Henry's Fork Watershed Council Annual Watershed Conference
Meeting Minutes

December 13, 2022

Introductions and Community Building

Aaron Dalling, co-facilitator from Fremont-Madison Irrigation District (FMID) welcomed everyone to the hybrid annual conference. The group went around with introductions and then called for a moment of silence before opening for announcements and community building.

Upper Snake Regional Fisheries Manager, Idaho Dept. of Fish and Game
Brett High, Idaho Dept of Fish and Game

Immediate effects of 2 year-drought on fish populations:

- Corral Creek Lake: mountain lake in upper Big Lost had first ever recorded fish kill (no fish)
- South Fork Snake River Tributaries:
    - Burns Creek: fish populations down
    - Pine Creek: down by 1500 fish (1/2)
    - Palisades Creek: also half the population we'd expect to see
    - Bottom line: total spawning for 2022, 2nd lowest in last 10 years, immediately following some record highs
    - Very low water years

Delayed effects of drought on fisheries:

- Fisheries are built on multiple age classes of fish
- If you have a drought year(s), it will take a few years to work through the fishery
- 2022: Box Canyon: average =2,700 RBT per mile
    - 2,100 RBT per mile in 2022, significantly lower than long-term average
    - Very strong relationship between winter flows and trout populations
    - Observed 1,245 RBT vs predicted 3,148 RBT
        - Flows so low that possibly weren't able to capture all fish
    - 52% annual natural mortality in Box Canyon: normal = 45-60%
    - Mountain Whitefish also are showing an overall decreasing trend in population over recent decades
- Stone Bridge: 1,741 trout per mile in 2022
    - Similar to what we've had in previous years
    - Drought seems to have more limited effect on this section of river
    - Why? Could be influence of warm river spring or Ashton Reservoir refugia
    - Or brown trout are just resilient
    - SB = 80% RBT and 20% BNT, but brown trout (BNT) are on the rise
- Big Lost – in 80s/90s had the highest number of trout per mile in our region (~5,000 fish per mile)
    - That's no longer true. Now, closer to 1,000 RBT/mile

Unquantified Effects:

- Henrys Lake: Anglers like large fish and many fish
    - Now open to year-round fishing because fish populations were consistent through time
    - Now tracking a declining trend for Yellowstone Cutthroat Trout (YCT) relative weight
    - Also monitoring a Utah Chub increase in population, may compete for food resources
    - U of I graduate student studied impacts of Utah Chub in Henrys Lake 2018-2020
        - Did not see a change in average length of ages of YCT through time
        - Data indicates that Utah Chub are not having an impact on YCT, so still question mark as to why YCT relative weight on is on decline
    - Trout per net night corresponds to catch rates, and numbers are down in 2022 (5 vs goal of 11)

Summary:

- Fish need water
- Effects of drought on fish populations vary
    - Drastic and immediate
    - Delayed
    - Complex and difficult to quantify
- While populations may be negatively impacted in the short term, they can quickly rebound

Teton River Yellowstone Cutthroat Trout Status

Brian Van Winkle, Friends of the Teton River

Friends of the Teton River's mission is to restore and conserve the Teton River Watershed, ensuring a lasting legacy of clean water, healthy streams, and a vibrant wild fishery. FTR implements programs and projects founded on sound science, community education, and cooperation with landowners, citizens and agency partners. They conduct work in water quality, education, stream channel restoration, fisheries, and partnerships.

43% of the historic range of Yellowstone Cutthroat Trout is currently occupied in the GYE. 23% of the current distribution is genetically unaltered. In the Nickerson monitoring reach of the Teton River, FTR has seen a decline in overall trout densities in recent years. Fisheries program goals include determining long-term trends, providing data, prioritizing YCT conservation projects and monitoring. FTR conducts a basin wide electrofishing survey. 2020 Teton Tributary trout assessment survey surveyed 68 sites on Trail, Teton, South Leigh, North Leigh, Game, Canyon, Calamity, Bitch and Badger Creeks. 15 years of data reveal an annual 2% decrease in trout abundance. Over time, YCT have stayed stable at 45% of trout captured.

South Fork of Teton population began to decline in 2011, with brown trout increasing in proportion to other species of trout. Parkinson reach populations increased in 2020, possibly thanks to conservation work in Canyon Creek. Nickerson reach saw increase in 2015, but decrease since then.

In cooperation with USGS, e-DNA study to detect Brown Trout in Teton watershed. Detections throughout the watershed, including a number of tributaries. FTR also conducts annual monitoring including, fluvial trout PIT tagging, YCT redd surveys, water quality monitoring, temperature monitoring,

and fish screen operation and maintenance. Over 5,000 fish have been PIT tagged in the Teton watershed. Tags monitor fish movement and effectiveness of restoration efforts. 471 trout were tagged in 2021. Zero tagged in 2022. In terms of stream restoration, 2,200 feet of streambank were restored in 2021/2022. Also conducted irrigation diversion screening infrastructure improvements. FTR maintains 36 temperature loggers in the watershed.

South Fork Snake River Yellowstone Cutthroat Trout Status
Brett High, Idaho Dept. of Fish and Game

This Watershed Council is good at taking topics where there are different and competing interests, and finding ways to benefit everyone. South Fork has the strongest YCT fluvial population in the state of Idaho. History of management of YCT:

- 1997: Henderson graduate student study for spawn timing and spawn location. Found RBTs were spawning in tributaries
- Early 2000s: host graduate study and public opinion – start weir program, goal to remove RBT to keep spawning refugia for YCT. Killed RBT during fall surveys and public weighed in on that.
- Mid 2000s: weirs were not enough to change increasing trend of RBT. Additional studies by USGS and Rob Van Kirk (ISU) concluded that 25,000 cfs freshet would be needed in spring. Led to 3 prong approach – flows, weirs and harvest. Regulation changes to allow fishing year-round and remove bag limits on RBT.
- Late 2000s: 2009 was a big recruitment year for RBT, so in 2010 RBT harvest incentive program started
- 2017: never attained the 25,000 cfs freshets needed (development has occurred and would cause damage to homes), and still not seeing decline in RBT

Management Goals:

- Protect genetic integrity and population viability of YCT
- In 1980s, RBT was 10% or less in population surveys

Implemented suppression strategies when goals weren't being met. Angler harvest didn't keep up. Have successfully done this in a stream – Palisades Creek – and results are published. So, decided to try on the mainstem to address issues. Goal to remove 30% of RBT population from the South Fork = ~12,000 fish. Anglers harvest on average 2,900 from 2010 – 2020. In 2021, 10,654 RBT removed (and relocated; 2% mortality). Same goal in 2022: 30% of current population estimates. About 9,500 fish removed. Harvest Incentive Program was key because it helped close the gap and meet the goal. 13-year program and $67,3000 paid. In 2022, 2,300 harvested and ~$5,000 paid out.

Concerningly, decrease in RBT was low, and big decrease in YCT. Drought is a major concern. Brown trout populations are still pretty stable and are not as impacted by drought.

IDFG's goal is not to eradicate RBT – FMP is clear about this. Going to go for 5 years, then assess. Going to create a designated webpage for it as well.

Upper Henry's Fork and Island Park Reservoir Fisheries
Jack McLaren, Henry's Fork Foundation/Utah State University

Focus on everything upstream of Island Park Reservoir. Rainbow trout, stocked kokanee salmon, and remnant populations of YCT, some eastern Brook Trout and Mountain Whitefish. Fish habitat in the Henry's Fork is made up of a number of individual habitats that fish move between. For survival that includes, refugia, growth, and reproduction. Changes to one of these three effect all.

This section of the river faces threats including nutrient pollution and drought. Not considered the best fishery among anglers. Kokanee habitat is sensitive to temperature and dissolved oxygen. Conducted weekly vertical profiles at five locations in Island Park Reservoir to get a sense of each of various types of habitat. Found that drawdown of the reservoir rapidly destroys kokanee habitat when it occurs. Cool inflow from springs is critical for maintaining the little habitat that remains during drawdown. Drawdown is found to reduce kokanee abundance.

In the upper Henry's Fork, results found fish prefer greater depths, slower water velocity, and macrophyte-free water. Also, preferred habitat frequency is stable along reach-scale macrophyte gradient. Total fish numbers are a function of Island Park Reservoir drawdown. Fish availability for anglers is likely a function of fish numbers, fish fertility, and fish habitat. And fish habitat is a function of water depth and overall productivity.

Lower Henry's Fork Habitat Modeling
Christina Morrisett, Henry's Fork Foundation/Utah State University

The lower Henry's Fork— defined as the reach between St. Anthony and Parker—hosts an "irrigation-season flow target" used by water managers to determine how much water to send out of Island Park Reservoir daily. This target is in place to ensure streamflow meets irrigation demand and maintains aquatic habitat. In 2018 that target was 1,000 cfs.

Given its importance to watershed management, Christina was tasked with recommending a flow target strategy. To do so, Christina used local hydraulic measurements and habitat unit mapping in combination with published habitat suitability criteria for Brown Trout (*Salmo trutta*), Rainbow Trout (*Oncorhynchus mykiss*), and Mountain Whitefish (*Prosopium williamsoni*) to create species-specific streamflow-habitat models for the lower Henry's Fork.

We know now that streamflow changes with canal diversions. Christina ultimately recommended changing the flow target from 1000 cfs at St. Anthony to 350 cfs at Parker. This new target reduces within-season habitat variability while staying within the 45-year mean habitat range, maintains connectivity to groundwater springs, and has increased end-of-year reservoir carryover. This work is currently accepted with revisions in the peer-reviewed publication *River Research and Applications*.

HFF created a website for water managers to pull real-time data to show flow is at Parker and elsewhere to assist daily water management. Implementing the low flow target at Parker saved 1200 ac-ft in WY 2020 and 2,400 ac-ft in Island Park Reservoir in WY 2021. It also allowed earlier fill of Island Park Reservoir.

Effects of Water Quantity and Water Quality on the Henry's Fork Fishing Experience
Rob Van Kirk, Henry's Fork Foundation

Fishing experience on the Henry's Fork is determined directly by fish abundance and size, aquatic insect abundance and species, weather and other environmental factors, and indirectly by the effect that environmental factors have on fish and insects. However, all of these effects are filtered through angler perception, expectations, and fishing preferences. Formal and informal surveys consistently indicate that the three characteristics of the Henry's Fork fishing experience most important to anglers are, in decreasing order of importance, the opportunity to fish to rising fish, aesthetics (including habitat quality), and number/size of fish caught. Streamflow directly affects these characteristics through aesthetics, which anglers perceive relative to their preferences for water depth and water clarity. Generally, anglers have a lower tolerance for higher flows when water clarity is poor and vice versa. Streamflow indirectly affects these characteristics via the positive relationship between winter outflow from Island Park Dam and trout recruitment into the population downstream. Winter flow is, in turn, primarily a function of overall water supply. These dependencies are well understood, can be predicted ahead of the fishing season, and can be influenced by water management and water conservation. In 2022, most angler dissatisfaction relative to streamflow occurred during rapid and large fluctuations in flow caused by heavy springtime rain and to high outflow from Island Park during July.

The effects of water quality on fishing experience are less well understood, more difficult to predict, and harder to influence via management. Data from HFF's water quality monitoring network and research indicate that water temperature, dissolved oxygen, food availability, and the ability of fish to move among different habitats to seek optimal conditions do not have negative biological effects, even when anglers may perceive otherwise. However, suspended sediment deposition and transport—particularly between Island Park Dam and Pinehaven—can have biological effects in addition to those perceived by anglers. Turbidity has an immediate effect on angling experience as it affects aesthetics but a lagged effect on hatches. Although our data set is still relatively small, we have found statistically significant relationships between sediment deposition in the Harriman reach and quality of the insect community. Sediment deposition in that reach is higher during years with high irrigation-season outflow from Island Park Dam, higher aquatic vegetation abundance, and weather-driven events that mobilize sediment in Island Park Reservoir. Sediment export from the Harriman reach is higher when springtime flows are high and plant growth is low. In 2022, sediment delivery from the reservoir was higher than average during the early summer, but export was also higher due to much lower-than-average plant growth due to cold temperatures during the spring. This resulted in high dissatisfaction among anglers due to high turbidity during June and July but may have less negative effect on insect hatches over the next year or two than expected because much of it was exported from rather than deposited in the Harriman reach. Ensuring good water clarity and quality hatches in the Harriman reach is proving to be the biggest challenge to maintaining the quality of fishing experience anglers expect on the Henry's Fork.

Conant Creek Canal Project

Daniel Wilcox, Henry's Fork Foundation/Friends of the Teton River

Many different partners collaborated to make this project happened. The Farms and Fish Program consists of regional organizations working with local irrigators and agricultural producers who voluntarily implement new management practices with the intent to maintain quality fisheries in the Henry's Fork Watershed. Island Park Reservoir is crucial to the fishery, but the reservoir's mandate does not include fisheries.

Conant Creek is critical habitat for an array of cold-water fish species, including Yellowstone Cutthroat Trout.

Conant Creek Canal consists of three primary reaches: 1) the point of diversion from Conant Creek, 2) the spillback to the Creek, and 3) the end of the canal and terminal pond. The headgate is only used for coarse delivery of water and is adjusted only a couple of times per irrigation season. Farmers in this area rely on healthy soils and dependable water sources. This irrigation infrastructure supports 3,200 acres of irrigated farmland.

In August 2019, discharge in the canal system was measured at the diversion, upstream of the spill structure, downstream of the spill structure, and upstream of the terminal pond. The project is estimated to eliminate 2,850 ac-ft/year in canal seepage and increase flows in Conant Creek by 13 cfs. Also, expected to save 1,987 ac-ft/year of storage water in Island Park Reservoir, improve aquatic habitat, connectivity, and ecological resiliency for cold-water species and increase in farmers' participation in NRCS conservation programs.

Phase 1 involves lining 5.7 miles of canal with liner to reduce seepage and increase conveyance to 99%. Phase 2 will involve establishing automation equipment at diversion headgates and spillback locations. The 3-year project budget is $2.17 million, of which $1.1 million is federal funding secured through the WaterSMART program. Other sources of funding include Idaho Soil and Water Conservation and others.

US Bureau of Reclamation Infrastructure Funding and Looking Ahead
Jennifer Carrington, US Bureau of Reclamation

The United States continues to face growing challenges to its infrastructure, water supply, and ecosystems due to population growth, climate change, and aging water delivery systems. The Bipartisan Infrastructure Law and the Inflation Reduction Act were enacted to address the many challenges in the arid West. The Bipartisan Infrastructure Law, which just celebrated its one-year anniversary, provides $8.3 billion to Reclamation for water infrastructure and $2.5 billion for authorized water rights settlement projects over a five-year period. The Inflation Reduction Act underscores the Administration's all-of-government approach to bolstering climate resilience and protecting natural areas for current and future generations.

As climate change continues to have a significant impact on ecosystems and water supply, Reclamation, the State of Idaho, and water users are collaboratively investigating new water storage opportunities that leverage existing federal water infrastructure.

Director Carrington has been in this role since mid-year and has been with the US Bureau of Reclamation for decades. The Director received her MS degree at Boise State University and during that time had the opportunity to interview both Dale Swensen of Fremont-Madison irrigation District and Jan Brown of the Henry's Fork Foundation about the founding of the Henry's Fork Watershed Council.

Related to the Infrastructure Bill, USBR has held a number of stakeholder sessions about these funding opportunities. They are recorded and available online as well. $8.3 billion for FY22-26 on top of USBR's

budget. Aging infrastructure is a key priority. $400 million went toward WaterSMART grants. The Inflation Reduction Act provides additional funding opportunities, including towards water and habitat restoration in our area. There is a lot of funding and opportunities to be had. USBR has folks who can help us work through the details on how we might be a recipient of some of that funding. This is one of the largest investments in climate resilience in the nation's history.

USBR's WaterSMART program focuses on water conservation. In 2022, 12 WaterSMART grants were selected in the Upper Snake Region. Some include: Henry's Fork Foundation $1.1 million for Conant Creek Canal and $2 million in bill funding for Friends of the Teton River on the Canyon Creek project. Funding opportunities for Applied Science, WEEG, small scale water efficiency grants, and new opportunities will have funding announcements coming out in the early new year. Leah Meeks is the WaterSMART grant guru in their office and she is always happy to come out and talk to folks. David Denton is the liaison with the Washington DC office and a good resource. Reach out to Mike Hilliard or others with questions.

Eastern Snake Plain Aquifer Recharge: working with others on efforts to stabilize the ESPA. Funding has been awarded via WaterSMART. Continue to meet regularly with IWRB as well.

Water Storage: USBR and State of Idaho and water users are investigating new water storage opportunities. One example is the effort to create additional storage via 6 ft raise at Anderson Ranch Dam. Began final design work in November 2021. Environmental compliance work in 2023. USBR and Corps of Engineers are conducting Phase 2 of Ririe winter storage study. Delaying anticipated completion dates to provide leeway for dam safety advisory review and to run climate analysis scenarios in 2023.

Good communication will be crucial between USBR and partners going forward. The Director is here to facilitate that communication. USBR is aware of concerns regarding Palisades Reservoir levels and potential for sediment. Director asked that Palisades be one of the first reservoirs USBR looks at for sediment conditions.

Community Building and Wrap Up

Keith Esplin, EIWRC - want to elaborate on how important collaborations are. An Idaho canal diverts 1300-1400 cfs, water runs 50-60 miles. Parts of the year they lost over 70% to seepage. They have all kinds of needs for infrastructure improvements. Asked if they will apply for funds. Said no, they can't match the grants.