

## Bozeman FTC Staff

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### 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  
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



## June Report – FTC Highlights:

Beginning in June, some additional high-priority work started to resume at the BFTC. In order to help promote employee safety, Cal Fraser volunteered to put his sewing skills to good use by making mask that were distributed to BFTC staff along with the Montana Partners for Wildlife program.



Cal Fraser and his trusty sewing machine making masks.

## Contact Us:

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Dr. Wendy Sealey uses a micrometer to measure feed pellet diameter during manufacture of Atlantic salmon feed to ensure the feed pellet has the appropriate size and pellet characteristics requested by the collaborating research group.

Drs. Molly Webb and Wendy Sealey, and Jason Ilgen in collaboration with Dr. Christopher Guy (Montana Cooperative Fishery Research Unit) and Hilary Treanor (Montana Cooperative Fishery Research Unit) received a second shipment of Pallid Sturgeon embryos from Gavins Point National Fish Hatchery for the larval Pallid Sturgeon diet trial.



Molly Webb receiving shipment of Pallid Sturgeon embryos from Gavins Point National Fish Hatchery (Photo Credit: Christopher Guy).

The objective of this study is to identify a diet that improves survival and size of first feeding larval Pallid Sturgeon regardless of genetic lot. Pallid Sturgeon were fed artemia, 50/50 artemia and Otohime (a manufactured feed), or Otohime. Preliminary analysis from the first trial resulted in highest survival in larvae fed artemia and the lowest survival in larvae fed Otohime. A size difference was evident in larvae fed for 21 days on each respective diet.

For more information, please contact [Dr. Molly Webb](#)



Representative Pallid Sturgeon larvae fed artemia (closest to the ruler), a 50/50 diet of artemia and Otohime (a manufactured feed; center), and Otohime (farthest from ruler) (Photo Credit: Christopher Guy).



Kyle Moon collecting fecal samples as part of ongoing feed digestibility trials. USFWS Photo –Dr. Wendy Sealey

Dr. Wendy Sealey and contractor Mark Portman (Piscine Aquaculture) ground and sifted commercial June sucker diets to provide appropriate larval feed sizes for the June Sucker Recovery Program at the Fisheries Experiment Station in Logan Utah. The commercially produced custom diet formulation (originally formulated by USFWS personnel at BFTC) requires the recovery program to purchase large amounts of one feed size that is too large for the larval June suckers. Since 2009, BFTC has used our grinding and sifting equipment to provide appropriate sizes in small amounts (30 pounds of 250- 450 um and 100 pounds of 450-650 um) to the program. These efforts have improved survival through providing better nutrition at the appropriate size and reducing waste accumulation.

Additionally feeds were manufactured for the Benson-Hill digestibility trial, Alternative to Antibiotics research trial, as well as, for a research project that is part of an ongoing collaboration with Dr. André Dumas of The Center For Aquaculture Technology.

For more information, please contact [Drs. Wendy Sealey](#) and [Gibson Gaylord](#)

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The laboratory study titled "Developing Non-lethal Contaminant Sampling Methods for Pallid Sturgeon" was completed on June 19th. The data will help determine whether survival and health condition of Pallid Sturgeon was reduced by tissue biopsy procedures; growth, survival and photographic documentation will be analyzed to determine how dermal punch affect survival and health (e.g. healing, infection, visual health assessment) of pallid sturgeon. The results will determine if biopsy can be used in field sampling.

For more information, please contact [Kevin Kappenman](#).

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Dr. Molly Webb is working in collaboration with Dr. Christopher Guy (Montana Cooperative Fishery Research Unit) and graduate student Colter Brown (Montana State University) to describe the spawning characteristics and assess juvenile sampling methods and habitat for Mountain Whitefish in the Green River, Wyoming. In the last two decades, Mountain Whitefish population declines have been reported in many waterbodies in the southern part of the species range. The most thorough investigation of Mountain Whitefish movement and early-life history in the southern portion of the species range was conducted in the Madison River, Montana by these researchers—a population that has experienced recruitment problems. Conversely, the Mountain Whitefish population in the upper Green River, Wyoming has consistent recruitment and a stable age structure. Comparing the movement and early-life history characteristics between the Madison and Green River populations will provide a better understanding of the factors that may be limiting recruitment and provide additional knowledge on this understudied species.

For more information, please contact [Dr. Molly Webb](#)



Mountain Whitefish in the Green River, Wyoming

(Photo Credit: Christopher Guy).

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Jason Ilgen continued to provide oversight, guidance, and his skills to facilitate progress on the fish passage flume. For more information, please contact [Jason Ilgen](#).



Getting the water from the pump well to the head of the flume requires a lot of plumbing and pipe. The pumps have been connected to the main line (left) and the main line is nearing completion near the head of the test flume(right). *USFWS photo-Jason Ilgen*

As flume construction continues, so too does planning and preparation for its use. Mini Denil fish-ladders have been designed and built for a collaborative project involving the Bozeman Fish Technology Center, Montana State University (Western Transport Institute and Department of Engineering), and the Montana Cooperative Fishery Research Unit. The focus of this project is to develop and lab-test scaled-down Denil fish ladders (approximately 60 and 75% of full-scale scale) and assess the passage efficiency to support Arctic Grayling and Westslope Cutthroat Trout.

For more information, please contact [Kevin Kappenman](#).



The completed mini Denils are shown in the pictures during a planning meeting for the upcoming study titled "Developing Small-Scale Denil Fishways for Use in Headwater Streams; New Technology and Standards for Increasing the Landscape Connectivity Benefits of Fishways to support Bull Trout, Arctic Grayling, and Cutthroat Trout". (Photo Credit: USFWS-Kevin Kappenman).

### Fish on Station:

LOT NUMBER	TOTAL Number	TOTAL Weight (lbs)	Approximate Length (in)
Pallid Sturgeon	40	40	19
Rainbow Trout	1500	300	8
Rainbow Trout	1200	75	5
Rainbow Trout	900	110	7
Rainbow Trout	700	467	11
Rainbow Trout	1200	4	2
Arctic grayling	300	37	7
Pallid Sturgeon	20	100	32



## Other FTC Happenings:

- During the month of June, about half of the staff remained off-site in telework status due to COVID-19.
- Dr. Gibson Gaylord trained Kyle Moon, Biological Science Technician, on the operations of the protein analyzer, bomb calorimeter, and freeze drier operations in the Analytical Lab.
- Staff participated on numerous coordination calls related to ongoing and future projects/operations.
- Multiple new agreements were discussed/coordinated/developed with various partners.
- Staff worked on of several pending manuscripts to be submitted for publication, as well as providing peer reviews of submitted manuscripts.
- Performed maintenance on the extruder including the screws and water delivery system.
- Upgraded the air filters in the Piper Building to a higher efficiency type capable of filtering particles in the size ranges of the corona virus.

Contractor Mark Portman working on the feed extruder. USFWS photo-Dr. Wendy Sealey

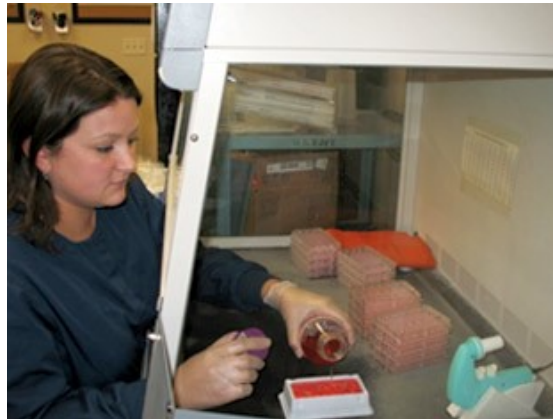
# Bozeman FHC

## June 2020 Highlights:

*Bozeman FHC continues to operate with limited on-site staffing during the COVID-19 pandemic to protect staff safety and health.*

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

- Leadville NFH; Virology inspection on Greenback/Hayden Creek cutthroat trout – 6/1, 163 fish.
- Gavins Point NFH; Virology inspection on juvenile walleye, yellow perch, bluegill, black crappie, smallmouth bass and largemouth bass – 6/8, 6/22, & 6/29, 360 fish.



*Fish Biologist,  
Amberly Huttinger  
preparing to  
inoculate virology  
samples. Photo:  
USFWS/L. Hopper*

## Contact Us

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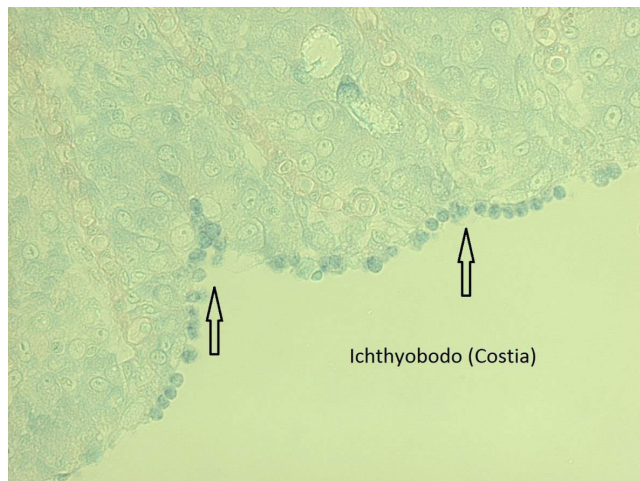
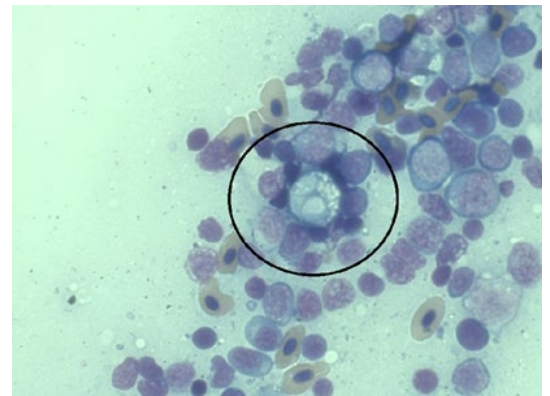
*Inoculating virology  
samples onto 24-well  
plates containing fish  
cells. Photo:  
USFWS/Bozeman FHC*



## Laboratory Diagnostic Support to Prevent and Reduce Hatchery and Wild Fish Losses:

- La Crosse FHC, WI – Provided molecular/genetic assistance in identifying potential *Tetracapsuloides bryosalmonae* (formerly PKX) diagnostic case for legacy Region 3. *T. bryosalmonae* was not identified.
- Staff participated in numerous phone/email conversations with hatchery managers and partners regarding fish health concerns or questions and treatment recommendations, particularly for external parasites.

*Tetracapsuloides bryosalmonae* (formerly PKX) parasite in kidney tissue imprint. Photo: USFWS/A. Huttinger

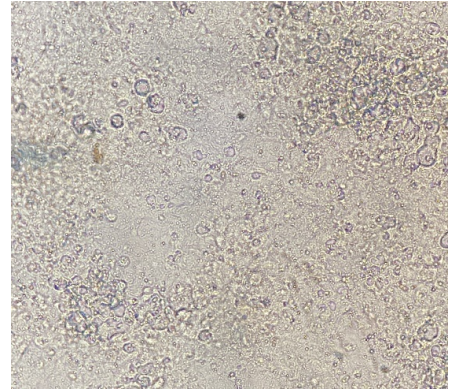


Common external fish parasite, *Costia*, lining fused gill lamellae. Photo: USFWS/A. Huttinger

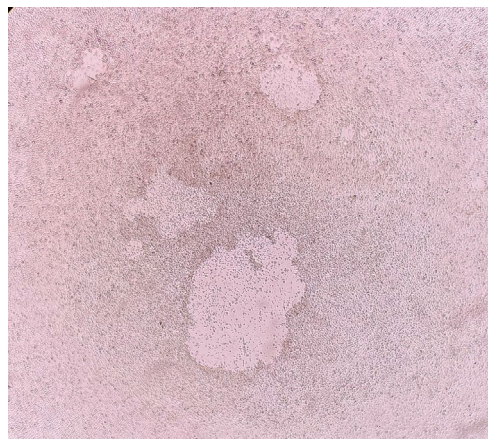


## Laboratory Services Supporting Partner Recovery, Restoration and Recreation:

- Montana Fish, Wildlife and Parks; Complete health inspections on adult brood and yearling Westslope cutthroat trout from Sun Ranch Hatchery, Westslope Trout Company and Sekokini Springs State Fish Hatchery, 572 fish
- Colorado Parks and Wildlife; Requested BFHC's assistance in identifying an unknown virus isolate from hatchery rainbow trout. BFHC identified and confirmed cutthroat trout virus (CTV) by cell culture and PCR.
- Utah Division of Wildlife Resources; Requested BFHC's assistance with analyzing 60 individual DNA samples for whirling disease confirmation by PCR.
- Wild Fish Health Survey - Montana;
  - Complete inspections, virology testing and molecular pathogen testing on fathead minnow, white sucker, lake chub, silvery minnow, longnose dace, rainbow, cutthroat and brook trout from four different MT reservoirs and creeks - 385 fish.
  - Isolated and confirmed Fathead Minnow Picornavirus (FHMPV) from 2 wild sites.



*Cutthroat trout virus (CTV)-infected Chinook salmon embryo cells (CHSE-214 cell line). Photo: USFWS/A. Huttinger*



*Fathead minnow picornavirus (FHMPV) cytopathic effect on Epithelioma Papulosum Cyprini cells (EPC cell line). Photo: USFWS/A. Huttinger*

## Partnerships, Employee Development & Other News:

- Utah Division of Wildlife Resources requested that BFHC review and edit the Colorado River Fish and Wildlife Council's draft Fish Health Agreement.
- Staff is finalizing plans for BFHC eDNA lab layout, workflow and equipment needs and continuing to work with the Whitney Genetics Lab to develop appropriate SOPs and lab-specific Quality Assurance/Control documentation.
- Staff collaborated with partners from USGS, Montana Fish, Wildlife and Parks and the School of Life Sciences in the United Kingdom to finalize a draft manuscript on *Tetracapsuloides bryosalmonae* (PKX) and the 2016 Yellowstone River mass mortality event.
- Staff met with Christian Ference, Applications Engineer for Moleaer Inc. on 6/19 to discuss nanobubble technology and fish health study design at Garrison Dam NFH following nanobubble implementation.
- Staff completed annual Grizzly Bear safety training for field work.
- Montana Fish, Wildlife and Parks and the National Park Service requested BFHC's assistance in collecting health samples in Yellowstone National Park during Yellowstone cutthroat trout spawning. Unfortunately, spawning efforts were not successful and no eggs or samples were collected. Staff still got to enjoy the amazing wildlife and scenery in YNP!



*Yellowstone National Park beauty. Photo: USFWS/L. Hopper*

