September 2011

Editor:
Roger Edwards

LAKE WISE

A Voice for Quiet Waters

The Newsletter of the Oregon Lakes Association

Countdown to OLA Conference is Now Underway

There is no particular reason the OLA Conference this year has been delayed beyond the September date of recent years, but the 2011 meeting will take place on Friday and Saturday, the 21st and 22nd of October, at the Native American Center on the Portland State University campus. Another change from recent years is the offered tour of Portland's Bull Run watershed from 9:00 am to 4:30 pm on Friday. The normal business meeting will convene on Friday evening, but tour participants must be in Portland and ready for the outing well in advance of this customary kick-off event. Long time OLA members should feel comfortable at Saturday's full schedule of presentations, breaks, and OLA business matters.

The need for tour participants to be in Portland on Friday morning makes an extra night of lodging necessary for people from out-of-town. Portland has a full range of downtown hotels to select from, and the Green and Yellow light rail lines provide free shuttle service from the downtown area to the PSU campus. The most convenient lodging for the OLA Conference however, is the University Place Hotel at 310 SW Lincoln Street, which is the southeast corner of the campus and just four blocks east of the Native American Center. The Hotel offers rooms at a base price of $89 when the Oregon Lakes Association is mentioned at registration. The PSU football team will host the Willamette University Bearcats on the day of the Conference (kick-off at 5:05 pm) so there may be competition for University Place Hotel rooms as well as on the gridiron at Jeld-Wen Field. Early registration is encouraged.

Another feature available at the Conference this year is a one-on-one display of the updated, on-line *Atlas of Oregon Lakes*. The finished product of this long term project is expected to be unveiled before the Conference gets underway. It resides on a dedicated server at PSU and presently contains the complete printed edition from 1985, additional information about the listed lakes, and more lakes on the list. The website holds the promise of providing accessible, up to date information on an unlimited number of Oregon lakes. So while the present display of this information is impressive, it is the design of the website and its potential to be continuously updated that is the most exciting aspect of this achievement.

A trip to Portland can be a daunting prospect, but there are big city amenities that warrant the effort. Shopping and dining have attractions for some, there are always interesting exhibits at the Oregon Zoo and the Oregon Historical Society, the Oregon Symphony has a Pops Concert of 1960-70s songs scheduled, and the Portland Winterhawks have a game on home ice. The time that the trip requires gives OLA members a chance to consider whether a term as a Board Director could be of interest. Most of the present Board members have served multiple terms, which is proof that there is some personal satisfaction in the experience. The two year terms insert periodic discussions of lake matters into your schedule, and give you first-hand experience applicable to the governance of any organization. Furthermore, OLA engages in some useful projects to promote the well-being of Oregon lakes. The cyanobacteria workshop of May 2010 is an example of an official OLA event and there is other work, such as the on-line AOL, that proceeds informally through the mutual attention of OLA members. The effectiveness of OLA as an organization is dependent on its network of members. Participation in the annual Conference is a vital step in building this network.

Oregon Lakes Association
a voice for quiet waters

2011 Conference Preliminary Program

Saturday, October 22, 2011

Native American Center, Portland State University, Portland, Oregon

Conference Co-sponsor:

Portland State UNIVERSITY

Center for Lakes and Reservoirs

Registration and Coffee	8:00 a.m.
Opening Karen Font Williams, OLA President *Welcome* TBA, Confederated Tribes of the Grand Ronde	
Mark Sytsma, Center for Lakes and Reservoirs, Portland State University *Offerings and Current Projects at CLR*	
Mark Rosenkranz, Lake Oswego Corporation *Six Years of Alum Use on Oswego Lake: Lessons learned during our phosphorus reduction efforts*	
Elaine Stewart, Metro Regional Government *Blue Lake (East Multnomah County) Management Partnerships*	
Poster Viewing and Vendor Walkabout (Refreshments)	10:30 - 10:50
Wayne Carmichael, Prof. Emeritus, Wright State University *Management and risk guidelines for cyanobacteria harmful algae blooms and their toxins: Historical perspective and future recommendations*	
Panel Discussion – *Harmful Algal Bloom Surveillance and Response in Oregon: What's New and What's Next?* Dan Turner, Oregon Dept. Environmental Quality TBA, Oregon Health Authority HABs Program Trish Carroll, U.S. Forest Service TBA, One county's response to a HAB occurrence TBA, U.S. Army Corps of Engineers	
Lunch and Association Elections and Voting	12:30 - 1:30
(Open presentation slot)	
TBA, City of Portland Water Bureau *Bull Run Reservoir Management for Endangered Species Recovery*	
Ted D. Harris and Frank Wilhelm, Dept. of Fish and Wildlife, University of Idaho *Willow Creek Reservoir - cyanobacteria and toxin production related to nutrient ratios*	
Poster Viewing and Vendor Walkabout (Refreshments)	3:00 – 3:20
Nick Tufillaro and Curt Davis, Oregon State University *Looking at Oregon Lakes from Space*	
Douglas W. Larson, Retired, U.S. Army Corps of Engineers and Ron Larson, U.S. Fish and Wildlife Service *Saving Lake Abert: Salt Lake in the high dessert*	
(Open presentation slot)	
Adjourn. See you in 2012!	04:30

OLA Business Measures for the Conference

Association Board to Propose By-laws Changes to the Membership

The Oregon Lakes Association Board of Directors is announcing a vote to amend the Association's By-laws on October 22, 2011 at the OLA Annual Conference. Proposed By-laws amendments will be posted on the OLA website (www.oregonlakes.org) no later than Friday October 7, 2011. Copies of the proposed amendments will also be available at the OLA Annual Conference, Friday and Saturday, October 21 and 22, 2011.

Ballots will be accepted until 1p.m., Saturday, October 22, 2011. Procedures for voting, including proxy and absentee voting, will be posted on the OLA website no later than Friday October 7, 2011.

Association Executive Committee Elections

The Oregon Lakes Association is opening nominations for four positions on the Association's Executive Committee: President, Past President, Secretary, and Vice-President. Candidates must be OLA members and the Past President must have served at least one term as OLA's president. Nominations will be accepted until October 22, 2011, at approximately 1 p.m., including nominations from the floor of the OLA Annual Conference. Voting will take place immediately following the final call for nominations on October 22, 2011. Procedures for voting, including proxy and absentee voting, will be posted on the OLA website no later than Friday October 7, 2011.

The OLA Board continues to accept nominations from members interested in being appointed to the Board of Directors. Director terms are for two years. Please send nominations and declarations of interest in Board of Director positions to OLA Secretary Ben Johnson at: free2roca@gmail.com.

Could This Be Your Last Chance to See Bull Run?

The rare opportunity to tour the Bull Run watershed should be of interest to OLA members attending the Conference in October. Examples of multiple lake management strategies will be on view during the day's activities. The watershed has served as Portland's domestic water supply since 1895, and has been closed to public entry since 1904, when President Theodore Roosevelt signed "An Act for the Protection of the Bull Run Forest Reserve and the Sources of the Water Supply of the City of Portland, State of Oregon."

The wisdom of being the first user of a rainfall derived water source and then closely guarding that source of water, has allowed Portland to avoid the expense of building and operating a drinking water filtration plant. Portland remains one of the few major cities in the country with an unfiltered, surface water supply. Other benefits of this decision were evident as early as March 1925, when Lewis A. McArthur, author of the first three editions of *Oregon Geographical Names*, wrote:

> Two lakes stand out above all others in importance to Oregonians. The first is Bull Run Lake which furnishes necessary domestic and industrial water supply to nearly a third of the population of the state. The civic and economic importance of the lake cannot be stated in mere dollars. The lake is one of Oregon's very greatest assets and should be remembered as such. Veiled from the public both by law and nature, Bull Run Lake sits surrounded by virgin forests and puts forth the best it has to give for the comfort and health of over a quarter of a million souls.
>
> From "Lakes of Oregon", *Oregon Historical Quarterly*, volume 26(1).

The 102 square mile watershed afforded this protection lays in the western foothills of Mt. Hood, between the elevations of 750 and 4700 feet above sea level. Snow accumulation at these elevations rarely lasts until the end of July so supplying water to almost a quarter of the 3,823,465 Oregonians tallied in 2009 is largely

dependent on rain storms in late May to early June. Over a year's time, various locations in the watershed receive between 80 and 130 inches of precipitation. The storms during late spring top off the basin's lakes and reservoirs with enough water to meet demand until rain clouds return in the fall, bringing an end to summer drawdown. This water is conveyed to Portland through three conduits with a combined capacity of 225 million gallons/day. Water demand can exceed this value on hot summer days, and occasionally in winter when freezing temperatures lead households to keep their faucets dripping. It is usually July of each year when daily water demand becomes greater than the volume of water flowing into the Bull Run Reservoirs. There was a time of extensive logging in the watershed and while those harvests have ended, the topic remains controversial.

The watershed tour will focus on Bull Run Lake and the two Bull Run Reservoirs. All three are discussed in the *Atlas of Oregon Lakes*, and Bull Run Lake is featured on the OLA website. The lake is the headwaters of the Bull Run River but most of the water in the system enters the river in downstream tributaries. The drainage basin of the lake is just 3.5 square miles and the lake itself covers 466 acres. Its capacity is 30,600 acre feet, about a third of which is available to augment supply through artificial drawdown, if needed. This full allotment has been pumped from the lake in the past, but it is now the resource of last resort behind the Water Bureau's well field along the Columbia River. It was largely the need to draw down Bull Run Lake that led the Water Bureau to begin systematic monitoring of the lake, and to make it a USGS stage gauging site.

Bull Run Reservoir 1 is the upstream impoundment of the two, serial reservoirs on the Bull Run River, and it was the first to be built. The dam site had a small community during the 1925-29 construction years, and the chief engineer's house continues to serve as a scenic meeting place for discussion of watershed topics. The gravity, arch design of the dam was novel at the time and was the forerunner for the Owyhee and Hoover dams. The reservoir could be full or in extreme drawdown on the day of the tour, but will provide pertinent subject matter in either case. Retrofitting a multiple level intake tower onto an existing dam, managing floating debris, channel cutting through sediment beds, and the benefit of spillway gates are subjects that have all been extensively discussed here.

Bull Run Reservoir 2 came on-line in 1962 and changed the water supply from a river run, to a reservoir water source. There are desirable attributes to both and the idea of running a pipeline from the Headworks to the closest tributary remains a future option. Much of the infrastructure at Dam 2 is concerned with eliminating the head of the stored water. Opposing Howell-Bunger valves were the original solution, but hydropower generation and a substantial pressure reducing valve are now both available for use as well. Filling the conduits to town and beginning the disinfection process is accomplished at the Headworks at an elevation of 750', which makes the delivery to most of the Portland area a gravity operation. Drawdown is purposely minimized in this reservoir to maximize the benefits of temperature stratification, dilution, and settling time.

There are numerous other features in the watershed that may be of interest to OLA members on the tour. The Headworks is still served by the original 30 foot dam that began diverting water of the Bull Run River to Portland 116 years ago. The tour could stop at the North Fork of the Bull Run River to view the auto sampler there that allows tracking of how reservoir tributaries affect the water quality of the watershed. Monitoring data from this and from other tributaries have been converted into water quality standards that clearly show the range of conditions that can be expected to occur over the course of a year. Perhaps there will be a vision of the future at the canyon of Blazed Alder Creek. Building a dam at this location would guarantee an ample water supply for future generations of Portland area residents. There will be no opportunity to see the secret Chantrelle patch, where the University of Washington is taking advantage of the absence of human disturbance to study the natural history of these mushrooms. Nevertheless, one of the lasting, take away impressions of the tour may be that of a watershed with minimal activities and development.

Seating on the tour is limited so early registration for the Conference offers the best chance of reserving a spot on the bus. The priority of the request will determine who goes on the tour, and participants must provide good contact information on their Conference registration form to assure they receive notification of last minute instructions.

The 1985 *Atlas of Oregon Lakes* has been Updated and Put On-Line in 2011

By Richard Lycan, Professor Emeritus, Portland State University

Editor's note: Dr. Lycan has understated his contributions to this project. He provided the inspiration to get it started and coordinated the diverse tasks that proved necessary to reach this point. His involvement in each step of the process was instrumental in maintaining progress. The on-line AOL will never be finished, but the format that has been established under his guidance will serve Oregon's lake community well into the future.

After several years of effort, the on-line *Atlas of Oregon Lakes* (on-line AOL) is undergoing final refinements before going public in early October, prior to the annual meetings of the Oregon Lakes Association and the North American Lake Management Society. The URL for the atlas is: http://aol.geos.pdx.edu/.

This effort has been lead by the Center for Lakes and Reservoirs with support from the Center for Spatial Analysis, Academic Research and Computing, and the College of Urban and Public Affairs, all at Portland State University. The funding for the project was from the U.S. Environmental Protection Agency through the Exchange Network Grant Program via the Oregon Department of Environmental Quality, as well as support from Portland State University. The on-line AOL made use of and extended the work of the original print *Atlas of Oregon Lakes*, published by Oregon State University Press in 1985. The project could not have been completed without the help of student workers and willing volunteers, including the authors of the 1985 atlas.

The on-line AOL is intended to inform both a scientific and popular audience about Oregon's lakes. A major purpose is to provide access to water quality data in the Pacific Northwest Water Quality Exchange Database (PNWWQX). It will provide a gateway through which qualified persons can enter new lake data into this database and through which users of the website can view and download these data. In addition, the website will provide access to information of interest about lakes to the general public. Viewers will be able to see detailed maps of thousands of Oregon lakes and their surrounding areas, including bathymetric maps of 180 lakes. They will be able to download PDF format maps of lakes, with bathymetric maps, pages from the 1985 print atlas, data pages for 40 Oregon lakes included in the EPA National Lakes Survey, water quality data on lakes, and information about the lake's watershed. There will be access to a photo library on Oregon lakes.

Initially, the on-line AOL will provide web links to the Oregon Department of Fish and Wildlife's Weekly Regional Fishing Report, and the Oregon State Marine Board's Facilities Database. Other organizations also will be able to link their websites to the on-line AOL. Building these links will become easier as Oregon state agencies transition to using the lake identifiers (water body reach ID) used in the National Hydro Database.

On-line AOL presently provides substantial information about 216 Oregon lakes. This number includes 203 lakes from the 1985 print atlas, 40 lakes in the EPA National Lakes Survey, and a number of lakes on which the PSU Center for Lakes and Reservoirs has conducted research. The lists overlap in case you are checking the math. As data are added to the PNWWQX data they will become available through this website. However adding more bathymetric maps, lake photos, and analyses of the lake watersheds will require additional resources. There is interest in republishing the lakes atlas as a print volume, but updating the narrative would be a costly and labor intensive effort. The on-line AOL could be an intermediate step to reach this goal.

A Second Chance to Take a Look at Tiger Trout

The previous issue of *Lake Wise* noted that Phillips Lake was going to receive an ODFW stocking of tiger trout to help control the yellow perch numbers there. Fish Lake in Jackson County will also get 4000 of these hybrids in a test to see how well they can curb tui chub populations. The tigers come from a breeding program that the Washington Department of Fish and Wildlife is conducting to add diversity to their fishing opportunities and to control unwanted fish populations there. Washington has had a similar program with tiger muskies, the sterile hybrid between northern pike and muskellunge. It was the success of that program that led to interest in tiger trout.

There has been sporadic interest in tiger trout for decades now. Until recently the consensus has been that they are too difficult to produce to have an impact on the fisheries of the state experimenting with them. Utah however, seems to have overcome the inherent problems and tigers are appearing in lakes throughout that state. Tiger trout are most often described as the offspring produced when brook trout (*Salvelinus namaycush*) males fertilize the eggs of brown trout (*Salmo trutta*) females. This can happen naturally in the wild, but it is rare because aggressive brown trout do not tolerate brook trout around their redds. These odds might improve somewhat if brook trout numbers are significantly greater than brown trout within a particular fishery. The more pertinent problem however is that brown trout are trout with a chromosome number of 80, and brook trout are chars with a chromosome number of 84. The sex cells of the two species are thus different enough that the survival rate of the progeny is diminished. Artificially shocking the eggs with a heat treatment soon after fertilization has improved the survival rate sufficiently to justify the effort at hatcheries. The heat treatment is timed to disrupt the initial cell divisions of the new embryos in a manner that decreases the impact of the genetic differences.

"Tiger trout" is a descriptive term referencing the distinctive markings of these fish. Instead of the speckled or spotted appearance common to trout, tiger trout have curved lines in contrasting colors that give them a striped look. Their colors can vary from a prominent brown and yellow with an orange tinged belly, to the more customary fish colors of silver and dark. Throughout this color range, the irregular, vermicular markings distinguishing tiger trout are present. This pattern is also apparent in offspring of the reverse cross, where brown trout males fertilize brook trout eggs, but these tigers are deemed less hardy. It is a situation similar to the breeding of horses and donkeys to produce mule or hinny hybrids.

Like many hybrids, tiger trout are incapable of reproducing. Even with a life span of about 10 years, their introduction into lakes and reservoirs poses little threat of an irreversible change to a fishery. A fishery out of balance can benefit from the addition of tiger trout because of their diet of smaller fish. Small fish are abundant in lakes overrun with unwanted species, and there is little else to eat there due to the feeding pressure on available invertebrate prey. If 4000 tiger trout eat one small fish a day, they will devour 1,460,000 small fish in a year, which is a number substantially larger than the 200,000 perch/year that ODFW netted from Phillips Lake during the past three years. ODFW has plans to continue annual stocking of surplus tiger trout from Washington into both Phillips and Fish Lakes. The Oregon Legislature has already agreed with the ODFW plan to only allow catch and release of tiger trout at these two lakes.

Oregon is blessed with ten Fish Lakes. It is the Jackson County Fish Lake that is about to, or has already received the hungry tiger trout. This Fish Lake is a Bureau of Reclamation impoundment 30 miles east of Medford, and downstream and 5 miles southwest of Fourmile Lake. It is a small, natural lake laying between Mt. Mcloughlin and Brown Mountain, on NF Little Butte Creek. The lake was enlarged into an 8400 acre-feet reservoir in 1915. The water it receives from Fourmile Lake comes via the Cascade Canal, which is a Medford Irrigation District diversion from the Klamath River Basin.

Moving water from one river basin to another is tedious, but it is not always difficult. The outlet at Fourmile Lake is at an elevation of 5748 feet. Fish Lake is on the other side of the divide at 4639 feet, making the water transfer feasible if the divide dips between these two elevations in the vicinity of the lakes. The straight line distance between the lakes is a bit more than 5 miles and the completed canal is about 10 miles long. Construction began in 1910 and was completed late in 1915. The canal diverts about 5462 acre feet of water to the Rogue Basin annually.

Tui chub were first noted at Fish Lake in the mid 1940's, and have persisted through four rotenone treatments and a commercial harvest effort, which has removed close to a million fish since 2007. The geology at the lake is of volcanic origin and water movement in the region has a substantial subsurface component. The Cascade Canal ends about a mile and a half above the reservoir, where the water seeps into the Brown Mountain lava flow and percolates through the remaining distance before emerging as spring water at the head of the lake. The subsurface flow of fresh water into the lake there and elsewhere is sufficient to prevent the complete kill of gill breathing animals by surface applications of rotenone. Underwater seeps will offer nuisance chub no refuge from marauding tiger trout.

Bullheads Attract ODFW Ire at South Twin Lake

Following Commission approval in early September, planning is now underway to treat Deschutes County's South Twin Lake with rotenone this coming October. South Twin Lake was the first in Oregon to receive a rotenone application when tui chub overran the trout fishery there in 1941. There have been several subsequent treatments at the lake as well, which makes the short time frame of this project possible. Fishing regulations for daily catch, possession, and size restrictions have been suspended to encourage anglers to make use of the lake's fish. The season will end a few days early on October 23rd. A public meeting in late September or early October will describe the treatment plan in greater detail and receive public comments.

Bullheads appeared spontaneously in the lake soon after the turn of the century, which of course, was just a few years ago. South Twin Lake has no inlet or outlet and so poses little threat to its nearby North Twin or Wickiup Reservoir, but the infestation has notably degraded the established rainbow fishery at this popular lake. Legal sized trout are planted annually in late spring, and carryovers from previous years can attain lengths of 16 inches, when zooplankton is plentiful. As discussed in the November 2009 issue of *Lake Wise*, bullheads are bottom feeding omnivores that thrive in still or sluggish waters, and so compete with planted trout for available food. South Twin Lake has also been subjected to the illegal introduction of threespine stickleback, *Gasterosteus aculeatus*, another species that can reproduce in the lake and so make it harder for trout there. These freshwater stickleback are thought to have a marine origin and their adaptability to diverse conditions have made them the subject of speciation research. The opportunity to study the range of variation in a threespined stickleback population of a closed basin lake would certainly be of interest to this research.

Detroit Lake Marina Certified in OSMB Clean Marina Program

The efforts to use best management practices to operate an environmental friendly business earned the recognition of the Oregon State Marine Board for the Detroit Lake Marina on June 6th. The Clean Marina Program began in 2006 and the Detroit Lake Marina was among the first of the 200 eligible marinas in Oregon to begin revising their procedures to meet the standards of the certification. The list of Clean Marinas now is at 50 and includes three other lake facilities; Odell Lake Resort, Lake Billy Chinook's Cove Palisades Marina, and Kane's Marina, which is just downstream of Detroit Lake Marina on Detroit Lake's Breitenbush River arm.

LAKE WISE
The Oregon Lakes Association
Newsletter 2011 #3

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

Detroit Lake Marina . . . (cont.)

It is not surprising that both marinas on Detroit Lake have achieved Clean Marina certification. The lake ranks fourth in popularity among Oregon boaters. Only the Columbia and Willamette Rivers, and the Pacific Ocean are ranked higher in OSMB's Triennial Report on Recreational Boating. This flood control reservoir of the US Army Corps of Engineers on the NF Santiam River is just 46 miles ESE of Salem, a location making it readily accessible to Oregon's population centers. Detroit Lake Marina serves its customers as a full service marina with daily, weekly, monthly, and seasonal rentals of 400 slips for boats up to and greater than 36 feet. It is within walking distance to the town of Detroit and its river bend location offers protection from wind and waves from the lake. More information about the marina's services is available at www.detroitlakemarina.com.

NALMS has a Conference This October Too

The NALMS Conference will be in Spokane, Washington, during the week right after the OLA Conference. A key part of both of these meetings is the opportunity to gain the acquaintance of people who have common interests in lakes. The broader scope of NALMS attracts people from throughout the nation and beyond, but the tools and techniques on display at their symposia have local pertinence. The NALMS Conference theme, "Diverse and Sustainable Lake Management", is applicable everywhere.

Most, if not all conceivable lake topics will be discussed in one of the concurrent, technical sessions scheduled for Wednesday and Thursday. There are six Tuesday workshops that focus on phosphorus problems, freshwater algae, and the use of lake and watershed assessment instruments and software. Tours to local lakes are also planned. Early bird registration rates end on September 16th, Conference rates at the Doubletree Hotel Spokane will not be available after September 22nd, and Conference registration rates will increase again on October 16th. Additional details and Conference registration can be accessed at www.nalms.org.