

WATERLINE

June 2006

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Waterline for future reference.**

About the *Waterline*

The *Waterline* is the newsletter of the Washington State Lake Protection Association (WALPA). Articles may be reproduced; credit the *Waterline*.

WALPA is a chapter of the North American Lake Management Society (NALMS).

The next deadline is August 1 for the September issue. Send articles to Editor Paula R. Lowe, pmrlowe@comcast.net.

For information about future articles in the newsletter or to inquire about advertising, call 360-491-0109.

Copies are mailed or e-mailed to members of WALPA. To receive an electronic copy of the newsletter (a PDF file), e-mail your request to Beth.Cullen@METROKC.GOV; all others will receive the newsletter by U.S. postal mail.

Newsletter Committee:

Peter Burgoon, Beth Cullen, Kelly McLain, and Glen Rothrock.

Correction

In the previous issue, the Lake Focus on Pend Oreille mistakenly identified Oregon as a member of the Tri-State Water Quality Council. The organization represents groups from Washington, Idaho, and Montana.

Regional conference in Portland

By BiJay Adams, president-elect, WALPA

This year WALPA is co-hosting a regional conference with the Oregon Lakes Association (OLA) and the North American Lake Management Society (NALMS). The conference theme is Research and Management Trends in the Pacific Northwest and will be offered in conjunction with the Western Regional Panel on Aquatic Nuisance Species and the Portland State University Center for Lakes and Reservoirs. The conference will be held at Portland State University in Portland, Oregon, on September 13 and 14. On Friday, September 15 field trips will be offered.

This regional conference offers a unique opportunity to learn the concerns and challenges experienced by other Pacific Northwest states while forging connections among lake and resource managers, researchers and citizens. Session topics include: Pacific Northwest lakes; macrophytes and invasive plants; fisheries in lakes; lake restorations and lake

management techniques; public education; invasive species and endangered species; and an exhibitor session for new instrumentation and field applications.

Rooms are reserved at the University Place Hotel on the southeast end of the Portland State campus. For reservations or information about the hotel, call 1-503-221-0140 or visit www.uplace.pdx.edu/.

There are opportunities to sponsor the conference and to display a commercial and/or educational exhibit. For information, contact Vanessa Howard at 503-725-9706 or vhoward@pdx.edu.

For additional information, please check the NALMS website, www.nalms.org, or the OLA and WALPA websites at www.oregonlakes.org/ and www.nalms.org/walpa/, or contact Mark Sytsma at 503-725-3833 or sytsmam@pdx.edu.

Winning a ban on phosphates

**By Paula R. Lowe, editor,
*Waterline***

First laundry detergent now dishwashing detergent. A new state law limits the phosphorus content in dishwashing detergent.

Dishwashing detergent that contains 0.5 percent or more of phosphorus by weight may not be sold starting July 1, 2008. The new law does not apply to the sale or distribution of detergents for commercial and industrial uses.

For details, visit <http://apps.leg.wa.gov/billinfo/summary>.

Renew membership

Annual dues rates:

\$15 - students
\$20 - individuals
\$30 - professionals
\$40 - organizations & lake associations
\$10 - individuals who belong to lake associations that are WALPA members

The membership year is April 1 through March 31. Dues are renewable April 1 or at the annual conference.

Send your membership dues to: WALPA, P.O. Box 4245, Seattle, WA 98104

Lake Focus on Rattlesnake Lake

By Carla B. Milesi, Taylor Associates

Rattlesnake Lake is a 112-acre lake located 32 miles east of downtown Seattle. The lake sits adjacent to the 91,339 acre Cedar River Watershed, that is owned by the City of Seattle, and supplies drinking water to people in the greater Seattle area. Geologically Rattlesnake Lake is very new; it was "accidentally" formed less than 100 years ago.

Rattlesnake Lake is in an area that was long known as Rattlesnake Prairie. There are several stories floating about to explain the significance of the lake's name. One story suggests the local Native American tribe named the area Rattlesnake Prairie because of the abundance of Camas Lilies (*Camassia quamash*). Camas Lilies were a major portion of plant food for the tribes, and when the dried seed pods of these plants blew in the wind, they sounded similar to the rattle of a rattlesnake. Some pre-European maps identify the area as Rattlesnake Prairie, lending credence to this story. Another more common account suggests the area acquired its name later, in the mid-1800s, from Seattle pioneer Arthur A. Denny when the rattle of seed pods on the nearby prairie frightened a road surveyor who thought he was being attacked by a rattler.

Archaeological evidence shows that people have inhabited Rattlesnake Prairie for thousands of years. Aboriginal people camped on the prairie, fished and hunted the area as early as 7,000 BC. In more recent history, the area provided a seasonal home for the Snoqualmie Tribe, who periodically burned the prairie to encourage the growth of the Camas Lily. During the winter and spring a small lake, known as Rainy Season Lake, would form on the prairie from rain and groundwater infiltration.

In 1906, the Chicago, Milwaukee and St. Paul Railway was built through the area and by 1907, a



The town of Moncton slowly flooded after completion of the Masonry Dam in 1915. Photo (item: 7511) courtesy of Seattle Municipal Archives.

new community was built on the shores of Rainy Season Lake. This community was named Moncton, purportedly after one of its settlers, and it quickly grew to a town of nearly 200. The town, which was inhabited predominantly by railroad workers, had a hotel, barbershop, saloon, restaurant, and a few stores.

In 1912, the City of Seattle began construction on the Masonry Dam in the Cedar River Watershed, nearby the town of Moncton and Rainy Season Lake. This relatively small dam was needed to generate electric power and store drinking water for the City of Seattle. By the spring of 1915, the dam was completed and water began to fill the Masonry Pool behind the dam. Although the dam was watertight, the northern hillside that was made up of glacial moraine was not. Water slowly seeped through the hillside and made its way to the groundwater-fed Rainy Season Lake. As the Masonry Pool filled, Rainy Season Lake rose and slowly began to flood the town of Moncton. Within two months Moncton was nearly submerged and today's Rattlesnake Lake was formed.

Worried that the debris-filled lake would seep into the Cedar River Watershed and contaminate the city's

drinking water, the City of Seattle condemned the town of Moncton. A total of \$47,658 was paid to residents for their land, and soon after crews tore down and removed the homes and buildings.

For years no one was allowed to swim in Rattlesnake Lake for fear of water seeping into and contaminating the drinking water supply. Once it was determined that the glacial moraine filtered out any impurities, the lake was opened to the public and in 1970 Rattlesnake Lake Park was created. Today Rattlesnake Lake is a popular recreation area for fishing, swimming, hiking, and even some scuba diving to look for remnants of Moncton.

Rattlesnake Lake is primarily fed from groundwater seeping through the glacial moraine from Masonry Pool, and so the lake water quality is very high. Because it is a popular swimming area, the lake is tested once during the summer for fecal coliform and weekly for E. Coli. Data from 2004 and 2005 show only one measurement of E. Coli that was considered to be high enough to be a "moderate concern."

The clean water of Rattlesnake Lake provides great habitat for
continued on page 3

Lake Focus on Rattlesnake Lake *from page 2*

rainbow and triploid rainbow trout, both of which are stocked annually by the Washington State Department of Fish and Wildlife. In April 2006 Rattlesnake Lake was stocked with 12,500 rainbow trout, and 965 triploid rainbow trout. The triploid rainbows are called "triploid" because they have three sets of chromosomes rather than two, which makes them sterile and ideal to stock in areas where natural reproduction of hatchery trout could adversely affect native species. The triploids are popular with fishing enthusiasts because they are voracious eaters and can grow to prize sizes if they are not caught the first season after stocking. Because Rattlesnake Lake is a selective fishery, the trout can only be caught using barbless hooks and no bait.

The lake is also a popular starting

point for several hiking trails, including the 100-mile long Iron Horse Trail that stretches from Rattlesnake Lake to the Columbia River. Although thousands of people visit Rattlesnake Lake Park each year to enjoy the multitude of recreational activities, many are unaware of the lake's intriguing history.

Note: WALPA makes no guarantee to the accuracy of this information.

Want to recommend a lake for the next Lake Focus? Send suggestions and questions to Heidi Wachter at Heidi@taylorassoc.net.

Sources for this article:

- Katie Saylor, education programs specialist, Seattle Public Utilities
HistoryLink.org (The Online

Encyclopedia of Washington State History), www.historylink.org.

- Friends of the Cedar River Watershed website, www.cedarriver.org

- www.washingtonlakes.com

- Rattlesnake Lake, Bacteria Levels and Water Temperature, King County Department of Natural Resources, <http://dnr.metrokc.gov/wlr/waterres/swimbeach/ArchiveData.aspx?Locator=A999SB>

- Triploid Rainbow Trout Plants in Washington for 2006, http://wdfw.wa.gov/fish/prospects/triploid_trout.htm

- 2006 Hatchery Trout Stocking Plan for Washington Lakes and Streams, Washington Department of Fish and Wildlife, Fish Program Fish Management Division

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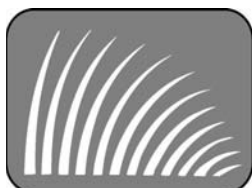


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Red swamp crayfish impacts freshwater ecosystems

By Karl W. Mueller, certified fisheries professional, Chimaera Endeavors

The red swamp crayfish, *Procambarus clarkii*, a native of the south-central United States and northeastern Mexico, is the most widely-introduced crayfish in the world. In 2000, I discovered red swamp crayfish in Pine Lake located on the Sammamish Plateau in King County. Shortly thereafter, red swamp crayfish were found in two other lakes in King County: Lake Washington and Steel Lake. The source and impact of these introductions are unknown.

Why should we be concerned about red swamp crayfish in Washington lakes? Quite simply, wherever they are introduced, the potential for negative ecological impacts is great. Crayfish affect littoral communities through feeding links with multiple trophic levels and non-trophic activities such as burrowing. Perhaps the most well documented impact of non-indigenous crayfishes is altering aquatic plant communities. Crayfish are facultative herbivores; the red swamp crayfish feeds selectively on aquatic macrophytes. This feeding strategy resulted in substantial reductions in plant biomass and cover in freshwater systems of Africa and Europe where the red swamp crayfish was introduced. The fallout: as macrophyte biomass and cover decreased, phytoplankton biomass increased. Moreover, the invader caused declines in species richness of the affected aquatic plant communities.

One consequence of submerged vegetation removal by red swamp crayfish is increased turbidity, which alters the properties and fate of light in the water column with subsequent changes in the rate of photosynthesis. Another consequence of herbivory by red swamp crayfish is reductions in waterfowl numbers and species richness. For example, more than 50 percent of the waterfowl species using Chozas Lake, Spain, for breeding and migratory purposes disappeared after the introduction of red swamp crayfish.

In other long-term studies of Chozas Lake, researchers found that

total phosphorus increased after the introduction of red swamp crayfish. Red swamp crayfish act as nutrient pumps, transforming and transporting sediment-bound nutrients to the water column. Their burrowing activity also increases turbidity affecting water quality. Ostensibly, bioturbation contributes indirectly to phytoplankton-driven equilibria and increases in chlorophyll *a* wherever red swamp crayfish are introduced.

Besides grazing on aquatic macrophytes, crayfish feed on periphyton; yet an indirect impact on periphyton is of greater significance – crayfish prey on periphyton-grazing snails. Molluscivory by crayfishes has cascading effects on lower trophic levels. Numerous studies have shown that periphyton biomass and chlorophyll *a* increase in the presence of crayfish. Furthermore, invasive crayfish may alter the recruitment and distribution of native molluscs. The red swamp crayfish easily dispatches thin-shelled snails, even causing declines in some African and European snail populations.

Macroinvertebrates and amphibians also are affected by the introduction of non-indigenous crayfishes. For example, European scientists found that invasive red swamp crayfish selectively fed on true fly midges and mayfly nymphs causing reductions in insect biomass and changes in species composition of macroinvertebrate communities. Introduced signal crayfish, *Pacifastacus leniusculus*, significantly reduce toad tadpole survival through direct predation, and may injure frog tadpoles reducing their odds of morphing into froglets. In controlled laboratory studies, red swamp crayfish adopt a sit-and-wait strategy and are adept at capturing and handling the eggs and larvae of frogs and toads. Similarly, in the wild, introduced red swamp crayfish consume newt eggs and larvae as well as deter reproduction in adult newts through aggressive behavior.

Fish are well known predators of crayfish, but turnabout is fair



Red swamp crayfish. Photo by Karl Mueller.

play. Indeed, red swamp crayfish are capable of capturing and consuming live trout fry, and signal crayfish feed on small benthic fishes and exclude them from shelter, increasing the benthic fishes' susceptibility to predation. Furthermore, crayfish compete directly with fish for macroinvertebrate prey; thus, by altering food web dynamics, introduced crayfish reduce energy transfer to fish.

What about possible impacts to native signal crayfish? Of the three known locations of red swamp crayfish in Washington, only Pine Lake, with its sympatric populations of native signal crayfish and the invader, is being studied. My preliminary data reveal that, irrespective of sampling gear type, the non-indigenous red swamp crayfish dominated my catch during a 2005 baseline survey of crayfish stocks. The scientific literature is replete with examples of native crayfishes being displaced by invasive crayfishes. Mechanisms of displacement include competition for food, reproductive interference, selective predation based on size and behavior, and competitive interactions over shelters that influence susceptibility to predation. Future studies should examine these mechanisms to assess the impact of non-indigenous crayfish on native crayfish in Washington.

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there's so little room for error.



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WALPA Board proposes bylaws changes

By Isabel Ragland, secretary, WALPA

At the April board meeting, it was announced that the number of votes received for the proposed amendment to pro-rate new member dues did not reach the required threshold to ratify the changes. The vote on this amendment will be held at the business meeting during the September regional conference. The board is proposing a second amendment to the bylaws to lower the number of responses required for a mail-in vote amending the bylaws from two-thirds of the membership to a quorum of the membership. A quorum is defined as a majority plus one. The two proposed bylaws amendments are listed below.

Current Bylaws:

ARTICLE IV. MEMBERSHIP

Section D. The membership year of the Association shall end on March 31st of each year or at the time of the annual conference, whichever occurs later in the year. Annual membership

dues are not pro-ratable. Dues are payable to the Washington State Lake Protection Association, for deposit by the Treasurer.

ARTICLE XVI. AMENDMENT PROCEDURES.

SECTION B. These Bylaws may be amended by two-thirds (2/3) of the members voting at any Meeting of the Association which has been authorized by the Board. If notice of the Bylaw amendments was provided to members at least thirty (30) days prior to the Meeting, a majority of those voting shall be required to adopt amendments.

Proposed Change to Bylaws:

ARTICLE IV. MEMBERSHIP.

SECTION D. The membership year of the Association shall end on March 31st of each year or at the time of the annual conference, whichever occurs later in the year. Annual membership dues are ~~not~~ pro-ratable; *new members*

joining the second half of the year will pay half the annual dues. Dues are payable to the Washington State Lake Protection Association, for deposit by the Treasurer.

ARTICLE XVI. AMENDMENT PROCEDURES.

SECTION B. These Bylaws may be amended by two-thirds (2/3) of the members voting at any Meeting of the Association which has been authorized by the Board. If notice of the Bylaw amendments was provided to members at least thirty (30) days prior to the Meeting, a majority of those voting shall be required to adopt amendments. *A mail-in vote to adopt an amendment of the Bylaws shall require a response from a quorum (majority + one) of the membership. A mail-in vote is defined as either a vote received by regular mail or by electronic mail.*