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

August Report – FTC Highlights:

With plenty of fortitude, planning and dedication, Jason Ilgen's efforts finally paid off. The multi-year flume project ended this month when the final electrical connections were made and dive shafts were installed on the vertical axial flow pumps. Water now flows through the 56' long flume (pictured below). With flow capabilities ranging from 1 gpm to 3,700 gpm and leaping ranges from 1" to 48" with a minimum 12" plunge pool, the flume will be a valuable asset when addressing fish passage and fish barrier projects.

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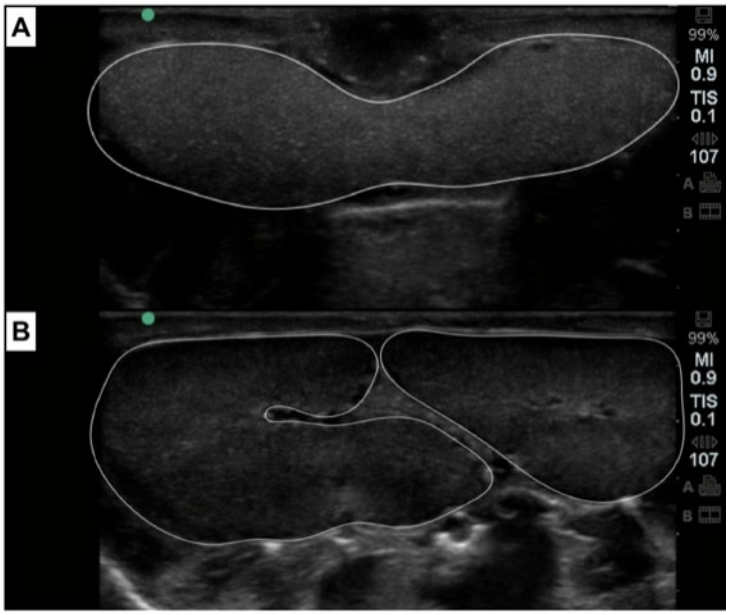
Keep up with your water quality! Cal Fraser recognized some inefficiencies with the bio-filtration cycle. This bio-media appeared to be rolling the way it should. However, below the surface ½ of the media was connected by a build up of calcium carbonate. The calcium carbonate built up over the last few trials from heating the hard water common to the BFTC.

Dr. Molly Webb and Montana State University graduate student Lauren McGarvey collaborated with the Confederated Tribes of the Colville Reservation and the USGS Montana Cooperative Fishery Research Unit to develop non-lethal tools to assign sex and reproductive condition in Burbot from Lake Roosevelt, Washington. Gametogenesis in Burbot was described over the course of a reproductive cycle. Plasma 11-ketotestosterone and estradiol-17β concentrations were used to assign sex with 98% accuracy to reproductively active Burbot. Ultrasound technology was used to assign sex with 96% accuracy.



Ultrasound images of late vitellogenic ovaries from an adult female Burbot (A) and ripe (stage 4) testicular tissue from an adult male Burbot (B). The ultrasound transducer was placed perpendicular to the midline at the urogenital pore to capture the images. The white lines delineate ovarian tissue (A) and testicular tissue (B). The lobes of the ovaries were rounded and clearly connected (A) whereas the testes were angular and unconnected (B) (Photo Credit: Lauren McGarvey).

Dr. Molly Webb has also been collaborating with Lee Bender and staff at Saratoga National Fish Hatchery to assist with improvement of husbandry conditions for the endangered Wyoming Toad.

Wyoming Toad in captivity at Saratoga National Fish Hatchery (Photo Credit: Saratoga National Fish Hatchery).

That's no cat. That is little Cora Ilgen. Cora recently participated in a Montana Outdoor Science School camp called, "Fins and Flies." The week-long course describes general ecology and the relationship between aquatic insects and native fish. To cap off the program, kids fished the BFTC fishing derby pond and had a blast.

Dam board replacement of both cold spring boxes to improve and conserve cold-water transfer to the wet labs.

Cal Fraser (below) continues to design smaller scale systems for use in the FTC quarantine rooms. He is currently modifying an 8' rectangular tank into a living stream. The design will include a higher flow riffle area, a low flow pool area, eddy and run sections. The new tank design will be pliable, and able to better accommodate a variety of species per their preferred habitat and research objectives.

Kevin Kappenman has been anxiously waiting for water to flow through the new flume. Below, arctic grayling are being tagged and will be exposed to several flow conditions and newly designed denil fish ladders over the next few weeks. Westslope cutthroat trout are also on the schedule to be studied once the grayling project has been completed.

Even with hundreds of visitors a day utilizing the local trail systems, this bear finds a way to cruise through the BFTC just after dark.

Zack Conley working on the extruder screws for maintenance in the feed manufacturing building. Taking note of the order the screw heads are taken off, the twin drive barrel requires both sets to be paired exactly.

Arctic grayling being exercised by a submersible pump.

Other FTC Happenings:

- Gibson Gaylord participated in a research planning meeting for the project, "Waste Management and Water Quality Improvement on Commercial Trout Farms through Nutritional Strategies." (USDA NIFA project).
- Gibson Gaylord began conversations with Lee Bender, Project Leader, and Ana Bode, Biological Technician at Saratoga NFH regarding bug diet fortification for use of cockroaches as live feed for Wyoming toads.
- Wendy Sealey and Mark Portman (contractor) manufactured steelhead fish feed and packaged 1.5, 1.0 and 0.7 mm of the slow-sinking feed. This research project is part of an ongoing collaboration with the Oregon State Hatchery System.
- Nutrient waste load monitoring of the BFTC water sources and discharge was conducted.

Bozeman Fish Technology Center

Bozeman Fish Health Center

August, 2020 Highlights:

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

- Gavins Point NFH; Bacteriology and Virology on paddlefish - 60 fish.
- Gavins Point NFH; Fin clip samples from Kendall Warm Springs dace submitted for genetic analysis/ongoing conservation genetics project – 29 fish.
- Ennis NFH; Virology testing on EED strain of RBT – 150 fish.
- Saratoga NFH; Wyoming toad chytrid fungus (Bd) molecular testing – 10 pooled samples. +0/10 samples were positive.
- WY Ecological Services-Wyoming Toad Recovery Team; Chytrid fungus (Bd) molecular testing for routine surveillance – 41 toad swabs. +12/41 samples were positive for Bd.
- Rocky Mountain National Park, CO; Necropsy and comprehensive health testing on cutthroat trout from Ouzel Creek – 60 fish. Travel to this annual Wild Fish Health Survey collection was cancelled due to Covid-19, so fish were collected/shipped by Chris Kennedy and crew, COFWCO.
- Green River Basin FWCO; Complete health inspection including Asian tapeworm testing on red shiners - tested as a surrogate species for Colorado pikeminnow transfer into Ouray NFH then on to Southwestern Native Aquatic Resources and Recovery Center in NM.

Fish biologist, Molly Bensley collecting tissue samples from red shiners from the Green River in Utah. Photos: USFWS/T. Weiss

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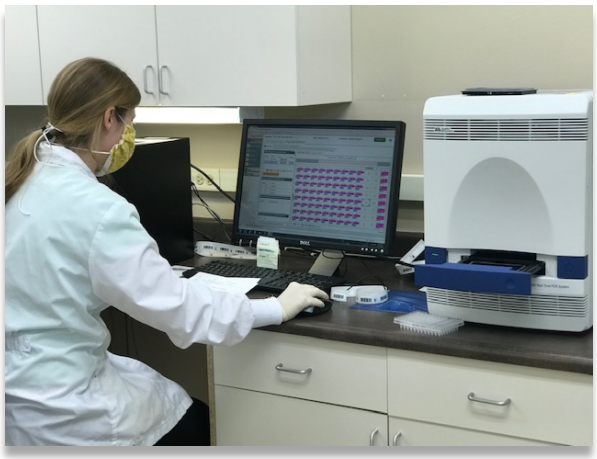
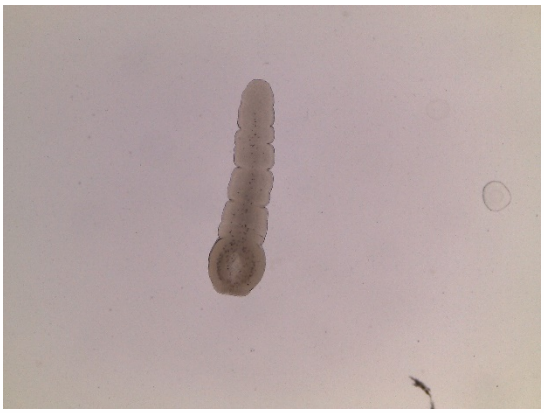
Visit us on the web!
https://www.fws.gov/mountain-prairie/fisheries/fhc.php



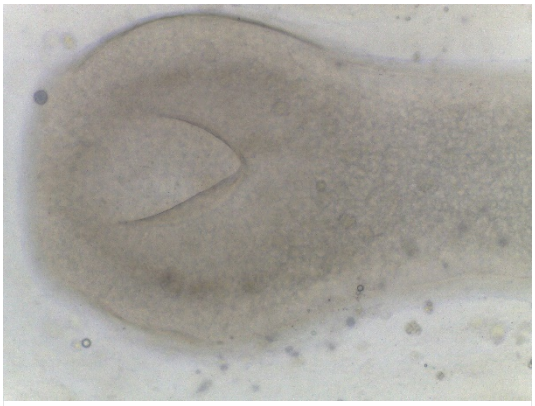
Fish biologist, Renee Yamamoto analyzing chytrid fungus quantitative PCR (qPCR) samples collected from endangered WY toads. Photo: USFWS/T. Weiss

Young paddlefish from Gavins Point NFH, SD. Photo: USFWS/R. Yamamoto



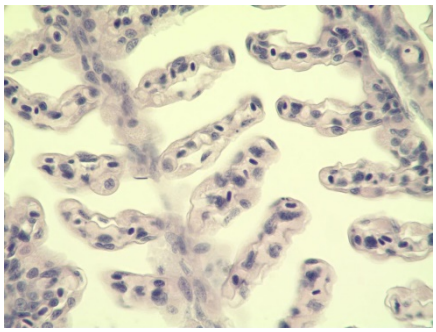
Immature Asian tapeworm (S. acheilognathi) found in the intestine of a red shiner. Confirmed by PCR at BFHC. Photo: USFWS/T. Weiss

Developing Asian tapeworm (S. acheilognathi) pyramid-shaped scolex and bothria. Photo: USFWS/T. Weiss



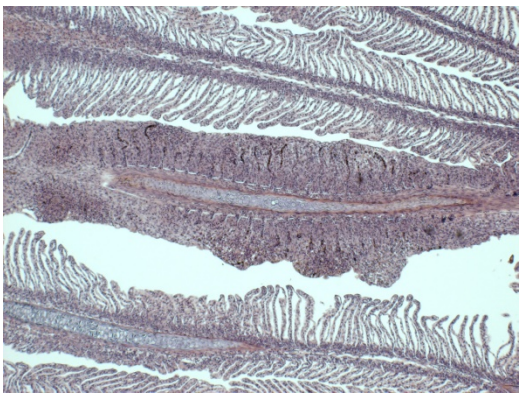
Fish Health Diagnostic and Histopathology Support for NFH's and Partners:

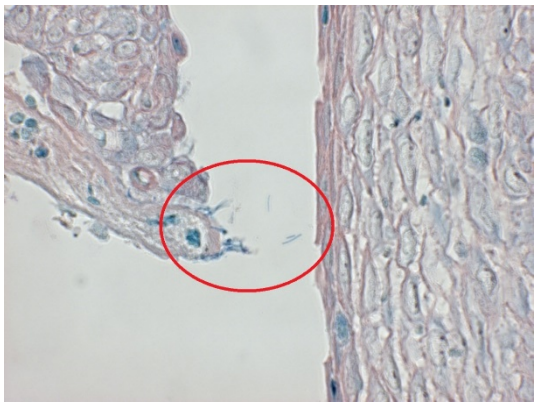
- Comprehensive diagnostic testing was completed for 2 LR6 Federal facilities on Snake River cutthroat and rainbow trout.
- Edenton NFH, NC – Request from hatchery manager for histopathology analyses on 17 endangered Cape Fear shiners and 10 white shiner broodstock. Samples are being processed.
- Bozeman FTC staff submitted 99 intestines for histology processing for nutrition studies.
- University of Idaho-Aquaculture Research Institute requested histology processing and analysis for a nutrition study. Forty eight intestine and liver samples were submitted.
- FHC staff participated in numerous phone/email conversations with hatchery staff and partners regarding fish health issues or questions, biosecurity, fish culture/husbandry and treatment recommendations.



Hypertrophy (swelling) in gill epithelium (H&E stain). Photo: USFWS/A. Huttinger

Severe hyperplasia (increase in cell number) and fusion in gill filament (H&E stain). Photo: USFWS/A. Huttinger





Bacteria in skin lesion (Giemsa stain). Photo: USFWS/A. Huttinger

Laboratory Services Supporting State Partner Recovery, Restoration and Recreation:

- Montana Fish, Wildlife and Parks; Health inspections and certifications on kokanee, brook trout, cutbow, rainbow trout, brown trout, Westslope cutthroat, channel catfish, goldeye, fathead minnow, river carpsucker, freshwater drum, walleye, black crappie and yellow perch from 2 State facilities and 7 rivers, creeks and reservoirs in MT – 665 fish.

  One regulated pathogen (*Myxobolus cerebralis*-whirling disease parasite) was detected and confirmed. Several tests are still pending.

Outreach and Education:

- The expanding pollinator gardens at the Bozeman FHC continue to attract many different pollinators, birds and other critters. This month, the Hungarian partridge (Huns) visited several times and our cottontail rabbits and gophers are fat and happy.

Hungarian partridge visiting the Bozeman FHC gardens. Other regular pollinating visitors too.
Photo: USFWS/T. Weiss

Partnerships, Employee Development & Other News:

- FY20 BFHC FIS accomplishments were completed.
- Staff continued preparing for upcoming Missouri River Asian carp eDNA surveillance at Bozeman FHC by installing new equipment, freezers and a door to turn a storage area into an eDNA-specific DNA extraction lab.
- Lacey Hopper participated in a Project Leader sand table exercise on quick response Covid-19 scenarios.
- Renee Yamamoto and Lacey Hopper joined LR5 and LR2 on a planning call for the FWS rainbow trout/Apache trout broodstock system-wide funded genetics project.
- Staff participated in a FHC Teams HazCom safety training as part of our quarterly lab safety meeting.
- Tammy Weiss joined and began actively participating in the USFWS Community of Practice (COP) for Pollinator Conservation.
- Rick Cordes participated in calls for lab QA/QC, and LIMS database.
- Worked with LR3 and LR2 FHC's on revising a portion of the new USFWS Aquatic Animal Health Policy per HQ's request.
- Provided a final review on a salmonid Proliferative Kidney Disease (PKD) book chapter as requested by partners from Michigan State University, Norway, Italy and the Czech Republic.
- Participated in a planning call for LR6 Missouri River Asian carp eDNA and joined the FY21 national Asian carp planning call.

From storage room to Asian carp eDNA extraction lab! We are getting there. Photo: USFWS/T. Weiss