

Bozeman Staff

March 2020

Fish Technology Center

George Jordan, Acting Complex Director

Zach Conley, General Biologist

Cal Fraser, Fish Biologist

Dr. Gibson Gaylord, Physiologist
(Lead Researcher-Diet and Nutrition)

Jon Gilleen, Maintenance
Mechanic

Jason Ilgen, Biological Science
Technician

Kevin Kappenman, Research Fish
Biologist (Lead Researcher-Fish
Passage)

Sharri Lunde, Administrative
Assistant

Dr. Wendy Sealey, Physiologist
(Lead Researcher-Diet and
Nutrition)

Matt Toner, Fish Biologist (MGMT)

Dr. Molly Webb, Fish Biologist
(Lead Researcher-Reproductive
Physiology)

Bozeman Fish Technology and Health Complex



March Report – FTC Highlights:

Stepping in to help:

A research collaborator came to us after the commercial company they had hired to produce feed was unable to successfully pellet the formulation. The BFTC nutrition group, Zachariah Conley, Gibson Gaylord, Mark Portman, and Wendy Sealey manufactured, packaged and shipped 150 kg of 1 mm practical-type salmon feed so that the research group could conduct their experiment without further delay.



*One millimeter feed pellets created by Bozeman Fish Technology Center staff.
USFWS Photo-Wendy Sealey*

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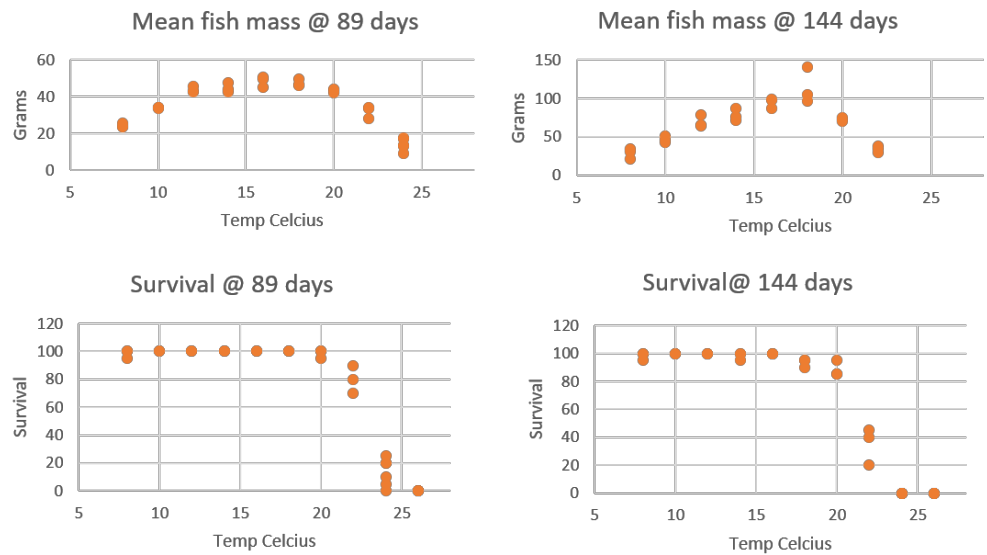


Bozeman FTC staff Wendy Sealey (top right), Matt Toner (top left) and Cal Fraser collecting and recording data as part of the Artic Grayling Thermal Optima Trial. Photo USFWS-Gibson Gaylord

Artic Grayling Thermal Optima Trial:

The fish-rearing portion of the Artic Grayling thermal optima trial was completed. Plasma and erythrocyte samples were collected for blood chemistry analysis and expression of thermal stress related genes.

Future work will include laboratory analysis of whole fish proximate composition and condition indices assessments, along with statistical analysis of upper lethal temperature and optimal culture temperature; and plasma and erythrocyte sample analysis. For more information, please contact Dr. Gibson Gaylord.



Growth curves (top row; grams per fish) and mortality curves (bottom row) developed as part of the Artic Grayling Thermal Optima Trial. These data are considered preliminary and not for citation.

Naturally Recycled Proteins digestibility Trials:

Ten, 50 kg portions of 4 mm diets were manufactured for the Naturally Recycled Proteins ingredient digestibility trial that was initiated March 6th. BFTC staff weighed and counted 30 tanks of Rainbow Trout in early March and started feeding the fish their test diets on Monday, March 9. Wendy Sealey, Zachariah Conley, Gibson Gaylord, Mark Portman and Matt Toner subsequently completed collection of fecal material (practicing safe social distancing) before being moved into telework status.

For more information, please contact Dr. Wendy Sealey.

Pallid Sturgeon Fin Curl:

Pallid Sturgeon at several conservation propagation facilities have experienced fin curl which precludes the hatchery from stocking the animals into the wild as there is evidence that fin curl negatively affects post-stocking survival. This can potentially limit the ability of fisheries managers to adequately meet goals set forth for Pallid Sturgeon recovery. Dr. Molly Webb distributed a questionnaire nationally and internationally to sturgeon and paddlefish conservation propagation and aquaculture facilities that is designed to identify species of sturgeons or paddlefish that experience fin curl, the leading factor(s) hypothesized to cause fin curl, and modifications/changes to the facility or culture environment that have eradicated fin curl.



Left photo: Pallid sturgeon juvenile with fully developed fins. Right photo: Pallid sturgeon juvenile with fin curl. *USFWS Photo—Matt Toner*

Skinny Pallid Sturgeon in the lower Missouri River:

Skinny poor conditioned reproductive-aged pallid sturgeon have been captured between Gavins' Point Dam and the Kansas River (Central Lowlands Management Unit). These emaciated fish were associated with high water years occurring in 2011 with decreasing catch rates of emaciated fish observed in the last several years. In order to try to get a better understanding of potential ecological mechanisms driving poor condition, we partnered with the Ecology Department and USGS Co-op Unit at Montana State University. This study began November 4, 2019. Three replicate tanks of pallid sturgeon (5 fish per tank, total of 45) were reared for each of three varying feed rations: high, medium, fasting. The study concluded March 18, 2020, with all fish, except for one tank of

medium ration fish, being lethally sampled. Samples will be analyzed over the next year. Additionally, in March, a biopsy study was initiated in the some of the remaining pallid sturgeon to assess effects of dermal punches used to collect tissue for contaminant analysis. For more information, please contact Kevin Kappenman.



Pallid sturgeon in a circular tank that were part of the feed project. *USFWS Photo—Cal Fraser*



Juvenile Arctic grayling involved in the thermal optima study. *USFWS Photo—Gibson Gaylord*

Flume Construction:

In order to stay on schedule with the contractors, Jason Ilgen worked in isolation to assemble the full length of flume for proper alignment. Additionally, the flume sump was completed and thus the biggest hurdle of the project has been over-come.



Rebar in flume-sump prior to pouring concrete.
USFWS Photo—Jason Ilgen

Other FTC Happenings:

- During the month of March, about half of the staff moved off-site to begin teleworking due to the COVID-19 outbreak.
- Wendy Sealey participated on a USDA/SBIR Phase I Aquaculture Panel where over 65 grants were reviewed (virtually over three days), proposals were ranked and written panel summaries completed for awarding funding totaling over 1 million.
- Staff participated on numerous calls related to COVID 19.
- February station safety findings were addressed.
- Several new agreements were discussed/coordinated with various partners.
- Schedules were developed for fish culture and building infrastructure personnel to minimize employee overlap on station to help comply with various orders and directives while still ensuring non-telework compatible activities are addressed.
- Several Master's defenses are scheduled for April for students associated with BFTC researchers or research projects.
- Kevin Kappenmen and Molly Webb participated in the Upper Basin Pallid Sturgeon Workgroup spring meeting.



Young Paddle fish at the Bozeman Fish Technology Center.
USFWS Photo—Cal Fraser



Rainbow Trout fry at the Bozeman Fish Technology Center.
USFWS Photo—Cal Fraser

Fish on Station:

LOT NUMBER	TOTAL Number	TOTAL Weight (lbs)	Approximate Length (in)
Pallid Sturgeon	40	40	19
Paddle fish	100	100	16
Rainbow Trout	3000	86	4
Rainbow Trout	2000	333	7
Rainbow Trout	4000	16	2
Rainbow Trout	4000	2	1
Rainbow Trout	700	350	10
Arctic grayling	2000	200	6
Pallid Sturgeon	20	100	32

Fish Health Center

Lacey Hopper, Project Leader

Molly Bensley, Fish Biologist

Rick Cordes, Fish and Wildlife Biologist

Amberly Huttinger, Fish Biologist

Tammy Weiss, Fish Biologist

Renee Yamamoto (Martin), Fish Biologist

Contact Us

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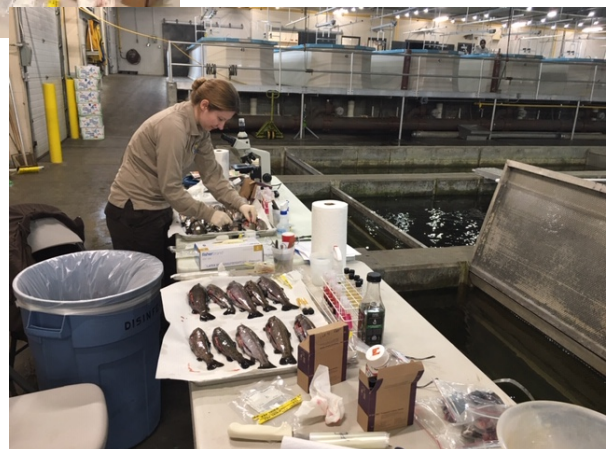
Bozeman FHC March Highlights:

Laboratory Services Supporting Recovery, Restoration and Recreation – Federal Health Inspections:

- Ennis NFH; Virology testing on Rainbow Trout – 3/3/20, 150 fish.
- Jones Hole NFH; Complete inspection on Bear Lake and Bear River Cutthroat, Kokanee Salmon, Tiger and Rainbow trout - 3/3/20, 360 fish.
- Ouray NFH; Complete inspection on Bonytail Chub and Razorback Sucker – 3/4/20, 120 fish.
- Creston NFH; Virology testing on Rainbow Trout – 3/10/20, 60 fish.
- Garrison Dam NFH; Complete inspection on Rainbow and Brown trout and Fall Chinook Salmon – 3/12/20, 360 fish.
- Saratoga NFH; Complete inspection on Lake, Brown, Cutthroat and Rainbow trout – 3/24/20, 540 fish.
- Jackson NFH; Complete inspection on Cutthroat Trout – 3/26/20, 60 fish.
- DC Booth; Complete inspection on Rainbow Trout – 3/31/20, 60 fish.



Bozeman FHC Fish Biologist, Renee Yamamoto collecting samples at Garrison Dam NFH. Photo: USFWS/L. Hopper



Laboratory Services Supporting Tribal Trust – Health Inspections:

- Big Springs Ute Tribal Fish Hatchery; Complete inspection on Rainbow, Brown and Tiger trout – 3/2/20, 360 fish.

Some nice fish reared at the Big Springs Ute Tribal Hatchery! Photo: Big Springs Hatchery/Dave Chapoose



Laboratory Services Supporting Partner Recovery, Restoration and Recreation:

- Continued collaborating with ES, USGS, Gavins Point and Jackson NFH's to develop additional genetic microsatellite markers in support of Kendall Warm Spring Dace recovery
- Montana Fish, Wildlife and Parks; Complete health inspection services on 8 different cold, cool and warm water species from 3 State Fish Hatcheries, 780 fish.
- Missouri River Sturgeon Iridovirus (MRSIV) testing on 60 Pallid Sturgeon from Miles City SFH, MT by conventional and real-time PCR
- Wild Fish Survey-Montana;
 - Big Hole River- Brown Trout complete health inspection and histopathology diagnostics
 - Willow Creek Reservoir- Rainbow and Brook trout complete health inspection (pre-testing before egg transfer to Ennis NFH)

The National Wild Fish Health Survey
USFWS sponsored program that examines free-ranging fish to better understand the national distribution of fish pathogens.



An associated database stores, compiles, and permits queries of information gathered during fish examinations.

<http://www.fws.gov/wildfishsurvey>



Partnerships, Employee Development & Upcoming:

- Due to COVID-19, all travel to hatcheries for annual fish health inspections was suspended. Biologists from the Wyoming Game and Fish Department's Fish Health Lab graciously traveled to and collected tissue samples for Saratoga NFH's large inspection. This was a great example of how important strong partnerships are!
- Staff collaborated with Montana Fish, Wildlife and Parks on reviewing and editing a book chapter on Proliferative Kidney Disease (PKD) as requested by scientists from Michigan State University
- As requested by NPS biologists, joined the Yellowstone Cutthroat Trout Workgroup meeting held March 4th-5th held at the Bozeman FTC to initiate additional collaborative wild fish health sample collections with partnering agencies. Held a fish health Q&A session with agencies in attendance
- Staff participated in a conference call with the Whitney Genetics Lab in LaCrosse, WI and the USFWS R5/7 Regional Office to plan for future Asian carp eDNA surveillance at Bozeman FHC
- Staff will participate in the Wyoming Toad Recovery Team online Spring meeting April 23rd
- Completed the final technical report for Erwin NFH's (TN) Rainbow Trout broodstock genetic strain testing. This work was also completed for Ennis NFH in 2019. BFHC is now working with the USFWS Northeast Fishery Center on expanding genetic strain testing to additional broodstock facilities via a system-wide 1311 project proposal

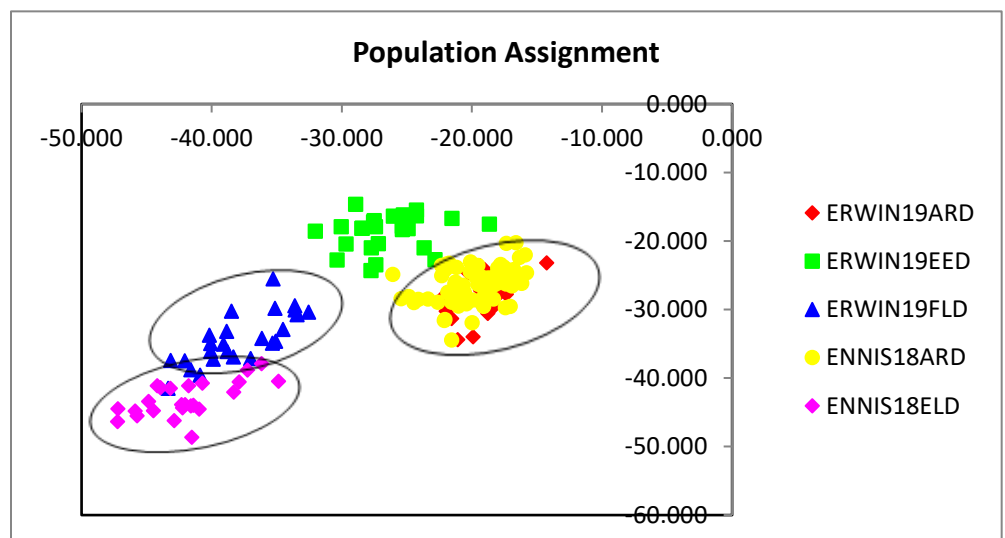


Figure 1 (from Erwin NFH final report): Population assignment summary graph of five groups of Rainbow trout created using GenAEx 6.5 (Peakall and Smouse 2006, 2012). Credit: Renee Yamamoto, USFWS Bozeman FHC