March 2010

Editor:
Roger Edwards

LAKE WISE

A Voice for Quiet Waters

The Oregon Lakes Association Newsletter

Old Business Comes First

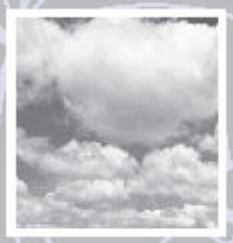
In this first newsletter of the new year, there are some loose ends from the past year needing attention. The simplest of these unresolved news stories are the cyanobacteria advisories at Sru Lake and Tenmile Lake, which lingered beyond press time for the November 2009 issue of *Lake Wise.* Both of these advisories were lifted on November 30th, after 83 days on Sru Lake and 74 days at Tenmile Lake.

The November 2009 *Lake Wise* also contained the strong, but incorrect statement that OLA enjoyed a fine welcome in Lincoln City, "on the very first time OLA has met there". A quick but belated check of the facts shows that OLA's very first Conference was held in Lincoln City in 1990 and the annual meeting reconvened there again in 1996. It is true that OLA was well received in the city last September. An account of that meeting appears in the Winter 2009 issue of the NALMS quarterly, *LakeLine*, complete with a color photo showing the entire length of the D River.

The draft report about the leaking Canyon Creek Meadows Reservoir, which was described in the newsletter last June, presents a grim prognosis for this popular facility. The dam was built on permeable materials that provide a large area for seepage. There is just a low probability of successfully halting leakage around and possibly under the dam, making removal of the existing structure the prudent option.

A couple of other updates on ongoing projects are warranted. First off, the proposal reported in last year's April and August newsletters to build a marina in Foster Lake is now a reality. Edgewater Resort has completed the first stage of their new marina and stands ready to add more moorage slips as demand requires. The second update is the PGE /Confederated Tribes of Warm Springs project to build a water inlet tower in Lake Billy Chinook, which was first described in the June 2008 *Lake Wise.* It was completed last December and is now operational. Juvenile salmon and kokanee following re-established river currents have freely entered the facility's fish trap and have been trucked downstream of the Pelton project dams. The flow correction the tower was designed to achieve has apparently been successful and steelhead juveniles setting out on their downstream migration are expected to appear in the trap later this spring. A change in the lake's thermal stratification pattern is anticipated as water withdrawals through the tower move to the lake surface over the coming year. The Suttle Lake sockeye story on page 4 of this issue is a continuation of this project.

The Oregon State Marine Board's decision to close Waldo Lake to gas powered engines warrants a bit more discussion even though this chain of events and their aftermath were well reported in the press. News of this proposal goes back to the March 2007 issue of *Lake Wise*. In response to the OSMB request for comments, the OLA Board submitted a letter in favor of this decision, citing the unique character and fragility of the lake, and the increasing use it is likely to receive as Oregon's population grows. "Full speed ahead" power boating can be pursued on numerous lakes and reservoirs throughout Oregon, but paved access to a Wilderness destination is now another unique characteristic of Waldo Lake.

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So What is Electric Boating Like?

Because it is no longer an option to throttle down a ski boat to Waldo Lake's 10 mph speed limit, in order to use the boat on Waldo Lake now, it must be re-equipped with an electric motor. The top speed of a silent electric motor is closer to 7 mph, and it requires a battery bank for power. The batteries are best kept charged with an on-board battery charger, and there are other accessory gadgets that further increase the convenience of electric boating. The expense of refitting a ski boat quickly climbs into the thousands of dollars, making this limited option of power boating on Waldo Lake somewhat of a chimera.

But wait. Cruising the internet through the myriad entries under "electric boating" is kind of appealing; just as real electric boating was to people during the Industrial Age in England, one of several locations where interest in this mode of transportation developed. Seemingly effortless movement, without the noise and soot of diesels or steam boilers, made an afternoon on the water a very pleasant outing. The popularity of this pastime is evidenced by the establishment of a half dozen public "charging stations" along the Thames River by 1888. The Thames, of course, has long been a transportation corridor so it is not surprising it would attract state-of-the-art technology. Interest in electric pleasure boating waned during and beyond the World War years, for everyone except submarine enthusiasts, but is now growing again worldwide. Even now there are nine public 'charging stations" along the tide-free Thames.

The common image of electric boating involves a scrawny outboard and a 12 volt battery or two. This is the basic system. This particular outboard is a trolling motor, which is not meant for use as a primary means of propulsion, but may serve as such for small boats. There are trolling motor models running on 12, 36, 48, and 60 volts, but typically these motors produce less than 2 horsepower of thrust. That might not be enough power to get you home if the wind starts to blow. The cost of these motors range from about $200 to less than $1000.

Primary propulsion motors are much meatier. Their cost begins at about $2000. Systems capable of cruising at 6 mph for 10 hours on a single charge are available, but there is a list of factors to be considered to optimize the performance of any electric boat. The greatest efficiency will occur in a boat designed for electric propulsion. Electric motors are not meant for travel at planing speeds so a hull configuration based on displacement offers an advantage to electric boaters. The weight and the space requirements for the batteries must both be considered. There are styles of motors available other than outboards, and there is no limit on the models of boats an electric motor can push or pull. The pontoon barge seems like the most likely candidate as these boats were designed for conversation rather than speed, so a quiet, efficient propulsion system for this type of boat is an especially good match.

The batteries for an electric boat are a key element of the system and the one requiring the most attention. With care, a life of from 5 to 7 years can be expected by keeping them recharged. This task is best done with the use of a smart charger that will avoid over charging. Complete recharging requires 12 hours but there is negligible cost involved. The batteries are repeatedly charged and discharged, so a deep cycle battery is called for rather than a starting battery as is used in cars. Wet cell batteries are the least expensive and offer the greatest capacity, but their cells must be checked regularly for electrolyte level. Gel batteries typically last longer, and sealed batteries might be the best choice if spilled electrolyte is an issue. All the batteries can produce hydrogen gas and so must be vented.

A battery bank consists of twice the number of batteries needed to meet the rating of the motor. So a 36 volt motor needs six 12 volt batteries. You can double this number to increase the cruising time between charges if

you understand the difference between series and parallel circuitry. Solar, photovoltaic panels offer another approach to augmenting power. They don't produce enough electricity to dispense with the batteries yet, but they do facilitate charging and reduce the rate of discharge. With solar panels, you will never need a tow on a sunny day.

There are other means of producing electricity without noise. The November 6, 1909 issue of *Scientific American* pictured an entire page of diverse, "curious inventions", one of which was a two masted boat with windmills rather than sails. Through a series of drive shafts and beveled gearing, the power of the wimdmills was directed to a propeller that would drive the boat. There was no indication that this experiment was actually conducted although it might have produced an interesting approach for tacking against the wind. The idea might also gain respect by powering a generator on a modern electric boat. A Savonius type windmill might best serve in this application. The space available on a pontoon barge might be enough for a propane, patio fire pit that could be fitted with a thermopile generator, or perhaps a confirmed cyclist could be convinced to contribute some pedal power to a connected generator or charger.

The attraction of augmenting the available electrical power aboard a battery powered boat comes from the same inefficiencies that plaque all battery users; batteries are very bulky for the power they contain. Worldwide research is working to improve this ratio and electric boaters surely watch this progress with interest, along with hybrid car drivers and laptop users. Furthermore it is battery replacement that is the recurrent cost of electric boating. Even with these limitations however, it is easy to see how silent power cruising would appeal to some boaters. And Waldo Lake would be a pleasant place for such an outing.

A curious invention from the pages of Scientific American

Will Suttle Lake Regain a Former Distinction?

Historical records document two major runs of sockeye salmon in Oregon; in the Metolius River and in the Grande Ronde River. Both of these runs have long been inactive as a result of fish barrier dams that were placed on the outlet of Suttle Lake and Wallowa Lake, which served as rearing ponds for the newly hatched sockeye of these runs. Neither of these runs are listed as threatened nor endangered however, because descendants of these fish are thought to persist as land-locked kokanee in the respective drainage basins. The ability of the sockeye to switch from an anadromous to a land-locked life cycle is beneficial to the species and logically leads to the question of whether the reverse is also true.

The experiment to answer this question is now underway. Suttle Lake is upstream and about 25 miles southwest of Round Butte Dam, and is connected to Lake Billy Chinook by Lake Creek, which enters the Metolius River near Camp Sherman. The new inlet tower at Round Butte Dam has re-established river surface currents in Lake Billy Chinook and so has restored the downstream migration of anadromous smolts. The kokanee in the Metolius Basin are no longer land-locked, and they have already been included in the catch at the fish sorting facility at the inlet tower. The kokanee smolts moving downstream will spend 2-4 years at sea and then return to the Deschutes River. After swimming up the fish ladders at the downstream Pelton dams, they will be trapped and moved over Round Butte Dam back to the Metolius River. Nostalgic sockeye yearning to carry out their traditional migration, where spawning occurred above Suttle Lake in Link Creek, may spurn the allures of Lake Billy Chinook and continue on to Suttle Lake. If enough of them show up there, the USFS Sisters Ranger District may elect to modify the 4' dam that remains as the final obstacle for this historic run.

PGE and the Confederated Tribes of Warm Springs are committed to restoring the Spring Chinook and Summer steelhead runs in the Deschutes Basin. The work and money they have expended on this project would be doubly blessed if the effort also produced a largely serendipitous restoration of the Suttle Lake sockeye run.

Latest on the EPA's Final Rule on Pesticides

by Beth Moore, ODEQ General Permits Coordinator, moore.beth@deq.state.or.us

On November 27, 2006, EPA issued a final rule that in summary stated that the application of pesticide into, over, and near water does not require a National Pollutant Discharge Elimination System (NPDES) permit as long as the FIFRA label is followed. There were challenges to EPA's final rule and as a result, the 6th Circuit Court determined that NPDES permits are required for all biological pesticides and chemical pesticide residuals when such applications are made into, over and near water.

The court has given EPA a two year stay until April 9, 2011 when the ruling takes effect. EPA is using this time to work on an NPDES general permit for pesticides; gathering information from state permitting programs including Oregon DEQ, the regulated community, and environmental organizations. EPA has put together a workgroup that is made up of state agencies that regulate pesticides, state agencies that regulate water quality, and EPA regions representing office of pesticides and office of water. ODEQ is part of this workgroup. EPA is expected to have a general permit ready for public comment in May 2010, and a final permit by December 2010. The regulated community is required to be covered under the permit by April 2011.

What does this mean in Oregon?

Currently, if the pesticide product is applied consistent with FIFRA labeling, no NPDES permit is required. EPA is the lead on the general permit. Oregon DEQ plans to work with the permit EPA has drafted as the basis for the pesticide general permit used in Oregon. The types of pesticide applications considered for coverage includes:

Herbicides used to control weeds in lakes and ponds;
Herbicides used to control weeds in irrigation systems and other waterways;
Insecticides used in wide-area insect suppression programs;
Herbicides used to control weeds along ditch banks in drainage systems;
Herbicides used in wide-area control programs directed at aquatic invasive plant species;
Herbicides, insecticides and other pesticides used in forestry programs when applied over water;
Products applied to kill fish, mussels or other invasive aquatic species.

Irrigation return flows and agricultural runoff will not require NPDES permits as they are specifically exempt from the Clean Water Act.

Background Information:
The main EPA web site with all the background information is at
http://cfpub.epa.gov/npdes/home.cfm?program_id=41.
For the October 2009 EPA Web Cast with the Pesticide Program Dialogue of committee members, which was open to the public, go to
http://cfpub2.epa.gov/npdes/courseinfo.cfm?program_id=0&outreach_id=483&schedule_id=1072.
The December 2009 EPA discussion with the State FIFRA Issues Research and Evaluation Group on the proposed NPDES general permit is at
http://aapco.ceris.purdue.edu/doc/min2009/min120709sfireg.html#cont17.

Status Report on the Blue Lake in Fairview OR

by Whitney Temple, 2009 Metro Intern

Editor's Note: For several years Metro and the Oregon Department of Environmental Quality have shared resources to monitor Blue Lake water quality throughout the summer. Metro has hired exceptionally skilled water quality interns, often graduate students from PSU's Center for Lakes and Reservoirs. DEQ provides training and field equipment and writes a sampling plan for the season. Metro's intern collects field data weekly and transports water samples to the DEQ laboratory, now in Hillsboro. Interns have sampled the lake more frequently to track water quality changes from events such as boating tournaments, algae blooms, and raising lake levels with groundwater pumped from wells in Blue Lake Park. In addition to field work, interns have organized and analyzed data, made presentations, authored reports and written field manuals.

Metro lists internship opportunities on the Jobs section of their website: http://www.oregonmetro.gov/

Blue Lake is a naturally eutrophic shallow 65-acre groundwater-fed lake in Fairview, 13 miles east of Portland. Sediment core records show that the lake had large populations of cyanobacteria in 1900, predating lakeshore development. It has had historic problems with aquatic weeds dating back to early development around the lake in the 1930s. Eurasian watermilfoil (*Myriophyllum spicatum*), an invasive submersed plant, was first found in the lake in 1973 and is now by far the most abundant plant found in the lake. Based on the data from an early 1980s Clean Lakes Assessment, Blue Lake was placed on Oregon's 1998 303(d) listing for abundant algae, macrophytes, and high summertime pH. Since 2006, Metro, which manages the lake and the surrounding Blue Lake Park, has monitored the lake's water chemistry, algae, and macrophytes through the summer.

From July to October 2009, the lake's pH exceeded DEQ's benchmark of 8.5 standard units in two-thirds of weekly measurements at one-half meter and one-third of measurements at the bottom of the epilimnion. Secchi depth declined from 4 meters in June to less than one meter in October, following the general trend of previous years. Available nutrient data from 2009 are consistent with recent years' data. Phosphorus just above the thermocline exceeded the DEQ benchmark of 50 µg/L for both available samples in July 2009. The N:P ratio since 2002 indicates that productivity in the lake tends to be phosphorus limited.

Three non-native and five native plant species were found in 2009. Two of the non-native species, Eurasian watermilfoil and fragrant waterlily (*Nymphea odorata*), were the most abundant plants in the lake. Native

species were found at fewer sites and were less abundant when found. By the end of the summer, boat navigation was impeded around the perimeter due to profuse Eurasian watermilfoil at the water surface.

Cyanobacteria, mainly *Anabaena sp.*, dominated the algal populations in the lake throughout the summer. The summer average algal biovolume in 2009 was second highest for the five years on record since 2002. The highest biovolume was during the only other of those years during which an algae bloom occurred (2003). A toxic cyanobacteria bloom after fall turnover caused closure of the lake through much of October 2009.

Analysis of the available data since 2002 indicate that water clarity has increased since 2007, when three SolarBee thermal mixers were installed in the lake. This coincided with the spread of plants, especially Eurasian watermilfoil, around the lake. During this period, pH also increased, probably associated with the high level of productivity in the lake. Shifts between algae and macrophyte dominance have commonly occurred every few years in Blue Lake, and may or may not be associated with the SolarBee units.

Management of the lake is confounded by its lack of surface inflows or outflows, so little flushing of water or nutrients occurs. Although overall nutrient loading is assumed to be low, the sediments and inflowing groundwater are nutrient-rich. These natural rather than anthropogenic sources of nutrients mean that lowering the lake's nutrient content is unlikely. Metro is working with DEQ to continue monitoring water quality in the lake and with the local homeowners association to define target outcomes and appropriate future management approaches.

Save the Date: OLA Conference in Corvallis on September 10-11

The details have yet to be worked out, but OLA is pleased to connect with interested students and faculty at Oregon State University at the annual Conference this Fall. The Beavers have no game scheduled on the weekend of September 11th so there should be lodging available. There are typically more lake topics to consider at our meetings than time to do them justice, so mark down this date for a lakes weekend in Benton County.

Harmful Algal Bloom Workshop Coming to Corvallis in May

The Oregon Lakes Association in conjunction with the Oregon Department of Human Services – Public Health Division – Harmful Algal Bloom Surveillance Program will hold a Harmful Algal Bloom (HABs) workshop at Oregon State University on Monday and Tuesday, May 24th and 25th. This event will provide an opportunity for lake and water supply managers to broaden their understanding of HABs monitoring, taxonomy, toxins, and treatment. The conference will be led by world renowned cyanobacteria specialist Dr. Wayne Carmichael, professor emeritus at Wright State University, and Oregon State University cyanobacteria microbiologist Dr. Theo Dreher. Registration will be limited to 40 participants. Interested participants will be able to register and make payment on the Oregon Lakes Association website http://www.oregonlakes.org/ after April 8, 2010. Registration will end on May 3, 2010. Until the on-line registration is available, please notify us via e-mail of your interest at webmaster@oregonlakes.org.

Tentative outline of workshop
Room 304 Nash Hall, Oregon State University
http://oregonstate.edu/campusmap/

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PO Box 345
Portland OR 97207-0345

OLA Mission: The Oregon Lakes Association, a non-profit organization founded in 1990, 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

Corvallis HAB Workshop (cont.)

May 24th, 2010
Morning
History/biology/toxicology of Cyanobacteria HABs
Detection and Analysis Methods for Cyanobacteria and Cyanotoxins
Lab Exercises - Cyanobacteria taxonomy/identification, sample collection and handling

Afternoon
Lab exercises with kits (ELISA and PPIA) that measure microcystin, cylindrospermopsin, and saxitoxin

May 25th, 2010
Morning
Taxonomy/Sampling/Handling of CyanoHABs
Chemistry/Toxicology of Cyanotoxins
Health Risk of CyanoHABs and HAB occurrences in Oregon

Afternoon
Water Treatment for Removal and Inactivation of Cyanotoxins; Management and Mitigation
Genetic ID of Cyanobacteria
Wrap-up