

2019 ANNUAL GENERAL MEETING



by Kaitlin Thurman

Feast and Famine from the Headwaters to the Sea

WASHINGTON-BRITISH COLUMBIA CHAPTER
OF THE AMERICAN FISHERIES SOCIETY

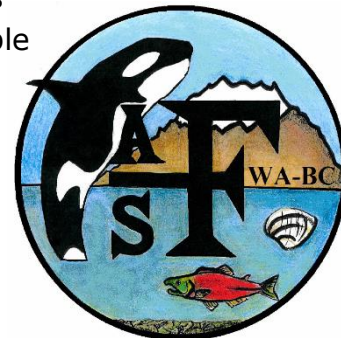
Kitsap Conference Center
Bremerton, WA
April 8–11, 2019

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Things to Remember

- Come to the registration table if you have questions or concerns
- Sign up to become a WA-BC AFS member at the registration table
- Support student travel by buying gear at the silent auction
- Buy some gear with our WA-BC Chapter 2019 meeting logo
- Check out the Trade Show!



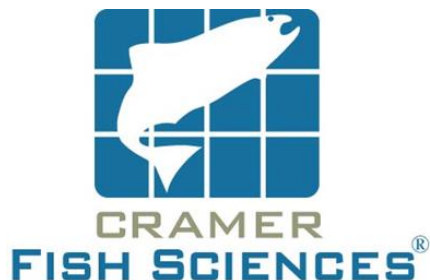
Conference Sponsors

Ling Cod Level (\$1,000 +)



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**FISH and
WILDLIFE**

Rockfish Level (\$500)



EWOS®



**Freshwater Fisheries
Society of BC**



Contributor Level (\$250)

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Washington-British Columbia Chapter of the American Fisheries Society – AGM 2019

President's Welcome

Welcome to the beautiful waterfront in Bremerton, Washington! The theme for our meeting this year is "Feast and Famine from the Headwaters to the Sea," and we intentionally selected Bremerton for our meeting location to highlight many of the major regional issues that have been in the news and recent discussion circles of many of our colleagues. Consistent with that theme, we have lined up a diverse group of talks which are reflected by a diverse suite of symposia topics. You definitely will be engaged in these discussions so thank you for joining us.

One of the big topics we are all familiar with across the region has been the current depressed status of the Southern Resident Killer Whales. We have invited Dr. Greg Ruggerone to share with us some cutting-edge research that will address that topic during our plenary session and we will host an additional symposium later in the week to elaborate further on the topic. In addition, we have invited Dr. Michael Phelps to our plenary to share some emerging genome-editing technologies that have the potential to transform Pacific Northwest fisheries ecology in ways we had not previously envisioned.

We wanted this meeting to be memorable and we decided that a nice way to do that would be to develop a meeting logo that we could stamp on some new SWAG gear. We recruited local artists to submit their ideas and original artwork for a meeting logo that would encompass the meeting theme and that would represent the Chapter. We had several excellent submissions and, in the end, the Chapter's popular vote selected Kaitlin Thurman's submission. Make sure to stop by the SWAG station and grab some new gear.

If furthering your knowledge is your thing, consider signing up for one of our workshops this year. First, on Monday evening, Ficus Chan will demonstrate how you can forage for seafood in the intertidal regions of our sea shore and prepare the whole host of the foods you are likely to encounter. I for one do not want to miss this, and you don't either so be sure to sign up on our meeting website. Then on Wednesday, Dr. Todd Pearsons will share his expertise on taking great photos underwater. You may already be familiar with Todd's photos presented in a recent issue of Fisheries and at this workshop, he will share his tips and tricks for taking great underwater photos. Bring your camera and make sure to sign up for this workshop as space will be limited.

Don't forget that we are recruiting for several of our Executive Committee positions this year, including Chapter Vice President, Student Representative, Secretary, Treasurer, and Communications Director. A full description of the position duties and terms are described in our Chapter bylaws and you can access them from the WA-BC Chapter webpage, but in a nutshell, these are great opportunities for professional development. Be sure to attend the business lunch on Wednesday where you will have the opportunity to submit nominations for these positions on the discussion floor. If you or someone you know might be interested, this will be a good time to get involved as we have some major meetings on the horizon including 2020, where we will host the Western Division meeting at the Pinnacle Harbourfront Hotel in Vancouver, and in 2022 we will host the National Meeting in Spokane, Washington. These will be huge meetings and as an Executive Officer, travel will be supported by the Chapter which, in these lean budget times plagued with travel restrictions, is a real benefit.

Finally, I would just like to say thank you for joining us this year in Bremerton. This meeting is shaping up to be one of the most memorable meetings ever, and I am super stoked to be part of it and to share the experience with all of you here.

Gabriel M. Temple, FP-C
President, WA-BC Chapter of the American Fisheries Society



Schedule at a Glance

Mon, April 8	Tues, April 9	Wed, April 10	Thur, April 11
	Registration (Lobby) 8:00 – 5:00 PM	Registration (Lobby) 8:00 – 5:00 PM	Registration (Lobby) 8:00 – 9:00 AM
	Welcome & Plenary Sessions (Ballrooms A & B) 9:00 – 11:00 AM	Continuing Education: Underwater Photography (Ballroom A)	Concurrent Sessions (Ballrooms A & B) 9:00 – 11:40 AM
	Spawning Run / Carcass Crawl (Starts at Conference Center Courtyard) 11:15 AM – 12:00 PM	Concurrent Session (Ballroom B) 9:00 AM – 12:00 PM	
AFS ExCom and Planning Committee Lunch Meeting (Oyster Bay) 11:30 AM – 1:00 PM	Lunch Buffet (Ballrooms C & D) 12:00 – 1:20 PM	WA-BC Chapter Annual Business Meeting and Lunch (Ballroom C & D) 12:00 – 1:20 PM	End of Conference, Vendor / Exhibitor Teardown 11:40 AM
Registration Opens (Lobby) 1:30 – 5:00 PM	Concurrent Sessions (Ballrooms A & B) 1:20 – 5:00 PM	Concurrent Sessions (Ballroom A & B) 1:20 – 5:00 PM	
Exhibitor Set Up (Gallery) and Poster Set Up (Ballrooms C & D) 1:30 – 5:00 PM			
Continuing Education: Intertidal Foraging and Cooking Workshop (Ballrooms A & B) 5:00 – 8:00 PM	Student / Mentor Panel & Mixer (Oyster Bay) 5:00 – 6:00 PM	Silent Auction (Ballrooms C & D) 5:30 – 8:00 PM	
	Trade Show Social, Poster Session Mixer, and Dinner Buffet (Gallery and Ballrooms C & D) 6:00 – 9:00 PM	Banquet and Entertainment (Ballrooms C & D) 6:00 – 9:00 PM	

*Concurrent sessions include symposia and contributed papers, as well as mid-morning and mid-afternoon breaks.

Symposia and contributed paper abstracts can be found at:
<https://wa-bc.fisheries.org/2019-meeting/>



AGM 2019 Planning Committee

Exciting events, including this year's Annual General Meeting, only come together because of an extraordinary team effort by your WA-BC Chapter Executive Committee and volunteer members. This year's Planning Committee was diverse and collaborative.

Brittany Jenewein – Program Chair, Accommodations, Budget, Symposia

Paul Spruell – Program Co-Chair, Symposia, Plenary, Scheduling

Gabriel Temple – Symposia, Plenary, Continuing Education, Business Meeting

Tamara Knudson – Tradeshow, Fundraising, Cederholm Scholarship, Awards, Silent Auction

Benjamin Cross – Publicity, Website, Printed Program, Student Scholarships, Volunteers

Ryan Klett – Accounting, Registration

Kirstin Gale – Trade Show, Fundraising, Silent Auction

Orlay Johnson – Best Student Paper Awards, Student Travel Scholarships

Bailey Gilbert – Silent Auction, Spawning Run

Dylan Glaser – Student/Mentor Mixer

Student Volunteers – Spawning Run, Audio-Visual, Registration



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Society of BC**



Washington-British Columbia Chapter of the American Fisheries Society – AGM 2019

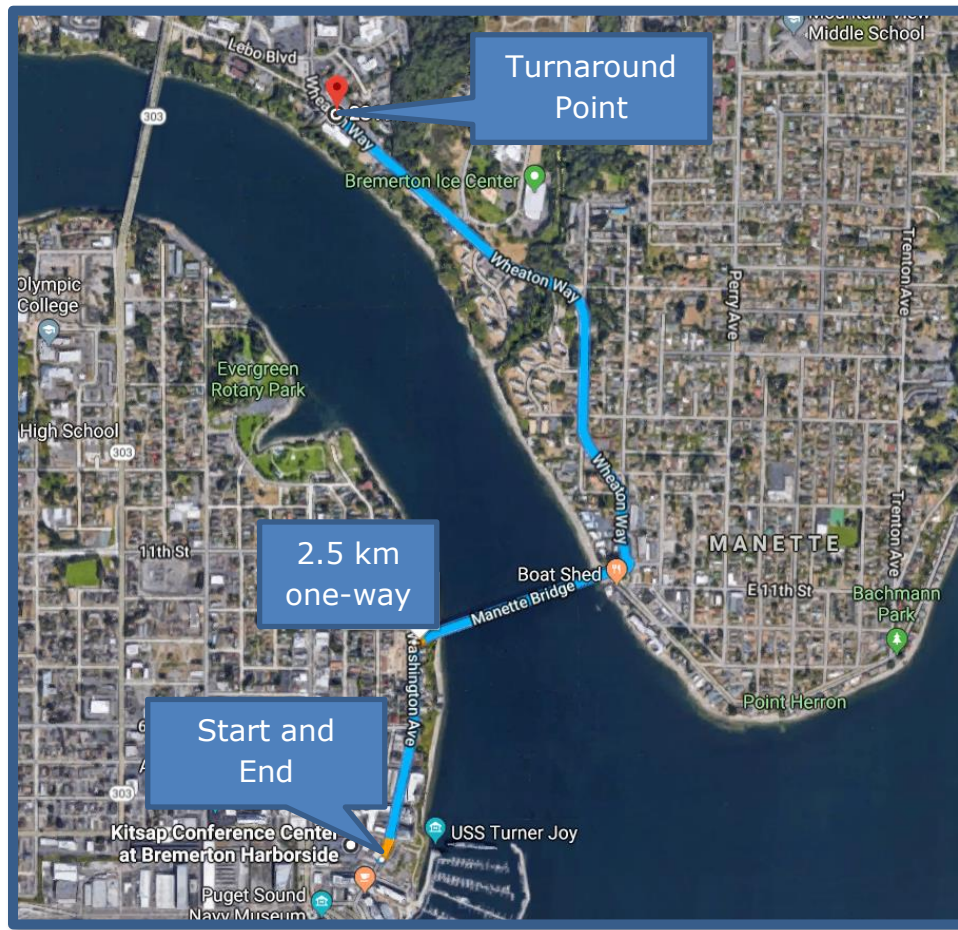
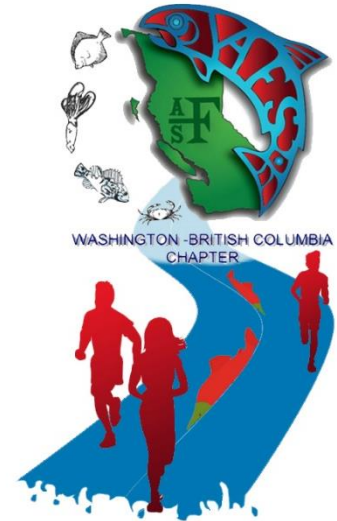
Spawning Run & Carcass Crawl

It's time for our annual AGM Spawning Run & Carcass Crawl! This is a fun, non-competitive, 5 km run / walk that will start at 11:15 AM on Tuesday, April 9. The race will start in the Kitsap Conference Center entrance and follow a course along the waterfront and over the Manette Bridge (see map below).

Participation is free, but please consider supporting Chapter activities by purchasing a WA-BC AFS water bottle - \$10 at the registration desk!

Be sure to sign up by 10 AM on Tuesday at the registration desk or through this link: <http://wa-bc.fisheries.org/2019-meeting/spawning-run/>.

Don't miss this opportunity to interact with colleagues in a relaxed and informal atmosphere! Find more information on our spawning run webpage, and feel free to stop by the AGM registration table with any questions.



Trade Show Exhibitors

American Institute of Fishery Research Biologists

AquaTactics Fish Health

Biomark

Collective Visions Gallery

Cryogenetics

Lotek Wireless

Pacific Netting Products

Spokane Tribal Fisheries

Teknologic

Vemco



Awards for Best Student Talk and Poster



Students are an integral part of the American Fisheries Society, and they bring the newest ideas as well as energy and enthusiasm to annual meetings. It is also a well-known fact that graduate students are the fuel that drives the engine of any university research lab! The WA-BC AGM is a great opportunity for students to present their latest research results and to network with colleagues and future employers, but it is also the perfect venue to recognize their hard work and dedication. The WA-BC Chapter will provide a competition at the 2019 AGM for student paper (oral and poster) presentations. The Chapter will award cash prizes to a "best" presentation, and acknowledgement of a runner-up, in both categories.



C. Jeff Cederholm Scholarship



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 recipients of the 2019 scholarships impressed the Endowment Committee and the Chapter ExCom. We are pleased to award \$1,000 each to:

- Timothy Taylor (Ph.D. candidate), Washington State University
- Michaela Lowe (Master's student), University of Washington
- Sarah Gutzmann (Undergraduate student), Simon Fraser University

Watch for the Spring issue of *The Confluence* for detailed information on each recipient!

Application forms for the 2020 awards will be available late 2019 / early 2020.



Special Events

Spawning Run and Carcass Crawl

Tuesday, April 9, 11:15 AM to 12:00 PM

Start: Kitsap Conference Center Courtyard

It's time for our annual AGM Spawning Run & Walk! This fun, non-competitive, free, 5K event will start from the Kitsap Conference Center Courtyard. Get that blood pumping! Remember to register online before the event (see page 6) and purchase your WA-BC AFS water bottle (\$10 at the registration desk) to support Chapter activities.

Student/Mentor Panel & Mixer

Tuesday, April 9, 5:00 PM to 6:00 PM

Location: Oyster Bay Room

The student-mentor panel and mixer provides an opportunity for students and early career professionals to come learn about careers in fisheries and what steps these professionals took to achieve their career goals. The event will begin with panelists describing where they work, what they do, and how they got there. After panelists introduce themselves, the floor will open up for a Q&A session where the audience can ask professionals questions. We have a diverse group of professionals this year. Think of some stimulating questions before you show up, or just sit back and enjoy the show! An extra drink ticket will be provided to participants (limited supply – come early!).

Trade Show Social and Poster Session (Includes Dinner Buffet)

Tuesday, April 9, 6:00 PM to 9:00 PM

Location: Sinclair Gallery and Ballrooms C & D

Join your fellow conference attendees for a full evening of good food and beverages at the cash bar. Of course, you'll also enjoy learning about the latest research, management, and technology while perusing through the Poster Session and the exhibitor tables at the Trade Show.

WA-BC Chapter Annual Business Meeting

Wednesday, April 10, 12:00 PM to 1:20 PM

Location: Ballrooms C & D

All AGM attendees are welcome and encouraged to attend the Annual Business Meeting. We encourage everyone to become a Chapter member – just stop by the registration table any time during the AGM! There will be updates about the Chapter's activities and finances over the past year and plans for the future, and it will also be a great time for you to ask questions, give your ideas on how we can continue to improve as a Chapter, as well as network and enjoy a free lunch.



Silent Auction**Wednesday, April 10, 5:30 PM to 8:00 PM****Location: Ballrooms C & D**

This year's Silent Auction is going to be terrific thanks to the hard work of our student subunit members and the generosity of many donors. Check out the Silent Auction items in Ballroom D and remember to bid early and often! There will be a cash bar open to get the evening off to a fun start. Remember, all proceeds go to support our students through Student Travel Awards to attend AFS conferences.

Banquet and Live Entertainment**Wednesday, April 10, 6:00 PM to 9:00 PM****Location: Ballrooms C & D**

Join us Wednesday, April 10 from 6:00pm to 9:00pm to enjoy a delicious banquet on the waterfront while bidding on the silent auction items to fund student travel, mingling with fish folks, and grooving to some tunes. We are thrilled to have Play It Forward performing throughout the night. Play It Forward plays brass music that's a little bit different. These five guys banded together through music in the University of Washington Husky Marching Band in Seattle to share their love of the art with the city. They strive to cover anything they like from street music to rock to pop, shaking off the expectations set for traditional brass bands. Their mission? To pay it forward to their community, bring good vibes, and inspire connections with the world around us... even if they're still figuring out what that means.



Plenary Speakers

Greg Ruggerone, Ph.D.

Natural Resources Consultants, Inc., Seattle

Dr. Greg Ruggerone has investigated population dynamics, ecology, and management of Pacific salmon in Alaska and the Pacific Northwest since 1979 as a Research Scientist at the University of Washington and Natural Resources Consultants. Most of his research involves factors that affect growth, age at maturation, and survival of salmon in freshwater and marine habitats, including predation studies involving seabirds, bears, char, and salmon in Alaska and the Columbia Basin. He often contributes to independent scientific review panels in the Columbia Basin, California, British Columbia, Alaska, and Russia. For the past 20 years, he has used the unique biennial pattern and exceptional abundances of Pink Salmon to explore the importance of species interactions in the North Pacific Ocean as a means to improve management and conservation of marine species.



Title: Pink Salmon Impacts on the North Pacific Ecosystem, including Southern Resident Killer Whales

Abstract: Pink Salmon returns to North America and Asia are more numerous now than ever. During 2005–2015, Pink Salmon abundance averaged nearly 500 million fish per year with peak abundances of ~650 million fish. Pink Salmon are especially abundant in odd-numbered years, reaching 76% of all Pacific salmon in peak years. This unique biennial pattern of Pink Salmon abundance provides a natural experimental control for testing hypotheses about interactions between Pink Salmon and other species in the North Pacific because biennial patterns cannot be explained by ocean conditions and climate. Here we provide evidence that Pink Salmon have strongly influenced the pelagic ecosystem structure of the North Pacific Ocean and Bering Sea. First, studies show that high abundances of Pink Salmon in odd years cause a trophic cascade by reducing the abundance of zooplankton, which in turn leads to a greater abundance of phytoplankton (zooplankton prey). Second, a range of evidence indicates Pink Salmon influence growth, age at maturation, and survival of Sockeye, Coho, and Chinook salmon. For example, reduced Sockeye Salmon productivity in relation to Pink Salmon has been shown for 35 Sockeye Salmon populations ranging from the Salish Sea (including the Fraser River) to Southeast Alaska, plus populations in Copper River and Bristol Bay, Alaska. Third, studies show that seabirds (Kittiwakes, Puffins, Auklets, Gulls) that consume similar prey as Pink Salmon near the Aleutian Islands experience reduced foraging and reproductive success in odd years when Pink Salmon abundance is high. This interaction has also been detected in Shearwaters that breed off Australia but



forage in the North Pacific. Lastly, we describe an unprecedented biennial pattern in the birth and mortality of Southern Resident Killer Whales (SRKW) in the Salish Sea that appears to be linked to the extreme biennial pattern of abundance of Pink Salmon in this region (avg. 18 million in odd years, 0.4 million in even years). From 1998 to 2017, mortality of newborn and older whales was 3.6 times higher (61 versus 17 whales) and successful births 50% lower (16 versus 32 whales) in even years than in odd years as the population decreased from 92 to 76 whales. We conclude that Pink Salmon impact a variety of species ranging from plankton to salmon to seabirds and to Killer Whales, extending from the Salish Sea to the Bering Sea. These interactions have important implications for management of fisheries, hatcheries, and North Pacific ecosystems, and for recovery of the critically endangered SRKW. Published manuscripts supporting these findings are available upon request.

Michael Phelps, Ph.D.

Instructor, University of Washington

Dr. Michael Phelps is an Instructor at the University of Washington. His current research investigates novel applications of CRISPR genome-editing technology for fish ecology, genomics, physiology and conservation. He has a bachelor's degree in cellular and marine biology from Western Washington University, a PhD in environmental science and fish physiology from the University of Rhode Island with Postdoctoral experience in stem cell biology and genome-editing technology from the University of Washington.



Title: Understanding Aquatic Ecosystems through Genome Editing

Abstract: Dr. Phelps will highlight emerging genome-editing technologies that have the potential to transform Pacific Northwest fisheries ecology in ways that were not previously possible. This includes using genome-editing to improve our understanding of species genetic diversity, the factors underlying local adaptation, and predator prey interactions. He will also discuss non-invasive genetic barcoding applications for fine-scale generational tracking of individuals over geographic space and time, for investigating the abundance and interaction of fish population in response to changing environmental, biological or anthropogenic factors. Advances in genome-editing technology now make it possible to alter genetic traits to facilitate adaptation, which is opening new fundamental questions about the core principles and objectives of modern fisheries management. The presentation will stimulate thoughtful discussion over key ethical considerations and potential applications for using genome editing to tackle long-standing fisheries conservation challenges. It will also help develop a framework for navigating the rapidly approaching intersection of aquatic ecology and genome editing fields, for which we are now at a crossroads.



American Fisheries Society

Presentation of "Make AFS your professional community for fisheries resources!"

Coming out of conversations with unit leaders and members from around the country, AFS learned that many fisheries professionals are unaware of the resources and services provided by the Society at the national level. AFS created this presentation to show the value of an AFS membership to Chapter meeting attendees.



Continuing Education

Intertidal Foraging and Cooking Workshop

Location: Oyster Bay Room

Monday, April 8 from 5:00 PM to 8:00 PM

WA-BC is excited to be hosting a continuing education opportunity prior to the meeting. Ficus Chan will be leading an Intertidal Foraging and Cooking Workshop on Monday, April 8 from 5:00 to 8:00 PM. The cost for the course is \$5, and it is open to all registrants.

Sign up at the registration desk or here: <https://wa-bc.fisheries.org/2019-meeting/intertidal-foraging-cooking/>.

About the Instructor: Ficus Chan is a *Jack of All Trades* within the world of fish and forestry of British Columbia and Washington State. He was blessed to be born and raised in Vancouver, BC and now currently living in Bellingham, WA, a region that perfectly fits Ficus' innate need for camping, fishing, foraging and exploring the outdoors. He followed his inner compass on a journey that allowed him to learn through his work as a resource technician, educator, fishery observer, manager, consultant, and commercial harvester. Ficus combines his passion for cooking with his knowledge of edible wilds and has led foraging and wild food workshops since 1995.

Description: British Columbia and Washington are blessed with miles and miles of wonderful, accessible shoreline inhabited by a diverse array of organisms that are not only fun to discover, but also tasty to eat. We will explore all the different creatures and seaweeds you can forage for in the intertidal zone including sea urchins, crabs, sea cucumbers, squid, clams, geoduck, whelks, oysters, mussels, gooseneck barnacles and more. We will also cover all the different ways you prepare and cook your harvest. Cooking demos of geoduck and seabiscuit (biscuit made with sea lettuce) are planned with samples to try.



Underwater Photography Workshop: Capturing Great Images Below the Surface

Location: Ballroom A

Wednesday, April 10 from 9:00 AM to 12:00 PM

Todd Pearsons will be leading an Underwater Photography Workshop on Wednesday, April 10 from 5:00 to 8:00 PM. The course is free but space is limited to the first 20 applicants.

Sign up at the registration desk or here: <https://wa-bc.fisheries.org/2019-meeting/underwater-photography-workshop/>.

About the Instructor: Todd Pearsons, Ph.D., is a long-time fisheries scientist, award winning communicator, and professional photographer who specializes in capturing images of life below the surface of the water, particularly rarely photographed species. His images have been published in many forms such as books, magazines, journals, museum displays, interpretive center displays, art pieces, and professional websites. An article about Todd's photography passion and skills was published in *Fisheries*, titled "Photography Interview of Todd Pearsons."

Description: One of the best ways to inspire audiences about communicating and valuing aquatic resources is to bring audiences to where aquatic life lives through underwater photography. This workshop will help you get started and improve your ability to take great images underwater. Topics to be covered include: getting started on a limited budget, assembling your underwater photography toolkit, behavior of the underwater photographer, underwater photography principles and tips, and many other topics. Common mistakes and hard-won secrets of underwater photography will be revealed. This workshop will focus on challenges and opportunities in freshwater environments, but many of the topics will apply to marine environments. Improve your fisheries talks, publications, and other communications by developing and improving your underwater photography skills.



Symposia Descriptions

Symposia and contributed paper abstracts can be found at:
[**https://wa-bc.fisheries.org/2019-meeting/**](https://wa-bc.fisheries.org/2019-meeting/)

Please note that an asterisk (*) preceding a presenter's name indicates that this is a student competitor for best paper.

Symposium: Habitat restoration - the foundation for preparing a feast?

Chair: Ryan Klett (Colville Confederated Tribes)

Date: Tuesday, April 9, 1:20 PM to 3:40 PM

Location: Ballroom B

This session provides a venue for researchers focused on habitat restoration research and improvement projects to showcase their work. Topics include: influence of habitat restoration on salmon productivity, modelling methods to assess the outcome of restoration projects, and integration with recovery strategies.

Title	Presenter	Affiliation
Supporting stream habitat restoration through modelling and data visualization	Ryan Klett	Colville Confederated Tribes
Effectiveness monitoring of riparian plantings in the interior Columbia Basin streams	Shelby Burgess	Cramer Fish Sciences
Fish, forest, and fire: Alternative riparian management to protect forests and fish	Kevin Cedar	Cramer Fish Sciences
Effects of livestock exclusion on stream banks and riparian vegetation in Washington and Oregon	Michelle Krall	Cramer Fish Sciences
Evaluating the effectiveness of engineered logjam projects at improving salmon habitat	*Caroline Walls	Western Washington University
Spatial variation in salmon production and implications for habitat restoration	Robert Bilby	Weyerhaeuser Co.



Symposium: Downstream fish passage facility performance, evaluation, and monitoring

Chair: Jacob Venard (HDR, Inc.)

Date: Tuesday, April 9, 1:20 PM to 5:00 PM

Location: Ballroom A

The successful implementation of performance evaluation and monitoring of downstream fish passage facilities is essential to determining the success of the facilities. These studies determine whether the facility is meeting performance standards and also help identify issues, troubleshoot problems, and guide next steps for potential improvements. Proper study design and implementation is necessary to accurately determine the effectiveness of the facilities, with great importance to both the owners and operators, and the agencies overseeing these facilities. The goals of this symposium are to provide results of such studies as well as lessons learned and guidance for the successful implementation of these studies, so that the necessary information is attained to accurately evaluate the performance of these facilities as well as guide the design, operation, and potential next steps for meeting requirements.

Title	Presenter	Affiliation
Application of Pacific Northwest fish passage lessons learned to expanding global opportunities	Jacob Venard	HDR, Inc.
The evolution and practicality of fish passage standards at high-head dams in the Pacific Northwest	Joshua Murauskas	Four Peaks Environmental
Methods for evaluation of performance standards at downstream fish passage facilities at Pacific Northwest hydropower projects	Audrey Thompson	The Adipose Group
Well Dam juvenile bypass baffle PIT detection system	Matt Brower	Biomark, Inc.
PIT detection barge: new approach for challenging monitoring locations	Phil Peterson	West Fork Environmental
Science & data solutions: downstream fish passage facility performance evaluation and monitoring	Megan Stachura	Four Peaks Environmental
Los Padres downstream bypass evaluation: field study out of a suitcase	Ian Welch	HDR, Inc.
Fitting a square fish into a round bypass - when passage standards and fish biology don't match	Nick Ackerman	Portland General Electric
Baker hydroelectric project floating surface collectors	Nick Verretto	Puget Sound Energy
Panel discussion		



Symposium: Environmental DNA (eDNA) as a tool for detection of aquatic species

Chair: Sarah Brown (Washington Department of Fish and Wildlife)

Date: Tuesday, April 9, 3:40 PM to 5:00 PM

Location: Ballroom B

Environmental DNA (eDNA) is a promising new tool to non-invasively monitor species of conservation concern. eDNA is DNA that is left in an environment (water, air, soil), as an organism passes through and leaves behind shed cells. This DNA can be detected through traditional molecular genetic techniques (qPCR, sequencing, etc.), and can potentially link a species to a geographic region. This technique is of particular interest to rare or threatened species, which are difficult or costly to detect through traditional means. This session will focus on the use of eDNA as a tool to aid in detection of aquatic species.

Title	Presenter	Affiliation
Perspectives from the World Fish Passage workshop	Kathleen Peters	Kitsap County
Environmental DNA monitoring for Pacific, Western River and Western Brook Lamprey from the Nisqually River	Sarah Brown	Washington Department of Fish and Wildlife
Use of eDNA methods to predict extent of fish occupancy and identify potential habitat breaks	Lucius Caldwell	Cramer Fish Sciences
A molecular reinterpretation of the biodiversity of <i>Cottus</i> in western North America	Michael Young	US Forest Service



Symposium: Salmon predators – orca and many other mouths feed

Chair: Mike Ford (National Oceanic and Atmospheric Administration)

Date: Wednesday, April 10, 9:00 AM to 11:40 AM

Location: Ballroom B

The recent decline of the Southern Resident orca population has sparked public and government officials' interests to a degree that is turning the heat up on potential management actions aimed to recover the population. However, salmon are a critical piece of the food web for many other species, and commercial and recreational management must be considered too. This symposium will describe orca prey limitations and some of the other "mouths" targeting orca prey, assess fisheries influence on salmon consumption of other predators, and look at some key salmon predator and fisheries studies that may play a role in developing a predator balance to allow for orca recovery.

Title	Presenter	Affiliation
Lack of prey as a limiting factor for orca recovery	Mike Ford	National Oceanic and Atmospheric Administration
A survey of the coast-wide collapse in northeast Pacific Chinook and Steelhead survival: Looming problems for set piece solutions	David Welch	Kintama Research Services Ltd
Increase in Chinook abundance for SRKW: reduce fishing or reduce seals	Fanny Couture	University of British Columbia
Reconstructing a century of coastal productivity and predator trophic position indicators in coastal WA and the Salish Sea with archival bone	*Megan Feddern	University of Washington
Managing salmon for wildlife: Do fisheries limit salmon consumption by bears in small streams?	*Alexandra Lincoln	University of Washington
Preying on the weak? Possible non-additive effects of seal predation and stress-related mortality in juvenile Coho and Chinook in the Salish Sea	Greig Oldford	University of British Columbia
Developing a place-based, selective salmon fishery in the Lower Columbia River, WA	Adrian Touhy	Wild Fish Conservancy



Symposium: Salmonids in the Skokomish River Basin: past, present, and future

Chair: Phil Sandstorm (Tacoma Power)

Date: Wednesday, April 10, 1:20 PM to 4:40 PM

Location: Ballroom B

Tacoma Power completed construction of Cushman No. 1 Dam and No. 2 Dam by 1930 impounding the North Fork Skokomish River and creating Lake Kokanee and Lake Cushman. For a number of years there was no passage above the dams, and the only fish in those lakes were fish that were trapped during construction or planted to maintain a fishery. In recent years Tacoma Power has invested to create adult passage (2013) and juvenile passage (2014) through trap and haul systems. Two conservation hatcheries (North Fork Skokomish River Hatchery and Saltwater Park) were created in 2014 to aid in reintroduction efforts, and monitoring and evaluations efforts have been initiated to further the understanding of existing populations and performance of hatchery programs. This symposium will focus on how the initial construction of the dams impacted salmonid populations in the North Fork Skokomish River, what we are learning while reintroduction and recovery actions are occurring, and future issues that will likely be encountered in this basin. At the end of the session we would like to hold a panel discussion focused on future directions for research efforts and populations as reintroduction and progression towards recovery continue. After a brief discussion the panel of representatives (from multiple agencies) would field questions from the audience.

Title	Presenter	Affiliation
The Skokomish River: A tribal perspective	Joseph Pavel	Skokomish Indian Tribe
North Fork Skokomish River hatchery programs	Andrew Ollenburg	Tacoma Power
Skokomish estuary restoration monitoring	Lisa Bellevea	Skokomish Indian Tribe
North Fork Skokomish River habitat – past, present and future	David Cogswell	Tacoma Power
Reservoir productivity: from water quality and zooplankton to Sockeye Salmon, <i>Oncorhynchus nerka</i>	Matt Peter	Tacoma Power
Performance of Cushman juvenile fish collector 2015–2018	Chris Noyes	Tacoma Power
Screw trap monitoring on the North Fork Skokomish River	Megan McCormick	Tacoma Power



Continued... Salmonids in the Skokomish River Basin: past, present, and future

Title	Presenter	Affiliation
Spawning ground surveys in the North Fork Skokomish River	Tim Hoffnagle	Tacoma Power
The future of hatcheries, management, and monitoring in the Skokomish Basin	Matt Bleich	Tacoma Power

Symposium: Contributed papers 1

Chair: Alf Haukenes (Washington Department of Fish and Wildlife)

Date: Wednesday, April 10, 1:20 PM to 5:00 PM

Location: Ballroom A

Title	Presenter	Affiliation
Bull Trout movement at multiple life stages in the White River, Washington	Jeffery Johnson	US Fish and Wildlife Service
Bull Trout exhibit life history responses after dam removal in the Elwha River, Washington	Kathryn Sutton	US Fish and Wildlife Service
Do fin rays offer a non-lethal approach for assessing life history patterns using geochemical analysis?	Roger Peters	US Fish and Wildlife Service
Comparing bioenergetic vs. correlative habitat suitability models for stream salmonids	Sean Naman	University of British Columbia
The Pacific Razor Clam populations in Washington revealed by stable isotopes	Yongwen Gao	Makah Fisheries Management
Indigenous integration of aquatic sciences and Traditional Ecological Knowledge for undergraduate culturally responsive education (i-NATURE): Piloting a culturally inclusive approach to STEM education for underrepresented minority undergraduates	Alexander Alexiades	Heritage University



Continued... Contributed papers 1

Title	Presenter	Affiliation
Long-term successes in fisheries management: Species recovery, dam evolution, and hatchery reform	Todd Pearsons	Grant PUD
Large river habitat complexity and productivity of Chinook Salmon in Puget Sound rivers	Jason Hall	Cramer Fish Sciences
Spatial distribution of adult hatchery and natural origin fall Chinook Salmon in the Hanford Reach of the Columbia River	Steven Richards	Washington Department of Fish and Wildlife
Effect of artificial nighttime lighting on subyearling salmonids in the Lake Washington system	Roger Tabor	US Fish and Wildlife Service

Symposium: Uninvited guests at the feast; consequences of non-native species introduction and spread

Chair: Paul Spruell (Eastern Washington University)

Date: Thursday, April 10, 9:00 AM to 11:40 AM

Location: Ballroom A

Anthropogenic changes to the environment often have unintended consequence with respect to community composition and structure. In many cases these environmental changes may allow populations of non-native species to increase in number substantially and may facilitate the colonization of new habitats, thus expanding the range and effect of these exotic species. In this symposium, we will examine the effects of non-native species including consideration of their current and future ranges, their direct and indirect on native species, and management actions aimed at mitigating their effects. summary report may be written with contributions from all participants.

Title	Presenter	Affiliation
Invasive Northern Pike suppression in Lake Roosevelt, Washington	Alix Silver	Spokane Tribe of Indians
Abundance of Smallmouth Bass <i>Micropterus dolomieu</i> in the Upper Spokane River, Washington	Taylor McCroskey	Oregon Department of Fish and Game
Quantitative food web analysis to detangle density dependence in restored habitats	*John Jorgensen	Washington State University



Continued... Uninvited guests at the feast; consequences of non-native species introduction and spread

Title	Presenter	Affiliation
Long-term population response of Coastal Cutthroat Trout to environmental fluctuations in a temperate-rainforest stream: hydrology, temperature, and invasive weeds and other biotic factors	Robert Vadas	Washington Department of Fish and Wildlife
The compensatory responses of intentionally overharvested Brook Trout <i>Salvelinus fontinalis</i> populations in the Canadian Rockies	*Dylan Glaser	University of Calgary
The Outro	Brian Saluskin	The Yakima Nation
Diet composition of Lake Trout <i>Salvelinus namaycush</i> in Upper Priest Lake, Idaho	*Coty Jasper	Eastern Washington University

Symposium: Contributed papers 2

Chair: Gabriel Temple (Washington Department of Fish and Wildlife)

Date: Thursday, April 11, 9:00 AM to 11:20 AM

Location: Ballroom B

Title	Presenter	Affiliation
Advances in oxygen supplementation	Tod Jones	Redd Zone, LLC
Ecological differences of juvenile Steelhead produced by natural origin and local hatchery origin adult Steelhead spawning in the wild	Benjamin Kennedy	US Fish and Wildlife Service
Developing methods to improve homing by hatchery salmon	Andrew Dittman	NWFSC, NOAA Fisheries
Investigating an ecological method for determining hatchery release timing of salmon	Eric Lauver	Grant PUD
The pros and cons of vaccination of hatchery stocks against disease	Wendy Olson	Aquatactics
Using bioenergetic modeling to evaluation prey limitations in lacustrine Brook Trout	*Timothy Taylor	Washington State University



Poster Session

Date: Tuesday, April 9, 6:00 PM to 9:00 PM

Location: Ballrooms C & D

Title	Presenter	Affiliation
Pacific Lamprey	Latonia Andy	Heritage University
Habitat complexity and environmental influences on intertidal Coast Salish food availability in the Southern Gulf Islands	*Amy Cline	Western Washington University
Yakima Steelhead VSP Project: Resident/Anadromous <i>O. mykiss</i> Studies	Gabriel Temple	Washington Department of Fish and Wildlife
Competition driven semelparity of Brook Stickleback <i>Culaea inconstans</i> in Turnbull National Wildlife Refuge	*Sasha Goheen	Eastern Washington University
Diverse options for monitoring fishway effectiveness using PIT tag technology	Matt Brower	Biomark
Multi-objective urban stream habitat monitoring	Bill Mavros	48 North Solutions
Fish diversity and abundance of the Upper Toppenish Creek, Yakima, Washington	Brooke Capetillo	Heritage University
Bull Trout <i>Salvelinus confluentus</i> can detect conspecific pheromones in a two choice Y-maze	*Hannah Coles	Eastern Washington University
Evaluating the efficacy of non-lethal ageing in a lacustrine Brook Trout population	*Timothy Taylor	Washington State University
UAVs – An efficient way to monitor restoration	Kerrie McArthur	Confluence Environmental Co.





**Western Division
American Fisheries Society**



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Washington-British Columbia Chapter of the American Fisheries Society – AGM 2019

Schedule by Day

Please note that an asterisk (*) preceding a presenter's name indicates that this is a student competitor for best paper.

Afternoon	Monday, April 8
Lunch	<u>OYSTER BAY</u> WA-BC Executive Committee and AGM Planning Committee Lunch Meeting (11:30 AM – 1:00 PM)
Afternoon	<u>LOBBY</u> Registration (1:30 – 5:30 PM) <u>SINCLAIR GALLERY</u> Trade Show Exhibitor Set Up (1:30 – 5:30 PM) <u>BALLROOMS C & D</u> Poster Set Up (1:30 – 5:30 PM)
Evening	<u>BALLROOMS A & B</u> Intertidal Foraging and Cooking Workshop (5:00 – 8:00 PM)

Morning & Lunch	Tuesday, April 9
Morning	<u>LOBBY</u> Registration (8:00 AM – 5:00 PM) Coffee and tea provided all day <u>BALLROOMS A & B</u> Welcome and Plenary Session (9:00 – 11:00 AM)
9:00-9:05	Welcome from City of Bremerton Mayor: Greg Wheeler
9:05-9:10	Welcome from Conference Chair: Brittany Jenewein
9:10-9:20	Presentation of "Make AFS your professional community for fisheries resources!"
9:20-10:00	Plenary Speaker: Dr. Michael Phelps, University of Washington
10:00-10:20	<u>SINCLAIR GALLERY</u> Morning Break (Coffee, tea, and pastries) <u>OYSTER BAY</u> Best Student Paper Award - Judges Meeting
10:20-11:00	<u>BALLROOMS A & B</u> Plenary Speaker: Dr. Greg Ruggerone, Natural Resources Consultants
11:15-12:00	<u>KITSAP CONFERENCE CENTER COURTYARD</u> Spawning Run / Carcass Crawl
12:00-1:20	<u>BALLROOMS C & D</u> Lunch



Afternoon & Evening	Tuesday, April 9 continued	
Afternoon	<u>BALLROOM A</u> Downstream fish passage facility performance, evaluation, and monitoring Chair: Jacob Venard	<u>BALLROOM B</u> Habitat Restoration - the foundation for preparing a feast? Chair: Ryan Klett
1:20-1:40	Jacob Venard: Application of Pacific Northwest fish passage lessons learned to expanding global opportunities	Ryan Klett: Supporting stream habitat restoration through modelling and data visualization
1:40-2:00	Joshua Murauskas: The evolution and practicality of fish passage standards at high-head dams in the Pacific Northwest	Shelby Burgess: Effectiveness monitoring of riparian plantings in the interior Columbia Basin streams
2:00-2:20	Audrey Thompson: Methods for evaluation of performance standards at downstream fish passage facilities at Pacific Northwest hydropower projects	Kevin Cedar: Fish, forest, and fire: Alternative riparian management to protect forests and fish
2:20-2:40	Matt Brower: Well Dam juvenile bypass baffle PIT detection system	Michelle Krall: Effects of livestock exclusion on stream banks and riparian vegetation in Washington and Oregon
2:40-3:00	Phil Peterson: PIT detection barge: new approach for challenging monitoring locations	*Caroline Walls: Evaluating the effectiveness of engineered logjam projects at improving salmon habitat
3:00-3:20	<u>SINCLAIR GALLERY</u> Afternoon Break (Coffee & Tea Service)	
3:20-3:40	Megan Stachura: Data automation and visualization to support fisheries management at high-head dams	Robert Bilby: Spatial variation in salmon production and implications for habitat restoration
3:40-4:00	Ian Welch: Los Padres downstream bypass evaluation: field study out of a suitcase	Environmental DNA (eDNA) as a tool for detection of aquatic species Chair: Sarah Brown
		Kathleen Peters: Perspectives from the World Fish Passage workshop
4:00-4:20	Nick Ackerman: Fitting a square fish into a round bypass - when passage standards and fish biology don't match	Sarah Brown: Environmental DNA monitoring for Pacific, Western River and Western Brook Lamprey from the Nisqually River
4:20-4:40	Nick Verretto: Baker hydroelectric project floating surface collectors	Lucius Caldwell: Use of eDNA methods to predict extent of fish occupancy and identify potential habitat breaks
4:40-5:00	Panel Discussion	Michael Young: A molecular reinterpretation of the biodiversity of <i>Cottus</i> in western North America
5:00-6:00	<u>OYSTER BAY</u> Student/Mentor Panel & Mixer	
6:00-9:00	<u>BALLROOMS C & D / SINCLAIR GALLERY</u> Trade Show Social & Poster Session (Dinner Buffet Included)	



Morning & Lunch	Wednesday, April 10	
Morning	<u>LOBBY</u> Registration (8:00 AM – 5:00 PM) Coffee and tea provided all day	
Morning	<u>BALLROOM A</u> Underwater Photography Workshop Instructors: Todd Pearsons	<u>BALLROOM B</u> Salmon Predators Chair: Mike Ford
9:00-9:20	Underwater photography workshop: capturing great images below the surface	Mike Ford: Lack of prey as a limiting factor for orca recovery
9:20-9:40		David Welch: A survey of the coast-wide collapse in northeast Pacific Chinook and Steelhead survival: Looming problems for set piece solutions
9:40-10:00		Fanny Couture: Increase in Chinook abundance for SRKW: reduce fishing or reduce seals
10:00-10:20	<u>SINCLAIR GALLERY</u> Morning Break (Coffee, tea, and pastries)	
10:20-10:40	Continued: Underwater photography workshop: capturing great images below the surface	*Megan Feddern: Reconstructing a century of coastal productivity and predator trophic position indicators in coastal WA and the Salish Sea with archival bone
10:40-11:00		*Alexandra Lincoln: Managing salmon for wildlife: Do fisheries limit salmon consumption by bears in small streams?
11:00-11:20		Greig Oldford: Preying on the weak? Possible non-additive effects of seal predation and stress-related mortality in juvenile Coho and Chinook in the Salish Sea
11:20-11:40		Adrian Touhy: Developing a place-based, selective salmon fishery in the Lower Columbia River, Washington
11:40-12:00		Break
12:00-1:20	<u>BALLROOMS C & D</u> WA-BC Chapter Business Lunch All AGM attendees are welcome!	



Afternoon & Evening	Wednesday, April 10 continued	
Afternoon	BALLROOM A Contributed papers 1 Chair: Alf Haukenes	BALLROOM B Salmonids in the Skokomish River Basin: past, present, and future Chair: Phil Sandstorm
1:20-1:40	Jeffery Johnson: Bull Trout movement at multiple life stages in the White River, WA	Joseph Pavel: The Skokomish River: A tribal perspective
1:40-2:00	Kathryn Sutton: Bull Trout exhibit life history responses after dam removal in the Elwha River, WA	Andrew Ollenburger: North Fork Skokomish River hatchery programs
2:00-2:20	Roger Peters: Do fin rays offer a non-lethal approach for assessing life history patterns using geochemical analysis?	Lisa Bellevea: Skokomish estuary restoration monitoring
2:20-2:40	Sean Naman: Comparing bioenergetic vs. correlative habitat suitability models for stream salmonids	David Cogswell: North Fork Skokomish River habitat – past, present and future
2:40-3:00	Yongwen Gao: The Pacific Razor Clam populations in Washington revealed by stable isotopes	Matt Peter: Reservoir productivity: from water quality and zooplankton to Sockeye Salmon <i>Oncorhynchus nerka</i>
3:00-3:20	SINCLAIR GALLERY Afternoon Break (Coffee & Tea Service)	
	BALLROOM A Contributed papers 1 Chair: Alf Haukenes	BALLROOM B Salmonids in the Skokomish River Basin: past, present, and future Chair: Phil Sandstorm
3:20-3:40	Alexander Alexiades: Indigenous integration of aquatic sciences and Traditional Ecological Knowledge for undergraduate culturally responsive education (i-NATURE)	Chris Noyes: Performance of Cushman juvenile fish collector 2015–2018
3:40 – 4:00	Todd Pearsons: Long-term successes in fisheries management: Species recovery, dam evolution, and hatchery reform	Megan McCormick: Screw trap monitoring on the North Fork Skokomish River
4:00-4:20	Jason Hall: Large river habitat complexity and productivity of Chinook Salmon in Puget Sound rivers	Tim Hoffnagle: Spawning ground surveys in the North Fork Skokomish River
4:20-4:40	Steven Richards: Spatial distribution of adult hatchery and natural origin fall Chinook Salmon in the Hanford Reach of the Columbia River	Matt Bleich: The future of hatcheries, management, and monitoring in the Skokomish Basin
4:40-5:00	Roger Tabor: Effect of artificial nighttime lighting on subyearling salmonids in the Lake Washington system	
5:30-8:00	BALLROOMS C & D Silent Auction	
6:00-9:00	BALLROOMS C & D Banquet and Entertainment	



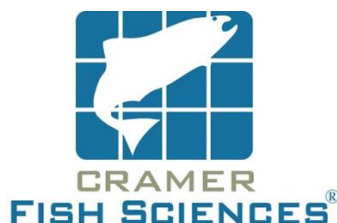
Morning & Lunch	Thursday, April 11	
Morning	LOBBY Registration (8:00–9:00 AM) Coffee and tea provided all morning	
Morning	BALLROOMS A Uninvited guests at the feast Chair: Paul Spruell	BALLROOM B Contributed papers Chair: Gabriel Temple
9:00–9:20	Alix Silver: Invasive Northern Pike suppression in Lake Roosevelt, WA	Tod Jones: Advances in oxygen supplementation
9:20–9:40	Taylor McCroskey: Abundance of Smallmouth Bass <i>Micropterus dolomieu</i> in the Upper Spokane River, Washington	Benjamin Kennedy: Ecological differences of juvenile Steelhead produced by natural origin and local hatchery origin adult Steelhead spawning in the wild
9:40–10:00	*John Jorgensen: Quantitative food web analysis to detangle density dependence in restored habitats	Andrew Dittman: Developing methods to improve homing by hatchery salmon
10:00–10:20	SINCLAIR GALLERY Morning Break (Coffee, tea, and pastries)	
10:20–10:40	Robert Vadas: Long-term population response of Coastal Cutthroat Trout to environmental fluctuations in a temperate-rainforest stream	Eric Lauver: Investigating an ecological method for determining hatchery release timing of salmon
10:40–11:00	*Dylan Glaser: The compensatory responses of intentionally overharvested Brook Trout <i>Salvelinus fontinalis</i> populations in the Canadian Rockies	Wendy Olson: The pros and cons of vaccination of hatchery stocks against disease
11:00–11:20	Brian Saluskin: The Outro	*Timothy Taylor: Using bioenergetic modeling to evaluate lacustrine Brook Trout prey limitations
11:20–11:40	*Coty Jasper: Diet composition of Lake Trout <i>Salvelinus namaycush</i> in Upper Priest Lake, Idaho	
11:40	CONFERENCE ENDS Trade Show/Poster Teardown	

See you in 2020!

WA-BC Chapter Executive Committee, from left to right: Gabriel Temple, Orlay Johnson, Kirstin Gale, Tamara Knudson, Brittany Jenewein, and Benjamin Cross. Not present: Ryan Klett and Paul Spruell



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Venue Map – Kitsap Conference Center

