Hey Everybody,

It is February and Spring is about to do it's thing. If you walk into the Fish lab and it smells fishy, there is a good reason for this. Halfway through January GHC got five thousand new members as our Coho started hatching.

That's right our eggs have hatched and are currently in the alvein stage of development. At this stage the young salmon do not eat regularly but feed off a yolk sac. In the next few weeks, the fish will "button up" (deplete the yolk sac) and be ready to be transferred to indoor raceways. While the volunteers wait for this stage of development they find themselves working outside more along the trail system of Lake Swano, or expressing themselves creatively inside the Fish Lab. Here are some of the cool new collaborations and projects we are working on while we wait for our fish to emerge:

1. **Student Art Projects, and a Collaboration with Erik Sandgren for his Fall 2016 Courses**
2. **Collaboration with Janet Parker in Grounds, and with Todd Bates in Forestry to work on restoring our trails**
3. **Research Progress**

Bringing Art and Science Together for Interdisciplinary Activities. There are two new murals around the Fish Lab. Volunteer Nick Neely decorated the front of the Koi pond earlier last month with a portrait of Koi and water lilies. After seeing his work around the hatchery, we decided to recruit more creative minds, beginning with Kasia Tugaga. If you walk by the Microbiology lab you will see an example of her creative skills applied to Biology in the form of a mock awareness poster for the zombie apocalypse, for which she used real biological concepts and genetic mechanisms to inspire her work.

More recently, Kasia has been painting Charlie the Choker on the back wall of the Fish Lab, and the progress is great! She has been given the wall next to the African Cichlid tank for her next project and we cannot wait to see what she has in store for us. With a few more wall spaces available, if you have an interest in creating a small mural that ties together science and art, please get in touch. We are particularly interested in work that focuses on the rich history of Grays Harbor, its intersection with our ecosystem, and how we can create a more prosperous future by finding an equilibrium between nature and industry.


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If anybody is an expert on this particular subject, it is our very own Erik Sandgren. You have likely seen his work around town, whether at a showing or as you drive by the Nirvana mural. We are very excited to announce that we will be working with Mr. Sandgren as we continue to restore the Aquaculture building, and that he will be working with his 2016/2017 students to create a mural that wraps around the exterior of the building.

Collaborations to Restore the Trails for Educational and Recreational Use. Over the past month the Fish Lab volunteers have been taking to the trails to identify ways to restore this educational and recreational resource for use by our community. The volunteers began by cleaning up trash that was laying around the lakes ecosystem, and have moved on to setting up Saturday work parties to help keep the trails safe for everyone that uses them.

Through collaborations with Janet Parker in Grounds, and Todd Bates in forestry, we have identified small projects that have a large impact for those who frequent the trails. Having seen quite a few joggers during our trash clean ups, we identified re-treading the bridges as a priority and have been working with Ms. Parker to complete this task. This has already been noticed by members of the community who use the trails for their morning run; several of whom have thanked us as they jogged by. Ms. Parker is also working with us on our next project, which is to rebuild the outdoor classroom benches. Although our volunteers are dedicated and willing to learn, Ms. Parker has become a necessary team member considering her expertise and experience. Thank you to Janet Parker, Zach Miller, Tim and Anita Plagge, Tom Kuester, Roneathe Lee, and Joe Kalisch for all the hard work!

While the re-treaded bridges are nice, after the past few wind storms you might not have been able to access the trails to get to them. Several trees had fallen across the trails, making some of them difficult to navigate. The operation of a chainsaw is not innately safe, and it is something that needs to be taught to the operator to ensure they are using the tool in a safe manner. Luckily, Todd Bates trains his Forestry students in just that skill, and last Friday they put their education to work.

We would like to thank Mr. Bates and his exceptional students for their outstanding work, which has functionally re-opened the trails for many community members. I am personally looking forward to working with Mr. Bates in the near future, as he has offered to educate us on invasive plants so we can help remove them in the months to come. Stay tuned to hear more about invasive plant removal days, or drop by during our regular volunteer hours to help us work toward restoring this amazing resource for our community.

Progress on the Research Front. It has been almost a year, now, since I began to refocus my research efforts from infectious diseases to subjects relevant to our ecosystem. Although microbes remain my one true love, I have been working with students to identify ways in which we at GHC can use basic biological research to learn more about our ecosystem.

The first project that has emerged is a look into the genetic diversity of our salmon. Although initially focused on microsatellite analysis, our background research of the primary literature has led us to a gene responsible for innate resistance to microbes in *O. kisutch* (Coho salmon). This particular gene is highly conserved, and is even present in the human genome. From a genetics standpoint, this is indicative of something incredibly important to survival. Interestingly, this gene has never been sequenced, analyzed, or characterized in *O. kisutch*. We have obtained a partial RNA sequence of this gene, published by a research group in Brazil, and aligned the

reverse transcript of that sequence to known *O. mykiss* (Steelhead) sequences. Using this information, we are hoping to create a series of primers that will enable us to find the entire genomic DNA sequence for the gene in our very own fish. This student lead project, headed up by Joe Kalisch, has the potential to identify incredibly important information for the field.

The second project, with Gideon Fadele as the lead, is the bioinformatics characterization of transmembrane proteins presented by common salmon pathogens. Gideon has been focusing his work on *Aeromonas salmonicida*, the bacteria responsible for furunculosis, and has identified several potential epitopes that may be useful both to understand the disease and fight against it. As a first year student, Gideon's progress is incredibly impressive and I am looking forward to seeing where his work leads us.

Finally, the task remains to identify members of the microbiome here in Lake Swano. To do this, April Bacongco, Sam Richardson, and Cassie Nylander have been putting in time managing the microbes and helping BIO260 students with their identifications. These students have been excellent resources and peer mentors to my BIO260 course, and I know that my students have greatly benefited from their presence this quarter.

Thank you to all of my research teammates: Joe Kalisch, April Bacongco, Cassey Nylander, Samantha Richardson, Gideon Fadele, and of course Kathy Kaires, without whom very little is possible. ☺

There is always something new going on down at the Fish Lab, feel free to drop by for our regular volunteer hours on **Mondays and Wednesdays beginning at 3pm, and Saturdays beginning at 8am**. If you know somebody who would be interested in what we are doing, feel free to pass our newsletter along. If you would like to be removed from our mailing list, please reply to this email with "unsubscribe".

Amanda Lyn Gunn, Ph.d.
Biology Instructor
Grays Harbor College
amanda.gunn@ghc.edu