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

October-November FTC Highlights:

Dr. Molly Webb, in collaboration with Dr. Christopher Guy (Montana Cooperative Fishery Research Unit) and graduate student, Tanner Cox (Montana Cooperative Fishery Research Unit, Montana State University) have been studying the reproductive ecology of hatchery-origin Pallid Sturgeon in the Missouri River upstream of Fort Peck Dam in the Missouri River. The team documented the first successful spawning of Pallid Sturgeon upstream of Fort Peck Reservoir. Females in this study matured between ages 18 and 22 and had biennial reproductive cycles, while males matured between ages 15 and 22 and had either annual or biennial reproductive cycles. A high proportion (62.5%) of female Pallid Sturgeon underwent ovarian follicular atresia during their presumed-first gametogenic cycle.

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Above, the new LECO protein analyzer is being installed. Staff will receive training from a certified technician on operation and general maintenance.

The protein analyzer is a critical piece of laboratory equipment for the feed development program. Quantifying total protein of experimental feeds allows researchers to collect specific data associated with growth rates. Quantifying optimal protein consumption also allows for precise diet development for sensitive species.

With winter setting in soon, Jason Ilgen took time to winterize water lines, pumps, and any sensitive equipment associated with the new fish passage flume. Jason also took data and plotted the pump performance curves across the range of flow for each pump. Finalized data shows that the new vertical axial flow pumps outperformed existing submersible pumps by pumping four times more efficiently at similar discharge flows. Another benefit is, the new pumps did not increase the water temperature over multi-day experiments. The older submersible style pumps would increase water temperature several degrees just over a 24-hour run time.

Prior to startup of an experiment in one of the quarantine rooms, Cal Fraser has been tracking bio-filter bacterial growth through water quality testing. Make-up water is limited to the system due to effluent treatment. Thus, water quality is a top priority throughout experiments. Gibson Gaylord will be running a pair of trials as soon as the bio-filter has stabilized and nitrifying bacteria are established.

This isn't just a picture of fish boiling up for feed. This is planning for putting COVID-19 behind us all in 2021. With COVID at a peak in the spring of 2020, the annual kids fishing derby was cancelled. The pond has been cleaned and 800 fish have been stocked for grow out. So here is a picture of hope, and getting young kids fishing again in 2021!

Matt Toner and Jason Ilgen discussed the potential to increase the fish passage program capabilities by using existing infrastructure. Current concept would be to have side-by-side trials of fish passage structures with the current raceway reuse system. Flow and temperature profiles would not mimic flume capabilities, but low flow structures could be accomplished.

The feed development team which includes Gibson Gaylord, Wendy Sealey, Kyle Moon, and Zac Conley, have been busy working in the feed lab on several multi-year projects. They have been manufacturing diets for several native species for experimental restoration projects including: bluehead sucker (restoration efforts for Utah), Steelhead & Chinook salmon (experimental program through Oregon State University) and red drum (Louisiana University's Marine Science Consortium Collaborative Research project).

Keep up with routine maintenance! A small air leak in the pneumatic valves caused this pair of sand filters to come close to failing. The issue was noticed during a routine maintenance check and corrected immediately with no disruption to water flow to culture tanks.

Bozeman Fish Health Center

October-November, 2020 Highlights:

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

- Garrison Dam National Fish Hatchery (NFH); Nanobubble/nitrogen degassing study, two batches (Oct. and Nov.) of 20 live rainbow trout for necropsy & comprehensive health analyses and 20 fish for histological examination.

Caudal fin erosion on a rainbow trout. Credit: USFWS.

- Diagnostics and Histopathology submitted; 8 cases from 4 facilities including 1 FWS legacy Region 3 NFH (requested assistance with ongoing, chronic mortality). Species supported included: rainbow trout, brown trout and Kendall Warm Springs Dace.

Sick trout with swollen, flared gills. Credit: L. Hopper, USFWS.

- Complete health inspections; Ennis NFH – rainbow trout, Garrison Dam NFH – Fall Chinook salmon, Saratoga NFH – lake trout and brown trout.

Fish Health Center Staff:

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

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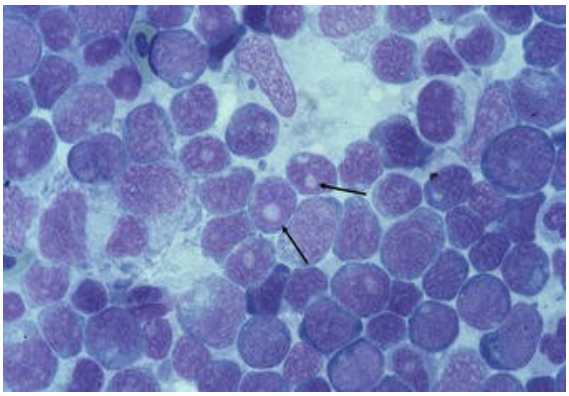
https://www.fws.gov/mountain-prairie/fisheries/fhc.php

- Genetic testing; Gavins Point NFH – Kendall Warm Springs Dace fin clip samples for conservation genetics, Leadville NFH –Wyoming toad mucus swabs for chytrid fungus testing, Ennis NFH - Rainbow trout fin clips collected for a national broodstock genetic analysis project (approved 1311 system-wide study).
- Rocky Mountain National Park, CO; Thirty brook and brown trout were collected, preserved and processed for diagnostic histology analyses to investigate a fish kill event.

Pathogens detected and confirmed: Chinook Salmon Reovirus (aquareovirus), *Nucleospora salmonis*.

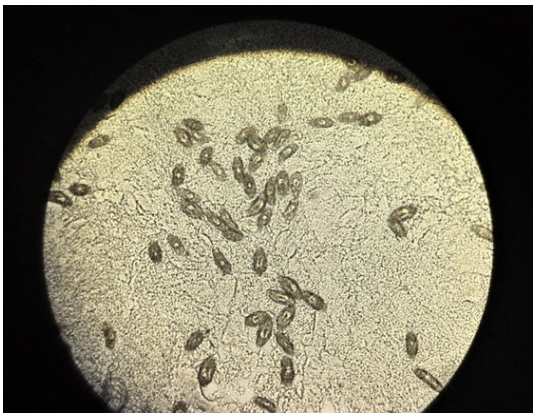


Nucleospora salmonis, a parasite that infects the cells of salmonid fishes causing a leukemia-like condition. Credit: B. MacConnell

Laboratory Services Supporting <u>Tribal Partner</u> Recovery, Restoration and Recreation:

- Big Springs Ute Tribal Hatchery, UT; Diagnostics requested for chronic, elevated mortality in rainbow trout. External parasites were identified, treatment was suggested and mortality dropped.

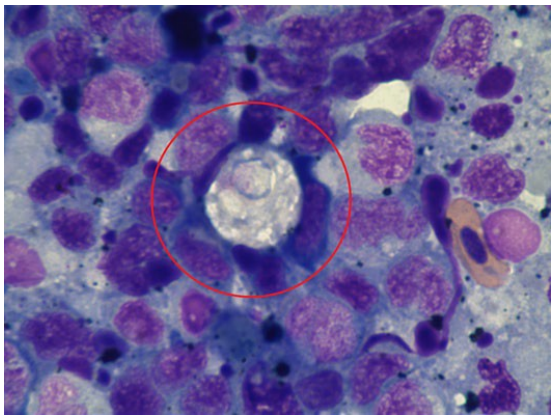
Gyrodactylus parasites in skin mucus. Credit: L. Hopper, USFWS.



Laboratory Services Supporting <u>State Partner</u> Recovery, Restoration and Recreation:

- Montana Fish, Wildlife and Parks; Wild fish health inspections and certifications completed on bluegill, fathead minnow, yellow perch, white sucker, white crappie, spottail shiners, smallmouth bass, walleye, channel catfish, black crappie and Fall Chinook salmon from 6 rivers, creeks and reservoirs in MT – 541 fish.
- Montana Fish, Wildlife and Parks; Hatchery fish health inspections and certifications completed on kokanee, Fall Chinook salmon, rainbow trout, Yellowstone cutthroat trout, pallid sturgeon, bluegill, and brook trout from 7 state facilities – 623 fish.
- Montana Fish, Wildlife and Parks; Diagnostic evaluations and histopathology on wild brown trout and hatchery-reared bluegill.
- Kansas Dept. of Wildlife, Parks, & Tourism; Wild fish health virology testing completed on channel catfish, wiper, white crappie, white perch, bluegill, walleye, black crappie, white bass, largemouth bass, gizzard shad, freshwater drum, carp, and sauger from 5 popular sport fishing reservoirs – 750 fish.

One regulated pathogen (*largemouth bass virus-LMBV*) was detected and confirmed. Other pathogens detected and confirmed: fathead minnow picornavirus, *Tetracapsuloides bryosalmonae* (PKX).



Tetracapsuloides bryosalmonae (PKX) in kidney tissue. T. bryosalmonae causes proliferative kidney disease in trout. Credit: A. Huttinger, USFWS.

Outreach and Education:

- Several species of pollinators visited the pollinator gardens during the unusually warm fall weather before the temperature dropped to well below zero in late October. Our bird feeders continue to draw in numerous bird species including Hungarian partridge and even a few stray ducks.

Fall pollinators getting their last visit in before the freeze! Credit: T. Weiss & R. Yamamoto, USFWS.

Have a Safe and Happy Holiday Season!

~The Bozeman FTC/FHC Team~