

Bozeman Staff

2019

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Bozeman Fish Technology and Health Complex



October/November Monthly Report - FTC



Dr. Gibson Gaylord manufacturing feed

The Bozeman FTC Diet and Nutrition program worked with partners from USDA-ARS (Agricultural Research Service), USDA-NIFA (National Institute of Food and Agriculture) and University of Idaho to continue developing specialized salmonid diets utilizing soybean meal as an alternative ingredient. In addition, organic acids and essential oils are being investigated as feed additives to potentially reduce the use of antibiotics. Multiple feeding trials with rainbow trout are currently in progress.



Arctic Grayling

System-Wide 1311 Funding Project Update – Bozeman FTC is evaluating thermal tolerance and optimal temperature ranges for Arctic Grayling (*Thymallus arcticus*). Eggs were obtained from Montana Fish, Wildlife and Parks, hatched at the FTC and grown to approximately 10 g. In late October, they were moved into the thermal unit, conditioned to the tanks for 1 week after which a temperature ramp profile of 1 °C

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per day was initiated to attain target temperatures of 8 to 24 °C. The temperature trial will be run for 16 weeks to assess survival, growth rates, and feed efficiency.



Bonytail Chub

System-Wide 1311 Funding Project

Update - Bozeman FTC is refining dietary protein-energy ratios for Bonytail Chub (*Gila elegans*). Eggs were received from

Southwestern Native Aquatic Resources and Recovery Center, to Bozeman FTC where they were hatched and reared on enriched *Artemia* and transitioned to dry feeds for feeding trials of 6 diets. Diets were manufactured at the BFTC and shipped to Ouray NFH Grand Valley and Randlett Units the week of November 4th to initiate hatchery feeding trials.



Adult Pallid Sturgeon

Researchers from Montana State University and Bozeman FTC are collaborating to investigate the ecological mechanisms underlying the occurrence of emaciated adult Pallid Sturgeon. Development of a research, monitoring and evaluation program for stream-side health and

condition assessment of adult Pallid Sturgeon is also underway.

Additional FTC News:

Fish Passage Flume-Concrete work was scheduled to begin Nov. 1st but is currently on hold until contractors are caught up on other projects.

Mentoring- Five Montana State University graduate students are being mentored by FTC research staff.

Employee Development- Dr. Wendy Sealy attended a workshop at Verily Life Sciences in San Francisco to learn about the nutritional needs of cultured sterile mosquitoes in the fight against mosquito-borne illnesses.

Hosted a meeting for Regional Refuge Administrative Officers and budget analysts.



New FTC Fish Passage flume waiting to be assembled!

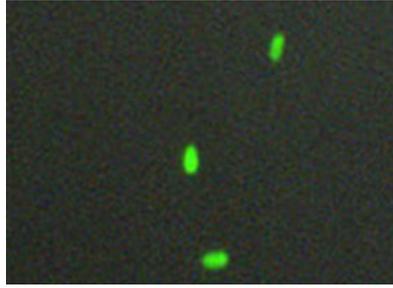
October/November Monthly Report – FHC

Laboratory Services:

- Fall Chinook spawning at Garrison NFH-full inspections
- Garrison NFH-Adult Pallid Sturgeon mortality assessment (frozen tissue); Gas bubble disease assessment
- Lake and Brown Trout spawning at Saratoga NFH- Ovarian fluid testing by virology
- Kansas Department of Wildlife, Parks and Tourism- Virology for 386 fish, 11 species at 3 sites
- Montana Fish, Wildlife and Parks- 501 virology samples, 48 bacteriology samples from 4 species, 5 sites
- DC Booth *Yersinia ruckeri* (enteric redmouth disease) environmental DNA (eDNA) monitoring-bacterial culture
- 240 heads screened for Whirling Disease
- Completed bacteriology from Rocky Mountain National Park wild fish survey; *Renibacterium salmoninarum* (bacterial kidney disease) detected by DFAT



Fall Chinook spawning at Garrison



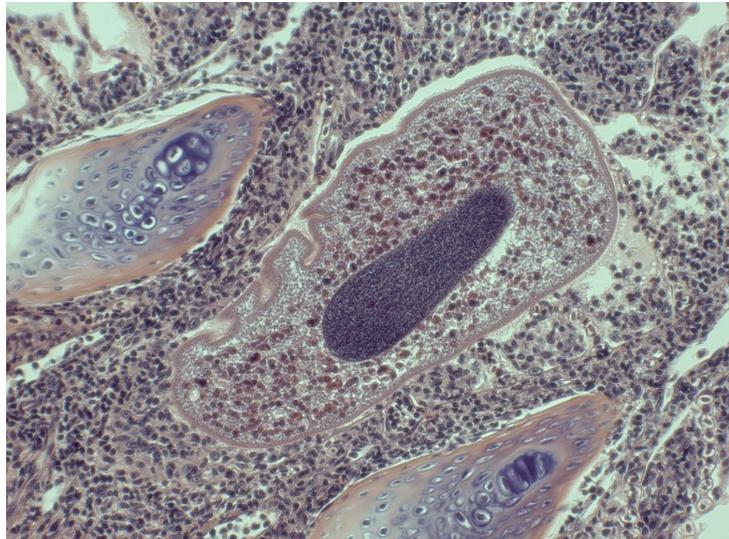
Renibacterium salmoninarum positive by DFAT (Direct Fluorescent Antibody Test)

- Molecular Biology/PCR/Genetics-
 1. Non-native salmonid eDNA real-time PCR screening from Rocky Mountain NP in collaboration with CO FWCO - Greenback cutthroat recovery
 2. Bd (chytrid fungus) PCR screening for four groups of captive Wyoming toads at Leadville NFH. All samples were negative for Bd
 3. Real-time PCR screening of samples collected from Rocky Mountain NP and three sites on the Cache La Poudre River for *Renibacterium salmoninarum* and *Tetracapsuloides bryosalmonae* (PKX parasite). Brook trout and brown trout from the Cache La Poudre River were Rs positive. All samples were PKX negative.
 4. DC Booth experimental *Y. ruckeri* eDNA surveillance of 4 sites by PCR. None detected.



ABI 7500 Real-Time PCR System

- Histopathology-
 1. Year 4 of the Hagerman hatchery steelhead Recirculating Aquaculture System (RAS) vs. standard raceway study was completed.
 2. Juvenile Colorado pike minnow samples collected at Ouray NFH - gill irritation diagnostic.
 3. Frozen adult pallid sturgeon morts from Garrison NFH. Cellular changes in the tissues due to being frozen and post mortem resulted in no pathology determination.
 4. FHC staff assisted the Bozeman FTC by sectioning and preparing slides for a reproductive physiology research project for Dr. Molly Webb.



Ichthyophthirius multifiliis parasite (center) in steelhead gill tissue - H&E Stain



Renee Yamamoto and Rick Cordes (BFHC) Sampling in Rocky Mountain National Park with Chris Kennedy, COFWCO