August
2008

Editor:
Roger Edwards

LAKE WISE

A Voice for Quiet Waters

The Oregon Lakes Association Newsletter

See You in September

In the northeast corner of Oregon, the word "Wallowa" is universally pronounced to rhyme with "Wow." It is an appropriate correlation because "Wow" is an apt description for much of Wallowa County. It is certainly fitting for Wallowa Lake, the site of OLA's annual Conference next month. But "Wow" will likely show up in your conversations long before you reach the lake. Joseph, Oregon and Wallowa Lake are not destinations that are easily attained. Essentially, you can drive there from La Grande on Highway 82, or come south from Lewiston, Idaho on Highway 3. Both routes serve as buffer zones that distract lingering thoughts from diverse departure points. Even before the snow-capped peaks of the Eagle Cap Mountains peek over the hills, the views of the Grande Ronde, Wallowa, Minam, and Lostine Rivers along Highway 82 can be therapeutic, and the view down into Joseph Creek Canyon from Highway 3 makes you better appreciate your just completed dip to cross the Grande Ronde River.

Wallowa Lake is a special place and always has been. Its relative isolation and its display of the primordial forces that brought about its creation provide the lake with a timeless sense of serenity. Interest in preserving this natural treasure seems to grow in proportion to the increasing population pressure calling for some level of private development. A defensible position between these opposing outlooks is not easily discovered. That is why OLA has chosen to discuss property values and environmental stewardship at our Conference there. The debate is applicable throughout Oregon and beyond, but it is especially pertinent at a place where the question is being contested. While the details of the discussion continue to be refined, we will present Native American perspectives of land and natural resources for the reverential heritage that they confer. We invite active audience participation to help decide whether this view is relevant or can be accommodated within the "common good" element of government hierarchies and private property ownership.

There will be other lake related topics presented during the Saturday Conference, but Wallowa Lake is also a good place for families. There are activities available that appeal to all age groups. Mini-golf, bumper boats, canoeing, parasailing, horseback trails, hiking, and shopping are among the many attractions. The tram ride to the summit of 8,150 foot high Mt. Howard dispels all doubts about the region's comparison to the Alps of Switzerland. The statuary on display in Joseph and the nearby foundry tours demonstrate the state of the art for bronze castings. Lodging is also available to suit a range of tastes. All the amenities at the south end of the lake are within walking distance of one another and the United Methodist Camp, which is hosting our Conference. Reserving a yurt at the United Methodist Camp is a simple way to recover some of the transportation costs of getting there. Bringing the family also allows you to divide gasoline dollars by the size of your clan.

TENTATIVE AGENDA

OLA Annual Conference
Wallowa Lake United Methodist Camp
September 12-13, 2008

Friday, September 12th at 07:00 pm — OLA Business Meeting

Check at Bailey Hall in the United Methodist Camp for the location of this gathering, and then join the OLA Board for an informal discussion about the organization's priorities for the coming year.

Saturday, September 13th

08:00 am		Registration and orientation
08:45	Welcome	Roger Edwards, OLA President
09:00	Introduction to Wallowa Lake	Bill Knox, Oregon Dept. of Fish & Wildlife
09:30	Break and Vendor Walkabout	Electronic Data Solutions Hach Environmental In-Situ
10:00	Tribal Lands and Environmental Stewardship	Jennie Bricker, Stoel Rives LLP, moderator

A panel discussion session exploring Native American bonds to their lands with E. Arlan Washines, Yakama Nation Wildlife Program, and Stephen Purchase, Oregon Dept. of State Lands.

12:00 pm		Lunch and OLA Election
01:00	New Zealand Mudsnails in Idaho	Dr. Christine Moffat, University of Idaho
01:30	Bio-Control of Eurasian Watermilfoil	Steve Holt, EnviroScience
02:00	Boat Washing Stations	Randy Henry, Oregon Marine Board
02:30	Lakeside BMP's & Homeowner Self-Assessments	Jamie Davis, Idaho Association of Soil Conservation Districts
03:00	Break and Vendor Walkabout	
03:20	Updating the *Atlas of Oregon Lakes*	Dr. Richard Lycan, Portland State University
03:50	Upper Klamath Lake and Agency Lake	Dr. John Rueter, Portland State University
04:20	*Aphanizomenon* Control in Upper Klamath Lake	Kale Haggard, Oregon State University
04:50	Closing remarks	Roger Edwards, OLA President

Old Dams Face the Future

The National Marine Fisheries Service recently released their assessment of the operation of the 13 Willamette Basin dams. The report was required by a 2007 lawsuit initiated by Willamette Riverkeepers and Northwest Environmental Defense Center as part of on-going litigation to force federal agencies to step up their protection of Chinook salmon and steelhead under the Endangered Species Act. While the report did find that the dams and other parts of the basin's flood control project keep the fish out of their historic spawning grounds upstream and damage their habitat downstream, it is also true that the dams were designed and constructed under the

authority of the Flood Control Act of 1938, 1950, and 1962. At the time, flood control in the Willamette River basin was a high priority and not all of the unintended consequences of gaining some control of river stage fluctuations were foreseen. Predicting the future is still an imprecise science, but the passage of time does make more tools and knowledge available to remedy former oversights.

The realistic and prudent actions that have been added to the proposed action plan for the Willamette flood control project specifically directs that improvements in fish passage, both upstream and downstream be implemented at Cougar Dam on the South Fork of the McKenzie River by 2014, at Lookout Point Dam on the Middle Fork of the Willamette River by 2021, and at Detroit Dam on the North Santiam River by 2023. These three facilities are the principal downstream impediments to fish migrations on the three rivers, although there are smaller regulating reservoirs immediately downstream of the latter two. The Leaburg Dam on the McKenzie River is about 35 miles downstream of Cougar Dam and it is required by 2014 to be able to sort and separate returning hatchery fish from wild fish so only wild fish can continue their migration toward Cougar Dam. These actions will not restore the entire historic spawning grounds of the affected runs, but will substantially add to the river reaches the fish can access. When coupled with other habitat improvements that are required by the proposed plan, which include restoring historic water temperatures in the receiving waters below Detroit and Big Cliff Dams by 2018, screening irrigation diversions by 2010, adding large woody debris to stream courses, and diminishing the impact of stream bank reinforcements, the threatened runs of Upper Willamette River Chinook salmon and Upper Willamette River steelhead should receive substantial relief.

Retrofitting aging dams with fish passage capabilities is an increasingly attractive enterprise. New construction would likely still use fish ladders for this design requirement, but retrofits more often explore fish traps and mechanical means to move migrating fish around dams. Barges, trucking, and trams have all been used for this purpose. It should be feasible to use the principles of navigation locks as a means of promoting fish passage as this concept also breaks the gradient of water pressure behind and below a dam into increments that can be negotiated by migrating fish. This approach may require a herding element to keep the fish moving in the proper direction at the proper time, but novel ideas are not so quickly dismissed now that breaching dams are among the listed alternatives.

Dams pool water for use in flood control, irrigation, transportation, power generation, and recreation, but they also decrease water quality by allowing insolation to raise water temperatures. Converting a river into a reservoir creates a habitat than is no longer optimal for its former inhabitants and invites the establishment of new populations. The increasing capacity of wind power has already created instances where the combination of wind and hydropower generation has exceeded the demand. The government has decided that using water as required by the Endangered Species Act overrides the objectives of previous legislation. And dams are finite structures anyway because they have limited value once their pools fill with sediment deposits. With all these tradeoffs, it seems that a clever idea is needed that does more than just permitting unobstructed fish migrations.

Draining a reservoir periodically addresses most of the concerns and might only briefly disrupt the benefits we gain from dams. The rate of refill would be a key factor in determining whether this strategy would be appropriate at a particular site. Flushing could refresh water quality and would be more of a shock to reservoir newcomers than older native species. The timing of the drawdown could minimize the impact to irrigators, and power generation would only be curtailed while the reservoir refilled. Fish migrations would have a brief opportunity to freely swim in whatever direction was needed before channel cutting through deposited sediments terminated the experiment. Channel cutting begins at the upstream end of a reservoir where the coarser material has settled out and produces unacceptable turbidity levels when these sediments are re-

suspended, but the process is not all bad. It very quickly re-suspends the deposits of multiple years' accumulation and moves sediments downstream. Maintaining a channel at the shallow end of a reservoir effectively increases the useable volume of the water stored behind a dam. A planned drawdown might even allow the mining of lake bottom sediments for even more sediment removal, and irrigators might appreciate dusting their croplands with lake sediments. Periodic draining would be most attractive where serial impoundments were in place because the disruption it causes is spread out between all the reservoirs in the series. The empty downstream reservoir is quickly refilled by draining its upstream neighbor. When it is the uppermost reservoir that is empty, there should be adequate water stored in the reservoirs downstream to maintain minimum streamflow until the upper reservoir has refilled. The computer modeling exercise to disprove the feasibility of this and other novel ideas have likely been done, but as the criteria for success continues to change, there may come a time when unconventional approaches don't look so foolish.

The Clean Water Act in the Spotlight

There have been fleeting references in the news recently suggesting that the Clean Water Act (CWA) may have been suspended. These alarming headlines refer to a bill titled the Clean Water Restoration Act (CWRA), which is waiting to be brought up for a vote in Congress. This bill was introduced in the House and Senate in May 2007 in response to a Supreme Court decision issued on June 19, 2006. The details of this episode are not near as lurid as the news reports would have you believe, but people with interest in the CWA should understand what it is all about.

The relevant court case is Rapanos v. United States, which sought to reverse the finding that a property owner had violated the CWA when he did not seek permits before filling old drainage ditches to a non-navigable creek that was 20 miles from the nearest river. In a 5-4 decision, the Supreme Court ruled in favor of the property owner under an interpretation of the CWA that he had not placed dredged or fill material into a navigable water. The fill material he had used is specifically prohibited in the law so the question centered about whether the ditches that were filled were a navigable water. A 5-4 decision is the narrowest of possible verdicts and so points out the lack of clarity about the law's applicability. The CWA seeks to make America's waters swimmable and fishable by making it a crime to discharge a pollutant into the navigable waters of the United States. In this instance, five Supreme Court Justices believed that the presence of the word "navigable" in the law exempted the land owner from the need to obtain permits.

The CWA defines navigable waters as follows:

> This includes: all navigable waters of the United States; tributaries of navigable waters of the United States; interstate waters; intrastate lakes, rivers, and streams which are utilized by interstate travelers for recreational or other purposes; intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce; and intrastate lakes, rivers, and streams which are used in industrial purposes by industries in interstate commerce. Navigable waters do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with U.S. EPA (40 CFR 401.11).

The ruling that came out of Rapanos v. United States provides guidelines for future enforcement of the CWA. The CWRA has been proposed because these new enforcement guidelines are less strict than those under which Mr. Rapanos was accused of violating the CWA. To reaffirm these former guidelines, the CWRA would delete

the word "navigable" from the CWA so enforcement would be based on the CWRA definition of "waters of the United States", which reads as follows:

All waters subject to the ebb and flow of the tide, the territorial seas, and all interstate and intrastate waters and their tributaries, including lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, and all impoundments of the foregoing, to the fullest extent that these waters, or activities affecting these waters, are subject to the legislative power of Congress under the Constitution.

This definition is a concise version of how "waters of the United States" is defined in the original CWA, and does give a much broader scope of jurisdiction than the definition for navigable waters. It is likely however, that there will still be intense scrutiny given to any puddle scheduled for a change regardless of the version that Congress selects.

Oregon's Role in the National Lakes Survey

By Shannon Hubler, Oregon Department of Environmental Quality

What is the National Lakes Survey? Last summer the Oregon Department of Environmental Quality (DEQ) surveyed lakes across Oregon as part of the National Lakes Survey (NLS). Funded by the United States Environmental Protection Agency (EPA), the NLS was designed to:

- Determine regional and national ecological integrity, trophic status, and recreational value of lakes.
- Build state and tribal capacity for monitoring and analyses of lakes, ponds, and reservoirs.
- Achieve a robust, statistically-valid set of lake data for better management.
- Develop baseline information to evaluate progress of lake conditions over time.

The NLS used a random selection process to identify lakes and reservoirs to survey in Oregon. This subsample of lakes is used to represent the population of all lakes in Oregon. The lakes selected are in 15 of Oregon's 36 counties, and in 13 of its 18 major drainage basins. The goal of the NLS in Oregon is to address two key questions about the quality of lakes, ponds, and reservoirs:

- What percent of the Oregon's lakes are in good, fair, and poor condition for key indicators of trophic state, ecological health, and recreation?
- What is the relative importance of key stressors such as nutrients and pathogens?

What was sampled? Waters eligible to be surveyed included natural and man-made freshwater lakes, ponds, and reservoirs greater than 4 hectares of surface area and at least 1 meter deep. A wide array of indicators was used to identify the condition of surveyed lakes. Trophic indicators included:

In situ temperature, specific conductivity, pH, and dissolved oxygen profiles;
Water chemical quality and nutrient concentrations;
Chlorophyll *a*, Secchi disk depth, turbidity, and color.

Indicators of ecological integrity included:

Sediment diatom cores;
Phytoplankton and zooplankton;
Shoreline physical habitat conditions;
Macroinvertebrates.

Recreational indicators included:

Pathogen indicator (*Enterococcus* DNA)
Algal toxins (microcystin)
Sediment mercury

A total of 32 lakes were sampled across Oregon, with two lakes surveyed twice. The random design brought us to a wide variety of sites. Elevation ranged from 30' – 7850'. Lake depths ranged from 1 m up to 128 m (Waldo Lake), however the maximum sampling depth was 50 m. The most difficult access was to Ice Lake in the Eagle Cap Wilderness, requiring the use of an outfitter and horses for the 8 mile and 3300' elevation gain journey. Needless to say, the beauty of the area made it well worth the extra effort.

County	Lake name	Survey date	Surface area (hectares)
BAKER	Clear Creek Reservoir	8/15/2007	13
BAKER	Phillips Reservoir	7/30/2007	912
BAKER	Van Patten Lake	9/19/2007	7
COOS	Horsfall Lake	7/23/2007	132
COOS	Powers Pond	6/26/2007	7
COOS	Powers Pond	9/6/2007	7
DESCHUTES	Hosmer Lake	8/7/2007	102
DESCHUTES	South Twin Lake	9/12/2007	41
DESCHUTES	Sparks Lake	8/8/2007	33
DOUGLAS	Cooper Creek Reservoir	6/27/2007	53
DOUGLAS	Lake Edna	7/24/2007	14
GRANT	Officer Reservoir	8/1/2007	6
GRANT	Strawberry Lake	9/18/2007	13
HARNEY	Baca Lake	7/18/2007	273
HARNEY	Mann Lake	7/17/2007	90
HARNEY	Moon Reservoir	7/17/2007	108
JACKSON	Emigrant Lake	9/4/2007	256
KLAMATH	Lake of the Woods	9/5/2007	477
LAKE	Junipers Reservoir	7/11/2007	59
LAKE	Junipers Reservoir	9/10/2007	59
LAKE	Lucky Reservoir	7/12/2007	14
LAKE	Pelican Lake	9/29/2007	92
LAKE	Piute Reservoir	9/11/2007	27
LANE	Clear Lake	7/26/2007	61
LANE	Fern Ridge Lake	6/25/2007	3230
LANE	Hills Creek Reservoir	8/27/2007	1062
LANE	Torrey Lake	8/29/2007	28
LANE	Waldo Lake	8/28/2007	2444
LINN	Big Lake	8/6/2007	91
LINN	Smith Reservoir	8/9/2007	64
MALHEUR	Beulah Reservoir	7/31/2007	717
MULTNOMAH	Smith Lake	8/20/2007	225
WALLOWA	Ice Lake	8/14/2007	24
WASCO	Clear Lake	8/21/2007	142

Sites surveyed by Oregon DEQ for the National Lakes Survey

<u>Reporting timeline and future sampling</u>

All samples and field data were sent to EPA for processing and analysis. EPA is planning on releasing a report on results at the national scale in 2009. DEQ is planning to produce a report on conditions in Oregon in late 2009 or early 2010. Field surveys for the NLS are scheduled to occur again in the summer of 2012.

Drawdown Record is a Useful Lake Characteristic

A lake's first depth measurement was likely done by someone in a boat with some sort of calibrated sounding line. The exercise was sufficient to satisfy the immediate need for this information, but the finding had little lasting value. Because the bottom contours of a lake are seldom uniform, depth measurements are dependent on where in a lake they are taken. These measurements can also vary even if repeated at the precise location of the original sounding due to the natural fluctuation in lake level over the course of a year. A good deal of care then is required for meaningful depth measurements.

In contrast, a lake's surface is almost always completely uniform. A reading of surface level taken anywhere is representative of the entire lake, for a given time period. The chief requirement for a meaningful measurement of lake level is the presence of a well documented measuring device or a solid lake feature that can be used as a reference point. Staff gauges or pressure transducers are commonly used, but more often on streams or reservoirs than lakes. Drawdown records for a lake without a specific stage measurement tool might still be produced in terms of elevation above sea level if there is some feature nearby of known elevation that can be incorporated into the measurement. Otherwise, it may be necessary to assemble the record in relative terms, such as the distance from a bridge deck to the water surface. A record of relative measurements will still document the extent and timing of the annual drawdown.

Even though drawdown is a key feature of a lake's annual cycle, much like surface temperature or hypolimnetic dissolved oxygen, it is not a record that is readily available. There may be some understanding of the annual range of the drawdown, but the extent of its monthly variation may well be lacking. Filling this void could be remedied by someone volunteering to make a note of periodical readings. Over time, this record could be converted to monthly averages that would have a degree of predictive value. This task was performed for Bull Run Lake and is described on the OLA website. The table there predicts that the lake elevation should be between 3170.7 and 3167.3' in early August. On August 6th, the day this newsletter went to the printers, the Bull Run Lake level was 3178.0', but was declining from this year's wet Spring. The Bull Run table is based on nine years of data. A longer span would increase the value of the data, but even now it could be used to estimate the likelihood that the lake would be about 8' higher than predicted. Without any data, no prediction could be made at all.

The key for putting together almost any database is consistency in gathering and sorting the information. The goal is to collect multiple readings of the same condition as it changes over time. The site selection where the measurements will be made, and the timing of the measurements then are important considerations. A volunteer effort typically draws on a small number of volunteers and so should not be overly demanding. Describing the annual drawdown and refilling cycle of a lake can be done with monthly averages. This information could be derived from readings taken on the same day of each week in the month, from two readings taken at least one week apart, or even a single reading taken anytime within three or four days of the month's midpoint. The point is to consistently adhere to the selected protocol. Attending to such issues will produce a level of statistical defensibility for the database, and perhaps more important, it will decrease the time required for the work to become a useful predictive tool.

LAKE WISE
The Oregon Lakes Association
Newsletter 2008 #3

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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

Additional Lake Meetings to Consider

OLA's Wallowa Lake Conference on September 13th is not the only opportunity available this Fall to meet people with common interests and hear discussions of lake issues. Both the Washington Lake Protection Association (WALPA) and the North American Lake Management Society (NALMS) have meetings scheduled before the year's end.

The WALPA Conference takes place on Tuesday and Wednesday, September 30 – October 1, at the Hawthorn Inn and Suites in Arlington WA, which is about 20 miles north of Everett. WALPA meetings offer concurrent sessions, allowing attendees to select the presentations that best match their interests. Hach Environmental has scheduled a session on the Monday before the Conference to demonstrate their instrumentation. The WALPA website, www.walpa.org, has full details about the meeting agenda and registration.

The NALMS Symposium is a joint meeting with the Alberta Lake Management Society and will be held in the Canadian Rockies, about 30 miles northwest of Banff at the Chateau Lake Louise in Alberta, Canada. The dates are November 11-14, which are Tuesday through Friday. If visiting a five-star hotel at a scenic location at 5680' elevation is not enough reason for this trip, NALMS has planned their conference around the themes of lake management in a changing environment. The people and vendors who are attracted to NALMS Symposiums bring together a wealth of experience about lake concerns. This assemblage of knowledge extends the breadth of the meeting because it is just as likely that a break-through moment will occur during a casual conversation as in a presentation specific to a topic of interest, or in one of the several pre-symposium workshops being offered. The particulars about this meeting can be found at www.nalms.org.