

Outlet



MONTANA CHAPTER OF THE AMERICAN FISHERIES SOCIETY

January 2022

President's Hook by Lisa Eby



Lisa Eby: Montana chapter AFS president

By the time this newsletter hits your email inboxes, it will be 2022, so Happy New Year!

I am always so impressed with the group of professionals that work in our state. Montanans are fortunate to have such dedicated scientists and managers working throughout the state's various governmental agencies,

as well as in its private and nongovernmental organizations. I would like to thank all members for their hard work in their profession, for the resources they protect, and for their participation in the American Fisheries Society. As we move into this new year, please let us know what the officers and the membership can do to keep the Chapter active and healthy.

It has been another challenging year. One that has seen loss of treasured colleagues, as well as difficulties created by the pandemic and managing resources in the face of drought. Even so, some great fisheries work has been done! I encourage each of you to share your work by giving a presentation at our annual meeting in March. We all want to hear about

the exciting work that you are engaged in. Our annual meetings provide a forum that allows us to exchange ideas for current and upcoming challenges, to update colleagues about the fascinating work being done in MT, and, even when virtual, to foster the fellowship that makes our work so satisfying.

As we begin looking towards 2022, I want to extend my appreciation to those people busy planning the upcoming annual meeting and those maintaining our committee activities. If you want to get more involved, please feel free to contact the chair of the committee directly or one of the Excom members. Join our Facebook page to stay in touch throughout the year—share your work, learn about fisheries activities and AFS events

Montana Chapter AFS 55th Annual Meeting “Montana's Fisheries at a Crossroads: Evaluating All Pathways”

We are once again calling on members to share some of the great fisheries work they have been doing over the past year by giving an oral presentation at the 55th MT AFS Annual Meeting., held March 1st—4th 2022. The

meeting will again be virtual. All papers are welcome, including formal scientific studies and general informational talks. We make every effort to include every presentation in the program. Abstracts can be submitted by visiting

the Montana AFS website and following the link once open in mid-January: <https://units.fisheries.org/montana/event/annual-chapter-meeting/>
Abstract submission deadline: **January 31, 2022**

Important Dates:

- **JANUARY 24, 2022-** WALLY MCCLURE SCHOLARSHIP DEADLINE
- **JANUARY 28, 2022-** AWARD NOMINATIONS DEADLINE
- **JANUARY 31, 2022-** ANNUAL MEETING ABSTRACT DEADLINE
- **JANUARY 31, 2022-** RAF SUBMISSION DEADLINE
- **MARCH 1— 4, 2022** MTAFS ANNUAL MEETING

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Montana Chapter Annual Meeting *continued...*

FOR ADDITIONAL MEETING
DETAILS CONTACT:
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AND
LISA.EBY@UMONTANA.EDU

Oral presentation guidelines: Oral presentations will have a 15-minute time slot or a lightning talk (7 minutes) option and recommend leaving 2-3 minutes for questions. Pre-recorded oral presentations can be a maximum of 15 minutes. Pre-recorded talks will be posted to the website so membership can view

them at their leisure. Please be prepared to submit pre-recorded talks the week before the meeting, so we can get them on the website in time. Stayed tuned for updated Continuing Education opportunities that will be available during the meeting. We need your help in recognizing resource professionals with significant contributions to protecting and re-

storing aquatic habitats and fishes in Montana at our upcoming 2022 Virtual Montana Chapter AFS annual meeting. Please send nominations to Traci Sylte, awards chair: tracisylte@gmail.com by 5pm on January 28th, 2022



2022 Tentative Meeting Agenda

Tuesday, March 1st:

A.M.: Continuing Education Workshop: TBD
P.M.: Plenary Session: Fisheries Challenges During the Drought Conditions of 2021
P.M.: Plenary Expert/Speakers Roundtable
P.M.: Evening Social: Brad Shepard Remembrance/Toast

Wednesday, March 2nd:

A.M.: Contributed Papers
P.M.: Business Lunch Meeting
P.M.: Brad Shepard Symposium: Native Species Conservation
P.M.: Evening Social: UM Fish Trivia

Thursday, March 3rd:

A.M.: Contributed Papers
P.M.: Symposium: Montana's Long-term River Data Sets
P.M.: Break Out Fisheries Topics
P.M.: MSU Student Fisheries Society Student Raffle and Poster Session

Friday, March 4th:

A.M.: Continuing Education Workshop: TBD
P.M.: Break Out Fisheries Topics
P.M.: Adjourn

Annual Meeting Update by David Stagliano

Hello Members, this will be my 16th year attending the MT AFS Annual Chapter Meetings, my 1st as a meeting planner. While I truly wanted to arrange a super fun, in-person meeting in Helena, because of the weirdness of vaccine mandates and other viral issues (no, not the Madison River management plan), we will be fully virtual again this year. But, since it's our 2nd meeting using the virtual platform (Cvent), we hope that it will go even more smoothly than last year and offer a few more interactive options for

attendees. So, sit in your comfy chair, grab a cup of coffee or a hoppy, distilled or fermented drink for the afternoon sessions and learn about what your colleagues have been up to this past year.

Of course, nothing can replace the in-person interactions, conversations, collaborations and beer drinking that occurs in the hallways of the conference center or at the local brewery, we can still share the good fisheries work that is happening across Montana. Please consider sharing your accomplish-

ments with a presentation especially if it falls within one of our symposium topics, Brad Shepard-Native Species Conservation, Eastern Montana Warm-Water SOC Species, Reservoir Fisheries Management for Recreation and Identifying Trends Using Long-term River Data Sets.

Although we will be missing our gregarious and stalwart member, Brad Sheppard, this year; we are hoping to plan an in-person "Fisheries Workshop" in May to honor and remember him properly with some great food, beers, and conversation around the campfire.



David Stagliano: Montana Chapter AFS President Elect

A Good Year for Conservation by Leanne Roulson Parent AFS President

As fisheries folk, we value fish and the waters that sustain them, but sometimes it's hard to get people outside of the fish world to see aquatics conservation as a priority. However, 2021 was a good year for aquatics and here's why:

1. The EPA is moving toward a science-based definition of wetlands and waters that will prioritize concepts like connectivity and the role of headwater streams in watershed integrity. (<https://www.epa.gov/wotus>) Side-note: check out the picture they used for this website... looks familiar, no?
2. The Infrastructure Investment and Jobs Act will provide over \$4M in potential funding to Montana for aquatic-related projects like culvert replacement and

green infrastructure (See National Culvert Repair and Replacement Program) <https://www.commerce.senate.gov/services/files/7A88B060-F769-4772-969E-29E9B2ABA903>

3. The Recovering America's Wildlife Act (RAWA) continues to gain bi-partisan support. It now has 32 co-sponsors in the Senate (SB2372) and 140 in the House (HR2773).

Each of these marks progress for aquatic resource conservation, and indicates support for what we do from a broad slice of our country. Here's hoping that projects we are able to pursue in 2022 because of these changes increase that community visibility and support. Happy New Year!

"THE INFRASTRUCTURE INVESTMENT AND JOBS ACT WILL PROVIDE OVER \$4M IN FUNDING TO MONTANA AQUATIC-RELATED PROJECTS"



#recoverwildlife

RECOVERING AMERICA'S WILDLIFE ACT

A S F

fisheries.org/rawa

In Memoriam Bradley B. Shepard June 12, 1952—September 23, 2021

Brad Shepard died suddenly and unexpectedly on September 23, 2021, while going fishing on his island on the Yellowstone River with his favorite fishing partner, his son Ben, by his side. Bradley Bernard Shepard was born June 12, 1952, in Dayton, Ohio. He found his passion very early in life; fishing with his grandfather at the age of 2 years. He headed west as soon as he was out of high school, settling in Bozeman, Montana. Shepard earned a BS in fish and wildlife management from Montana State University (MSU) in 1975, an MS in fisheries resources from the University of Idaho in 1981, and PhD in fish and wildlife biology from MSU in 2010.

Shepard was a legendary fisheries biologist who devoted his 40+ year career to research, management, and conservation of native fish in Montana and beyond. He worked as a fisheries biologist, manager, researcher, and professor, taking him from the largest Montana rivers with Bull Trout

Salvelinus confluentus and sturgeon *Acipenser* spp., to the smallest mountain streams with Cutthroat Trout *Oncorhynchus clarkii* and Arctic Grayling *Thymallus arcticus*. He worked over 30 years as a fisheries biologist for Montana Fish, Wildlife, and Parks, 4 years as a senior aquatic scientist with the Wildlife Conservation Society, and 6 years as a private consultant

and adjunct professor at MSU. Shepard contributed his time and expertise to numerous agencies, tribes, and conservation organizations throughout the western United States and Canada. He relished working with colleagues in the field where numerous fisheries projects were conceived through endless discussions while sampling fish or sitting around a campfire at night.

Shepard championed all native fish and habitat conservation, but there is no doubt that his tireless efforts working on issues facing Cutthroat Trout stand out as a career highlight. This work started in the mid 1980s on small populations in southwestern Montana, and by the early 1990s Shepard was guiding the development of a multilevel approach to conserve Cutthroat Trout in Montana and range-wide. Shepard was chair of a multiagency technical committee that developed guidelines for conservation and recovery efforts for native Cutthroat Trout in Montana that were adopted and carried out by state and federal agencies, tribes, and NGOs, as well as agricultural and timber industries. He led or assisted other biologists on conservation efforts that ranged from securing aboriginal Cutthroat Trout populations of fewer than 100 fish, to removing nonnative trout and introducing Westslope Cutthroat Trout *O. clarkii lewisi* into 60 miles of Cherry

Creek. Shepard's research and conservation efforts helped in the development and implementation of dozens of completed and ongoing Cutthroat Trout projects in Montana and across the western USA in hundreds of stream miles and dozens of lakes. Cutthroat Trout have no better friend than Brad Shepard; he loved his "cuttie buddies."

Shepard had an insatiable curiosity, and a need to learn and make a difference, which translated into cutting-edge science, impactful management collaborations, mentorship of biologists young and old, and memorable fishing trips. He particularly enjoyed interacting with students and worked closely with the Montana Cooperative Fishery Research Unit at MSU, where he exhibited boundless generosity and energy in helping, advising, and mentoring graduate students and technicians, most of whom are still carrying on his important work. Shepard had an enormous "biologist tree" and many of us are privileged to be branches on that tree—now the next generation will put down their roots in the shade of his legacy.

During his career, Shepard published a long list of papers on his research, many of which are considered seminal papers in fisheries science and native trout conservation. He was an active member of the American Fisheries Society, serving as President of the Montana Chapter in



The Legend: Brad Shepard

1995, sharing numerous stimulating presentations at AFS meetings, earning the prestigious Career Achievement Award in 2009, and leading efforts to bring science to policy and management on many fish and habitat conservation issues across the West. Shepard leaves his wife Mary Lennon of Livingston, Montana, and two children, Ben Shepard of Bozeman and Madison Shepard of Rohnert Park, California.

This article was first published in *Fisheries* 19 October 2021. doi.org/10.1002/fsh.10691

Fish Talk: Featuring Chris Guy by Sam Bourret

Dr. Guy is the assistant unit leader at the Montana Cooperative Fishery Research Unit, part of the U.S. Geological Survey. Along with an outstanding number of peer-reviewed publications, professional accomplishments, and work conserving Montana fisheries, he has been a member of AFS since 1986.

Outlet: Dr. Guy, you have been involved with AFS in many facets throughout your career. What motivates your involvement with the society?

CG: One of my main motivations in participating and working within AFS is the interaction with colleagues beyond campus. Within the local, state, and parent chapters AFS provides ample opportunity to learn about fisheries projects outside of our typical geographic area. Also, I am involved in AFS as an example for my students, who can gain networking opportunities and connections beyond the local level. Lastly, AFS is a great way to give back to the profession. It takes a lot of work to be an active member or officer and often without recognition by your employer, but the point is, you are taking those positions to give back to the professional society, which benefits its members and the natural resource.

Outlet: What inspired you to develop the fishes of MT app, and how did the process work?

CG: First, I would like to rec-

ognize my collaborators on that project including Al Zale, Tom McMahon, David Schmetterling, and Whitney Tilt. The idea started because the Fishes of Montana book needed an update, and instead of updating with a new book that is static we decided to produce something that was more flexible for updating. For example, if a species name or distribution map changes you need a new edition for a book to illustrate the change, but with an app we can represent that change in a new update with a few key strokes. Furthermore, we decided to put the Fishes of Montana revision in an app format that the students in an ichthyology class, anglers fishing on the Bitterroot, and the general public could use. The real traditionalists still would like a book, but we think the app was successful based on the thousands of downloads we have had.

Outlet: Tell us about the podcast you started “Today’s Voices of Conservation” and how you had the idea?

CG: The podcast is hosted by myself and my cohost, Dr. Andrea Litt, who studies mammals here at MSU. The inspiration for this came through my teaching of a communications class in the department, where we focus on lay audience presentations in addition to the typical professional presentations. We decided that a podcast would be a great way to engage the students in communication, especially to the lay audience,

and it has been great. We have had around 18,000 downloads from all around the world, which is far more citations than most of us would get on any paper. The stories from the students have been so inspiring and heartwarming.

Outlet: What are some of the largest challenges facing Montana fisheries in the future?

CG: Climate change is certainly one of the biggest challenges in Montana given that coldwater and coolwater fisheries are extremely popular and a huge revenue source for the state. Also, coupled with climate change is angler use. As angler use increases with water temperatures, there could be a critical point where fish populations will be severely stressed. Given recreation fishing and tourism are a big part of Montana’s economy, how to balance use with changing environmental conditions will likely be the focus for the future.

Outlet: How can fisheries professionals become better communicators?

CG: It’s easy to say and difficult to accomplish, but practice. Also, really understand your audience, ask the questions, “What does my audience want to know, and why did they come to my presentation?” The answer to those questions change with a presentation to TU, AFS, and the general public. If you



Chris Guy

have the same talk for all three of those audiences, you are only going to connect with one of the audiences. Good presentations take a lot of time to develop. We do an exercise in the class where we have the students listen to Thane Maynard’s “90-Second Naturalist” piece on NPR and then have them prepare a 90-second talk about their research. To give them an example, I worked on a 90-second presentation about one of my projects. It took me four hours to finish my 90-second presentation on Pallid Sturgeon! One of my biggest frustrations as an educator is to see former students that had the communications class and, learned all the techniques for great presentations, slip into the old habits of bad presentations. I have thought a lot about why this happens, and I think it has to do with time, perhaps people don’t have the time to develop a good presentation with an interesting story with high-quality images given their other responsibilities. That is, they can’t focus on a single presentation like they could in school. Bottom line: it’s very difficult to be a good communicator.

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History of the Montana AFS Resource Action Fund

by Jim Dunnigan and Steve Dalbey

“THE CHAPTER ACCEPTS ANNUAL RAF GRANT APPLICATIONS UNTIL MID-JANUARY FROM INDIVIDUALS AND ORGANIZATIONS”

A variety of federal and state based grants are available to support fisheries conservation, restoration, outreach and education, and research efforts, but national and regional competition for these funds is often fierce and difficult to secure, especially for smaller projects. The Montana Chapter AFS recognized this limitation and seized on the opportunity to support projects within the state that closely align with the Chapter’s mission and values. The Montana Chapter AFS established the Resource Action Fund (RAF) in 1989 to provide financial support for public outreach and education, habitat and fish passage improvement projects, species conservation efforts, data management and research projects throughout Montana. The Chapter accepts annual RAF grant applications until mid-January from individuals and organizations regardless of Chapter or parent society membership status. Projects qualifying for the RAF funding must demonstrate that the proposed project will provide at least one of the following:

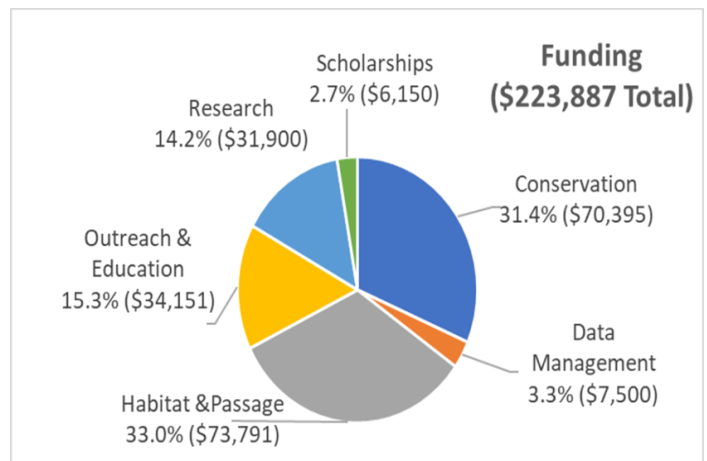
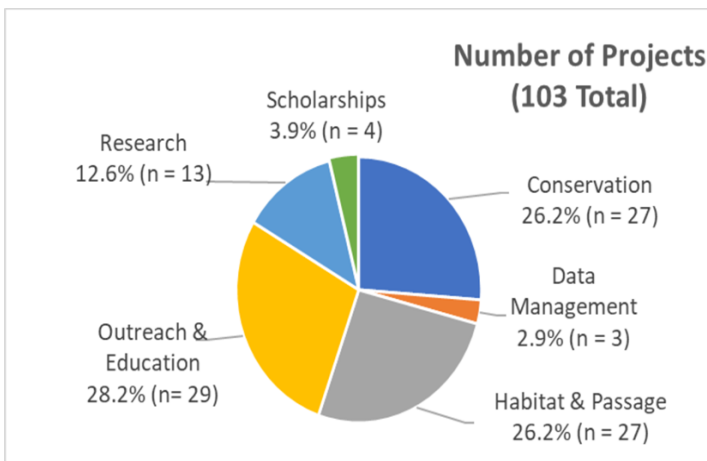
1. Benefit to a Montana’s native aquatic species or species of special concern
2. Short and/or long-term benefits to Montana’s or regional fisheries resources
3. Support of Chapter objectives

4. Relevance to ongoing and previous work in the geographic area or research area of the proposed project.

Qualifying RAF grant applications must demonstrate the following:

1. Endorsement and support by an appropriate Chapter committee
2. Coordination with applicable local, state, or federal agency personnel
3. All necessary permits or licenses have been obtained or are obtainable
4. Disclose the status (secured, solicited or denied) of additional project funding
5. Long-term Chapter funding would not be necessary for project completion

RAF grants are funded from the Chapter’s annual operating budget with revenue from membership dues, AFS member rebates, donations, and net revenue from the Chapter’s annual meeting. The Chapter’s executive committee (President, Past-President, President Elect, and Secretary-Treasurer) evaluates the Chapter’s annual budget and determines the maximum funding available for RAF grants in accordance with guidelines within the Chapter’s Financial Sustainability Plan. The Chapter’s executive committee reviews all applications and has the authority to approve grants up to \$2,000, but grant requests more than \$2,000 are presented at the annual Chapter meeting for approval by a majority membership vote.



The Fish Formerly Known as Mountain Sucker by Niall Clancy

With all of the organizations rebranding lately, we shouldn't be surprised that some fish want to get in on the action too. As a follow-up to my January 2019 *Outlet* article with Ryan Kovach entitled, "Montana Fishes Have New Scientific Names," here is another. Unmack et al. (2014) used mitochondrial DNA and morphometrics to conclude that *Catostomus* fishes of the sub-genus *Pantosteus* (the "mountain sucker complex") constitute more species than previously recognized. For instance, the Bluehead Sucker (*C. discobolus*) actually represents two separate species: one in the Colorado River basin (*C. discobolus*) and one in the Bonneville-Upper Snake basins (*C. virescens*). Of interest to Montana, Unmack et al. suggest that Mountain Suckers (*C. platyrhynchus*)

should actually be split into four different species: one in the Columbia River basin (*C. bondi*), one in the Lahontan basin (*C. lahontan*), one in the Bonneville- Snake-Green basins (*C. platyrhynchus*), and one in the Missouri River basin including Montana (*C. jordani*). Subsequent study has supported splitting these groups into separate species (Bangs et al. 2018), and they are now recognized as such by *NatureServe*. However, there remains debate as to whether *Pantosteus* should be elevated to its own genus as Unmack et al. also suggest. You will likely see both used in the future.

The most commonly used name for our newly described *Catostomus jordani* is 'Plains Sucker,' including by the federal Fisheries & Oceans Canada

in describing Alberta-Saskatchewan populations in streams that flow into Montana (Macnaughton et al. 2019; Teillet et al. 2021). However, many studies adopting the new scientific name still refer to them as 'Mountain Sucker.' I would suggest we consider also switching over to **Plains Sucker** so that traits and trends of other "mountain sucker" species are not confused with those of *C. jordani*. This may become especially important given evidence for potential population-level declines in parts of their range (Patton et al. 1998; Schultz and Bertrand 2012; Fopma 2020).

Bangs, M.R., M. R. Douglas, S. M. Musmann, and M. E. Douglas. 2018. Unraveling historical introgression and resolving phylogenetic dis-

cord within *Catostomus* (Osteichthys: Catostomidae). *BMC Evolutionary Biology* 18: 86.

Fopma, S. J. 2020. Distribution, density, movement, and support for management of Mountain Sucker, *Pantosteus jordani*, in the Black Hills of South Dakota. Doctoral dissertation, South Dakota State University.

Macnaughton, C. J., T. Rudolfson, D. A. Watkinson, and E. C. Enders. 2019. Standardized field sampling method for monitoring the distribution and relative abundance of Plains Suckers (*Pantosteus jordani*) populations in Canada. Canadian Technical Report of Fisheries and Aquatic Sciences 3316.

Schultz, L. D., and K. N. Bertrand. 2012. Long term trends and outlook for Mountain Sucker in the Black Hills of South Dakota. *American Midland Naturalist* 167: 96-110.

Teillet, M., D. A. Watkinson, S. F. Petry, and E. C. Enders. 2021. Report on Plains Suckers (*Pantosteus jordani*), Rocky Mountain Sculpin (*Cottus sp.*), Western Silvery Minnow (*Hybognathus argyritis*), and Stonecat (*Noturus flavus*) sampling conducted in 2020 in the Milk River drainage, Alberta. Canadian Data Report of Fisheries and Aquatic Sciences 1330.

Unmack P. J., T. E. Dowling, N. J. Laitinen, C. L. Secor, R. L. Mayden, D. K. Shiozawa, G. R. Smith. 2014. Influence of introgression and geological processes on phylogenetic relationships of western North American mountain suckers (*Pantosteus*, Catostomidae). *PLoS ONE* 9(3): e90061. <https://doi.org/10.1371/>



Credit: Bradley Rasmussen

Outlet



Donovan Bell

Student Profile: Donovan Bell **PhD Fish and Wildlife Biology—University of Montana**

I was born and raised in Juneau, Alaska, and have since bounced back and forth between Alaska and Montana. I completed a B.S. in Business Management at MSU before returning to Juneau, where I received a B.S. in Biology and was a fisheries scientist at the NOAA Auke Creek Research Station. I'm now working on my PhD at the University of Montana. With my free time, I enjoy exploring the great outdoors of Montana, wheth-

er on bike, skis, splitboard, or my own two feet.

My PhD research assesses several threats to native trout in Montana, including climate change, nonnative trout, and isolation. I'm using dynamic occupancy models to examine how rising stream temperatures, changing flow regimes, and interactions with nonnative trout have altered, and will continue to influence, the distribution of native trout in the Northern

Rockies of Montana. I am also conducting an experimental test of genetic rescue in small, isolated Westslope Cutthroat Trout, in which we are examining whether translocations can reduce inbreeding depression and, ultimately, extinction risk. Together, these two research projects aim to improve our understanding of threats to native trout and to help inform possible management strategies to mitigate these threats.



Kadie Heinle

Student Profile: Kadie Heinle **M.S. Fish and Wildlife Management—Montana State University** **MSU AFS Student Sub-Unit Treasurer 2020-2021**

I grew up in eastern Montana and got my start in fisheries through the AFS Hutton Scholar program in 2015. Since then, I received my bachelor's of science in aquatic wildlife biology from the University of Montana and have worked a variety of fisheries technician positions across the country. When I'm not tromping through a stream or staring at the computer, I'm either reading, baking, or spending time outside with my dog.

Yellowstone Cutthroat Trout are in a situation similar to many native salmonids, where they are highly valued ecologically and socio-economically across their native range, but are facing population declines from multiple threats including

climate change and non-native species. My research is using a combination of long- and short-term studies to understand the individual and synergistic effects of one aspect of climate change (drought conditions) and a non-native species (brown trout) on Yellowstone Cutthroat Trout survival, growth rates, and habitat use in a tributary system in the Crazy Mountains (Awaxawippiia). Specifically, I am using a long-term mark-recapture dataset to assess trends in Yellowstone Cutthroat Trout survival and growth rates as a function of habitat characteristics (e.g., streamflow and brown trout presence) in conjunction with short-term surveys on micro-habitat use and chronic stress levels to investigate potential

physiological mechanisms driving these broader trends in Yellowstone Cutthroat Trout growth and survival.

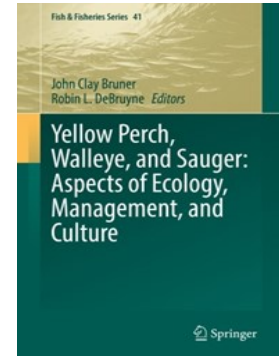
Yellow Perch, Walleye, and Sauger: Aspects of Ecology, Management, and Culture—New Book Announcement

Walleye, one of the most sought-after species of freshwater sport fishes in North America, have demonstrated appreciable declines in their numbers from their original populations since the beginning of the 20th century. Similarly, Yellow Perch, once the most commonly caught sport fish and an important commercial species in North America, have also shown de-

clines. Compiling up-to-date information on the biology and management of Walleye, Sauger, and Yellow Perch, including research on systematics, genetics, physiology, ecology, movement, population dynamics, culture, recent case histories, and management practices, will be of interest to managers, researchers, and students who deal with these important species, particularly in light of

habitat alterations, population shifts, and other biotic and abiotic factors related to a changing climate.

Bruner, John Clay, DeBruyne, Robin L. (Eds.) 2021. Yellow Perch, Walleye, and Sauger: Aspects of Ecology, Management, and Culture. Springer Fish & Fisheries Series Cham, Switzerland Vol. 41: 1-402 pp.



New Research Shows How Invasive Species Affect Native Food Webs source: University of Montana

Invasive species cause biodiversity loss and about \$120 billion in annual damages in the U.S. alone. Despite plentiful evidence that invasive species can change food webs, how invaders disrupt food webs and native species over time has remained unclear.

Now, thanks to a new collaborative study, there is greater insight into how invasive species progressively affect native food webs. The research was conducted by the University of Montana's Flathead Lake Biological Station, the U.S. Geological Survey and Montana Fish, Wildlife & Parks.

"This study provides new details about how invasive lake trout affect entire lake food webs," said U.S. Fish and Wildlife fish biologist Charles Wainright, who recently completed his graduate student

work at UM's biological station. "The findings will be important for conserving native species and ecosystems in Montana and elsewhere."

The study, recently published in the journal *Proceedings of the National Academy of Sciences*, used long-term fisheries monitoring records to determine the timing of invasion by a nonnative fish predator, Lake Trout, in 10 northwestern Montana lakes. It also analyzed food webs from those lakes to determine how they changed and impacted native communities as the invasions progressed. The research team showed that lake trout disrupted food webs by forcing native fishes to feed on suboptimal food sources in different habitats, eventually causing the loss of the native predator, Bull Trout, a threatened species protected under the U.S. Endangered Species Act.

"Native bull trout populations have drastically declined in many lakes across western Montana due to competitive interactions with invasive Lake Trout," said Clint Muhlfeld, a USGS aquatic ecologist and FLBS associate research professor. "For the first time, we show what happens not only to Bull Trout but entire food webs supporting them as Lake Trout invade and upset lake ecosystems over time."

The study also showed the food-web effects of Lake Trout invasion were especially pronounced as Lake Trout abundance increased rapidly 25 to 50 years after colonization. After 50 years, Lake Trout were the dominant apex predator in these food webs. The study shows that, given enough time, invasive Lake Trout can disrupt and replace a native fish species --



like Bull Trout -- and create divergent biological communities that are vastly different than uninvaded ecosystems.

The study's results stress the importance of protecting entire landscapes from biological invasions. The use of innovative bio-surveillance monitoring techniques, like environmental DNA, also are critical to increasing the likelihood of detecting invaders before they become established. For ecosystems that already have been invaded, this study's findings can inform proactive control efforts during the early stages of invasion to avoid food web disruptions that may be difficult to reverse.

The study, led by Wainright, was co-authored by Muhlfeld, Devlin, FLBS Director Jim Elser and Samuel Bourret of Montana Fish, Wildlife & Parks. The research was supported by the USGS Biological Threats Program, FLBS and philanthropic gifts.

The Montana Chapter of the American Fisheries Society was chartered in 1967. Among its objectives are conservation, development, and wise utilization of the fisheries; promotion of the educational, scientific, and technological development and advancement of all branches of fisheries science and practice; and exchange and dissemination of knowledge about fish, fisheries, and related subjects.



MONTANA CHAPTER OF THE AMERICAN FISHERIES SOCIETY

<http://units.fisheries.org/montana>

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Stay tuned for 2022 Annual Chapter Meeting Continuing Education Workshops...

Back by popular demand ,the Outlet is pleased to announce a 2022 MTAFS photo contest and special edition photo issue featuring the winners and best images. Stay tuned for more information at the annual meeting.

Your Chapter's ExComm and Committee Chairs

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