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

July Report – FTC Highlights:

MSU Master's candidate Sierra Quinn and MSU Technician Joshua Heisman were trained in procedures to create a homogenized sample for proximate analysis from whole body carcasses of adult pallid sturgeon. After training by Zachary Conley MSU staff prepared samples from 45 adult pallid sturgeon that were sampled in a diet manipulation study. The Proximate analysis samples will be used to compare the effects of diet rations on adult sturgeon energy reserves, determine the efficacy of using a Distell Fat Meter to measure energy reserves in adult sturgeon, and develop an extensive suite of health assessment variables for prediction of whole body energy content of pallid sturgeon. For more information, please contact **Kevin Kappenman**.

Kevin Kapenman and the fish passage team submitted a manuscript titled "Flow control plates to manage Denil fishways in irrigation diversions for upstream passage of Arctic grayling" to the ASCE Journal of Irrigation and Drainage Engineering.

Contact Us:

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High efficiency cartridge filters and pleated pre-filters were installed as an upgrade in the office and laboratory HVAC air handling units. These were sourced following guidelines from the CDC on returning to work in schools and office spaces during the COVID-19 pandemic. For more information, please contact Jon Gilleen.

Dr. Wendy Sealey provide hatchery support to the State of Utah's June Sucker Recovery Program by providing target nutrient specification and formulation for the diets. She also provide particle reduction guidance to Utah Fisheries Experiment Station to improve blue head sucker fry.

Mark Portman, Zachariah Conley and Dr. Sealey manufactured carnivorous fish feed, packaged and shipped 175 lbs of 2.5 mm which allowed the research project to continue through the current pandemic. This research project is in collaboration with Andre Dumas of Aquaculture Technology Center. For more information, please contact Dr. Wendy Sealey.

Dr. Molly Webb is collaborating with Ryan Sylvester (Montana Fish, Wildlife, and Parks) to determine if the hatchery-origin White Sturgeon released into the Kootenai River in Montana have reached puberty. Determining if and when these fish begin puberty and spawn is essential in assessing the reproductive health and fitness of this endangered population.

The former Native Fisheries Management office building has left the station. The 1970's vintage double wide trailer house started life in Colorado then served nearly 20 years as seasonal housing in Lake Village, YNP before being relocated to Bozeman in the late 1990's along with several breeding families of mice. After a GSA sale it is set to begin a new chapter in life located on a ranch outside of Lewistown, MT. For those with good eyes, yes that is a log truck with bunks making the transport. This area will allow space for the new volunteer camp pads.

The newest visitor to Bozeman FTC. This mountain lion took a stroll through the station residence front lawn at 4 am one morning.

Dr. Molly Webb is collaborating with Dr. Robert Gresswell (retired USGS Northern Rocky Mountain Science Center), Nick Heredia (previously with the USGS Northern Rocky Mountain Science Center), and others on a publication examining the reproductive structure of Lake Trout in Yellowstone Lake. This work has important implications for modeling Lake Trout population trends and the overall suppression efforts for the invasive predator in this novel environment. It underscores the importance of determining the reproductive dynamics to assess invasive fish populations more broadly. For more information, please contact Dr. Molly Webb.

Histological section of post-spawned Lake Trout from Yellowstone Lake with central post-ovulatory follicle and cortical alveolar and primary oocytes along the periphery (Photo Credit: Nicki Diedrich).

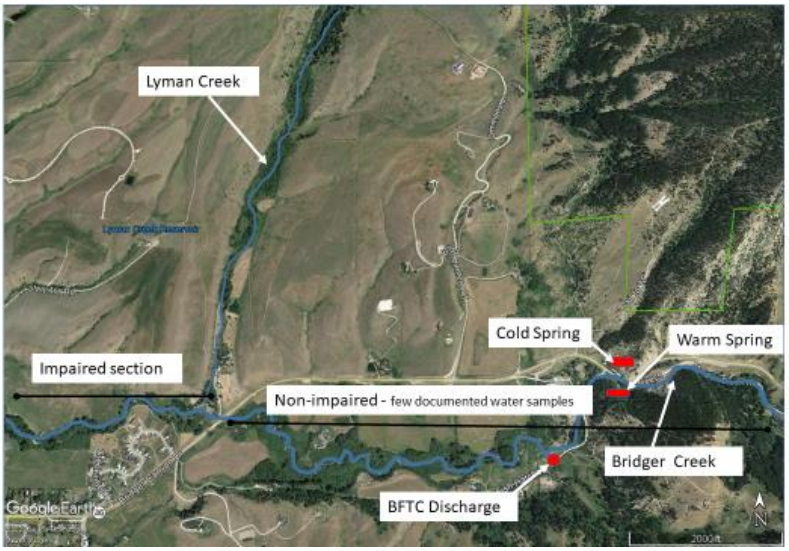
Cal Fraser has been busy retrofitting/reconstructing the west quarantine building. This quarantine facility is perfectly suited for holding, rearing, and spawning small aquatic species. The goal of this project is to focus on providing technical assistance to National Fish Hatcheries, specifically for threatened and endangered species. For more information, please contact Cal Fraser.

The zebra fish system is being installed inside the west quarantine building, this will provide a system for fish rearing for small fish species.

Zach, Gibson, and Mark made repairs to the feed extruder. New arms and blades were installed on the cutter head and extruder was disassembled for cleaning and inspection.

Jason Ilgen has been busy putting the final touches on the flume system. He has finished all the necessary plumbing, leveling the system, and installing miscellaneous covers. The contract was awarded for setting up the electrical supply and should be fully operational by September. For more information, please contact Jason Ilgen.

The current MPDES permit is on its final monitoring year and will need to be renewed in 2021. Results collected within the current 5 year cycle indicate that the source water has a background nitrate load and comparing upstream conditions to 100' below the main effluent there is a negligible effect from the BFTC effluent. The results of the additional nutrient sampling will help shape the new MPDES permit and also support information established in the Lower Gallatin Watershed Restoration Plan. For more information, please contact Matt Toner.



George Jordan completed his acting director role. The job originally set for 4 months got extended to 5 months. We want to thanks George for all of his efforts

Kyle processed sample for proteins and lipids for an alternative to antibiotic study. He also performed maintenance on the protein analyzer and the calorimeter.

Publication:

Nouri, M.-Z., K. Kroll, **M. Webb**, and N. Denslow. 2020. Quantification of steroid hormones in low volume plasma and tissue homogenates of fish using LC-MS/MS. General and Comparative Endocrinology 296:113543.

Other FTC Happenings:

- Zach performed RIA analysis on white sturgeon and pallid sturgeon samples.
- Multiple new agreements were discussed/coordinated/developed with various partners.
- Staff completed numerous assigned trainings including those associated with Grants Solutions.
- BFTC environmental audit was conducted.
- Several members of the BFTC team provided peer reviews of manuscripts submitted by others for publication.
- Several staff members continued work on publishing a large number of manuscripts.

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

July 2020 Highlights:

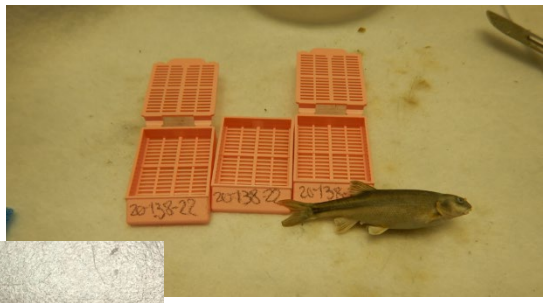
Bozeman FHC is currently operating with limited lab staffing during the COVID-19 pandemic. Even with social distancing restrictions in place, much Mission-Critical work continues to be accomplished!

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

- Saratoga NFH; Virology only inspection on cutthroat trout fry – 7/7, 60 fish.
- Gavins Point NFH; Complete fish health inspection and histological baseline analysis on Kendall Warm Springs dace – 7/21, 63 fish.
- Garrison Dam NFH; Baseline health sampling for nanobubble/degassing study on Shasta rainbow trout – 20 live fish and 20 for histology. 7/16, Samples will be analyzed monthly until stocked.

Fish health inspection of cutthroat trout fry from Saratoga NFH. Photo: USFWS/A. Huttinger

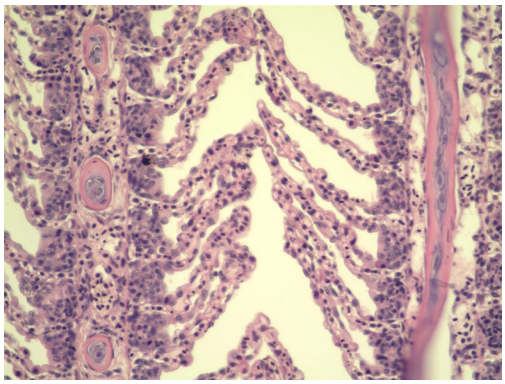
Kendall Warm Springs dace histology samples. Photos: USFWS/T. Weiss

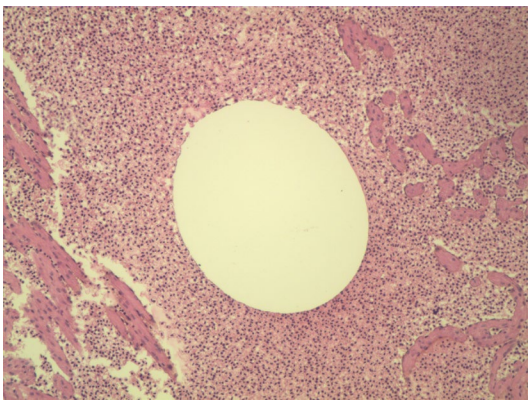


Laboratory Diagnostic Support to Reduce Hatchery and Wild Fish Losses:

- Jackson NFH; Kendall WS dace for histology and a fin clip for genetics – 7/7, 1 fish.
- Grizzly and Wolf Discovery Center, West Yellowstone, MT; Received two live adult Yellowstone cutthroat trout for fish health diagnostics – 7/20.
- Gavins Point NFH; Received two Kendall Warm Springs dace specimens submitted in fixative for histological analysis – 7/21.
- Staff participated in numerous phone/email conversations with hatchery managers and partners regarding fish health issues or questions and treatment recommendations.

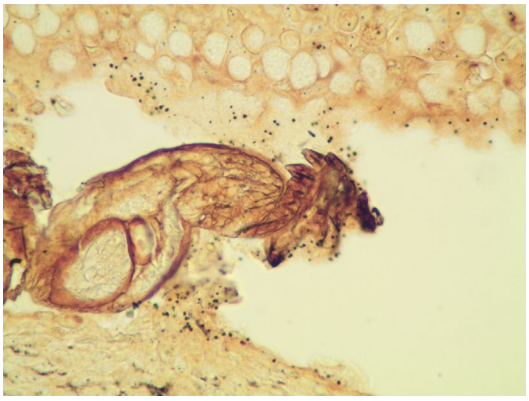
Hypertrophy (swelling) of gill epithelial cells (H&E stain). Photo: USFWS/A. Huttinger





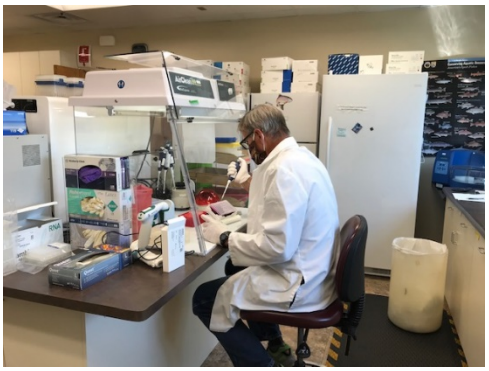
Air bubble in heart tissue (H&E stain). Photo: USFWS/A. Huttinger

Gyrodactylus sp. parasite on skin tissue (Steiner stain). Photo: USFWS/A. Huttinger



Laboratory Services Supporting Partner Recovery, Restoration and Recreation:

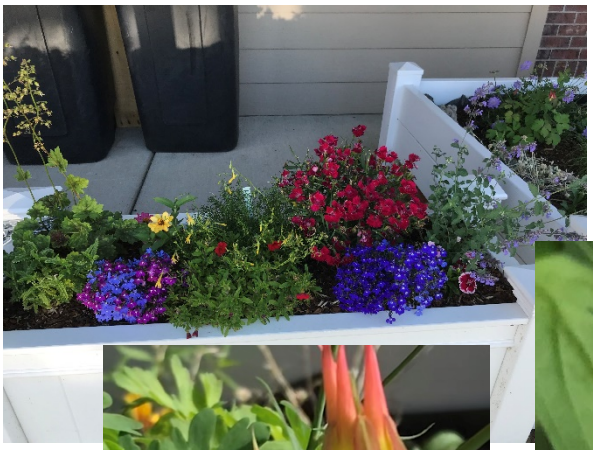
- Montana Fish, Wildlife and Parks; Virology health inspection on largemouth bass and bluegill juveniles from Mark Bartholomew Pond in Miles City, MT – 7/14, 120 fish.
- Montana Fish, Wildlife and Parks; Virology health inspection on channel catfish and largemouth bass from Miles City SFH in Miles City, MT – 7/15, 120 fish.
- Montana Fish, Wildlife and Parks; Virology health inspection on fathead minnow from Grant Reservoir, MT – 7/15, 60 fish.
- Montana Fish, Wildlife and Parks; Complete health inspection on rainbow trout and chinook salmon from Fort Peck SFH, MT – 7/16, 180 fish.
- Colorado Aquatic Animal Health Laboratory, Brush, CO; Received 12 extracted DNA samples for *Renibacterium salmoninarum* (BKD) PCR diagnostics – 7/16.
- Montana Fish, Wildlife and Parks; *Myxobolus cerebralis* testing on rainbow trout yearlings from Spring Creek Trout Hatchery, MT – 7/23, 60 fish.
- Montana Fish, Wildlife and Parks; Complete health inspection on Westslope cutthroat trout from Lange Creek, MT – 7/30, 43 fish.



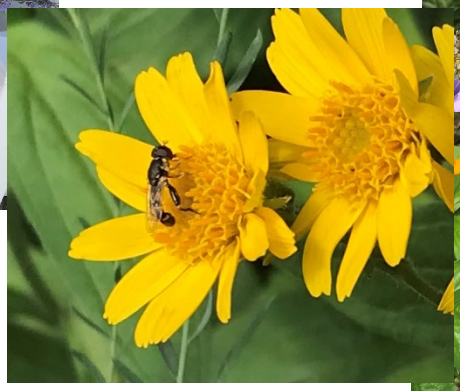
Fish biologist, Rick Cordes, conducting PCR analysis (right) and analyzing fish heads for Myxobolus cerebralis (bottom).
Photos: USFWS/T. Weiss

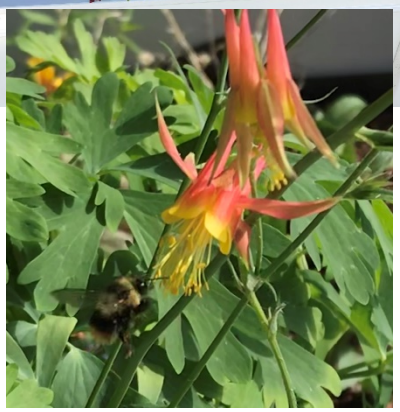
Outreach and Education:

- The pollinator garden at the Bozeman FHC continues to expand and consists of mixed native and nonnative plants in raised flowerbeds. The garden has attracted many pollinators including bees, wasps, moths, butterflies, hummingbirds, and ants. Other non-pollinator species such as gophers, rabbits, marmots, birds, and spiders also enjoy the garden!



Bozeman FHC pollinator garden beauty. Photos: USFWS/T. Weiss





Mason bees are making use of the bee/butterfly houses

Unexpected visitors to the pollinator garden: Marmot and gophers.

Partnerships, Employee Development & Other News:

- FHC Staff grew coldwater disease bacteria for Wendy Sealey, Bozeman FTC, for an upcoming research project utilizing essential oils.
- Staff continued participating in email correspondence with multiple regional FAC/State partners and the Whitney Genetics Lab (WGL) in LaCrosse, WI to plan for upcoming Asian carp eDNA surveillance at Bozeman FHC.
- Staff began purchasing equipment and supplies for the BFHC eDNA lab. Staff is working with WGL to develop appropriate SOPs and lab-specific Quality Assurance/Control documentation.
- Staff participated in a Kendall Warm Spring Dace conference call.
- Per FAC HQ request, staff helped edit the most recent draft of the new FWS National Aquatic Animal Health Policy
- A 1311 system-wide proposal for a FWS rainbow trout broodstock genetics and performance project involving multiple regions and partners was funded.
- Staff participated in the Director's Safety Video Message on safe driving.
- A virtual Environmental Safety Audit was conducted on 7/23.
- Participated in the 26th Annual Aquaculture Drug Approval Coordination Workshop via Webinar 7/28 and 7/30.
- Provided a 2nd edit for a book chapter on Proliferative Kidney Disease (PKD) in cooperation with Montana Fish, Wildlife and Parks and Michigan State University

Photo: USFWS/T. Weiss