August 2009

Editor:
Roger Edwards

LAKE WISE

A Voice for Quiet Waters

The Oregon Lakes Association Newsletter

There is a Lot Going on at Devils Lake

The OLA Conference scheduled for September 11-12 at Lincoln City is, in part, a tribute to Devils Lake and the on-going work of the Devils Lake Water Improvement District, which works full time to see that the lake is an asset to the community. It wasn't always so. Decades of taking the lake for granted led to its being named the worst polluted lake in Oregon during the 1960's. When area residents formed Oregon's first water improvement district in 1984, the lake was clogged with emergent and submerged vegetation, and lake front property owners were experiencing declining valuations.

Shoaling, algae blooms, and the growth of macrophytes were recognized problems that confronted the Devils Lake Water Improvement District (www.dlwid.org) when it began its work. An EPS funded Diagnosis and Feasibility Study, undertaken in the early 1980's, eventually led to the introduction of 10,000 sterile, Chinese Grass Carp in 1986, and 17,050 more in 1987, for weed control. Voters approved a tax base for the DLWID in 1988, as the weed beds were disappearing. The grass carp are voracious feeders, but they were unable to completely suppress the weed growth until another 5,000 fish were planted in 1993. This third introduction resulted in the elimination of nearly all macrophytes from the bottom of Devils Lake within a year. When plant growth was no longer present to utilize the rich nutrient supply still in the lake, algal blooms dominated by cyanobacteria became more prevalent and prolonged.

Devils Lake is not alone in its challenges with cyanobacteria, as evidenced by the 2005 release of new guidelines for dealing with these blooms by the Oregon Department of Health and Human Services. In addition to these guidelines, DLWID began its Cyano-Watch program in 2006, which now includes educational information, cyanobacteria enumeration, and cyanotoxin monitoring. This close monitoring of cyanobacteria blooms has brought recreation advisories in 2007-2009. Other monitoring programs the District conducts include long-term data sets for physical parameters and the monitoring of *E. coli* at area freshwater beaches in the summer months.

In recent lake management projects, DLWID has helped replace an agricultural push up dam with an infiltration gallery, and has joined in the work to notch another dam on the same tributary to ease the passage of Coho salmon upstream of Devils Lake. This latter project, the "Rock Creek Dam Modification for Coho Passage", won the Oregon State Land Board's Stream Restoration Award in 2006. Operation of a third dam, the D River dam at the lake's outlet, has also been modified to improve fish runs. The crest of this dam has also had to be lowered to comply with its recalculated, water storage permit from the Oregon Water Resources Department.

Over the years, DLWID has allied with municipal, county, state, federal, and tribal governments for improvements on and around Devils Lake. An intergovernmental agreement between DLWID, Lincoln City, and Lincoln County has unified the approach to erosion prevention and sediment control. With a similar

agreement, a plan for mandatory septic system inspections is under development for the unsewered portions of the lake's drainage basin. Wetland conservation and stormwater runoff strategies are also in their planning phases to minimize soil movement to the lake. An ordinance for boathouse and dock specifications is nearly in place, and programs promoting lakescaping and the use of lead-free fishing tackle are underway. SOLV clean-up events, educational fairs, and lake celebrations are and have been regular occurrences at Devils Lake. This is the third year the District has offered summer water quality internships. So there are a lot of things going on at Devils Lake. Do join us there in September to look into the details of this lake work.

"Wouldn't it be nice to have a little cabin in the woods."

Once upon a time, a little cabin in the woods was a pleasant retreat. Today they qualify as a Vacation Home and by the way, who do the woods belong to? Property taxes are a topic most people have an opinion about. Almost everyone, except the officials who spend them, agree that they are burdensome. However they are also a local tax that does provide a way for a community to express community values, although it is hard for property owners to support a property tax proposal that will be based on a future appraisal that can fluctuate widely.

There is a special class of lake dwellers who get a double dose of appraisers each year. These are the people who have Special Use Permits for Recreational Residences on national forest land. Private cabins on public lands can generate strong opinions on their own right, but there remain about 14,000, grandfathered lots on public lands nationally who must face separate Forest Service appraisals for the property they are using, and local county scrutiny of their structure upon it. There seems to be some variation in the agreements that allowed these private structures as the lot size and the restrictions in place are not uniform. A generally accepted part of these agreements however reasons that because the cabins are on public lands, only the space within the cabin walls is exempted from public access. The payment of an annual user fee is another accepted condition, but the usual sum of $10-25 from the 1930 era is substantially higher now. The unpredictability of the increases has produced complaints.

Congress and the Forest Service have repeatedly indicated their support for the programs that permitted the private cabins and their on-going utilization. It is questionable however whether new cabins would be allowed on existing vacant lots. In a far different time, the Organic Administration Act of 1897 authorized one year permits for private cabins on public lands, but the offer was not widely utilized, perhaps because those with the leisure time for such idylls did not find rustic shelters appealing, or felt a one year permit was insufficient protection for a more comfortable investment. In any case, Congress passed the Occupancy Permits Act in 1915 to foster the recreational use of the national forests and attract private investment to them by allowing families to build up to 1200 square foot cabins on quarter acre lots near lakes and streams. The cabins could not be year-round residences or be used as rental property, and there were other limitations as well, but they were eligible for multi-year permits that could be inherited or sold. When the program was cancelled in 1960, more than 20,000 families had taken advantage of the offer.

This change in policy created enough uncertainty to support the founding of the National Forest Homeowners Association in 1962. By 1969 there was sufficient evidence of inconsistencies in the administration of the program to produce a Congressional plan that would issue 20 year Special Use Permits based on periodic appraisals. Permit fees were meant to cover the Forest Service's administrative costs and provide compensation to local counties for roads and similar services. A multiplier of 5% of the fair market value of the bare lot

appraisal was chosen to establish the fee amount. Additional changes were made to the appraisal policies in 1988. A review of 9600 of the 15,200 Recreational Residence properties still around in 1996 found that 58% of the assessments had little change from the previous year, 39% had a threefold increase, and < 3% saw a fivefold increase.

Congress once again tried to express their intent on the matter in 2000 with legislation they entitled, Cabin Use Fee Fairness Act. It too is now bogged down in claims and counter claims. At issue is the fact that a special use permit in a national forest does have value that is increasingly recognized. Successive appraisals of these plots reflect their increasing attractiveness. Long term permit holders however, don't necessarily have the means to keep up with the whimsy of real estate marketing. They could sell their cabin and its contract, but buyers willing to jump into this controversy have proved hard to find. Land appraisals may not be the best basis for the permit fees, but bureaucracies do not readily relinquish established revenues. So the stalemate continues.

There are almost 700 permit holders in Oregon with modest cabins near Elk, Paulina, Crescent, and Odell Lakes in the Deschutes NF; Fish Lake in the Rogue NF; Diamond Lake in the Umpqua NF; Detroit Lake in the Willamette NF; and Lake of the Woods in the Winema NF. These beleaguered citizens, and their brethren who fancy flowing water, could do us all a favor if they can convince their Congressmen that certainty is required for fees to be fair. Neither fees nor taxes should be open-ended. Fixing the assessment on property and structures when ownership is transferred would achieve this condition, and would allow the calculation of tax obligations to within a few dollars when families figure their budgets. Fixing assessments at the property's purchase price would also stabilize communities and return the property tax to its intended role.

Breaking News Updates

The marina proposal for Foster Lake, which was described in the April 2009 issue of *Lake Wise*, has been approved. The US Army Corps of Engineers issued a Finding of No Significant Impact on June 19th, clearing the way for the lease to be let to Edgewater RV Resort and Marina LLC. The company hopes to have the main walkway and some of the first row of slips in place for use this season. The availability of year round moorage space should ease the crowding at Foster Lake boat ramps. Another benefit of the facility is a reduction in the risk of spreading invasive species between lakes, because boats moored at one lake are less likely to be used elsewhere.

The "Selective Water Withdrawal Tower" at PGE's Round Butte Dam, which was discussed in the June issues of *Lake Wise* for both 2008 and 2009, is now expected to be operational by year's end. The analysis of the April construction mishap is on-going, but the needed modifications to the structure are underway. Smolts of the salmon and steelhead fry that had been placed in upstream tributaries have not had their downstream migration interrupted by the delay. They were successfully trapped, tagged, trucked downstream, and tracked passing through Bonneville Dam during July.

Oregon's record kokanee reported in the June 2009 *Lake Wise*, has been deposed. A bigger fish was caught in July and outweighed its 6 pound, 12 ounce predecessor by 5 ounces. The champs might have known one another as they both grew up in Wallowa Lake. The catch revived speculation about the historic fishery that was put at risk when opossum shrimp (*Mysis relicta*) were introduced into the lake. There is no question that good numbers of large kokanee remain in Wallowa Lake, but competition between young kokanee and the

shrimp may be reducing the total number of fish within their population. This has been the course at other lakes where opossum shrimp were introduced, but perhaps there may be an additional factor at play in Wallowa Lake.

An Overdue Update from Dunes City

June 2007 was the last time *Lake Wise* reported news from Dunes City. That article described the first Oregon ban of phosphorus fertilizers in an ordinance that restricted cleaning agents too. As the regulation was put into place there were questions about how well the rules could be enforced, but in testimony before the Oregon Senate this Spring, Senator Joanne Verger, whose District includes Dunes City, stated the measure has proved effective. Dunes City is between Woahink and Siltcoos Lakes, and the residents there are attentive to lake issues. They recognize the benefit of limiting their use of phosphorus products.

Dunes City has many lake issues to confront. A lengthy discussion with the Oregon Water Resources Department about water rights was concluded in 2005 and found unallocated water rights were available from Woahink Lake. By year's end the city had received applications for 86 new lots around the lake. Realizing their unpreparedness to accommodate these requests, a 120 day moratorium was enacted to consider the consequences of more people and activity within the lake basin. It was a time of crash limnology training for everyone involved. Volunteer committees argued pro and cons, and funneled draft ordinances to the City Council, where the discussions continued. Added awareness of the issues at stake came from a heated, but unsuccessful recall election for four council members. Woahink Lake's first ever cyanobacteria blooms, which appeared in 2005 and 2006 may have swayed the opinions of some voters in that election to support lake protection measures.

When the *Atlas of Oregon Lakes* was published in 1985, it described Woahink Lake conditions as oligotrophic, but warned continued development pressure would place this rating at risk. It was not the only study of the lake to voice this assessment. Current monitoring results indeed are consistent with a rating of mesotrophic, but also give indications that conditions are improving. Total phosphorus levels have seen a drop from an annual average of 12 to 8 µg/L from 2005 to 2008. While the factors causing this change are unknown, a measure requiring inspections of septic systems every 5 years has been in place since 2006, and the phosphorus limitation ordinance and an erosion and sediment control ordinance were both enacted in early 2007. Discussions about how stormwater might best be handled began in December 2005. The agreement that would end these deliberations has proved elusive, but the sticking points are made available for the community to ponder by posting the committee minutes on the Dunes City website, by articles in the periodic newsletter the City produces, and by presentations at the lake fair that has become an annual event.

Dunes City relies on volunteers for all of its work and keeping the populace informed increases the interest in helping out. Among many other achievements, volunteers have produced a record of systematic water quality observations going back 20 years. Secchi depth, temperature, and dissolved oxygen measurements began as part of the PSU Citizen Lake Watch program. Current monitoring also measures total phosphorus, total nitrogen, *E. coli*, turbidity, pH, chlorophyll a, and algae species for both Woahink and Siltcoos Lakes. Present monitoring follows the ODEQ methodology and quality control standards. These data track seasonal and annual changes of lake conditions, provide a basis of comparison to judge the effectiveness of management actions, and demonstrate a level of technical competence in grant proposals, which are the lifeblood for a city without a tax base.

Oregon Lakes Association
a voice for quiet waters

TentativeAgenda

Saturday, September 12, 2009
Union 50, Lincoln City, Oregon

Registration and lunch preference selection	8:00 - 8:45
Welcome Roger Edwards, OLA President	8:45 – 9:00
Introduction to Lincoln City and Devils Lake TBA	9:00 - 9:15
Devils Lake Management Paul Robertson, Devils Lake Water Improvement District	9:15 - 9:40
Aquatic Weed Management in Coastal Lakes Rich Miller, Portland State University	9:40 - 10:05
Ten Mile Lake: Water Quality Planning and Partnerships David Waltz, OR Dept. of Environmental Quality	10:05 - 10:30
Break: Poster Viewing and Vendor Walkabout (beverages & snacks provided)	10:30 - 10:50
Harmful Algae Blooms Laura Boswell, OR Dept. of Human Services, Health Division	10:50 – 11:15
Toxic Algae Issues in Washington State Jean Jacoby, Seattle University	11:15 - 11:40
OLA Election	11:40 - 11:55
Lunch at Kyllo's Seafood (provided)	12:00 - 1:15
Toxic Cyanobacterial Monitoring in the Future: Genetic Testing Theo Dreher, Oregon State University	1:15 - 1:40
Phosphorus and Sediment Transport to Oswego Lake from a Small Urban Stream Ben Johnson, Portland State University	1:40 - 2:05
Aquatic Invasive Species 2009 Legislation Randy Henry, Oregon State Marine Board	2:05 - 2:30
Break: Poster Viewing and Vendor Walkabout (beverages & snacks provided)	2:30 - 2:50
Upper Klamath Lake: Recent Studies Stan Geiger	2:50 – 3:15
New Responsibilities for Lake Management Science in a Time of Changing Paradigms John Rueter, Portland State University	3:15 - 3:40
Atlas of Oregon Lakes: Update Richard Lycan, Portland State University	3:40 - 4:05
Closing Remarks Roger Edwards, OLA President	4:05 – 4:15
Adjourn	

Phosphorus has been in the News Lately

A curious sequence of events has occurred this year, beginning in March when the Oregon Senate started discussing SB 631, which would add dishwashing agents to the 1991 law restricting the phosphorus content in laundry detergents to <0.5% by weight. In April an article appeared in *NALMS Notes* describing WALPA's successful campaign to place phosphorus limits in dishwasher detergent in Washington. Their ban will take effect in 2010, when the detergent industry intends to have a full line of phosphate free and low-phosphorus products. Washington joins Illinois, Massachusetts, Michigan, Minnesota, New York, Pennsylvania, Vermont, and Virginia in enacting this legislation. Governor Kulongoski signed the Oregon measure into law on June 11th, shortly before the June issue of *NALMS Notes* was released.

In this issue, former NALMS President Ken Wagner observed that the limits placed on laundry detergents had not had as much of an effect on watershed phosphorus levels as had been hoped, even though documentation presented to legislators claimed that it made up to 50% of the phosphorus in wastewater. He concluded that while source control of phosphorus in laundry detergents, and dishwashing detergents too, is a logical strategy to reduce wastewater inputs, it would be more effective to address the phosphorus discharge levels in wastewater treatment.

In this same timeframe, the Clean Water Services' Durham Advanced Wastewater Treatment Plant in Tigard went live with a novel phosphorus removal technology that promises to pay back its $2.5 million investment in just five years. The juxtaposition of these diverse news items makes them more remarkable, and there is appeal too in the logical progression of the steps. Furthermore it is timely that another technology should emerge to recover the elements of refined products as the natural supply of raw materials continues to dwindle. The beginning pages of most elementary science texts state authoritatively that, "Matter is neither created nor destroyed". It follows then that the importance of recycling as a business plan can only increase.

The process to remove phosphorus at the Durham plant is a product of Ostara Nutrient Recovery Technologies, Inc., of Vancouver BC. Clean Water Services purchased three of their recovery reactors after a pilot study demonstrated the technology's effectiveness. The process is of course proprietary, but involves a chemical treatment of the sludge dewatering liquor that is produced in the normal operation of the plant. Magnesium chloride and caustic are added in proportions to optimize the precipitation of struvite, which if not harvested would form deposits on wetted surfaces of the plant, reducing its efficiency and requiring maintenance expenditures. The harvested struvite is screened, dried, packaged, and ready for sale at the plant as a pelleted, slow release fertilizer. It has the chemical formula $MgNH_3PO_4 \cdot 6H_2O$ and an N-P-K fertilizer rating of 5-28-0 + 10% Mg. Clean Water Services expects to produce 40 tons/month of struvite under the trade name Crystal Green®, and the sale of this product along with the savings of maintenance costs should recapture their investment.

The removal efficiencies that have been achieved by the Ostara reactors at Durham are 90% for phosphorus and 20% for ammonia. The struvite molecular formula has a 1:1 ratio between phosphate and ammonia, and ammonia is present in the sludge dewatering liquor at a higher concentration than phosphorus. Phosphorus is the limiting factor in the process and when its removal is maximized, substantial levels of ammonia remain. It is important to note that the Ostara removal efficiencies occur within the greater removal capabilities of the treatment plant, which achieves nearly a 99% reduction for phosphorus and meets the restrictions on ammonia discharge by converting enough of it to nitrate compounds and nitrogen gas to meet the requirement for ammonia removal.

The final element of recent phosphorus news concerns the Crystal Green fertilizer now available for sale. Tests have shown the barley-sized pellets to be remarkably free of contaminants and an effective plant stimulant. The chemical structure of struvite resists weathering so it takes months to dissolve when exposed to environmental conditions, providing a release of nutrients slow enough to avoid overwhelming the nearby nutrient demand, if proper guidelines for application rate are followed. The first 11 tons of Crystal Green produced at Durham were purchased by the Ministry of the Environment in British Columbia to enrich nutrient depleted streams there. The action is a part of the effort to restore their salmon runs. There is irony in this use, given the concern about keeping phosphorus out of watersheds, but if it brings nutrient ratios back into balance, British Columbia could be the better for it. It is an experiment well worth watching.

A Walk in the Wilderness

The 2009 Omnibus Public Lands Management Act, which President Obama signed on March 30th, added 2 million acres of new wilderness area across the country. Nearly a tenth of this newly protected land is in Oregon. Memaloose Lake was prominently listed among these new wilderness areas and so *Lake Wise* targeted it for special scrutiny. It is one of five distinct and separate parcels in the Clackamas River drainage that are collectively called the Clackamas Wilderness Area, a new, 9470 acre designation of wilderness lands. Memaloose Lake is accessed by traveling east from Estacada on Highway 224 to the bridge upstream of North Fork Reservoir. The trailhead is just more than 12 miles beyond the bridge on Memaloose Road, which is a paved, one lane forest byway with turnouts for most of this distance. It is not uncommon to find snow on the road into June, especially at sections with a northern exposure.

The lake itself is located in a cirque basin at an elevation of 4114' in the South Fork Clackamas River drainage. It is a shallow lake of about 5 acres and the headwaters of Memaloose Creek. Its clear water allows a Secchi reading greater than the lake's 2 m depth. The lake can appear to be brown because its transparency allows the muddy bottom to be seen. It is profiled in volume 3 of the USGS *Lakes of Oregon* series, and in numerous hiking guides. The 1.3 mile trail 20 miles southeast of Estacada has long been a popular destination for outdoor enthusiasts in the Portland area. The vertical rise is just 640' but that equates to about a 10% slope given the short length of the hike. The trail winds through patches of rhododendrons and devil's club in a mixed fir/hemlock forest with many of the trees of a diameter greater than 3'. There is a panoramic view at the former lookout site on South Fork Mountain, for hikers willing to walk a mile beyond and an additional 740' above the lake.

The lake's shoreline has a talus slope to the west, bordered on both sides by forested areas, and a strip of meadow to the south. The littoral areas of the east and northeast shores support emergent grasses, and some *Ranuculus* as well. The outlet flows to the east and just to the south there are several small trickles flowing into the lake. On a recent visit, only a few damselflies were noted and dragonflies were even rarer. Both of these insect groups however outnumbered the mosquitoes. Most descriptions of the lake mention salamanders, and they are plentiful, but they are really rough skinned newts. Another feature that was present in abundance at the lake was Quiet.

LAKE WISE
The Oregon Lakes Association
Newsletter 2009 #3

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

There are approximately 47 officially defined Wilderness Areas in Oregon. They can be isolated islands of administrative protections or substantial tracts of contiguous lands. The Three Arch Wilderness, off the coast at Oceanside is the smallest at just 15 acres. Eagle Cap Wilderness in the Wallowa Mountains is the largest in Oregon with 350,461 acres, although the adjoining areas of the Mt. Washington, Three Sisters, and Waldo Lake Wilderness Areas in the Cascades total 378,646 acres. Many of these areas contain lakes with full wilderness protections. A visit to any of the wilderness lakes tends to be more contemplative than more typical lake excursions.

Where is McKeown Reservoir?

McKeown Reservoir is a small impoundment in Coos County, north of Coos Bay, south of Lakeside, and east of Beale Lake. It is in Township 24 South, Range 13 West, Section 10. The coordinates given by the Geographic Names Information System are latitude 43.5053914, longitude -124.2262265, which mark a spot very close to a depression on the east side of the railroad tracks and just west of Charlotte Lane. The depression appears to be flooded in Google Earth, but it is empty on the Lakeside topographical map. The South Coast Drainage Basin Map also appears to indicate the depression is the location of McKeown Reservoir. Still, there is doubt. It could be the linear pool paralleling the west side of the railroad tracks, or it might even be a pool of some sort immediately north of Charlotte Lane and midway between Hwy 101 and the railroad tracks.

It is very difficult to distinguish small features on maps. Ultimately, it requires a local authority to verify such questions. Does this expertise exist within the readership of *Lake Wise*? This article then is a test. Anyone with proof about the location of McKeown Reservoir is encouraged to contact the webmaster at the OLA website, www.oregonlakes.org, or with a note to the mail box at OLA, PO Box 345, Portland OR 97207.