst and a sudden onset, convulsive death cannot be routinely established, then it is difficult to fault linking the deaths with alkali water. Pulling heavy wagons was exhausting work that would produce dehydration in the draft animals. If this condition was not corrected, but instead made worse when the only available water had a high mineral content, then this combination of factors could well explain the animal carcasses that lined the trails to the West. There may have been instances where cyanotoxin poisoning led to the loss of livestock, but it was not the common occurrence that produced the trail wisdom to limit consumption of alkali water.



DEVILS LAKE WATER IMPROVEMENT DISTRICT

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Bullheads Attract Rotenone Applicators to Crook County

After the successful remediation of Diamond Lake became apparent in 2007, it is not surprising that the ODFW would have confidence in their use of rotenone treatments as a lake management tool. The next use of this tool came in late October when ODFW crews cleared infestations of brown bullheads from two Crook County impoundments; Walton Lake and Antelope Flat Reservoir.

Walton Lake is an 18 acre impoundment behind a 28' dam on Camp Creek, in a spring fed meadow along the Wheeler County line, upstream and 20 miles northeast of Ochoco Reservoir. The name originally proposed for this impoundment was King Reservoir, but while this name can still be referenced, Walton Lake is the name in popular usage. The reservoir is within the Ochoco National Forest, and there are two Forest Service campgrounds on the shores. It is open to swimmers but closed to motorboats.

Bullheads were first observed in Walton Lake in 1995 and by 1999 they dominated the catch. Before they were mysteriously introduced, a popular rainbow trout fishery going back to when the reservoir was established in 1954 had been maintained with a basic yield program that stocked 10,000 legal sized, and 3000 trophy rainbow from May to September each year. This fishery carried out the intentions of the Prineville chapter of the Isaak Walton League, which built and manages the reservoir to provide a family recreation opportunity in a part of Oregon where few natural lakes are readily available. The fishery at Walton Lake was further compromised in 2007 when smallmouth bass were discovered.

This mysterious introduction of smallmouth bass quickly spread downstream into Ochoco Creek, and ODFW staff expressed concern about the competitive pressure they would exert on redband trout there. Neither bullheads nor bass should be able to persist in Ochoco Creek so eliminating them from the upstream reservoir would be a way to safeguard the local redband population.

Antelope Flat Reservoir is also a privately constructed impoundment with a successful basic yield rainbow trout fishery program. The eutrophic waters of the reservoir produce growth rates that only need annual stocking of fingerlings to maintain the rainbow population. The reservoir is drawn down in the summer for irrigation and can experience winterkill if refill is not underway when freezing temperatures become common at the reservoir's 4960' elevation. Brown bullhead mysteriously appeared in Antelope Flat Reservoir during 2001 and had overrun the fishery by 2004. This introduction was accompanied by an increase of turbidity in the reservoir and downstream reaches due to the bottom feeding habit of bullheads and the tendency of the area's clay soils to stay in suspension once they are disturbed.

Antelope Flat Reservoir is a 170 acre impoundment behind a 33' dam on Bear Creek that was constructed in the early 1960's. Bear Creek merges with the Crooked River in Prineville Reservoir, which is 20 miles northwest of Antelope Flat Reservoir. Bear Creek Reservoir is a small fish-for-fee impoundment just downstream of Antelope Flat Reservoir that has also suffered from the bullhead introduction.

The preparation for the rotenone treatment at these two impoundments included lifting the catch limits to encourage the harvest of as many fish as possible, and a draw down to minimum pool. A weir was set up at the Antelope Flat Reservoir outlet to trap fish trying to escape downstream. In addition to the two reservoirs, rotenone was applied to Bear Creek Reservoir, to the length of Bear Creek between it and Antelope Flat Reservoir, and to a gravel pond in the Sno-Park just east of Walton Lake where bullheads are known to be. Potassium permanganate was dispensed at the outlet of Bear Creek Reservoir to neutralize any rotenone moving downstream. The bulk of the fish carcasses were collected and disposed offsite. The impoundments will be allowed to fill during the winter and will be closed to the public until the Spring of 2010, when trout stocking is

scheduled to resume. Signs will be posted that explain the consequences of illegal fish introductions and the penalties for being in possession of live fish.

The budget for this project totaled \$66,743, of which \$54,640 was paid from the ODFW Restoration and Enhancement Fund. The balance came from in-kind services of ODFW staff and \$2503 from the proprietor of Bear Creek Reservoir.

Is That a Bullhead or a Catfish?

Because these fish are commonly found throughout Oregon, it is surprising to learn that they are not native anywhere west of the Continental Divide. Their presence here and in other western states is a testament to their popularity in the eastern parts of the country, and to their tolerance of conditions that would limit the survival of other freshwater fish. They are bottom feeding omnivores and efficient reproducers, which further increases their ability to persist in diverse habitats. Bottom feeders don't do well in waters with a noticeable current and they are least likely to be found in high gradient streams. Their sense of smell guides their feeding, giving rise to the notion that catfish bait should be malodorous.

Both bullheads and catfish have scale free skin, several barbels around their mouths, a spine at the front of the dorsal fin and the pectoral fins, an adipose fin, and a substantial anal fin. They are grouped in the Family Ictaluridae, and *Ameiurus* appears to be the genus name now in favor. The chief difference between bullheads and catfish is that the notch in catfish tails is more pronounced. Catfish also can grow to be greater than 10 pounds, a size well beyond the normal range for bullheads. Catfish are more likely to have spots on their sides.

Oregon's best known catfish is the channel catfish, *Ictalurus punctatus*. It is found in the Columbia and lower Willamette drainages, but is more prevalent east of the Cascades in the Columbia, Snake, Owyhee, and John Day Rivers. The white catfish, *A. catus*, may be better established west of the Cascades. The flathead catfish, *Pylodictis olivaris* is in the Snake River, but its presence elsewhere in Oregon is uncertain. These three species can be distinguished from one another by counting the bony rays of the anal fin. The flathead catfish will have fewer than 18, it has a protuberant lower lip, and its adipose fin is elongated. The white catfish has 19-23 anal fin rays, it has the most forked tail of the Oregon species, and it has no spots. The channel catfish has more than 23 rays.

There are three species of bullheads known to be in Oregon. The brown bullhead, *A. nebulosus*, can be found throughout the state. The black bullhead, *A. melas*, is primarily in the streams and reservoirs of the Snake River drainage, and the yellow bullhead, *A. natalis*, is most common in the Willamette basin. The yellow bullheads have 24-27 anal fin rays, a rounded tail, and light colored chin barbels. Brown and black bullheads have 17-24 rays, square tails, and dark chin barbels. The black bullhead can be distinguished from the other two by noting that the posterior edge of their pectoral spines lack a barb, and that the membrane between the fin rays are black.

All of these bullheads can grow to 18" and put up a tussle when hooked. They are rendered indistinguishable from one another by the numerous recipes available for their white flesh. Bullheads taken from clear and cooler waters are said to be the most flavorful.

Are You Ready for a HydroLab?

OLA thanks Hach Hydromet for their continued support of our organization. The Hydrolab Series 5 Water Quality Instruments they featured at our Conference would be a welcome part of any water-monitoring program. Monitoring requirements can be met by choosing from the 16 available sensors to be included in one of three sonde formats. The mini-sonde has a 1.75" diameter and can measure 12 parameters, and the two 3.5" diameter models can measure 16 parameters simultaneously.



All three can be used for attended or unattended monitoring, but for extended deployments, the best choice would be the model that brushes the sensors at a programmable frequency. The sondes can be operated in real time from a laptop or from a dedicated datalogger designed for severe field conditions. They can withstand depths to 200 meters and their temperature range of -5 to 50 °C. permits hot water washing each time sampling is completed. The initial cost of this system varies with the options selected, but it is substantial. This investment is recoverable in the convenience, reliability, and consistency that it brings to data collection over the long life of the instrument. The complete line of Hach products can be viewed at www.hachhydromet.com.

Moving and Shaking at the OSMB

The Oregon State Marine Board was created by the Oregon Legislature in 1959, in response to the federal Safe Boating Act and to oversee the rise in boating popularity in a state blessed with navigable waters. Dollars were not plentiful back then either, so this new agency was designed to subsist solely on the fees they generated, and not on the state's General Fund. Boat registration fees and marine fuel tax revenues continue to finance much of the OSMB mission to promote boating safety, education, and access. These funds are returned to the boating community in the form of OSMB grants to build boat ramps, transient docking space, pump out stations, and other enhancements. Read on for a sampling of the varied issues that have recently appeared on the OSMB agenda.

Recognition of Kane's Hideaway Marina: Since the project began in 2006, the OSMB Clean Marina program now has 40 facilities that have voluntarily adopted to run their businesses with the Best Management Practices the certification requires. Kane's Hideaway Marina, on Detroit Lake, joins Odell Lake Marina and Lake Billy Chinook's Cove Palisades Marina as the third lake marina to be awarded this distinction. Located on the east shore of the lake's Breitenbush River arm, the full service marina operates from April 15th to September 15th on Oregon's most popular reservoir for boating. Their 400 slips offer overnight to seasonal moorage for boats <16 to 48' in length and reserves 30 spaces for sailboats. The services they offer are described in detail at www.kanesmarina.com.

Administration of new laws: In the last session of the Legislature, three boating laws were passed that take effect on January 1, 2010. The OSMB has a role in developing the details to administer these new laws. To emphasize the Oregon ban on using live fish as bait, and to give pause to bait bucket biologists, SB 571 looks at why people might transport live fish and authorizes a maximum five years imprisonment, a \$125,000 fine, or both, for violations where poor intentions are suspected.

HB 2583, the Clean Launch Law, prohibits launching a boat with visible aquatic species on the hull, motor, or trailer, or any invasive species inside the boat. This law supports the OSMB recommendation for boat owners to clean their craft of visible plants and animals, and drain and dry all interior compartments between launches.

HB 2220 creates a new program to prevent the spread of aquatic invasive species. The program will be funded by increasing the established boat registration fee with a \$5 surcharge. Boats registered outside of Oregon will require a \$20 permit fee to launch in Oregon waters. Manually powered boats >10' in length will also now require a \$5 permit. This permit is transferable among manually powered boats so it becomes more of an operator's permit that must be renewed annually. A manually powered boat with multiple passengers need have but one valid permit aboard for compliance. The money this new fee generates will be used principally to safeguard Oregon waters from *Dreissena* mussel infestations, but the education and inspections that result from this increased vigilance will watch for other aquatic pests as well.

Determination of Waldo Lake boating rules: The long discussion of whether to prohibit the use of internal combustion engines on Waldo Lake has made its way to the OSMB. The question has been before the public since 2001 when the USFS sought input for an Environmental Assessment they had prepared to address this issue. Procedural challenges brought against this EA and a subsequent one, which did ban chain saws and generators for most of the lake's shores in July 2009, have kept the issue open. (See *Lake Wise*, March 2007 and March 2008.) The recent court ruling that the USFS lacks the authority to designate boating rules on a navigable water owned by the people of Oregon, has wound up redirecting the question to the OSMB. The issue was raised at the scheduled OSMB meeting on June 18th, and the Board agreed to look into actions they could pursue, even before Governor Kulongoski requested they consider his specific proposal. Testimony on the Governor's request to halt the use of internal combustion engines on Waldo Lake will be heard at Eugene on November 23rd and in Bend on Dec 10th. Written testimony will be accepted through December 15th. Further details on this, and many other matters concerning lake management, can be found at www.boatoregon.com.

A Different Sort of Alkali Lake Problem

Oregon's Alkali Lake is a dry, playa mudflat in Lake County, 20 miles northeast of Abert Lake. In 1969 it became a toxic waste dump when Chemical Waste Storage and Disposal, Inc. obtained a permit from the Oregon Department of Agriculture, and placed approximately 25,000 drums of waste solvents there. Most of this material came from a Portland division of Rhodia, Inc., who manufactured Agent Orange among other products. The Oregon Department of Environmental Quality came into existence in 1970 and the US EPA followed in 1972. From 1972-1974, discussions between ODEQ and Chemical Waste Storage did end the movement of more waste to the site, but further remedy of the situation was not achieved before Chemical Waste Storage, Inc. became "insolvent".

The site became an ODEQ project, and after review and multilevel protests, the barrels were crushed on-site in 12 trenches within an area of about 10 acres in November 1976. The trenches were capped with gravel to prevent dispersal of contaminated dust, and four miles of barbed wire fencing was erected around the site to bar accidental entry. The resultant solvent ground water plume covers about 40 acres and appears to be stable according to the on-going monitoring of the site.

Earlier this year, an agreement was reached between ODEQ and Bayer Crop Science, Inc., the eventual successor to Rhodia, which spells out financial responsibility. There is a lump sum payment due to ODEQ for past costs and future monitoring. ODEQ will assume the next \$500,000 in costs incurred and 80% of the costs beyond that sum. While this agreement brings a resolution to this unfortunate incident, it does not address the bigger issue of how to safely dispose of nasty by-products. Could the incinerator at the US Army Umatilla Depot offer a solution when the current batch of Army ordnance there has undergone treatment?

PO Box 345
Portland OR 97207-0345

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.

Visit our website: www.oregonlakes.org

CLEAN LAKES INC.



Aquatic Ecosystem Restoration & Maintenance

Clean Lakes, Inc. and its staff have been providing aquatic ecosystems restoration and maintenance services to government and private sector clients worldwide since the mid 1970's, and have been actively involved in the control of exotic and invasive plant species in the western United States since the early 1980's. The corporation has offices in Couer d'Alene, Idaho and California. They have a flotilla of specialized craft for a variety of tasks. Bathymetric and vegetative mapping are used to define conditions, strategic planning, and assess progress. Permitting and familiarity with NPDES compliance requirements are routinely included in management plans.

Staff and equipment can carry out the work of their plans. Physical measurements are made with field sensors, and chemical samples are collected with approved methodology and sent to certified labs under chain of custody documentation. Equipment and experienced operators are available for dredging operations and pesticide application. Weed harvesting can be done in open water or in wetlands. The firm has experience with the installation of aeration systems. At our Lincoln City Conference, they demonstrated their instrumentation to analyze samples for *Dreissena* mussel veligers. These samples are fed into a flow cell where under polarized light, particles are scanned for the characteristic birefringence of the veliger shells. The automatic processing then measures, photographs, and categorizes the particle for further review. The complete range of services available from Clean Lakes, Inc. can be viewed at www.cleanlake.com.