

Hello Salmon Enthusiasts,

Fall weather is upon us, which for some may indicate it is time to hibernate in front of a nice warm fire with a good book. For the Fish Lab, it means the increased rainfall will help the salmon move in with the tides, searching for the spawning habitat they haven't seen in several years... and maybe there is time for that book in front of the fire as well.

As always, we have a lot going on at the GHC Fish Lab. This includes planning some exciting educational events for our 26 (and counting) Fall volunteers. Here is what you can expect to hear about in the attached newsletter:



Community events! While we try to take the Fish Labbers on official events, when possible, there are not enough Saturdays in the month for us to hit everything. Suggested community events related to our volunteer program are *Erik Sandgren's showing at the Polson Museum* (until 2017), and the *Mushroom Festival at the Quinault Lodge* (10/21-10/23).

What have we been doing with our nearly 200 volunteer-hours so far? In addition to the usual, we have also participated in a working field trip to surplus at the Satsop Springs rearing facility.

Upcoming events for the Fish Lab! Although we always maintain our regular volunteer hours (**Mon/Wed 3pm, Sat 8am**), we have a few things on our calendar that you might want to check out.

October 29th, 9am. Alder Creek Clean Up – Meet across from Swansons at the mouth of the creek.

October 29th, 5pm. Razor Clamming at Mocrocks. Although not an official Fish Lab event, many of the Fish Labbers will be meeting up with the Natural Resources Club to participate in the clam dig.

November 5th, 9am. We are working with the Historical Seaport to set up a tour and discuss their approach to renovate, repurpose, and restore the old saw mill to provide more Harbor-specific community education opportunities.

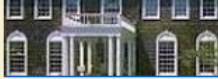
November 19th, 9am. Crafts day! We will be painting Grays Harbor Rocks for the geocache. Bring your own t-shirt, and we will spray a Fish Lab stencil onto it.

Want to get involved? No need to make an appointment, just drop by our regular volunteer hours and we will get you started. ☺

Community events! Of all the places I have lived, Fall in the Harbor is my absolute favorite. Local culture has so much to celebrate between storm watching, clam digs, and the hunting and fishing seasons. While anywhere else the rain would keep people indoors, the Harbor comes alive to celebrate our unique ecosystem.

A perfect example was Erik Sandgren's opening at the Polson Museum this weekend. Despite the weather, there was standing room only as a talented group of musicians performed a selection of folk songs to set the mood and we learned more about local history. During the break, I had the opportunity to peruse the museum and Mr. Sandgren's work, both with strong ties to the Harbor. The piece that stood out the most to me was a gorgeous painting of a small boat, and giant coho. It instantly became one of my all-time favorite pieces. I truly enjoyed the experience, and encourage everybody to drop by the Polson Museum to take a look for your self.


<http://www.eriksandgren.com/polson-museum-retrospective-further-into-the-woods>



THE POLSON MUSEUM

Farther Into the Woods

We are pleased to host a retrospective art exhibit featuring collected works of Grays Harbor artist Erik Sandgren.



Depicting historic logging, milling, and fishing on Grays Harbor, twenty-seven years of Sandgren's paintings, prints, and drawings are displayed. Beyond thirty-five framed pieces on our walls, we show five-hundred-and-four images on our TV. You'll see the trade tools of his work in glass cases, plus extended newspaper and magazine assessments.

Sandgren, long on staff at Grays Harbor College, has been well described by Washington historian John Hughes as "descriptive or abstract, sometimes all at once. His composites are a concatenation of images. Something that first appears as a snapshot becomes mythic. 'How do you translate what you know about a place into an image?' Sandgren asks. 'You can compress time with a painting; embed eras in its layers.'"

Another upcoming event is the Quinault Lodge Mushroom Festival. While we are not able to make it an official Fish Lab trip, many of our volunteers will be attending next weekend (Oct 21-23). The focus will be on local mushrooms, how to identify them and how to prepare them. Notably, the Fish Lab is currently collaborating with Grays Harbor Stream Team to



put together a mycology event on the Lake Swano Trail. Although we won't have the cooking demonstrations, we hope to have a mycologist give us a tour of the mushrooms growing right in our own back yard. As this comes together, we will post more details.

<http://wnpf.org/wp-content/uploads/2016/08/Quinault-Mushroom-Festival-2016.pdf>

What have our volunteers been doing? As mentioned above, when the rain increases the water flow of the Chehalis tributaries, two things are happening. The salmon released last year use the estuaries to prepare for their migration to the ocean, and the adult salmon return to begin spawning.

Our own salmon fry, released last Spring, are developing into smolts that adapt to the salt water environment in the estuary. Although thousands were released, predation has likely decreased their numbers significantly. For instance, I found this bird (pictured) preying on our fish just last week. By releasing the fry early, we will see a dramatic reduction in adult returns due to predation and habitat destruction, however these selective processes will hopefully return a stronger and more adapted gene pool in our returning stocks.

Read more about smolting here:
<http://salmonfactswork.weebly.com/smolt.html>

A very important way our volunteers have been helping this process along is by ensuring our juvenile habitat is undergoing minimal human-related destruction. For this reason, we have been monitoring water quality and cleaning up trash on a weekly basis. We have also been lucky to have a number of Forestry students dropping by this quarter, including Ted Elson who took us all on an impromptu trail tour to point out medicinal herbs growing around Lake Swano. We have also had Echo Hahn representing the GHC Natural Resources Club each week. We have all been enjoying the forestry perspective, and we are excited to learn more about the entire ecosystem.

To learn more about factors that influence salmon migration, check out this link:
<http://www.psmfc.org/efh/Jan99-sec3-22.html>

As a continuation of our long-term monitoring, begun during the Summer Research Program, several students have also been working on our microbiome research project. Samantha Richardson continues to work on identifying the bacteria identified along Alder Creek, while Brady Dier has been working on characterizing the riparian zone at each of our



water collection sites. This monitoring is ongoing along the forested, industrial, and residential areas of Alder Creek, and we hope to discover more about the effects of the environmental context on the nutrient environment within the juvenile salmon habitat. The GHC hybrid BIO100 course will also be participating in this study this year, with a 4-week segment on using bacteria to understand stream health.





To get ready for the salmon runs, Fish Labbers have also been meticulously preparing our equipment for this year's eggs. This includes constantly monitoring the flow rates to our incubation system, making sure we maintain a constant 3 gallons per minute to support the eggs. 3 gpm has been empirically determined to provide the necessary oxygen to the eggs without agitating them to the point of rupturing. We have also been running a blow-off on a weekly basis. This means we open up a pipe that bypasses the hatchery, allowing larger debris to pass through the system so the decomposing matter does not lead to an increase in microbial growth that could harm our eggs. After every blow-off, we clean incubation and all the troughs. As the water levels rise for Fall, this process will ensure we have cleared our pipes to avoid potential contamination.

Read more about spawning salmon here:
<http://salmonfactswork.weebly.com/spawner.html>

If all that sounds like a lot of cleaning to you, it actually is! To shake things up a bit, we always keep an ear to the ground for opportunities to volunteer with the larger hatcheries during spawning, surplus, and egg picking.



This week, we were contacted by Steve Franks of the Chehalis Basin Fisheries Task Force, who invited us to help surplus. What does that mean? The Department of Fish and Wildlife must consider complex concepts to determine how many fish to raise each year. The goal is to have returns that are sufficient for production, or put more simply: you need enough returning fish to give you the eggs for the next round. This number must then be adjusted for salmon lost to predation, harsh conditions, weather patterns, along with commercial and recreational harvest in both the ocean and tributaries. Each of these factors is a moving target, and it can be difficult to model how each issue might affect the returns three years in advance.



Why not raise a lot more than you need? Then you would be sure our local runs don't get shut down again, right? Well, it is also important to manage impacts on the wild salmon. Although they return with remarkable accuracy, a percentage of salmon will return to spawn off target. You would not want a large hatchery return to have a significant affect on the wild gene pool.

Thus, projected returns are modeled and continuously assessed to reduce impacts on wild fish. The surplus is the removal of hatchery fish that exceed sufficiency for production to reduce impact on wild spawning.

We would like to thank Steve and the CBFTF for providing this hands-on opportunity to our volunteers! Steve will be doing more surplus throughout the season, along with spawning on Mondays and Thursdays. The Fish Lab will be out to help whenever possible, but if you

have an interest in volunteering you can also contact the Satsop Springs facility to find out when the next work day will be.

About CBFTF: <http://www.cbftf.com/projects/projects.html>

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Upcoming events for the Fish Lab!

October 29th, 9am Alder Creek Clean Up Meet across from Swansons at the mouth of the creek. Last Spring we had one of our largest volunteer events working in collaboration with Aberdeen Stream Team to clean up Alder Creek. Sadly, it is already time for another clean-up. The good news is Aberdeen Stream Team, Aberdeen PUD, Clean Streams and Memes, GHC Fish Lab, GHC Natural Resources Club, and Grays Harbor Stream Team will ALL be getting together on a large-scale collaborative event! We expect to remove truck-loads of garbage, and assess the need for invasive species removal and stream bank maintenance. Come take part in keeping our natural resources clean!



<https://www.facebook.com/events/1464570343559691/>



October 29th, 5pm Razor Clamming at Mocrocks. I will hereby admit that I have not yet had the opportunity to go on a clam dig. This must be remedied, however I have no idea what I am doing! Fortunately, my volunteer time with the Fish Lab means I know plenty of expert clam diggers who have years of experience and extra tools to help me figure it out. Although this is not an *official* Fish Lab event, a bunch of us will be getting together to go digging together. If you, like me, have always wanted to participate but didn't know where to begin, this might just be your chance to learn in a supportive environment.

<http://wdfw.wa.gov/fishing/shellfish/razorclams/current.html>

November 5th, 9am Tentatively scheduled for a Historical Seaport Tour. The Historical Seaport has been brimming with activity lately, and it is all part of a large-scale plan. You might ask yourselves why a group dedicated to raising salmon and protecting the ecosystem would want a tour of the place known for tall ships. In fact, what is going on at the Seaport is of incredible interest to conservation groups in general! Their long-term plan is to convert the industrial infrastructure from a former resource extraction plant into an educational, vocational, and recreational mecca focused on everything that makes Harbor culture what it is. With regards to this process, several words come to mind. Remediation, mitigation, and restoration.

Remediation: putting a halt to, and or reversing, damage to the environment

Mitigation: reducing the severity of environmental damage

Restoration: bringing an environment back to its original condition

One of my goals for the Fish Lab is to learn, along-side the volunteers, how to protect the history, culture, and environment of Grays Harbor while also building a prosperous future. This is a challenge the Historical Seaport is facing head on, and I look forward to hearing more about it.

<http://www.historicalseaport.org/seaport-landing/>



November 19th, 9am Crafts day! We will be painting Grays Harbor Rocks for the geocache. We have also been asked if we have Fish Lab t-shirts or merchandise available, so we will be painting t-shirts. To celebrate our collaboration with Erik Sandgren's design students who are currently designing a mural for the aquaculture building, we will be using a smaller form stencil to create Fish Lab t-shirts with the same theme. Enormous thanks goes to Erik Sandgren and his work-study who have been working on this design. Bring your own t-shirt, and we will spray this year's Fish Lab stencil onto it.

Want to get involved? As always, we have our regular volunteer hours Mondays and Wednesdays 3-4pm, and Saturdays from 8am until around noon. Even if you are not sure you want to commit to being a regular volunteer, you are welcome to join us for a day to find out what it is all about. For the Fish Lab, like all environmental stewardship, all you need to do is show up.



This picture is from Erik Sandgren's website, the painting is currently on display at the Polson Museum.

<http://www.eriksandgren.com/portfolio/oils-acrylics>