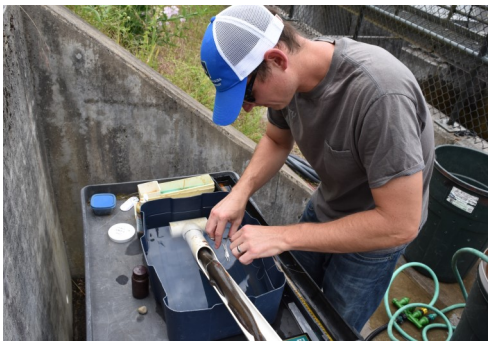
June 10, 2019

PGE Clackamas River Fisheries Newsletter — Spring 2019

After a cold winter with low river discharge, the Clackamas surprised us all with an April flow for the record books. A rain-on-snow event led to eight days of spill at North Fork Dam, causing tons (literally!) of staged gravel to move downstream. This past summer and fall, we placed approximately 20,000 cubic yards of gravel downstream of River Mill Dam and added 500 tons of gravel near Ripplebrook Campground in the Oak Grove Fork. Nearly all of this sediment was mobilized and distributed downstream. Several river areas dominated by bedrock just days before are now laden with the perfect material for a suite of ecological benefits, including fish spawning, invertebrate growth and cooling water temperatures.

To learn more about our work on the Clackamas and access past issues of the newsletter, visit: **PortlandGeneral.com/ClackamasUpdates**.

Featured Study: Trap and Haul of Adult Lamprey



Pacific lamprey were once widely distributed along the Pacific rim, from central Baja Mexico to the Bering Sea and along the coast of Japan. But over time, lamprey distribution shrank and populations declined, mostly due to human impact. While these creatures are often feared or misunderstood, they're both ecologically and culturally significant. Lamprey serve an important role in marine and freshwater food webs. Furthermore, they are cherished by Pacific Northwest Native American tribes who have harvested the fish for subsistence, ceremonial and medicinal purposes for centuries.

Lamprey in the Clackamas River Basin

Lamprey have had a bumpy history in the Clackamas as well. The construction of River Mill Dam in 1911 created a serious impediment to upstream passage for adults. Fish ladder infrastructure, highly successful at passing salmon and steelhead, caused problems for lamprey, who struggle to swim in swift currents around sharp corners. In 2006, the River Mill fish ladder was reconstructed to include lamprey passage features. Lamprey quickly responded to these improvements, recolonizing the stretch from River Mill Dam to Faraday Diversion Dam. However, evaluations indicated that passage through the North Fork fish ladder, constructed in 1958, was still low.

To better understand migration obstacles, we released lamprey within the North Fork Ladder and studied their responses. Some fish swam downstream, exiting the ladder into the Faraday Diversion Dam tailrace. Others continued upstream, swimming into North Fork forebay. Many lamprey either disappeared after release or over-wintered in the ladder. Based on these results, it is hard to identify a single cause of poor lamprey passage, but one possibility is a lack of motivation. Adult lamprey do not return to their natal stream like adult salmon. Rather, they are drawn to areas where juvenile lamprey reside. Since very few lamprey successfully reach upstream of North Fork Dam, there is likely a lack of juvenile pheromones to attract adults upstream. In 2017, PGE biologists started a lamprey trap and haul program to provide passage above North Fork Dam and help resolve some of these issues. We also continue to tag fish and evaluate their movement through the Clackamas Project.

How does the study work?

Each year, starting in 2017 and continuing through 2025, PGE biologists trap hundreds of adult lamprey and release them above North Fork Reservoir. By moving fish to the upper basin, we hope to increase juvenile production and entice adults to swim upstream. In 2017 and 2018, several collected fish were given radio tags, allowing us to study their migration throughout the year. We learned that lamprey actively moved upstream following their release and dispersed throughout their historic range. Additionally, up to 200 individuals are implanted with PIT tags annually and are used to evaluate passage through the North Fork ladder. Motivation appears to be increasing, but overall passage rates are still low.

What's next?

This year, we began collecting lamprey at the River Mill ladder in mid-May. Throughout the summer, up to 400 individuals total will be trapped and hauled upstream of North Fork Reservoir and another 100 to 200 will be PIT-tagged and released within our project to help evaluate passage. We are also evaluating the efficacy of future studies that involve changing operations or repeating passage tests to help us better understand what we can do to aid Pacific lamprey in the Clackamas Basin.

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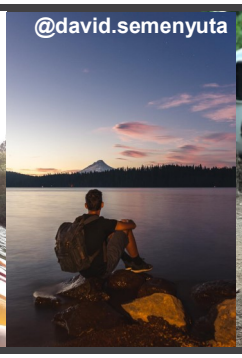
Details at PortlandGeneral.com/Parks



Juvenile Fish Update

Juvenile Species	2019 Run Year To-Date (Oct. 2018—May 2019)	Run Relative to 10-Year Total Average
Coho	270,678	225% (n=120,565)
Steelhead	45,326	128% (n=35,343)
Chinook	228,158	361% (n=63,238)

***Numbers in this chart represent total outmigration for all facilities combined, and 10-year averages represent the total run year.**

- Despite spilling for eight days in the month of April, juvenile collection numbers have been record-breaking this spring.
- Coho collection totaled 141,873 from March-May, or 236% of the 10-year average for this period — a modern-day record.
- Steelhead collection totaled 42,005 from March-May, 126% of the 10-year average for this period.

Downstream Fish Survival Studies

Since 2014, we've been conducting fish survival studies to help us evaluate the success of our downstream passage infrastructure. Wild salmon and steelhead smolts are captured in our juvenile sampling facilities, where they are given PIT tags and then released at various spots throughout the hydroproject. When these smolts pass by tag readers within our project areas, we detect their movement and use the data to calculate the percentage of fish moving successfully downstream through our facilities. We also recapture some of these fish and look at whether or not they have injuries.

So far, these studies have shown that our downstream passage upgrades, completed from 2011 to 2015, have paid off, resulting in improved migratory conditions for fish. In fact, the numbers indicate that our project has one of the highest-performing downstream passage facilities in the West. At North Fork Dam, 85-95% of smolts use our juvenile bypass system, and at River Mill Dam, more than 95% of smolts use the bypass. Fish utilizing our facilities pass the dams safely— injury and mortality rates are less than 1%. Our evaluations indicate that overall smolt survival is between 90-98%. In the coming years, we will work to refine these estimates through the use of more sophisticated technology.

Adult Fish Update

Adult Species	Run Total	Run Relative to 10-Year Average
Wild Winter Steelhead	925	66% (n=1,391)
Wild Spring Chinook	Predicted 2,798	Predicted 128% (n=2,182)

Complete daily fish counts can be found online.

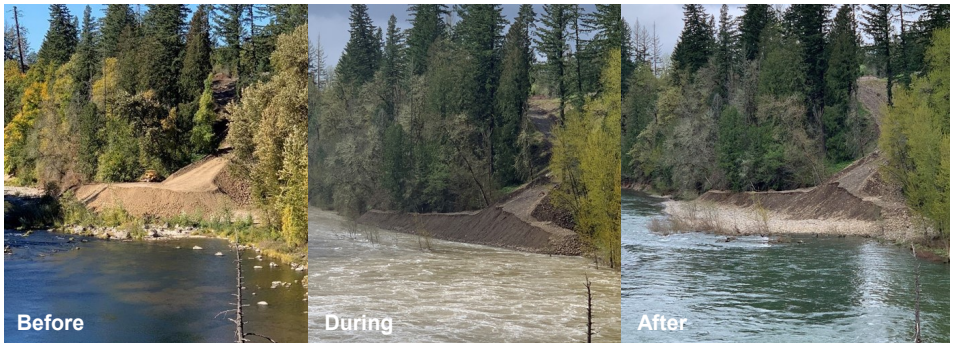
- The wild winter steelhead return is complete, reaching 66% of the 10-year average. While numbers are lower than they've been in recent years, the return is strong compared to the rest of the region, which is experiencing poor returns overall.
- The wild Chinook return is only 8.9% complete. While still early, returns indicate that the 2019 run will be strong relative to other populations in the region.

Announcements, News, and Resources

- PGE is hosting two open houses to gather public input on the future of the West Linn's Willamette River waterfront. Find out more about the events in the **West Linn Tidings**.
- The Faraday Powerhouse — PGE's first dam on the Clackamas River — is being demolished and rebuilt, improving safety and efficiency while preserving important cultural resources. Read more in **Estacada News**.
- Passage of spring Chinook at Bonneville dam is improving, but this year's run is still predicted to be poor overall. Details in the **Columbia Basin Bulletin**.
- According to American Rivers, a nonprofit conservation organization, the Willamette is the fifth most endangered river in the nation. The report cites dams operated by U.S. Army Corps of Engineers as a detriment to salmon and steelhead populations. Learn about the report in the **Lake Oswego Review**.
- ODFW's Recreation Report for the Willamette Zone, including the Clackamas River, can be found on **their website**.
- Fish counts and other information about the Eagle Creek National Fish Hatchery can be found on the **USFWS website**.

Restoration Report: Gravel Augmentation after High Flows

This past year, you might have noticed a large pile of gravel just downstream of River Mill Dam. This massive collection of rock was mined and placed last fall as part of our gravel augmentation effort. If you missed it, you'll have to look elsewhere now. During the high-flow event on April 7th, almost the entire pile (20,000 cubic yards!) was flushed downstream.



As Clackamas River flows approached 30,000 cubic feet per second, the bulk of the pile began to mobilize and was eventually transported over two miles downriver. The gravel did exactly what it was supposed to do — move with the river, filling in areas that previously had minimal river substrate, forming gravel bars, and providing opportunities for fish spawning and invertebrate growth.


PGE staff observe the amount of gravel dislodged from the pile.

This summer, we will identify specific areas where the sediment landed, evaluating changes to the size and composition of gravel throughout the lower river. The pile will be replenished with up to 20,000 cubic yards this upcoming summer or fall, based on the volume transported this spring.

Discover PGE Parks!

- **PGE Parks' Junior Ranger Program** runs Memorial Day through Labor Day. Kids of all ages can earn their stripes at PGE campgrounds this summer; check with the park host to get your first activity book and earn your badge!
- Mark your calendars! PGE is sponsoring and hosting the **Estacada Timber Festival** at Timber Park on July 4th. Come early for the town's Independence Day parade, and then stay all day for timber competitions like pole climbing, ax throwing and log rolling. The night wraps up with live music and a fireworks show.


Part of the new nature play area at Timber Park

Thank you for reading our Spring 2019 newsletter!

Visit our **website** to find more information about the Clackamas, including informative videos, fact sheets, and reports. News, updates and past issues of this newsletter can be found **here**.

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