

Bozeman FTC Staff

Fish Technology Center

Jeff Powell, Center 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
Officer

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

Matt Toner, Fish Biologist (MGMT)

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

Kyle Moon, Seasonal Biological
Science Technician

Bozeman Fish Technology and Health Complex



September Report – FTC Highlights:

The Bridger Foothills Fire was detected at approximately 3:00 pm on Friday, September 4th. Within hours, helicopters with water bucket drop equipment and planes dropping fire retardant were dispatched. Even with the rapid response on Friday, unfavorable weather conditions including high winds developed Saturday afternoon and evacuation notifications and procedures soon followed.



Evening photo, Friday Sept. 4th, of the fire moving up past the “M” directly across from the BFTC. This photo was taken ¼ mile west of the BFTC.

Over 50 agencies traveling from Tri-Cities, Washington to Sioux Falls, South Dakota assisted in the fire-fighting efforts. The cooperative effort between state, federal & tribal agencies, law enforcement and fire crews was an impressive process. We are extremely thankful for the fire-fighting crews who put their lives on the line during this wildfire, and for those who supported the crews as well.

Contact Us:

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Above: Fish Biologist, Zac Conley is collecting blood samples for lab analysis. Below: Mark Portman is collecting liver and intestine samples. The experiment conducted was examining the use of feed additives to alleviate the use of antibiotics.



Friday afternoon approximately 6:00 pm. Photo taken from the BFTC yard.

Fish Passage:



The first (shorter) denil fish ladder being lowered into the flume for Arctic grayling trials. The experimental ladder was constructed out of wood with removable dam slots so a variety of fish species and sizes could be evaluated.

Pictured right, are native Westslope cutthroat that were transferred to the BFTC. The fish will be PIT tagged and next in line to be exposed to various flows and fish ladder configurations.





This mountain lion cruised through at 5:30 am on Drinking Horse Mountain.



After fish are exposed to the flume holding area for 24 hours, a gate is opened and fish are allowed to navigate through the entire flume channel. Here, a group of grayling is stacking up just below the first step in the experimental flume. PIT tag antennas are located at several locations throughout the flume channel recording fish as they travel.



Pictured above, FTC staff are working on cleaning the public display pond. Jon Gilleen, a member of the Bridger Canyon Fire Dept., drove one of the department's remote fire engines to assist. The fire engine recently had some repairs completed to the water pump, so this cleaning effort gave Jon an opportunity to test the engine's pumping capability



The Sacajawea Audubon Society spent two weekends removing noxious weeds around the facility. These volunteers removed over 800 pounds of burdock plants, that when flowering can be lethal to birds. Station employee Kyle Moon assisted with the weed removal.

Other FTC Happenings:

- Wendy Sealey was invited to serve as a reviewer for the research council of Norway.
- Wendy Sealey and Gibson Gaylord participated in AADAP's semi-annual IACUC meeting.
- Wendy Sealey manufactured bluehead sucker fish feed for the newly developed program at the Fisheries Experiment Station located in Logan, Utah.
- Gibson Gaylord provided technical assistance to Andrew Phipps, White Sulphur Springs NFH for feed analysis on WSS-NFH custom feed for Big Sandy crayfish (threatened) as a surrogate for future trials with Guyandotte River crayfish.
- Completed a feeding trial for an alternative to antibiotics research project. Laboratory analysis of samples and the bacterial coldwater disease challenge portion of the trial is on-going. Contact Gibson Gaylord for information, see below for details of project.
- Staff worked on several pending manuscripts to be submitted for publication, as well as providing peer reviews of submitted manuscripts.
- Submitted an import permit for Kendall Warm Springs dace to Montana Fish, Wildlife and Parks.
- Began sterilizing the main water systems and performing general maintenance in the containment building.

“Alternative to Antibiotics Research: The use of organic acids and essential oils in rainbow trout and hybrid striped bass feeds to alleviate the use of antibiotics.”

In efforts to minimize antibiotic use, alternatives to antibiotics (ATA) have been examined across animal agriculture, including aquaculture. Two promising feed additive classes are organic acids and phytogenic compounds (essential oils). The mode of action of differing additives are not fully described but have shown varied success as antimicrobial agents based on bacterial type. A collaborative team is testing the efficacy of organic acids and essential oils against bacterial infections in fish. Feeds were utilized to culture hybrid striped bass and rainbow trout, respectively. Feeding trials have been completed and pathogen challenges against *streptococcus iniae* with hybrid striped bass and *Flavobacterium psychrophilum* with rainbow trout are pending. Dietary essential oil compounds and organic acids will be validated with LC-MS. Samples of gut, kidney, serum, and liver will be examined for changes in expression of inflammatory/immunological genes and changes in concomitant protein activity.

Bozeman Fish Health Center

September, 2020 Highlights:

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

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

- Garrison Dam NFH; Batch #2 of nanobubble degassing study fish, 20 live RBT for necropsy/comprehensive health analyses and 20 fish for histological examination.
- USGS-NOROCK, Bozeman MT; Received 19 frozen mountain whitefish, *Prosopium williamsoni* and mountain sucker, *Catostomus platyrhynchus* from the Yellowstone River in MT for *Tetracapsuloides bryosamonae* PCR testing. These samples were submitted as comparison with environmental (eDNA) samples collected and analyzed by USGS.



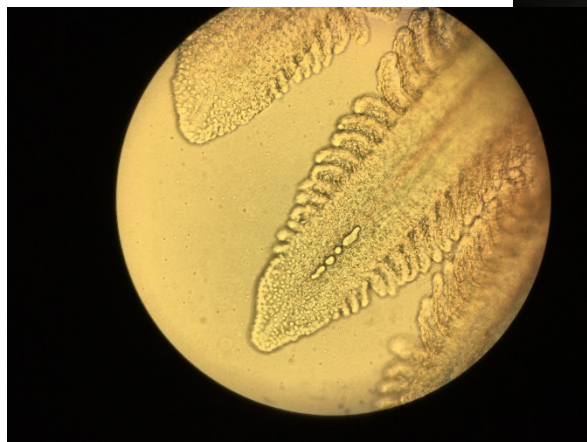
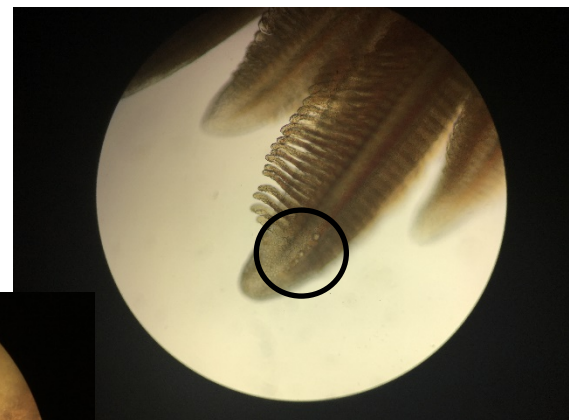
Fin erosion on a rainbow trout from Garrison Dam NFH. Fin quality is a monitored parameter during the nanobubble degassing study. Photo: L. Hopper.

Contact Us

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Visit us on the web!
<https://www.fws.gov/mountain-prairie/fisheries/fhc.php>

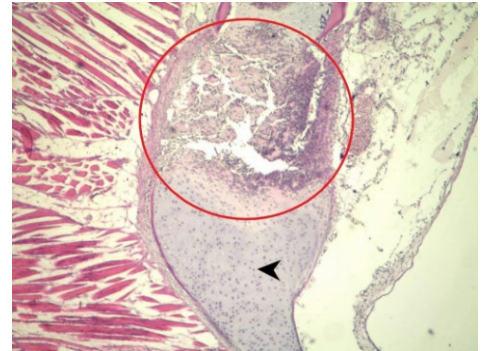
Gas bubbles in rainbow trout gills from non-nanobubble treated water. Photo: L. Hopper.



Fish Health Diagnostic and Histopathology Support for NFH's and Partners:

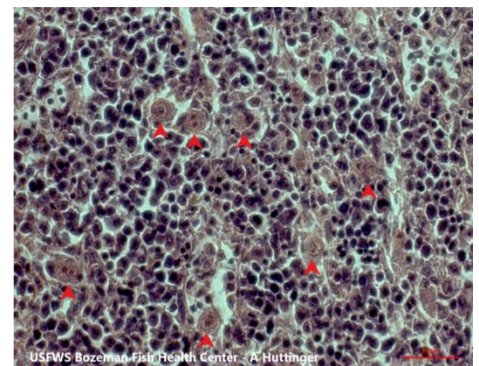
- Comprehensive diagnostic testing and histopathology was completed for 2 LR6 NFH's on cutthroat and rainbow trout. Coldwater disease and steatitis (inflammation of fatty tissue) was identified in one and overall health was checked following a feed treatment at another.

Right: Cartilage lesion (red circle) and normal cartilage (black arrow) - H&E Stain. Photo: A. Huttinger.



Left: Histologist, Amberly Huttinger reading stacks of histology slides. Photo: T. Weiss

- University of Idaho – Aquaculture Research Institute – Completed histological analyses and reporting for a rainbow trout diet study.
- Yellowstone River and Shields River, MT – Montana State partners requested assistance in confirming the cause of mortality in native mountain whitefish. *Tetracapsuloides bryosalmonae* (formerly PKX) which causes proliferative kidney disease (PKD) was identified by histology and confirmed by real-time PCR. This is the same pathogen that caused a large-scale mountain whitefish die-off in the Yellowstone River identified in 2016 by Bozeman FHC. See the story on NBC Nightly News at:



Tetracapsuloides bryosalmonae parasites (red arrows) in MWF kidney tissue – H&E Stain. Photo: A. Huttinger

<http://www.nbcnews.com/nightly-news/video/nearly-200-miles-of-yellowstone-river-closed-as-parasite-threatens-wildlife-751204931788>

Laboratory Inspection Services Supporting Partner Recovery, Restoration and Recreation:

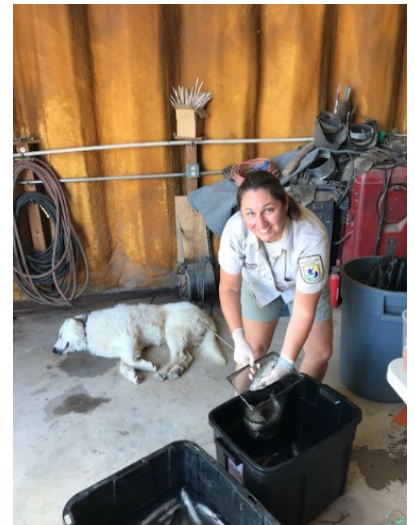
- Montana Fish, Wildlife and Parks; Health inspections and Certifications on rainbow trout, brook trout and yellow perch from 1 State facility, 2 creeks and 1 lake in MT – 420 fish.
- Utah Division of Wildlife Resources; Requested whirling disease molecular testing on salmonids from 2 creeks in UT – 90 fish. Provided assistance in troubleshooting UDWR's whirling disease PCR protocols.
- Black Canyon Trout Hatchery, ID; With assistance from Ron Hopper at Ennis National Fish Hatchery, BFHC provided a complete health inspection for hatchery certification on rainbow and cutthroat trout in support of private, State and Tribal recreational fishing programs – 300 fish plus 150 ovarian fluid samples.



Above: Cutthroat trout brood fish from Black Canyon Trout Hatchery, ID. Right: Lacey Hopper collecting fish health samples. Photo: R. Hopper



Hatchery mascot, Duke was great help at the Black Canyon inspection!
Photos: L. Hopper & R. Hopper

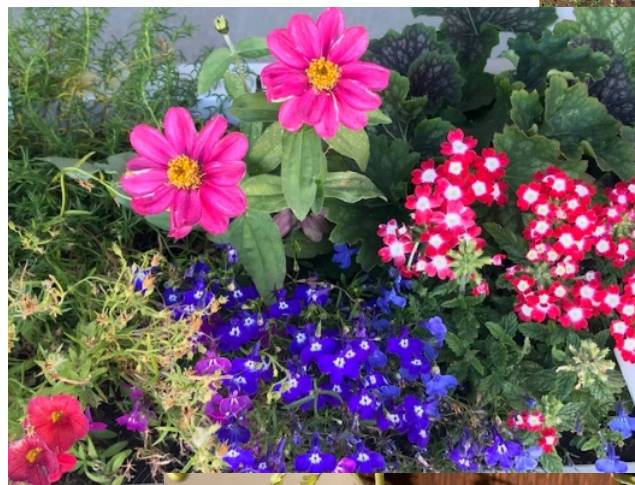


Outreach and Education:

- Due to unusually warm fall weather, we (and our pollinating friends) continue to enjoy the beautiful pollinator garden kept up by BFHC fish biologist, Tammy Weiss. We are still harvesting our cherry tomatoes!



September flowers still in bloom in the pollinator garden.
Photo: L. Hopper



FHC visitor, Cameron Hopper holding up his bee inspired by the BFHC pollinator garden!
Photo: L. Hopper

Partnerships, Employee Development & Other News:

- Staff continued working on a QA/QC draft plan for upcoming Missouri River Asian carp eDNA surveillance at Bozeman FHC in FY21, and joined a webinar on Asian carp eDNA GIS mapping.
- FHC staff participated in weekly Teams video calls to maintain station communication and camaraderie while remaining socially-distanced.
- Staff participated in a FHC Teams safety training on wildfire smoke inhalation and its effects on health. Staff also completed a portable fire extinguisher use refresher training via YouTube.
- Renee Yamamoto continued working on a Kendall Warm Springs Dace conservation genetics manuscript draft.
- Tammy Weiss continued participating in the USFWS Community of Practice (COP) for Pollinator Conservation and processed hundreds of histology slides.
- Rick Cordes participated in calls and emails regarding the new LIMS database implemented at FHCs.
- Amberly Huttinger, Tammy Weiss, Molly Bensley, Rick Cordes and Renee Yamamoto all worked on an experimental staining technique to detect the parasite *T. bryosalmonae* from frozen kidney tissue.
- Lacey Hopper participated in the Aquatic Animal Drug Approval Partnership (AADAP) Program's semi-annual IACUC review.
- BFHC completed and submitted FY21 budget projections to the Regional Office for review.

