

# 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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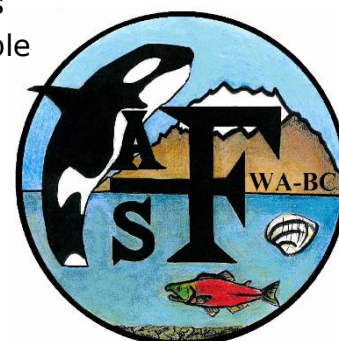
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## Things to Remember

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- 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

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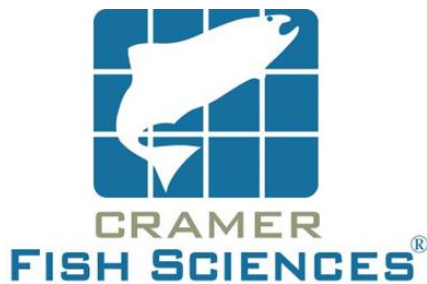
## Ling Cod Level (\$1,000 +)



Washington  
Department of  
**FISH and  
WILDLIFE**

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## Rockfish Level (\$500)



Freshwater Fisheries  
Society of BC



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## Contributor Level (\$250)



# President's Welcome

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

\*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

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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

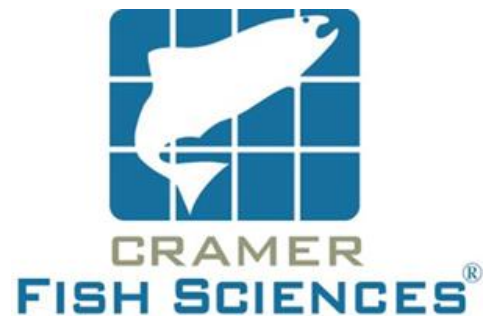
**Bailey Gilbert** – Silent Auction, Spawning Run

**Dylan Glaser** – Student/Mentor Mixer

**Student Volunteers** – Spawning Run, Audio-Visual, Registration



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**Freshwater Fisheries  
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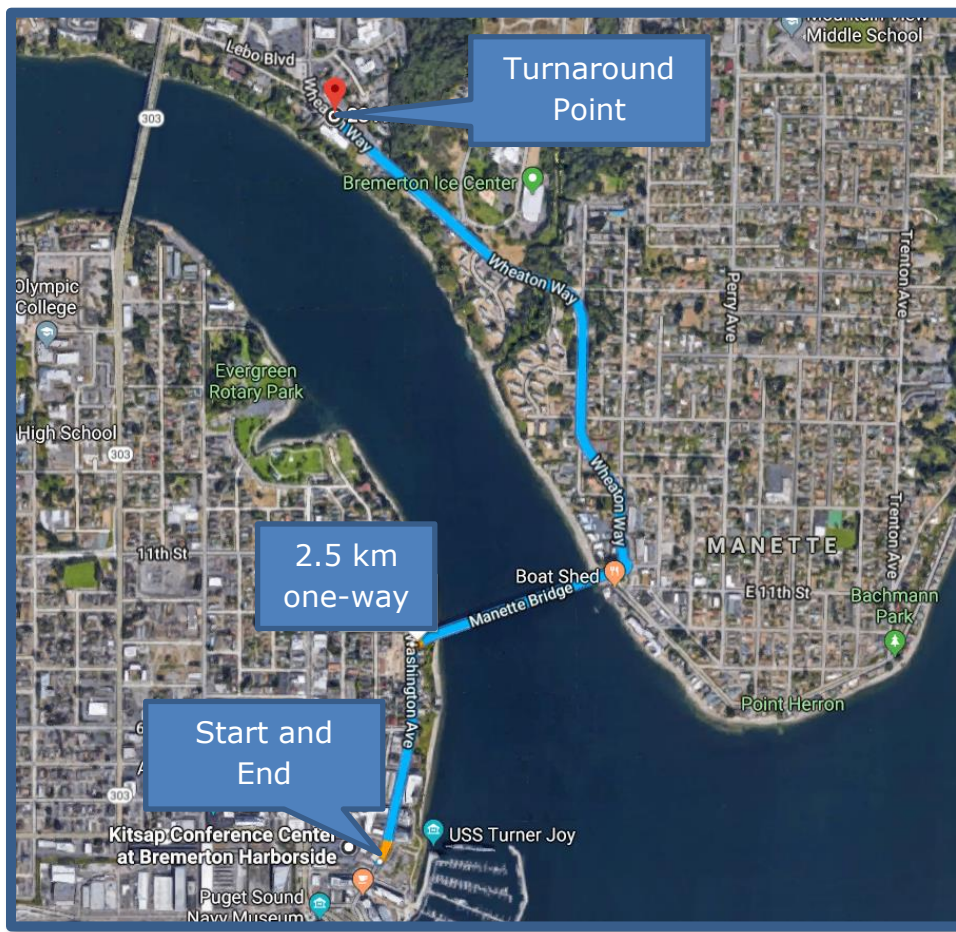
# Spawning Run & Carcass Crawl

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

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**American Institute of Fishery Research Biologists**

**AquaTactics Fish Health**

**Biomark**

**Collective Visions Gallery**

**Cryogenetics**

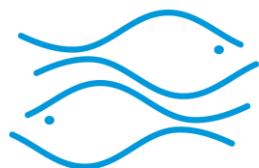
**Lotek Wireless**

**Pacific Netting Products**

**Spokane Tribal Fisheries**

**Teknologic**

**Vemco**



**cryogenetics**





# Awards for Best Student Talk and Poster

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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

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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

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## **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

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## **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.

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**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.

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## 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 is 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

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**Symposia and contributed paper abstracts can be found at:**  
<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.

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

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





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

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**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.

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



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

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### **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.

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



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## ***Symposium: Salmon predators – orca and many other mouths feed***

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### **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.

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



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

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### **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.

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



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

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

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***Symposium: Contributed papers 1***

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

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

Location: Ballroom A

<b>Title</b>	<b>Presenter</b>	<b>Affiliation</b>
<b>Bull Trout movement at multiple life stages in the White River, Washington</b>	Jeffery Johnson	US Fish and Wildlife Service
<b>Bull Trout exhibit life history responses after dam removal in the Elwha River, Washington</b>	Kathryn Sutton	US Fish and Wildlife Service
<b>Do fin rays offer a non-lethal approach for assessing life history patterns using geochemical analysis?</b>	Roger Peters	US Fish and Wildlife Service
<b>Comparing bioenergetic vs. correlative habitat suitability models for stream salmonids</b>	Sean Naman	University of British Columbia
<b>The Pacific Razor Clam populations in Washington revealed by stable isotopes</b>	Yongwen Gao	Makah Fisheries Management
<b>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</b>	Alexander Alexiades	Heritage University



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## *Continued... Contributed papers 1*

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

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

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### **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.

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



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

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<b>Title</b>	<b>Presenter</b>	<b>Affiliation</b>
<b>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</b>	Robert Vadas	Washington Department of Fish and Wildlife
<b>The compensatory responses of intentionally overharvested Brook Trout <i>Salvelinus fontinalis</i> populations in the Canadian Rockies</b>	*Dylan Glaser	University of Calgary
<b>The Outro</b>	Brian Saluskin	The Yakima Nation
<b>Diet composition of Lake Trout <i>Salvelinus namaycush</i> in Upper Priest Lake, Idaho</b>	*Coty Jasper	Eastern Washington University

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***Symposium: Contributed papers 2***

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

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

Location: Ballroom B

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



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## Poster Session

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

Location: Ballrooms C & D

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







Western Division  
American Fisheries Society



### Save the Date!

Join us for the AFS Western Division Meeting  
Hosted by the WA-BC Chapter in 2020  
April 12–16, 2020  
Pinnacle Harbourfront Hotel, Vancouver, BC



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## AMERICAN FISHERIES SOCIETY & THE WILDLIFE SOCIETY 2019 JOINT ANNUAL CONFERENCE



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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.

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

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



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



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



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



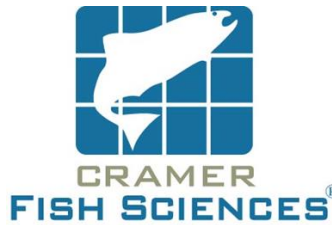
Morning & Lunch	Thursday, April 11	
Morning	<b>LOBBY</b> Registration (8:00–9:00 AM) Coffee and tea provided all morning	
Morning	<b>BALLROOMS A</b> Uninvited guests at the feast <b>Chair:</b> Paul Spruell	<b>BALLROOM B</b> Contributed papers <b>Chair:</b> Gabriel Temple
9:00-9:20	<b>Alix Silver:</b>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



Freshwater Fisheries Society of BC



# Venue Map – Kitsap Conference Center

