August 2010

Editor:
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LAKE WISE

A Voice for Quiet Waters

The Oregon Lakes Association Newsletter

Plan Now for the OLA Conference on September 10-11 at OSU

September 10-11 will be the second time this year that OLA convenes a meeting at Oregon State University. The workshop on Harmful Algal Blooms last May was well attended, and an equally informative program for the annual Conference is coming together. The OLA website at www.oregonlakes.org, has been updated to display the slides from the HAB Workshop presentations. To view these slides, click on the presentation of interest in the Workshop agenda in the Events section.

The OLA website also has updated information about the coming Conference. The proceedings begin this year at 4:00 pm on Friday, September 10 at the La Sells Stewart Center, with an open forum discussion about the Oregon role in the National Lakes Assessment. This EPA survey was performed in 2007 but the national report only became available this year. The Oregon report was just recently released. Two hours have been scheduled to review the completed study and to consider refinements for the coming 2012 study. The topic changes at 6:00 pm to the business aspect of OLA – what it is that we do, or could do, and how it gets done. Nominations for the 2011 OLA Board will be finalized, which gives OLA volunteers the opportunity to gain some relevant business experience. This discussion is set to continue until 7:30 or until the refreshments are devoured. An RSVP to kfontwilliams@gmail.com is requested for this Friday session.

The session on Saturday begins at the same place at 8:00 am. Once everyone has a name tag and a cup of coffee, the formal program will get underway. The National Lakes Assessment will again be a prominent topic, so any reflections from the evening before will be of use. The other presenters have also been selected for their knowledge about topics of interest to the Oregon lake community.

A good part of the decision to attend the annual Conference is to break normal routines, and to visit a different part of the state. Beyond the OSU campus, the Jackson Frazier wetlands are on the northeast edge of Corvallis, where Lancaster Avenue ends just north of Conifer Boulevard. The 2/3 of a mile boardwalk through the 144 acre wetland could be an invigorating way to begin Sunday morning.

Just across the Willamette River and a little to the southeast is Fisher's Island, where an unnamed gravel pit was sampled in the Oregon segment of the 2002 National Chemical Residue in Lake Fish Tissue Study. Farther south in Linn County, the town and museum at Brownsville provides an interesting side trip. The Museum is housed in the old train depot and offers visitors the chance to take a look at railroads circa 1900. The Museum is open from 1-5 pm on Sundays, and displays an impressive collection of pioneer artifacts and implements, commercial displays from former times, and accounts of the business community that once thrived in Brownsville.

Still in Linn County but now to the east, the new, modern marina at Foster Lake is ready for inspection. Just upstream on the Middle Fork of the Santiam River is Green Peter Lake. Bill Monroe called it Green Peter Reservoir, and an ideal place for kokanee in his 24 July 2010 *Oregonian* article. The impoundment there is a reservoir, but the reservoir's name is Green Peter Lake, GNIS #1158878.

If your drive to or from Corvallis passes through Philomath, it would be easy to finally take in the view atop Mary's Peak. At 4098', it is the tallest of the Coast Range mountains and offers a glimpse of Mt. Thielsen, on a clear day. Just 15 miles northwest of Corvallis, the town of Kings Valley is holding their annual Shrewsbury Renaissance Faire on September 11-12. The event focuses on merry olde England during 1558-1603 and strives to "Teach History through Faire Play". Elizabethian garb is encouraged, swords are allowed but must be kept sheathed, and there is no proficiency test for mandolins.

Interesting discussions, renewing acquaintances, and exploring side roads are all available in a single weekend. A registration form is enclosed so begin your plan now for the OLA Conference.

Errata/Editorial: The Naming of Lakes and Reservoirs

Careful reading of the previous issue of *Lake Wise* may have detected an inconsistency in references to the US Army Corps of Engineers impoundments at Fall Creek, Hills Creek, and Lookout Point. The text of the article describing the planned maintenance drawdowns at these facilities referred to them as "Reservoirs", while the charts showing the historical drawdown curves for these impoundments referred to them as "Lakes". By the protocol that *Lake Wise* has adopted for the names of water bodies, the references should have uniformly identified the three reservoirs as lakes.

The justification for this confusing conclusion conforms to the Geographical Names Information System decision to also recognize these reservoirs as lakes. The GNIS is the current federal program to establish and maintain uniform geographical name usage throughout the federal government. The program is administered by the USGS, and dates back to an 1890 executive order of President Benjamin Harrison, which created the US Board on Geographic Names. It is the job of the GNIS to serve as a clearing house for the naming of geographical features. The Board does not seek to have all geographical features named, but will rule on requests to recognize specific features. Successful requests will be categorized in one of 65 feature types, be assigned a unique numerical identifier, and be henceforth recognized by a specific name. In cases where a feature is known by multiple names, the Board can recognize these variant names, but clearly indicates the official name for each feature.

The official Board on Geographic Names decision about the three reservoirs in question was made in 1971. All three were named "Lakes" but were categorized as reservoirs. Both lakes and reservoirs are among the feature types that the Board recognizes. In this list, a lake is defined as, "A natural body of inland water, (backwater, lac, lagoon, laguna, pond, pool, resaca, waterhole)", and a reservoir is "Artificially impounded body of water, (lake, tank)." The citations for Fall Creek Lake (1158871), Hills Creek Lake (1158881), and Lookout Point Lake (1145479) all recognize that these water bodies are also known as Reservoirs, but these names were declared to be variants.

It is a worthwhile goal to standardize the use of specific names for specific places, so *Lake Wise* respects the decisions of the GNIS. It is the opinion of *Lake Wise* however that this goal would benefit by better agreement between a feature name and its type. A factor in the *Lake Wise* error leading to this discussion was that the same error appeared in the USACE news release announcing the maintenance drawdowns. (The reference to GNIS feature number 1158881 as Falls Creek Reservoir was unique to the June 2010 issue of the newsletter.) It is disingenuous to call a reservoir a lake, and doing so will inevitably lead to confusion.

Oregon Lakes Association
a voice for quiet waters

2010 Conference Preliminary Program

Saturday, September 11, 2010

La Sells Stewart Center, Oregon State University, Corvallis, Oregon

Conference Co-sponsor: OSU Department of Fisheries and Wildlife

Registration	8:00 a.m.
Welcome Karen Font Williams, OLA President Dr. Jesse Ford, OSU, Dept. Of Fisheries and Wildlife	
Andy Schaedel (Dan Turner), Oregon Dept. Environmental Quality Harmful Algal Blooms – Addressing as a Water Quality Problem	
Dan Turner, Oregon Dept. Environmental Quality Remote Sensing of Chlorophyll a Concentrations	
Don Ratcliff, Portland General Electric Changes in the thermal structure of Lake Billy Chinook with the new Selective Water Withdrawal Facility	
Poster Viewing and Vendor Walkabout (beverages and snacks provided)	10:30 - 10:50
Alan Herlihy, Dept. Of Fisheries and Wildlife, Oregon State University Selecting Reference Lakes for the Survey of the Nation's Lakes: Pitfalls and Selection of Candidate Reference Lakes in the Northeast and Northwestern U.S.	
Shannon Hubler, Oregon Dept. Of Environmental Quality 2007 National Lakes Assessment: How Oregon Lakes Compare and New Assessment Tools	
Tony Olsen, EPA National Health and Environmental Effects Research Laboratory National Lakes Assessment: Planning for 2012	
Lunch	12:15 - 1:30
Robert Hoffman, USGS Forest and Rangeland Ecosystem Science Center Sampling Oregon Dune Lakes with a Little Help from our Friends	
Jennie Bricker, Stoel Rives, LLC Ownership and Boundary Issues on Oregon Waterbodies	
Mark Rosenkranz, Lake Oswego Corp. Oswego Lake Drawdown	
Break: Poster Viewing and Vendor Walkabout (beverages and snacks provided)	3:00 – 3:30
Closing Remarks Karen Font Williams, OLA President	4:45

A Conference Warm-Up Exercise

Because of the focus on the National Lakes Assessment at this year's Conference, attendees can work on an extra credit homework assignment between now and September 10th; become familiar with the reports that the study produced. The three of greatest interest are the national summary, the Oregon general summary, and the Oregon individual lake summaries. The Oregon reports may warrant the most attention because their usefulness must be teased from a format designed to provide a statistical evaluation of lake condition on a national scale. Hyperlinks to the three reports are in the Friday Schedule option of the Conference page at the OLA website.

Wallowa Lake Kokanee Bring Attention to Oregon

The four record kokanee (*Oncorhynchus nerka*) caught at Wallowa Lake so far this year has brought wide spread notice and inquiries about this fishery. Jerome Logosz' 7.085 pound trophy from 2009 was bested on 26 February when Gene Thiel landed a 7.5 pound kokanee. The Oregon and US record went to Wan Teece on 24 March when she caught an 8.23 pound specimen. Bob Roth became the champion kokanee fisherman on 8 May with an 8.85 pounder. The Wallowa Lake, Oregon, US, and world record is now held by Ron Campbell, who caught a 9.67 pound kokanee on 13 June. The previous world record was a 9.6 pound fish caught in British Columbia's Okanagan Lake in 1988. In addition to these trophy fish, Wallowa Lake has produced numerous other 7 pound kokanee for happy fishermen during this span.

The interest generated by this succession of trophy catches regularly leads to discussions of mysis shrimp, *Mysis relicta*, which was introduced into Wallowa Lake in 1965-67. The introduction of these shrimp in other lakes has been a factor in the loss of kokanee fisheries. A study to determine the long term viability of kokanee in Wallowa Lake is underway, but has yet to reach a conclusion.

The analysis of 73 zooplankton samples collected with vertical lifts above and below the thermocline, at three sampling sites, at two-week intervals from May to November in 2008, has led zooplankton expert Allan Vogel to conclude that the zooplankton population is being impacted by mysis shrimp predation. A survey by hydroacoustic imagery on ten transects across the lake's width in 2009 showed a healthy population of young kokanee, which bodes well for the fishery if enough of these juveniles survive to reach spawning size.

Other lakes in neighboring states and Canada receiving *Mysis relicta* introductions have lost their kokanee fisheries for a variety of reasons. The shrimp's preference for low light and cold temperature allow them to avoid direct predation from adult kokanee, but permit the shrimp to feed on the kokanee young. Lakes with lake trout, *Salvelinus namaycush*, have seen the availability of the shrimp benefit these trout at the expense of kokanee populations. Shrimp predation on extant zoolplankton can prove limiting for kokanee.

All of these interrelations are in place in Wallowa Lake, and yet the kokanee there have persisted long after neighboring populations have failed. Overall fishing success at the lake has noticeably declined in recent years, which was a factor in launching the study now underway. It may be that Wallowa Lake kokanee are dependent on external conditions for their continued prominence. Landslides in the steep Eagle Cap Wilderness tributaries to the Wallowa River could severely degrade the kokanee spawning habitat. The low light conditions under the frozen lake during a prolonged winter could increase the intermingling of kokanee and shrimp and boost the nutritional status of the fish. Boaters attracted by the record kokanee could introduce *Dreissena* mussels or other invasive species into the lake. Recognized improvements to the Wallowa Lake dam could convert the land-locked kokanee fishery back to a run of anadromous sockeye salmon. As these possibilities play out,

could Wallowa Lake produce a kokanee that would rival the record 16.0 pound sockeye salmon caught in Alaska's Kenai River in 1974?

Oregon Treated to Record Run of Sockeye Salmon

Sadly, most of these fish were headed for Washington or Canada. The early August count at Bonneville Dam, the first of the Columbia River dams that salmon spawning runs encounter, was 386,406. The previous record there occurred in 1947 when a total of 335,300 sockeye were counted. This year's count at Wells Dam, the Columbia River dam just downstream of the Okanagan River near Brewster, Washington, has already exceeded 285,216. The Columbia River dam upstream of Wells Dam is Chief Joseph Dam, which has no provision for fish passage.

The count at Wells Dam is evidence that this year's run of sockeye largely by-passed the Snake and Wenatchee Rivers. Still, the managers overseeing the endangered sockeye runs in Idaho have been pleased with the increased Snake River counts they have seen this year, and the record run has allowed a rare, but limited, sport sockeye season at Lake Wenatchee.

The Okanagan River headwaters are in the mountains of British Columbia, upstream of Okanagan Lake. The present barrier to upstream migration in the Okanagan River is the dam forming Skaha Lake at Okanagan Falls, BC. This lake is downstream of Okanagan Lake, and upstream of Vaseux and Osoyoos Lakes. Osoyoos Lake straddles the US/Canadian border and has been the historic brood lake for juvenile Okanagan sockeye.

Declining water quality and dwindling sockeye runs to Osoyoos Lake led to a 1997 conference aimed at restoring the run. The return of Okanagan adult sockeye spawners in 1998 was an all-time low of 2048 fish. The goal of saving this run produced improvements to regional habitat and water quality conditions, and began a process that made the release of hatchery sockeye fry into Skaha Lake an annual event after 2003. Authorities commenting on this year's record returns regularly cite the judicial mandate for enhanced water releases at the Columbia River dams and optimal ocean conditions as factors contributing to the 2010 sockeye numbers. (It is not yet clear how the anoxic, dead zones routinely noted off the Oregon coast fit into these recent optimal ocean conditions.) The factors that are part of successful spawning runs are many and it is difficult to understand all of their interrelations. The Osoyoos example however demonstrates that sockeye salmon are a good candidate for restorative efforts.

Sockeye Salmon Biology

The sockeye salmon, *Oncorhyrnchus nerka*, is one of five salmon species native to the northwest Pacific region. It is also known as the blueback or red salmon, and it is called kokanee in its land locked form. The other NW salmon species are the chum or dog salmon, *O. keta*; the coho or silver salmon, *O. kisutch*; the Chinook or king salmon, *O. tshawytscha*; and the pink or humpback salmon, *O. gorbuscha*. The genus name refers to the "hooknose" jaw that males acquire on the spawning run. These salmon are anadromous and die after spawning. The criteria for field identification of these species change when they leave the ocean to spawn. In the ocean, sockeyes are the least spotted of the salmon species, having just tiny specks on their backs. Their sides and belly are silver, and there is no black on the tips of their anal, pelvic, and tail fins. On the spawning run, sockeyes are less than 16 pounds, their body turns red but has no vertical bars on their sides, and their head takes a greenish-olive color.

Taxonomists count the gill rakers on the first gill arch to differentiate among salmon species. Sockeyes typically have from 30 to 43 of these bony projections into the pharynx while the other salmon rarely have more than 30. Water flowing to the gills of salmon is raked by these structures to capture and direct food particles toward the esophagus before the water moves on to the fleshy, gill filaments for gas exchange. The greater number of gill rakers in sockeye salmon allows their diet to rely more on plankton and insects than their predaceous brethren. Feeding on a low trophic level of the food web minimizes the bioaccumulation of substances that can't be metabolized, such as mercury. Even more important, there is a greater assurance of adequate food abundance at lower trophic levels, making the sockeye food supply less susceptible to variable conditions. The large percentage of zooplankton in the sockeye diet gives them ready access to the proteins, fats, oils, and carbohydrates made by the primary producers that zooplankton feed upon. Epicures have noted that the flesh of sockeyes is favored for its firmness, deep color, and strong taste.

The life span of sockeye salmon is about 4-6 years, but they have more options of how this time is spent than do the other salmon species. They all begin their lives as hatchlings in the gravel bed of a fresh water system. Most often this birth place is a stream, but some sockeye choose to spawn in the shallows of a lake. The newly hatched alevins remain in the gravel until their attached yolk sac is depleted. Depending on water temperature, the free swimming, sockeye fry emerge from the gravel in April or May. Their initial behavior is to avoid light and to seek the habitat conditions afforded by a lake. Once within a nursery lake, they begin a routine of feeding in pelagic schools at dawn and dusk among their zooplankter prey. The schools descend to greater depths during the day and at night.

The time juvenile sockeyes spend in their nursery lake is variable. The trigger for leaving is unknown, but it has been observed that the residence period generally increases with latitude. A key feature of the sockeye life cycle is that fish can adapt to a fresh water existence as a kokanee, and spawn at the end of their life in the inlet streams of their lake. Kokanee thrive in land locked lakes where migration to the sea is not possible. It may be that by brooding in a lake, sockeye are just less subject to the flow of streams that sweep the smolts of other salmon species downstream to the ocean.

The downstream migration of sockeye smolts is swift. They have been observed swimming downstream, although they proceed through rapids tail first. Once in the ocean, they only pause in the estuary before heading to the feeding grounds in the Gulf of Alaska. There they no longer feed in schools, but continue with their planktivorous diet. Euphausiid shrimp is the most common prey. Amphipods and fish become more important as food items for sockeye that have spent more time at sea. Their growth rate is greatest during the first year of ocean life. Sockeye that have delayed their ocean migration tend to achieve a greater size. They can spend 1-4 years in the ocean before starting their spawning run.

The sockeye spawning run is an annual event occurring in late spring to early summer. It is compact in duration, and need not be uniform in timing between different population stocks. The runs can be a simple migration from the ocean to a coastal lake, or an arduous journey over significant distance and elevation. The fish cease to feed once the run has started, and undergo the change in appearance that can differentiate the sexes, chiefly due to the development of a humpback on the males. Spawning does not necessarily begin soon after the run has reached its natal, nursery lake. The Washington Department of Fish and Wildlife has observed sockeye spawning from August to February over the years and at the several sockeye runs in the state.

It is not illogical that an established life cycle would include a safeguard to improve the likelihood that the work of a lifetime will be fruitful. The immediate concerns that could trigger spawning are water temperature and flow. Decreasing water temperature signals that dissolved oxygen levels will be increasing, and promises too

that flows are unlikely to decrease much further. Flow is important to keep the deposited eggs wet, oxygenated, and clean. Water flow in a stream's main channel can be too swift for properly sized gravel to remain in place, so the ideal stream flow for spawning will be high enough to cover the gravel beds that form away from strong currents. Adequate flow will submerge a sufficient area of these gravels to minimize overlapping redds. Shallow areas of a stream are more likely to include obstructions that ripple the water surface, and ripples assure the water just downstream is optimally oxygenated. When the spawners excavate a depression 6-9 inches deep for their nesting site, the deposited silts there are resuspended and carried away, leaving a cache of clean gravel where the gentle, subsurface water flow will be unimpeded for a time. The depth of the redd provides some protection that all the overlying gravel will not be scoured away by winter flow levels.

Sockeye salmon are the third most abundant of the five salmon species of the northwest Pacific region. There are currently greater populations of pink and chum salmon. But a species that can increase in numbers by 150 fold during a 12 year span has the potential to become better than third rate.

Miller Lake Lamprey Get Another Boost

The June 2006 issue of *Lake Wise* contained an article about the unique lamprey species that once inhabited the Miller Lake in Klamath County, northeast of Crater Lake and west of Chemult OR. This Miller Lake was treated with toxaphene in 1958 to remove tui chub and lamprey from the planted rainbow trout fishery there. Preserved specimen of the lamprey were later recognized as a distinct species, *Entosphenus minimus*, which was thought to be extinct because its only known habitat had been treated. Since then, there have been several populations of *E. minimus* discovered in the Williamson and Sycan River basins. One of these populations is in the lower reaches of Miller Creek, which flows from Miller Lake to the area of Beaver Marsh, located along Highway 97 about 6 miles south of Chemult. The creek ends there so the Miller Lake drainage is closed.

Miller Creek drops about 1000' in elevation during its 10 mile course. An electroshock survey of the lake and the creek conducted in August 2004 only found lamprey at three adjacent sites along the lower reaches of the creek. The small barrier dam that had been built on Miller Creek to prevent lamprey repopulation of the lake after the toxaphene treatment was removed in October 2005. A repeat survey in October 2008 gave little indication the lamprey population was moving upstream.

The lamprey have a two stage life cycle where the juvenile form, known as ammocoetes larvae, spend up to 5 years in the bottom deposits of fresh water streams or lakes, as blind filter feeders. They were found in abundant numbers along the lake shore prior to 1958. When they reach their full size, of about 15 cm in length, the larvae metamorphose into their adult form and spend almost a year as a free living, fish parasite. Existing records suggest they are not efficient parasites, as adults ready to spawn are typically smaller than newly emerged adults. The 2008 survey of Miller Creek did note however, that some of the fish from sites with lamprey bore the round sucker scars of lamprey parasitism. The lampreys die after spawning.

Under the premise that lamprey in Miller Lake would provide an olfactory stimulus for the creek lamprey to move upstream, ODFW began this month to transplant lamprey from Miller Creek into Miller Lake. They plan to continue transplanting up to 10% of the lamprey they encounter during the next two years. The outcome of the experiment is not certain. Miller Lake remains a suitable habitat for the filter feeding ammocoetes, but since the last free swimming adult was removed, the lake has become a notable brown trout fishery. Brown trout are aggressive predators that may benefit from the addition of mediocre parasites to the lake. So while another chapter has been added to the Miller Lake lamprey story, the book is still not complete.

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Newsletter 2010 #3

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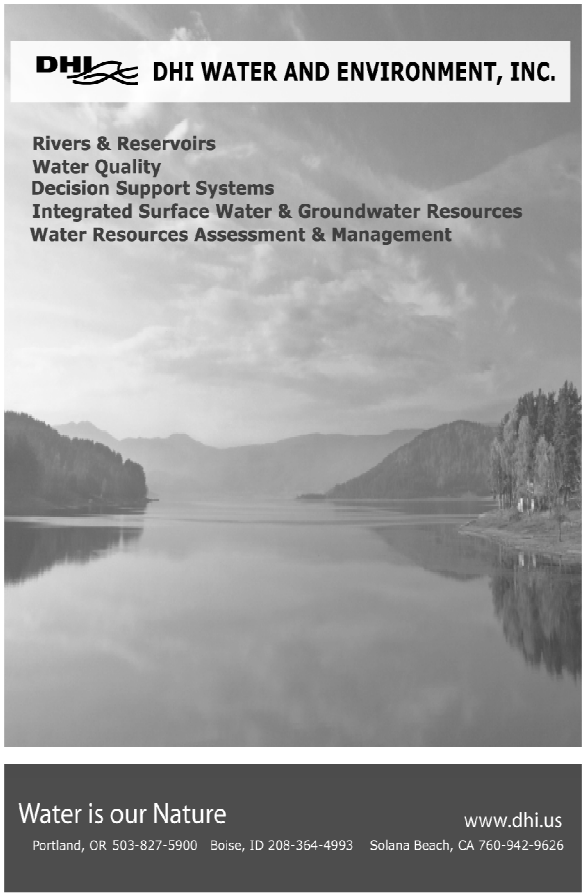
OLA Mission: The Oregon Lakes Association, a non-profit organization founded in 1990, promotes understanding, protection, and thoughtful management of lake and watershed ecosystems in Oregon. For additional information on OLA, write to the address above, or visit our website.

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

OLA Welcomes Corporate Member DHI Water and Environment, Inc.



DHI Water & Environment, Inc. is an independent, self-governing, research and consulting organization dealing with all aspects of the water environment. DHI has 40 staff members across the nation and over 1,000 internationally, the majority of whom are professional engineers and scientists with post-graduate qualifications and years of consulting, research and development experience.

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