NOAA FISHERIES

Alaska Fisheries Science Center

Little Port Walter Research Station 2023 Year in Review

Core Personnel

Charlie Waters
Station Manager

Heather Fulton-Bennett
Station Biologist

Brad Weinlaeder
Facilities

Andrew Gray
Supervisor

Photo: Heather Fulton-Bennett

2023
By the Numbers

44
People

8
Research Projects

6
Vessels in Operation

24
SCUBA Dives Logged

Personnel

8 AFSC scientists

1 NOAA Hollings Scholar

1 Alaska Sea Grant Fellow

1 graduate student (UAF)

1 Alaska Native Science and Engineering Program (ANSEP) intern

1 visiting scientist (UAF)

3 visiting staff from Alaska Department of Fish and Game (ADFG)

6 visiting staff from the Northern Southeast Regional Aquaculture Association (NSRAA)

2 visiting staff from the Marine Exchange of Alaska (MXAK)

1 NOAA Dive Instructor

4 volunteers

4 contractors (2 science, 2 facilities)

8 facilities staff (4 ABL, 1 Seattle, 3 NOAA HQ facilities)

3 administrative staff (2 ABL, 1 AFSC Seattle)

Vessels

RV Katmai

LPW 1 ("The Munson")

"The Work Barge"

R/V Sandlance

R/V Steelhead

R/V Seahorse

LPW staff and volunteers collect adult Chinook salmon from a purse seine

Research Projects

Development of an ocean-type broodstock of Chinook salmon for Alaska

All hatchery Chinook salmon in Southeast Alaska are stream-type; they spend two years in the hatchery before release into saltwater. LPW and NSRAA aim to develop an ocean-type stock of Chinook for hatcheries, which are released after just one year. If successful, the ocean-type broodstock would drastically reduce operating costs of Chinook salmon aquaculture activities in Alaska. In 2023, saltwater tolerance experiments were conducted on juvenile Chinook to assess their survival, blood chloride levels, and ATPase activity, which will inform optimal rearing protocols. In addition, gametes from 247 female and 387 male Chinook (~1.7 million fertilized eggs) were collected at LPW to continue this project. This work is led by Andrew Gray and Drs. Charlie Waters (ABL/EMA) and Heather Fulton-Bennett (ABL/LPW) in collaboration with NSRAA.

Oysters for Alaskan mariculture

In partnership with Pacific Hybreed, AFSC researchers led by Dr. Jordan Hollarsmith (AFSC Mariculture lead) and Henry Fleener (AFSC) began testing the efficacy of oyster mariculture at LPW by collecting water samples to quantify phytoplankton abundance and diversity as well as deploying experimental arrays of juvenile oysters in cages to track performance at different cage densities and locations. In 2024, a full cohort of pacific oysters will be deployed at LPW with data collected from those oysters informing future crossbreeding designs.

Effects of climate change and competition on condition of juvenile steelhead

Long-term data sets of environmental conditions and abundances of salmonids are being used to assess the impacts of climate change and competition on body condition of outmigrating steelhead smolts at LPW, which has implications for understanding population productivity in Southeast Alaska. This work is led by Emma Rudy Srebnik (2023 NOAA Hollings Scholar) and Dr. Charlie Waters.

ABL - Auke Bay Laboratories
AGP – Age & Growth Program
NCCOS – National Centers for Coastal Ocean Science
REFM – Resource Ecology & Fisheries Management
LPW – Little Port Walter Research Station
EMA – Ecosystem Monitoring & Assessment
PFAS – per- and polyfluoroalkyl substances
RMIS – Regional Mark Information System

Quantifying PFAS compound concentrations in juvenile and adult coho, pink, and Chinook salmon

PFAS are a growing class of man-made chemical compounds used in a wide range of commercial applications. Levels of PFAS compounds from LPW (relatively pristine) and Auke Creek (relatively urbanized) are being compared to assess their bioaccumulation potential in commercial fish stocks. This work is led by Drs. Felipe Arzayus, Ed Wirth, and Tony Pait (NCCOS).

Pacific Salmon Treaty (PST) management of Chinook salmon

The Little Port Walter Chinook salmon research program contributes key data for estimating harvest rates by commercial fisheries in Southeast Alaska and PST management. The 45+ year time series also aims to understand the impacts of climate change on salmon population productivity and ecology. In 2023, 1545 adult Chinook salmon were caught and processed for length, weight, sex, genetic samples, and fin clip status at LPW. 599 coded wire tags were retrieved and identified for fish age, stock, and inclusion in the coastwide RMIS database of tags recovered in fisheries and escapement. This work is led by Andrew Gray and Drs. Charlie Waters (ABL/EMA) and Heather Fulton-Bennett (ABL/LPW).

Understanding changes in salmon phenology due to climate change using long term datasets from LPW

This work is led by Dr. Charlie Waters (ABL/EMA) and past NOAA Hollings Scholar Julia Kischkat and will aid in understanding how populations in the region will respond to changing environmental conditions.

Development of spectroscopy tools to rapidly assess critical life history and energetic responses of groundfish

Juvenile Walleye Pollock and Pacific Cod are being raised at LPW to provide known age fish under controlled conditions for calibration model development, as well as age and growth research for broader fisheries management. This work is ongoing and led by Drs. Tom Helser and Esther Goldstein (REFM/AGP), with LPW sampling and collections led by Dr. Heather Fulton-Bennett (ABL/LPW). ANSEP student Aksiin Storer worked with staff to understand rates of mortality in these experimental populations.

Understanding reproductive phenology of the ESA listed sunflower star

Pycnopodia helianthoides is a keystone species in much of its range along the west coast. After many populations were wiped out by Sea Star Wasting Syndrome in 2014, efforts are being made to better understand their reproduction to aid in recovery efforts. LPW's healthy population of sunflower stars is critical in adding samples of adult and juvenile stars that are rare at other locations. The work at LPW is led by Dr. Heather Fulton-Bennett (ABL/LPW) and is in collaboration with Oregon State University and USGS.

Facilities Improvements

- New lighting controls were installed to aid in examining the effects of day length on smoltification
- Installation of a new generator to improve power security and stability
- LPW1 "The Munson" was fitted with a new transponder to improve fish sampling abilities
- SCUBA dives were carried out under the Wakefield and LPW float systems to inspect water and anchor lines

Publications

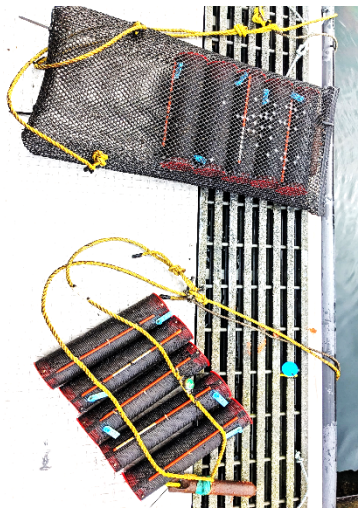
- Howe, N.S. 2023. Genomic evidence for hatchery-induced domestication selection in Chinook Salmon, *Oncorhynchus tshawytscha*. Masters Thesis. Texas Christian University, Fort Worth, TX, USA.
- *In review.* Hollarsmith, J.A., et al. "Strategies to deter Pacific herring (*Clupea pallasii*) from aquatic farm infrastructure."
- *In review*. Howe, N., Waters, C.D., et al. "Genome-wide signatures of domestication selection in Chinook salmon across three hatchery-wild population comparisons."

Running Total: 216!

Hollings Scholar Emma Rudy Srebnik dissects juvenile Chinook salmon to sample ATPase concentrations

Juliana Cornett (EMA/Genetics) and Andy Gray (EMA) use minnow traps to sample juvenile coho salmon for PFAS compounds

Dr. Charlie Waters (EMA), helps remove adult Chinook salmon from a purse seine



Experimental oyster cages
All Photos: Heather Fulton-Bennett

Gina M. Raimondo
U.S. Secretary of Commerce

Richard W. Spinrad
Under Secretary of Commerce
for Oceans and Atmosphere

Janet Coit
Assistant Administrator
for Fisheries

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