



THE CONFLUENCE

Newsletter of the Washington—British Columbia Chapter of the American Fisheries Society

Fall 2018

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We hope you're getting excited for our Washington-British Columbia Chapter of AFS 2019 Annual General Meeting (AGM) in Bremerton, Washington on April 8—11 because it should be a great meeting in an awesome location! The theme of the upcoming meeting is:

"Feast and Famine from the Headwaters to the Sea"

Being an aquatic organism in the Pacific Northwest is a constant struggle, whether one inhabits the headwaters or the sea. Some, like sea lions, are enjoying a moment of "feast" where populations are stronger than ever, perhaps even to the detriment of other species. But others, like Southern Resident Killer Whales and steelhead, are on the losing side, experiencing "famine" and facing extinction. We invite speakers to discuss potential causes for recent population trends, brainstorm ways we can help tip the scales for populations stuck in a cycle of famine, and share their experiences on the best ways to communicate this critical information to policy-makers. Please consider submitting a symposium proposal as early as possible (first call deadline is November 16). Also, we're looking for meeting logo designs, with selected designers receiving a complimentary registration or exhibitor table (deadline is December 1). More information about the meeting, including the call for symposia and call for logo designs, can be found at <https://wa-bc.fisheries.org/2019-meeting>.



2019 WA-BC Chapter Annual Meeting

April 8 – 11, 2019
Kitsap Conference Center, Bremerton, WA



2019 WA-BC AGM in Bremerton, Washington on April 8–11

More details about the meeting can be found at: <https://wa-bc.fisheries.org/2019-meeting/>

WA-BC Chapter Executive Committee



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AFS-BC President

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Shawna Warehime

President's Report

Greetings WABC Chapter members! Fall is in the air and as the season changes over, so does your WABC Chapter Executive Committee. Well, that's not entirely true as many of our Executive Team remain on staff, including Kirstin Gale as the chapter Secretary, Ryan Klett as the chapter Treasurer, Orlay Johnson as the chapter Student Representative, and Ben Cross as our chapter Communications Director. We are however, excited to have acquired Paul Spruell as our new chapter Vice President, while Tamara Knudsen has moved to the immediate Past President position, Brittany Jenewein progresses to the President Elect position, and I will assume the responsibilities as chapter President for the coming year. As President, I vow to do my best to represent the WABC chapter in an honorable and respectable fashion, to make our voice heard when necessary, and to lend an ear when appropriate. The chapter will face many new opportunities and many new challenges in the year to come (and years beyond). I challenge you as WABC Chapter members to take advantage of opportunities as they arise and to embrace the challenges we are confronted with.

Speaking of opportunities, planning is well under way for our 2019 Annual General Meeting. Brittany has secured an awesome meeting venue at the Kitsap Conference Center located on the waterfront in Bremerton, WA. We believe the accessibility of this location and the size of the facility will allow us to host one of the best chapter annual meetings we have ever had, both in size and in scope. Watch for updates on our meeting website (<https://wa-bc.fisheries.org/2019-meeting/>) and for our call for Symposia and submit your ideas to host a session or submit a paper. In addition, please let us know if you or someone you know is interested in becoming more involved with the chapter as we have lots of things we can use help with as we plan for this meeting. This will be an excellent opportunity for you to get more involved in chapter activities. Mark your calendars for April 8-11, 2019 and plan to join us in Bremerton. I know for a fact that each member of our Executive Committee will be ecstatic to see you there.

Our Executive Committee met in September to review our 2018/2019 work plan and our proposed operating budget for the coming year. In addition, we used the application process for the Western Division's "Outstanding Chapter Award" to help identify specific items our Chapter can improve upon over the coming year. For instance, I believe we can better market the AFS Certified Fisheries Professional certification program. Don't you? Using the Outstanding Chapter Award application in conjunction with the AFS guidance documents such as the AFS Vision 2020 and AFS Strategic Plan, we identified several additional topics we will address over the coming year. In the end, I believe our chapter will be more closely aligned with the vision and the values of the AFS, which is of course, why we are all here!

To wrap up, I'll just say that I am excited to see what challenges and opportunities face us in the coming year and with the leadership and membership expertise we have on hand, I believe we are poised to take advantage of either.

See you in Bremerton in April!
Gabe

Contact for President Gabriel Temple

Email: gabriel.temple.wabc.afs@gmail.com or afs.wabc@gmail.com

Meet the University of Washington Student Subunit Officers



Hi! I'm Bailey Gilbert, an undergraduate senior and I'm this year's President. Previously I served as the Communications Officer and have been a Fisheries Major since my sophomore year. I am also a Marine Biology and Environmental Studies Minor. What made me interested in the study of fisheries was primarily a love of the ocean and all bodies of water. You will find me at my happiest with my toes in the water. As the President of AFS-UW this year, I hope to increase productivity in the officer board as well as increase cohesion between undergraduates and graduates in SAFS.

Bailey Gilbert—President—bmg34@uw.edu

Hey there! I'm Elizabeth Ng and I'm a 3rd year PhD student in the School of Aquatic and Fishery Sciences. I'm doing my PhD in the Quantitative Ecology and Resource Management program! I did my BA in Biology and got my MS in Natural Resources and my MS in Statistical Science from the University of Idaho. What got me interested in SAFS is working at the interface of statistics, management, and ecology on applied problems in fisheries. SAFS is an awesome place to study because there are so many amazing researchers here! I'm hoping to support the Officer Board and find ways to collaborate with other SAFS groups to provide resources and professional advancement opportunities for AFS-UW members.

Elizabeth Ng—Vice President—elng@uw.edu



Hello! I am a 3rd year graduate student in the School of Aquatic and Fishery Sciences the Holtgrieve Ecosystem Ecology Lab. I did my BA in Biology with a specialization in ecology and conservation at Boston University. I became interested in SAFS because it provides a unique opportunity to study the intersection of resource management and ecology with a strong emphasis on quantitative and statistical methods. I am hoping to strengthen the community between graduate students and undergraduates at SAFS during my time as an AFS-UW officer, and I also hope to provide access to resource opportunities to AFS-UW members.

Megan Feddern—Secretary—mfeddern@uw.edu

Hi! I'm an undergraduate senior in the School of Aquatic and Fishery Sciences with a minor in Marine Biology. I became interested in SAFS by spending a quarter at Friday Harbor Laboratories my freshman year and loved it so much that I had to go back for round two my sophomore year and major in Aquatic and Fishery Sciences. I'm hoping get people excited about AFS-UW and convince them to come out to all the events!

Jonathan Huie—Treasurer—jmhuie@uw.edu

I am an Undergrad in my sophomore year majoring in Aquatic and Fishery Sciences and Oceanography and minoring in Paleobiology and Marine Biology. I love marine invertebrates and joined SAFS to learn more about them and how to make them my career. I am hoping, by becoming an AFS-UW officer this year, I can get more involved with the community and plan events and get more involved with AFS as a whole.

Marissa Leatherman—Communications Officer—male370@uw.edu



Wild Salmon Recovery in the Western United States: Four Facts and a Corollary

By Robert T. Lackey

Despite a few recent newspaper headlines heralding several “record” salmon runs, most salmon runs in California, Oregon, Washington, and Idaho are a mere shadow of their pre-1848 levels. Further, even most of these relatively small remaining runs are largely maintained by releases of hatchery-raised fish. *Wild* salmon — typically defined as those whose parents spawned naturally in natural habitat — comprise only a small portion of most runs and their overall abundance is a sliver of [historical levels](#).

The decline has been well known and for more than [160 years](#) there have been concerted efforts to recover salmon runs. Especially during the past three decades, the extent and cost of formal recovery efforts for *wild* salmon have substantially increased — in large part a response to requirements of the Endangered Species Act (ESA).

While using hatcheries to sustain relatively large salmon runs is plausible — although technically challenging — the requirements of the ESA relative to *wild* salmon has made the role of hatcheries in sustaining or increasing runs legally contentious.

In my interactions with professional colleagues over many years, they agree — [usually only when speaking unofficially](#) — that current efforts will not successfully recover *wild* salmon to abundances that would assure self-sustainability and support sizable sport and commercial harvest. Such a level of abundance would need to be at least a third or more of the typical pre-1848 run size.

Even with the very large expenditures to recover *wild* salmon, what that pushes the [most knowledgeable people](#) to the stunning conclusion that these well-meaning efforts will fail?

To succeed, a wild salmon recovery strategy must address several overarching and undisputed realities about the West Coast that have developed over many years. Without addressing these realities, any wild salmon recovery strategy will fall far short of expectations. It will be added to a long list — well over a century in the making — of noble, but failed salmon recovery strategies. Even if society continues to spend billions to restore wild salmon runs, these efforts ultimately will be only marginally successful.

What are these realities and how must they be changed to recover *wild* salmon to even a third of their historical level? Let’s look at the four key ones.

Fact 1: Overall, [wild salmon abundance](#) south of the Canadian border, is very low and has been so for a long time. Most spawning runs are far less than 10% of their pre-1848 levels. Over two dozen Endangered Species Act “species” (distinct population segments) are now listed as threatened or endangered. Many runs have already disappeared and more will follow unless there is a reversal of the long-term downward trajectory.

Fact 2: We have been well aware for a long time of the main [causes](#) of the dire state of salmon runs along the West Coast. These causes are well documented scientifically and include mining, dams, water pollution, habitat alteration, over-fishing, irrigation water withdrawals, predation on salmon by many species, competition with hatchery-produced salmon and other, often non-native fish species, and many other causes.

Fact 3: Anywhere wild salmon were once plentiful (Europe, Asian Far East, Eastern North America), the decline in their abundance is roughly inversely related to the [growth in the human population](#). Over decades and centuries, as the human population expanded in these regions, the size of salmon runs declined to miniscule levels. Since 1848, the West Coast is playing out similarly for wild salmon. For example, from a pre-1848 human population level of a few hundred thousand, California, Oregon, Washington, and Idaho are

Wild Salmon Recovery in the Western United States: Four Facts and a Corollary (Continued)

now home to 50 million people. Over the same time period, wild salmon abundance in the four States has declined from roughly 50 million to a few million. And the future? Assuming expected human population growth in these four States, by 2100 they will be home to somewhere between 150 and 200 million people — a tripling or quadrupling by the end of this century — barely 80 years from now.

Fact 4: It is not just the sheer number of humans (Fact 3), but their [individual and collective life-styles](#) that reduce the abundance of wild salmon. In the absence of dramatic changes in economic policies and life-styles, [future options](#) for restoring salmon runs to significant, sustainable levels will be greatly constrained. For example, by 2100, with 150-200 million people living in the 4 West Coast states, consider the *additional* demand for houses, roads, Costcos, Starbucks, air conditioning, drinking water, office buildings — the list is a very long one.

What about a candid assessment of current wild salmon recovery efforts and their future in California, Oregon, Washington, and Idaho?

Corollary 1: To succeed, a wild salmon recovery strategy must change the four facts or that strategy will fail. If society only continues to spend billions of dollars in quick-fix efforts to restore wild salmon runs, then in most cases these efforts will be only marginally successful and the long-term downward trajectory of wild salmon will continue. It is money spent on activities not likely to achieve recovery of wild salmon, however it helps people feel better as they continue the behaviors and choices that preclude the recovery of wild salmon. As important, it also sustains a jobs program for scientists and other technocrats by funding the [salmon recovery industry](#). This industry has become is a multibillion dollar enterprise and collectively forms an influential advocacy group.

Turning to the future to assess what is realistically plausible, maintaining sustainable populations of many highly valued *non-native* West Coast fish species (*e.g.*, bluegill, walleye, smallmouth bass, largemouth bass, brook trout, and striped bass) is feasible, because these species, unlike salmon, are well adapted to the [greatly altered](#) West Coast aquatic environments. Overall with a drastically altered aquatic environment, and not at all surprising, many nonnative fish species are doing well. Nor should it be surprising that wild salmon are struggling to hang on in environments for which they are poorly adapted.

In conclusion, if society continues to ignore these four facts and the corollary, no one should be surprised by the lack of long-term success of wild salmon recovery efforts. Perhaps these billions of dollars being spent to recover wild salmon should be considered “[guilt money](#)” — modern-day indulgences — a tax society and individuals willingly endure to alleviate collective and individual remorse about the sorry state of wild salmon. After all, it is money spent on activities unlikely to achieve the recovery of wild salmon, but it perhaps helps many people feel better as people continue the behaviors and choices that essentially preclude wild salmon recovery.

Dr. Lackey, formerly Deputy Director of EPA's Environmental Research Laboratory in Corvallis, Oregon, retired in 2008. For his work on strengthening the [role of science](#) in salmon policy, he was awarded EPA's Gold Medal — the agency's highest award. He is currently a professor of fisheries at Oregon State University.



Endowment Brief History

Jeff Cederholm dedicated his career to conservation of salmon and aquatic species and their habitats. Jeff passed away in 2006 leaving a legacy of education, pioneering contributions to scientific literature and periodicals and instilling of passion for wild salmon conservation in many people for decades. After a successful American Fisheries Society Meeting hosted by the WA-BC Chapter in Seattle 2011, the Chapter resolved in 2013 to apply raised funds and subsequent contributions to the endowment to create a permanent source of financial support for educational expenses. The Scholarship is administered by the WA-BC Chapter Endowment Committee.



The Scholarship

The scholarship endowment fund will provide **three \$1000 scholarships in 2019**, one each to an **undergraduate** student (pursuing a bachelor's or associate's degree), a student pursuing a **master's degree**, and a student pursuing a **doctorate**.

The following scholarship criteria apply:

Scholarships are intended for defrayment of educational expenses such as tuition, student fees, lab fees, books, supplies, room and board.

Scholarships will be awarded to students pursuing degrees in fisheries, aquatic sciences, or related fields at an accredited college or university.

Master's and PhD applicants must be Washington-British Columbia Chapter members at the time that their application is submitted.

Undergraduate applicants need not be Chapter members.

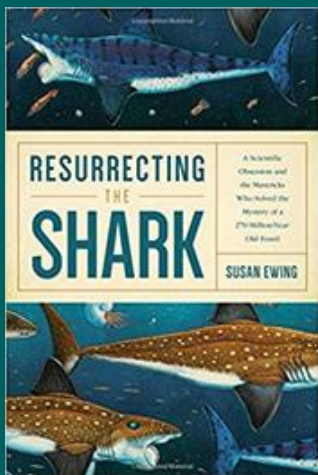
How to Apply

Provide a brief cover letter addressed to the C. Jeff Cederholm Scholarship Committee, fill out the attached application form, acquire two letters of recommendation and e-mail a merged pdf electronic version containing all elements to WA-BC AFS Past President, Tamara Knudson, tamarak@spokanetribe.com or mail to WA-BC chapter American Fisheries Society, P.O. Box 9322, Spokane, WA 99209. E-mail submissions are preferred.

Applications will be accepted through February 15th, 2019.



Orlay Johnson,
Reviewer



Resurrecting the Shark - A Scientific Obsession and the Mavericks Who Solved the Mystery of a 270-Million-Year-Old Fossil



Susan Ewing,
Author

The Book Nook

"Resurrecting the Shark - A Scientific Obsession and the Mavericks Who Solved the Mystery of a 270-Million-Year-Old Fossil"

Review by Orlay Johnson

Author: Susan Ewing. Pub: Pegasus Press. 2017.

Short Version – Fun read about a 40 ft long extinct prehistoric shark with buzz saw like dentition, but way too many historical details unless you are really into shark evolution – still the last half about Ray Troll, Jessie Pruitt (an Iraq Veteran and Idaho State University student) and their amazing research group called Team Helico is well worth the slower first half.

Full Version – Any book about 40 ft long prehistoric sharks (genus *Helicoprion*) with chainsaw like whorls of teeth, as got to be an interesting read. This is especially so when it features Ray Troll (shark aficionado and one of Alaska's premier marine animal artist), as well as the adventures of an Iraqi War Veteran, Jessie Pruitt who discovered a huge shark fossil in the basement of Idaho State University. Together with a host of other biologists and fossil detectives they work to solve a centuries long scientific mystery before an exhibit at the University. Plus, author Susan Ewing is an accomplished and nature writer (*The Great Alaska Nature Factbook: A Guide to the State's Remarkable Animals, Plants, and Natural Features* 2011) and a big fan of prehistoric life especially chimaeras (ratfish), the closest living relatives of *Helicoprion* (the original owner of the 270-million old fossil).

That said, it was a very hard book to read and review: The book goes into excruciating detail about shark evolution and paleontology as well as (it seems) every single person who ever found or touched a shark fossil – including their friends, wives, husbands, kids' social injustice, and everyone's general well-being. If this is something you find interesting, all is well and good, but if you just want to know about the chainsaw teeth and how people identified the shark – the book is a bit long in the jaw (sorry).

The reason for the mystery and the basis of this book, is that sharks and rays use cartilage instead of bone to anchor their muscles, and cartilage does not fossilize. So, there are no fossil bones, and all the examiners had to work with were teeth set in a buzz saw-like pattern. This is nothing like we see in sharks or their relatives today. Did they really have a chainsaw like mouth and was it ventral, dorsal, or? Regardless, for sure we have a truly bizarre and weird prehistoric shark from the Permian (240 mya) that has befuddled geologists, paleontologists, and others who have had the opportunity to examine the fossils and try and figure out what they mean.

However, to give you a sense of the detail and flavor of the book, the history begins with the discovery of the first documented *Helicoprion* shark fossil by a Mr. Davis, who was an Aussie prospector in the 1880s. He passed it on to a Rev. J. G. Nicolay and Ewing then goes into the history of geology and shark

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The Book Nook (Continued from Page 7)

paleontology including James Usher, Nicolaus Steno, William "Strata" Smith, Mearns Colliery, James Hutton, Henry B. Woodward of the British Museum and on and on. Anyway, you get the idea – this is actually fairly interesting, but it is really way way too much detail.

Never the less, Ewing's descriptions of shark paleontology can be riveting. Her reporting on how scientists over the years put together the pattern of the shark teeth (even if incorrectly) and its ecology, plus the migration or movement patterns of the shark is fascinating. These sharks were swimming in the 290 million years ago in the Permian oceans of Gondwana and Pangaea and their fossils turn up from Idaho to Russia. How they got there was a true mystery until the acceptance of continental drift, first proposed by Alfred Wegener in 1912, elaborated by Arthur Holmes in 1928, but not accepted till the 1960s with the discoveries of Harry Hess (1962) and R. Dietz (1961) of mantle convection currents, now known as "sea floor spreading." And, this is only a small fraction of the depth of discussion in just the first chapter...

The second half of the book is far more interesting from a purely storytelling perspective. Here the author moves to the modern-day mystery of what the sharks looked like and the adventures of "Team Helico." This is a group of shark experts from around world working to nail down the anatomy of the shark jaws, its ecology, and anatomy (did it have gill slits, did it have claspers, etc.). To make the story more interesting, they were under pressure to find some answers prior to a prehistoric shark display in June 2013 at the Idaho Museum of Natural History in Idaho Falls.

As an example, of the more personal nature of the story, this is a quote mid-book: *Troll was ecstatic when he heard they located the fossil. He could feel Zangerl and Bendix-Almgreen stirring and felt his own passion for the shark, quiescent for the last handful of years, thump alive in his heart and imagination. He all but booked a ballroom for the revival of the Helicoprion fan club. "Scan that sucker!" He urged Tapanila and Pruitt. "With what money?" They replied.*

Writing like this builds excitement and makes a reader keep reading – what will happen, will he succeed, will the scan of the dentition be the turning point, etc. The book just gets better from there – as prehistoric shark experts work to solve the mystery; we learn a basic principle of group decisions. When people, experts or not, get together to evaluate data – they rarely all agree and that is exactly what happens here. While, Team Helico put together a tantalizing saga of skill and change, "an uncontested agreed upon win would have been far too contrary to the great contrarian *Helicoprion* tradition. Every feature of the shark was contested such as what did the fins and dorsal spine look like, were there one or two whorls in the chainsaw-mouth apparatus, and was it inside or outside mouth?"

Even though not all of these questions get answered, Team Helico, through hard work and a committed, creative, and unconventional collaboration achieved the first major scientific breakthrough in the understand of *Helicoprion* in over a century – and this is a heck of a lot of fun to read about.

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ISU's Leif Tapanila and Jessie Pruett



Cast of *Helicoprion* tooth-whorl

The Book Nook (Continued from Page 8)

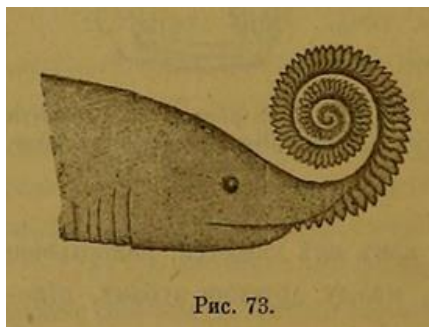
Another argument is over whether these sharks had claspers, the anatomical fins used to transfer sperm from male to female and a characteristic of every single species of living sharks. And amazingly enough, claspers actually fossilize... Again, you can read about the arguments over something which may seem obscure to most of us, but not to shark folks.

And then there is the final question – how in world did a creature so dominant in its time, 20-40 feet in length, with almost global distribution go extinct so quickly.

The motivation to arrive at some agreed upon conclusion was an exhibit at the Idaho Museum of Natural History in June 2013 – “The Whorl Tooth Sharks of Idaho.” Paleosculptor Gary Staab created two dramatic life-size replicas for the exhibit – one of which appeared to burst into the room through a hole in the wall (and there is humor here, but you’ll have to read the book...).



Regardless, one thing this book emphasizes –the discussions and arguments are not concluded – and new theories’ spring up daily (e.g. the Smithsonian has a whole different take on the tooth placement) and new fossils will need to be discovered before ideas become facts. This is emphasized in the last page of the book when something is found just 50 miles south of Idaho Falls in a rock quarry – but you’ll have to read the book to see what it is.



I do highly recommend this book, for those who like fossils, evolution, and bizarre sharks – while the first half has an overabundance of historical details, it builds a framework for the more up-to-date and exciting last half. One inescapable conclusion that shows in the writing is that Susan very much enjoyed researching and writing this book – she loves sharks, is a good friend of Ray Troll, but mainly she enjoyed learning about these beasts and being associated with such a fun group of devious, meticulous, argumentative, and hugely talented people. She quotes Isaac Asimov, to the effect that the most important expression in science isn’t *Eureka*, but *That’s odd...* So, go for a walk along that quarry wall, beach cliff or the Burgess Shale hike

you always wanted to take, and see if you find anything odd...or maybe just ponders the whys and wherefores of ancient sharks, *a la* Ray Troll (www.trollart.com).

Acknowledgements – many thanks to the reviewers including Drs. Fred Utter, Shirley Kronheim, and Joe Costello, who caught many of my errors. And as always, any factual or other errors are all mine.

References:

Brad Matsen; Ray Troll (October 25, 2012). "Planet Ocean: A Story of Life, the Sea, and Dancing to the Fossil Record".

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2019 Midwest Fish & Wildlife Conference Symposium

Using Standardized Assessments to Evaluate Harvest Regulations: Advancing Science-based Fisheries Management

Why have this symposium? Harvest regulation (i.e., minimum length limits, daily bag limits) use by agencies is ubiquitous. However, how agencies and research staff evaluate the effectiveness of regulations is less well known. Data which result from standardized assessments likely provide direct ways to assess outcomes of regulations. Here, we seek to provide a forum to:

- Summarize what is known about the effectiveness of harvest regulations across a wide variety of aquatic ecosystems;
- Share information on regulations evaluated, data collected, identified data gaps, and data sharing needs; and,
- Address how data from standardized assessments inform regulation evaluations and effective fishery management.

Who should submit their abstract to this symposium? All agency managers and/or research scientists that evaluate the effectiveness of regulations and collect standardized data from which they manage should consider submitting to this symposium. Presentations of particular use would address:

- Descriptions of state agency approaches to regulations and regulation evaluations, including indications of the data needed to evaluate;
- Descriptions of the use of standardized assessments to evaluate regulations; and,
- Considerations of how much data (e.g., how many years, how many generations) is needed to evaluate a regulation.

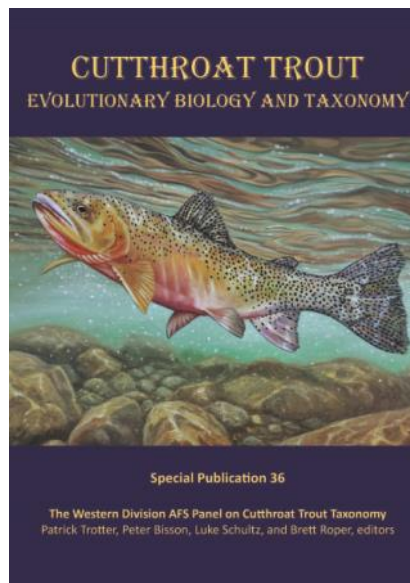
Find additional information here: <http://midwestfw.org/html/symposia.shtml>

Symposium organizers: Joseph Conroy, Jeremy Pritt, Ohio Dept. of Natural Resources; Martha Mather, Kansas Cooperative Fish and Wildlife Research Unit; and, John Dettmers, Great Lakes Fishery Commission



Education Corner

CUTTHROAT TROUT EVOLUTIONARY BIOLOGY AND TAXONOMY



Checkout the new publications at the [AFS bookstore](#), including *Cutthroat Trout Evolutionary Biology and Taxonomy* which features two editors that are members of our Chapter: **Patrick Trotter and Peter Bisson!!!**

WESTERN DIVISION AMERICAN FISHERIES SOCIETY STUDENT COLLOQUIUM

The 2018 Western Division AFS Student Colloquium will held at the Menucha Conference Center in Corbett, Oregon on **November 15–18, 2018**. The event is jointly hosted event by the Oregon State University and Mt. Hood Community College Student Subunits. This event is a great way to meet your fellow AFS student members, see student-peer conducted research and presentations, and learn to create engaging infographics. For more information, visit <https://wdafs.org/students/student-colloquium/>.

MIDWEST FISH AND WILDLIFE CONFERENCE

The 79th Midwest Fish & Wildlife Conference will be held **January 27–30, 2019** at the Hilton Cleveland Downtown Hotel in Cleveland, Ohio. The theme of the meeting is "Communicating Science to Fan the Flames of Conservation." To get all the details, check out the website at <http://midwestfw.org/html/symposia.shtml>.

ANNUAL STREAM RESTORATION SYMPOSIUM

The 18th Annual Stream Restoration Symposium is made possible through the work of the nonprofit, River Restoration Northwest, a scientific and educational organization formed in 2002. The symposium will be at the Skamania Lodge in Stevenson, Washington on **February 5–7, 2019!** Details can be found at www.rrnw.org.

AMERICAN FISHERIES SOCIETY & THE WILDLIFE SOCIETY



From **September 29 to October 3, 2019 in Reno, Nevada**, The Wildlife Society and American Fisheries Society will come together for the first-ever joint national conference of these two organizations. The event will likely be the largest gathering of fish and wildlife professionals ever, and will provide unprecedented opportunities for science-sharing and potential collaboration.





Washington-British Columbia Chapter of the American Fisheries Society

Chapter Information

Website: <http://wa-bc.fisheries.org/>

Facebook: <https://www.facebook.com/wabcafs>

Twitter: <https://twitter.com/wabcafs>

Want to join AFS and the WA-BC Chapter? <http://membership.fisheries.org/>

Questions? Suggestions? Contact:

President Gabriel Temple at gabriel.temple.wabc.afs@gmail.com

Want to write an article or submit any type of fisheries-relevant information to this newsletter? Contact:

Benjamin Cross at bekecr@gmail.com

The WA-BC Chapter of the American Fisheries Society, which includes members in Washington State and British Columbia, is an organization composed of professional biologists interested in the scientific conservation and enhancement of fish populations and their environment.

The mission of the Chapter is to:

1) advance the conservation and intelligent management of aquatic resources within a context of sound ecological principles,

2) gather and disseminate information pertaining to aquatic science and fisheries management, and

3) promote the educational and technical aspects of the fisheries profession.

In pursuit of our mission, we will strive to equitably represent the views of members, develop opportunities for effective leadership and conservation, and generate the resources necessary to carry out our programs.

The next WA-BC Chapter Annual General Meeting will be held in Bremerton, WA on April 8–11, 2019.

Watch for the latest updates!

<https://wa-bc.fisheries.org/2019-meeting/>



2018-2019 Executive Committee of WA-BC Chapter

From left to right: Gabriel Temple, Orlay Johnson, Kirstin Gale, Tamara Knudson, Brittany Jenewein, and Benjamin Cross. Not present: Ryan Klett and Paul Spruell