



WASHINGTON - BRITISH COLUMBIA
CHAPTER

40 YEARS OF FISH AND FISHERIES IN THE PACIFIC NORTHWEST

2018 ANNUAL GENERAL MEETING

WASHINGTON-BRITISH COLUMBIA CHAPTER
OF THE
AMERICAN FISHERIES SOCIETY

Kelowna, BC
March 19 – 22, 2018



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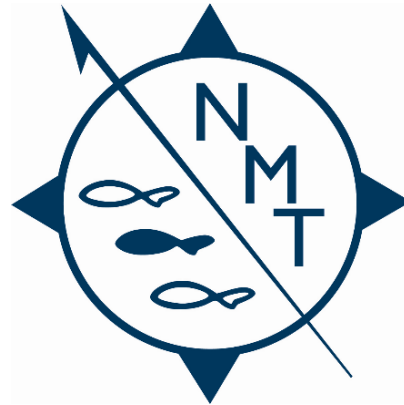
Things to Remember

- 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 awesome gear at the Silent Auction
- Buy a WA-BC Chapter water bottle
- Check out the Trade Show!



Conference Sponsors

Chinook Salmon Level (\$2,000 +)



Ling Cod Level (\$1000 +)



Rockfish Level (\$500)



Freshwater Fisheries
Society of BC



Washington
Department of
**FISH and
WILDLIFE**



Contributor Level (\$250)



President's Welcome

Welcome to the Okanagan, we hope you enjoy your time in Kelowna!

Welcome to beautiful Kelowna, British Columbia! I am especially excited for this year's AGM as we are expanding our meeting locations to include interior British Columbia, and because it's my first trip to Kelowna. This is a very special year for the Washington-British Columbia Chapter as we are celebrating our 40th Anniversary!

We celebrate our Anniversary this year with the meeting theme: "40 Years of Fish and Fisheries in the Pacific Northwest". We are pleased to welcome Jordan Coble and Paul Kariya as our plenary speakers this year. Jordan Coble is the Cultural and Operations Administrator for the Westbank First Nation Sncəwips Heritage Museum. Paul Kariya is a Senior Policy Advisor with Coastal First Nations, who are committed to protecting their environments and pursuing a sustainable economy. Thank you to Paul and Jordan for sharing your perspectives. A private screening of "A River Film" will follow the plenary speakers.

Our symposia this year are sure to be engaging! Symposia will focus on river connectivity with respect to fish passage and reintroduction, hatchery reform, Sockeye Salmon in the Pacific Northwest, Okanagan salmon restoration, future of Bull Trout and management, and methods for communicating results, probability, risk and uncertainty to managers and the general public.

We have several events throughout the meeting to check out. If you are ready for some fresh air after the plenary session, put on your running (or walking) shoes and join us for the Spawning Run. Please be sure to join us for the Trade Show and Poster Session on Tuesday evening. The Trade Show will run the duration of the meeting, and we have filled the room with vendors, exhibitors, and artists and are very excited to see what they have to share. We will be hosting a Student Mentor Mixer for students prior to the Poster Session. We are looking for a few more mentors, so if you would like to help, please see the registration desk. This is a great time to engage with students and find out what new and innovative research they are conducting.

Please join us Wednesday evening for great food, fun, and friends. Ptiodactyl will perform live music throughout the evening. And be sure to come prepared to bid at our silent auction. There will be some pretty cool swag this year! All funds raised in the silent auction go toward the Student Scholarship fund which supports student travel to conferences.

Finally, if you have considered getting more involved in AFS, please consider volunteering. There are several ways in which you can volunteer within the Chapter, and we are happy to help find the right volunteer opportunity for you. We will be recruiting for new Executive Committee Officers this spring. Get involved and give back in whatever way you can. It can be a very rewarding experience. Please enjoy the conference!



Tamara Knudson

President, WA-BC Chapter of the American Fisheries Society



Schedule at a Glance

Mon, March 19	Tues, March 20	Wed, March 21	Thur, March 22
	Registration (Foyer) 7:00 – 5:00 PM	Registration (Foyer) 7:30 – 5:00 PM	Registration (Foyer) 7:30 – 9:00 AM
	Breakfast (Ballroom – Salon B) 7:00 – 8:00 AM	Breakfast (Ballroom – Salon B) 8:00 – 9:00 AM	Continental Breakfast (Ballroom – Salon A) 8:00 – 9:00 AM
	Welcome & Plenary Sessions (Ballroom – Salon B) 8:00 – 9:45 AM	Concurrent Sessions (Vineyard 3 & 4) 9:00 AM – 12:00 PM	Concurrent Sessions (Vineyard 4) 9:00 – 11:40 AM
	Film Screening: A River Film (Ballroom – Salon B) 10:00 – 11:00 AM		
	Spawning Run / Carcass Crawl (Starts at Coast Capri Hotel Parking Lot) 11:00 AM – 12:30 PM		
AFS ExCom and Planning Committee Lunch Meeting (Executive Room 1) 11:00 AM – 1:00 PM	Lunch Buffet (Ballroom – Salon B) 12:30 – 1:20 PM	WA-BC Chapter Annual Business Meeting and Lunch (Ballroom – Salon B) 12:00 – 1:20 PM	End of Conference, Vendor / Exhibitor Teardown 11:40 AM
Registration Opens (Foyer) 1:00 – 5:00 PM	Concurrent Sessions (Vineyard 3 & 4) 1:20 – 5:00 PM	Concurrent Sessions (Vineyard 3 & 4) 1:20 – 5:00 PM	
Exhibitor and Poster Set-Up (Salon A) 1:00 – 5:00 PM			
Continuing Education: R Workshop (Vineyard 2) 1:30 – 4:30 PM	Student / Mentor Panel & Mixer (Vineyard 4) 5:00 – 6:00 PM	Silent Auction (Ballroom – Salon B) 5:30 – 7:30 PM	
	Trade Show Social & Poster Session Mixer (Ballroom – Salon A) 6:00 – 8:00 PM	Banquet and Entertainment (Ballroom – Salon B) 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/next-meeting/program/>



AGM 2018 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.

Gabriel Temple – Program Chair, Accommodations, Budget, Plenary

Brittany Jenewein – Program Co-Chair, Symposia, Student Volunteers, Printed Program

Tamara Knudson – Fundraising, Student/Mentor Panel & Mixer, Business Meeting, Student Travel Scholarships

Alix Silver – Fundraising, Cederholm Scholarship

Benjamin Cross – Publicity, Website

Ryan Klett – Accounting, Registration

Kirstin Gale – Trade Show, Fundraising, Printed Program

Orlay Johnson – Best Student Paper Awards, Student Travel Scholarships

Sam Wilson – Silent Auction, Continuing Education

Alex Lake – Spawning Run

Dominique Alexis – Okanagan Nation Alliance Coordinator

Student Volunteers – Spawning Run, Audio Visual



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 **Northwest Marine Technology**
www.nmt.us 360.468.3375



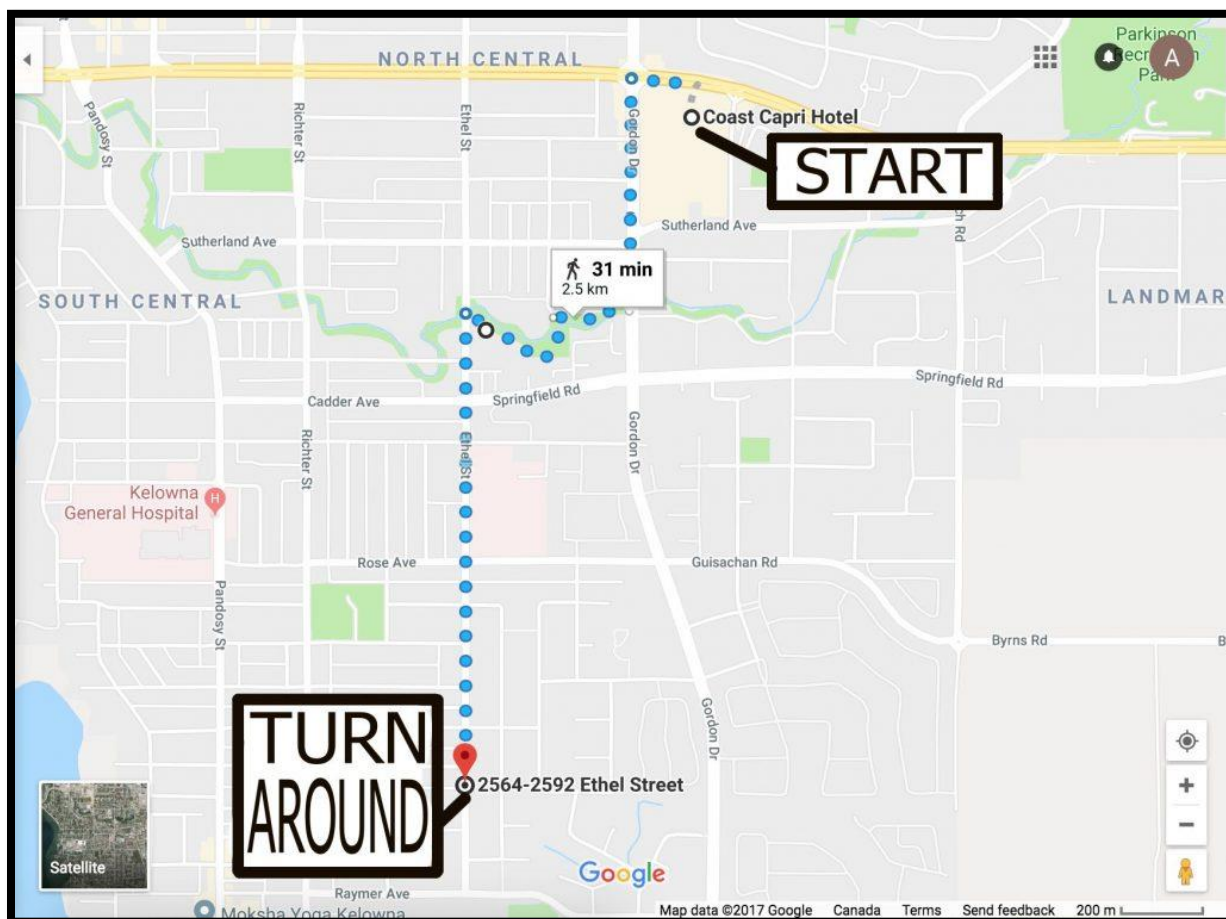
Spawning Run & Carcass Crawl

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 AM on Tuesday, March 20th. The race will start in the Coast Capri Hotel parking lot and follow a course through a residential area (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 through this link or at the registration desk: <https://wa-bc.fisheries.org/next-meeting/special-events/spawning-run/>.

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



Trade Show Exhibitors

American Institute of Fishery Research Biologists

BC Centre for Aquaculture Health Sciences

BC Wildlife Federation

Biomark

Canada Cryogenetics

Hoskin Scientific

Judy Vanderveen – Wildlife Artist

Lotek Wireless

Ninjadiva Design Studio

Pacific Netting Products

Syndel Canada

Thomson’s Finest Art

Upper Columbia Salmon Recovery Board

WA-BC Chapter of AFS

Whooshh Innovations



Judy Vanderveen
Wildlife Artist



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 2018 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 2018 Endowment Committee are pleased to award \$1,000 scholarships each to:

- Christine Stevenson (M.Sc. candidate), Simon Fraser University
- Megan Feddern (M.Sc. candidate), University of Washington
- Kyla Bivens (B.Sc. student), University of Washington

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

Application forms for the 2019 awards will be available late 2018 / early 2019.



Special Events

Spawning Run and Carcass Crawl

Tuesday, March 20, 11:00 AM to 12:30 PM

Start: Coast Capri Hotel parking lot

It's time for our annual AGM Spawning Run & Walk! This fun, non-competitive, free, 5K event will start from the Coast Capri Hotel parking lot. 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, March 20, 5:00 PM to 6:00 PM

Location: Vineyard 4

Students: Come join Fisheries Professionals in a panel discussion of career paths and opportunities following graduation, followed by a chance to mingle informally. Representatives from government, private industry, NGO's and academia will be on-hand and eager to share their personal career stories, as well as discuss current and future job prospects with their agencies and organizations. All attendees willing to share their knowledge and experience are encouraged to attend!

Want to volunteer to be on the mentor panel? Let us know at the registration desk!

Trade Show Social and Poster Session

Tuesday, March 20, 6:00 PM to 8:00 PM

Location: Ballroom – Salon A

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, March 21, 12:00 PM to 1:20 PM

Location: Ballroom – Salon B

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, March 21, 5:30 PM to 7:30 PM****Location: Ballroom – Salon B**

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 Salon B 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, March 21, 6:00 PM to 9:00 PM****Location: Ballroom – Salon B**

Join us Wednesday, March 21st from 6:00pm to 9:00pm for our banquet dinner and silent auction. We are thrilled to have Ptriodactyl performing throughout the night. Ptriodactyl is a unique fusion of groove and space. With their effervescent synergy, musical interplay, and sense of humour, Ptriodactyl captivates audiences. This electrifying trio includes Jessica Heaven (vocals), Gavia Lertzman-Lepofsky (violin, she's a WA-BC AFS member!!!), and Jake McIntyre-Paul (bass). You can check out their bio here:

<https://wa-bc.fisheries.org/wp-content/uploads/2018/02/Ptriodactyl-Bio.pdf>.



Plenary Speakers

JORDAN COBLE

Cultural and Operations Administrator
Westbank First Nation Sncəwips Heritage Museum

Jordan was born and raised in the heart of the Okanagan and is dedicated to working for his community and people through the creation of awareness and appreciation through collaboration and authentic representation. Jordan strives to ensure the voice of the Okanagan/Syilx people is heard and understood as valuable to all walks of life in relation to past, present and future generations. The interconnection between our people and our sense of place is unbreakable and needs to be valued. Jordan strives to ensure we are able to claim our rightful place in our representation, interpretation and application of our knowledge.



Jordan has been fortunate to lead the Sncəwips Heritage Museum to a number of awards as well as successful projects and is grateful for all those who continue to be friends and supporters. Jordan takes pride in ensuring the Museum's foundation is based on the best interests of the community and its members by providing a safe and comfortable space for positive experiences for all to enjoy.

Plenary Talk Title: Coyote Brought the Salmon to Our People: The Upstream Journey of Bringing Them Home

Abstract: In the span of 4 generations salmon have gone from being plentiful enough to feed nations of communities and families for Syilx / Okanagan people to being a resource we are lucky if we are able to access in any given year. Development continues to destroy the health of our salmon and the ecosystems that are vital to their survival. It is of the utmost importance to recognize traditional knowledge as the foundational component to ensuring salmon will continue to replenish our rivers and good health of future generations. But like the salmon, this journey continues to experience hardships and obstacles that are difficult to overcome. And like the salmon, the Syilx / Okanagan people continue to persist.

Biomark 

SPECIALISTS IN IDENTIFICATION SOLUTIONS



Washington-British Columbia Chapter of the American Fisheries Society – AGM 2018



PAUL KARIYA

Senior Policy Advisor
Coastal First Nations
Great Bear Initiative

Paul Kariya is Senior Policy Advisor with Coastal First Nations who are committed to protecting their environments and pursuing a sustainable economy. Prior to joining Coastal First Nations, Paul was the Executive Director of Clean Energy BC, and before

that he was Executive Director of Pacific Salmon Foundation and a Professor at Trinity Western University. He has worked in the public sector both federally and provincially. He was CEO of the provincial crown corporation, Fisheries Renewal BC, and Executive Director of the BC Treaty Commission. Paul serves on several community boards and has represented Canada as a Commissioner on the Pacific Salmon Commission. Paul comes from a commercial fishing family.

Plenary Talk Title: The Many Constructions of Salmon; How About Another One – Mine

Abstract: The address will be a personal reflection about the meaning of salmon in the everyday life of one Pacific Northwest resident. But the objective will be to help all of us understand that while salmon are beautiful, real, food and endangered ... they are also constructed by humans as jobs, income, barriers to development and recreation.

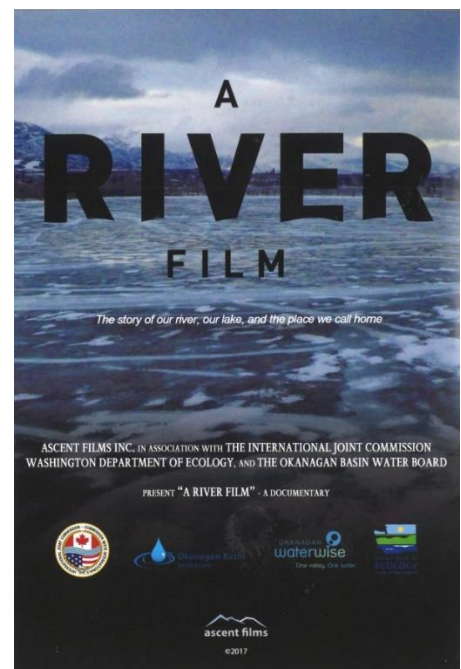
BRIAN SYMONDS

International Osoyoos Lake Board of Control

Private Screening of "A River Film"

"A River Film" is a story about people, and how they have, over many years, constructed a relationship with a river to support the needs and aspirations of many users, while working to maintain the environment that supports those differing priorities.

The central player in the story is the river, but the story can't be told without a focus on the people of the region. Their story concerns complex relationships with other people, fish, and the wider Columbia Basin. The uniqueness of the Okanagan/Okanogan Basin involves the fact that all this happens within a watershed that is regulated by two political entities across a US/Canada international boundary. Therefore, this story is also about the effects of



A River Film continued...

a regulatory scheme across an International border on a watershed that supports a wide range of economic and ecosystem uses.

“A River Film” is an annual story. As the years repeat, the story of the river unfolds in a pattern. The film’s theme is universal, concerning everyone involved. The story is positive and inspiring.

The film was produced by Ascent Films Inc. in association with The International Joint Commission, Washington Department of Ecology, and The Okanagan Basin Water Board. Brian Symonds of the International Osoyoos Lake Board of Control will be present to introduce the film and provide additional context. A trailer can be viewed at: <https://vimeo.com/235960865>.

Continuing Education

Beginner R Course

Location: Vineyard 2

Monday, March 19th from 1:30 PM to 4:40 PM.

WA-BC is excited to be hosting a continuing education opportunity prior to the meeting. Samantha Wilson, PhD Candidate at Simon Fraser University, will be leading a Beginner R Course on Monday, March 19th from 1:30 PM to 4:40 PM. The cost for the course is \$20, and it is open to all registrants. Please bring your own computer.

Sign up here or at the registration desk: <https://wa-bc.fisheries.org/next-meeting/continuing-education/>.

Description: R is a powerful open source (free!) program that is taking the ecology world by storm. In fisheries science we demand reproducibility and transparency in our data management and analysis, but it’s not always easy to track the thousand small choices you make during data analyses – but it is easy in R. R enables a completely reproducible and transparent process which can be duplicated across similar tasks (saving time), published and shared with other R users. So now I have convinced you of its worth, you may want to know; what exactly is R and how do you use a code-based open-source program? Learning to code in R can be a frustrating and slow process. This ~3hr workshop is meant to introduce new comers to the world of R; no prior experience with R is necessary! We will start with R basics in coding and progress to datasheet manipulation and plotting in base R. By the end of this workshop attendees will be able to set up a simple datasheet for statistical tests. The goal of this workshop is to give a leg up in the steep learning curve in R, and teach newcomers in R how to troubleshoot common problems.



Change, Challenge, and Opportunity in Fisheries: **Fishing for Solutions**



**WESTERN DIVISION AMERICAN FISHERIES SOCIETY
ANNUAL MEETING 21-25 MAY 2018
ANCHORAGE - ALASKA**

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Socials! Sessions! Film Festival! Networking!



For all your meeting information needs
visit our website:
www.wdmtg.fisheries.org

Or contact the meeting co-chairs:

Brian Missildine (Western Division AFS President)
Brian.Missildine@dfw.wa.gov
Jeff Falke (Alaska Chapter AFS President-Elect)
afs.alaska.presidentelect@gmail.com





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Symposia Descriptions

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

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



Symposium: Hatchery reform, progress and innovation

Chair: Todd Pearsons (Grant County Public Utility District)

Date: Tuesday, March 20th, 1:20 PM to 5:00 PM

Location: Vineyard 3

Hatchery reform recommendations of salmon and steelhead hatcheries in Washington and the Columbia Basin were made by the Hatchery Scientific Review Group some time ago. The intent of those recommendations was to align hatchery practices with hatchery goals. Although it is premature to evaluate the biological performances of some of the reform recommendations, the progress towards implementation of the recommendations can be evaluated. This symposium will emphasize progress towards achieving hatchery reform, and more specifically, targets of an index of domestication selection (i.e., Proportionate Natural Influence) and stray rates. Furthermore, additional concepts and refinements of hatchery reform and unconventional uses of hatcheries will also be explored. The talks in this symposium will provide examples of: 1) how reform recommendations are being implemented, 2) how well hatcheries are achieving recommendations, 3) if available, how reforms have changed biological performance, and 4) alternative concepts for hatchery reform and innovation.

Title	Presenter	Affiliation
The HSRG and hatchery reform in the Pacific Northwest	Andy Appleby	Hatchery Scientific Review Group
Teaming to achieve hatchery reform in a Columbia River hatchery	Todd Pearsons	Grant County Public Utility District
Tradeoffs associated with implementation of hatchery reform recommendations for the Wenatchee Summer Steelhead Program	Catherine Willard	Chelan County Public Utility District
Trade-offs in genetic and ecological risk and enhancement benefits in a Steelhead conservation program	Gregory Mackey	Douglas County Public Utility District
Integration of hatchery and harvest to achieve population objectives using hatchery reform principles for summer/fall Chinook in the Okanogan	Casey Baldwin	Colville Confederated Tribes
Hatchery reform in Yakama Territories	Bill Bosch	Yakama Fisheries - YKFP
Hatchery reform in Washington State	Brian Missildine	Washington Dept. of Fish and Wildlife
Implementing hatchery reform in the state of Idaho	Paul Kline	Idaho Department of Fish and Game
Trade-offs in multi-objective hatchery mitigation programs: You can have your fish and eat them too (but not as many as you may want)	Peter Graf	Grant County PUD
Panel discussion		



Symposium: River connectivity: technical, cultural and biological aspects of fish passage and reintroduction

Chair: Andy Peters (Pacific Netting Products)

Date: Tuesday, March 20th, 1:20 PM to 4:00 PM

Location: Vineyard 4

Fish passage and river connectivity barriers could be considered to be anything that hinders any life stage of fish and other aquatic organisms, energy and inert matter from moving through a waterway. Physical barriers include dams and deteriorating culverts. Environmental and biological barriers include water velocity, water temperature, quality, an increase in number of predators and deterioration of upstream habitat. Cultural barriers are comprised of the attitudes, customs and practices of people and industry. Technical barriers involve a lack of supporting or facilitating technologies, materials, engineering and know-how to address or implement solutions.

Restoring connectivity will increase habitat diversity, population resilience and restore important cultural and societal customs. While most barriers have the same general impact on fish—blocking migrations, the interactions of these barriers are complex and interdependent. Restoration of connectivity of freshwater habitats throughout the historic range of anadromous fish requires a coordinated approach.

In this symposium speakers will discuss various barriers and / or the methodologies to overcome them. Speakers will include those from industry, community, designers and developers of the passage systems, biologists and engineers responsible for designing and conducting evaluation study plans, researchers responsible for evaluating performance and project owners/operators. Presentations will include case-studies and lessons learned from other river connectivity projects.

This symposium will help attendees understand the complex and interdependent nature of fish passage and river connectivity barriers and how site specific, coordinated approaches can restore connectivity.

Title	Presenter	Affiliation
The importance of salmon to the Syilx – past, present, future	Michael Zimmer	Okanagan Nation Alliance
Anadromous fish reintroduction in the Upper Columbia River Basin - an overview	Stephen Smith	Upper Columbia United Tribes
Life cycle modeling of reintroduction scenarios for summer/fall Chinook upstream of Chief Joseph and Grand Coulee dams	Casey Baldwin	Colville Confederated Tribes
Recent developments in temperature and algae control	Andrew Peters	Pacific Netting Products
PIT tag technology: a flexible tool for fish passage and reintroduction projects	Phil Peterson	West Fork Environmental, Inc.



Continued... River connectivity: technical, cultural and biological aspects of fish passage and reintroduction

Title	Presenter	Affiliation
Flexible, adaptable upstream passage for reintroduction	Steve Dearden	Whooshh Innovations
Using a major highway construction project to improve both transportation and stream connectivity – the I-90 Case Study	Paul James	Central Washington University
Use of adult Pacific Lamprey passage structures at Bonneville Dam	Nathan Zorich	US Army Corps of Engineers
Response of juvenile Chinook Salmon, Steelhead, and other salmonids to wood placement in Interior Columbia Basin streams	Christopher Clark	Cramer Fish Sciences

Symposium: Methods for communicating results, probability, risk, and uncertainty to managers and the general public

Chair: Ann-Marie Huang (Fisheries and Oceans Canada)

Date: Wednesday, March 21st, 10:20 AM to 12:00 PM

Location: Vineyard 3

The general public does not think of probability in the same way as people with a technical background. If they did, casinos would not be so plentiful. This symposium will be a venue for people to share methods used for communicating results to people making decisions and/or feeding into the decision-making process – both methods that worked (and why) and that didn't work (and why). Methods can include, but are not limited to: choice of language, figures, and/or meeting process.

Title	Presenter	Affiliation
Communicating results to the decision makers. Lessons learned: the good, the bad, and the intractable	Ann-Marie Huang	Fisheries and Oceans Canada
Theory and practice of risk communication	Gottfried Pestal	SOLV Consulting Ltd.
Assessing localized habitat changes: an alternative to habitat suitability index models	Greg Courtice	Wood Environment and Infrastructure Solutions
Communicating results with sport salmon head recovery letters	Erika Anderson	Fisheries and Oceans Canada
Panel discussion		



Symposium: Sockeye Salmon in the Pacific Northwest

Chair: Jeff Fryer (Columbia River Inter-Tribal Fish Commission)

Date: Wednesday, March 21st, 9:00 AM to 4:00 PM

Location: Vineyard 4

The location of this year's Washington-British Columbia AFS meeting, Kelowna, sits near the divide between two great Sockeye Salmon rivers; the Columbia and the Fraser. Fraser River Sockeye runs prior to the early 1900's were immense; the size of historic Columbia River runs are less well-documented, but were certainly in the millions. Both runs trended steeply downward in the first half of the 20th century due to dams blocking most rearing lakes in the Columbia River and a landslide partially blocking the Fraser River in 1913. More recently, the 20th century, historic abundance with record low runs occurring in the past 20 years but also a near record high in the Fraser of nearly 30 million in 2010 and over 600,000 returning to the Columbia River in 2014, primarily to the Okanagan Basin. These runs are important to fisheries in both basins, thus considerable resources have been expended on managing and seeking to improve these runs. With these runs being at the southern end of their range and high temperatures being associated with large die-offs on the upstream migration in recent years, these stocks are highly vulnerable to climate change. These stocks are also located in areas with rapidly growing human populations and their associated impacts on watersheds. This symposium will focus on impacts on salmon imposed by climate change and human population and what management actions are, or can be, taken to offset these. While this symposium is expected to focus on the Fraser and Columbia rivers, submissions from other basins in the Pacific Northwest are also welcome.

Title	Presenter	Affiliation
Lake Washington Sockeye Salmon Program - opportunities and challenges	Mark LaRiviere	D. J. Warren & Associates
North Fork Skokomish River Sockeye Salmon Program: beginnings...	Tim Hoffnagle	Tacoma Power
What is causing declines in the annual returns of Fraser River Sockeye Salmon?	Mike Lapointe	Pacific Salmon Commission
Divergence of the condition of Sockeye Salmon fry among lake and river rearing habitats	*Elissa Sweeney-Bergen	Simon Fraser University
Productivity responses of Barkley Sound salmon to climate variation and change impacts in the Pacific Ocean.	Kim Hyatt	Fisheries and Oceans Canada



Continued... Sockeye Salmon in the Pacific Northwest

Title	Presenter	Affiliation
Pacific salmon responses to climate variation and change in freshwater ecosystems.	Howard Stiff	Fisheries and Oceans Canada
Developing and implementing adaptation strategies through upgrading and re-purposing existing in-stream infrastructure for conservation and sustainable production of salmon originating from the Somass watershed in British Columbia.	Craig Wightman	BC Conservation Foundation
Snake River Sockeye Salmon Recovery – historical perspective and progress towards meeting recovery objectives	Paul Kline	Idaho Department of Fish and Game
What can we say after thirty years of PIT-tagging Sockeye Salmon?	Joshua Murauskas	Four Peaks Environmental
Possible adaptation of Columbia Basin Sockeye to a warming climate	Jeff Fryer	Columbia River Inter-Tribal Fish Commission
Long-term ecological change and associated environmental forcings in critical freshwater nursery habitat for Okanagan Basin Sockeye Salmon (<i>Oncorhynchus nerka</i>): A comparative paleolimnological study of Wenatchee Lake, WA, USA, and Osoyoos and Skaha lakes, BC, Canada	Daniel Selbie	Fisheries and Oceans Canada
Yakama Nation Sockeye Project	Brian Saluskin	Yakama Nation
Genetic monitoring of Sockeye Salmon reintroductions: informed opportunities and adaptive management	Andrew Matala	Columbia River Inter-Tribal Fish Commission
Passage pilot for Sockeye reintroduction at Cle Elum using the Whooshh Fish Transport System	Steve Dearden	Whooshh Innovations
Stable isotopic comparison between otoliths of Chum Salmon and Sockeye Salmon	Yongwen Gao	Makah Fisheries Management



Symposium: Contributed papers

Chair: Benjamin Cross

Date: Wednesday, March 21st, 1:20 PM to 3:00 PM

Location: Vineyard 3

Title	Presenter	Affiliation
History of salmon marine netpen aquaculture in Washington State	Orlay Johnson	WABC Chapter AFS, Seattle Aquarium
Holy smolts it's time to go! Modelling age at seaward migration in juvenile Steelhead	*Colin Bailey	Simon Fraser University
Phenological mismatch reduces survival in wild steelhead trout (<i>Oncorhynchus mykiss</i>) population	Samantha Wilson	Simon Fraser University
Dynamic prey landscapes for four fishes foraging in the Skeena River estuary	*Michael Arbeider	Simon Fraser University
Balancing seasonal food web interactions to manage Kokanee production in a mixed fishery	*Brian Lanouette	Washington State University

Symposium: The future of bull trout populations and management in British Columbia and Washington

Chairs: Nikolaus Gantner (BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development - FLNRORD), Shawna Warehime (Eastern Washington University), and Rachel Chudnow (University of British Columbia)

Date: Wednesday, March 21st, 3:20 PM to 5:00 PM

Location: Vineyard 3

Environmental and anthropogenic stressors pose threats to Bull Trout *Salvelinus confluentus* populations in both British Columbia and Washington. Climate change is one major stressor, as water temperature is often the most important environmental parameter delineating the distribution of Bull Trout. In addition, land use practices, such as hydroelectric dams, forestry practices, and fisheries management practices can further affect Bull Trout populations directly and indirectly.

Bull Trout are federally listed with some level of conservation concern throughout their range. If the species is to thrive, it is necessary to examine causes for decline and evaluate pathways to recovery in the face of existing and emerging threats. This includes studying recovery initiatives currently underway as well as emerging technologies and



Continued... The future of Bull Trout populations and management in British Columbia and Washington

policies. For example, applications such as the Cold-Water Climate Shield model by the U.S. Forest Service Research and Development Branch and the advances in the utility of environmental DNA have been successfully employed to identify shifts in stream water temperatures and subsequent effects on salmonids, including Bull Trout. The promising method of environmental DNA appears to provide an alternative to traditional approaches.

This symposium is welcoming submissions from academia, government agencies, and the private sector on both sides of the border to share lessons learned and success stories from the past, as well as to jointly discuss future strategies to assess and manage Bull Trout populations. Submissions as platform presentations and poster presentations are welcome and a wrap-up panel discussion may be held to conclude the symposium. A summary report may be written with contributions from all participants.

Title	Presenter	Affiliation
Climate change influence on Upper Fraser Watershed and Bull Trout habitat	Nikolaus Gantner	BC Ministry of Forest, Lands, Natural Resource Operations and Rural Development
Bull Trout in the Yakima basin: a proposal to prevent future declines	Todd Newsome	Yakama Nation
Predator-prey interactions between Bull Trout and juvenile Sockeye Salmon in Chilko Lake, British Columbia	Nathan Furey	University of British Columbia and University of New Hampshire
Evaluating the effectiveness of fish passage operations for resident Bull Trout at a flood storage dam in Southeastern British Columbia	Katy Jay	BC Hydro
Hierarchical bayesian meta-analysis to characterize cross-population variation in the stock-recruit relationship for Bull Trout (<i>Salvelinus confluentus</i>)	*Rachel Chudnow	The University of British Columbia



**Freshwater Fisheries
Society of BC**



Washington-British Columbia Chapter of the American Fisheries Society – AGM 2018

Symposium: Okanagan salmon restoration

Chair: Chad Fuller (Okanagan Nation Alliance)

Date: Thursday, March 22nd, 9:00 AM to 11:40 AM

Location: Vineyard 4

Topics for our symposium will cover habitat, hydro, hatchery, health, and harvest.

Title	Presenter	Affiliation
Okanagan River restoration initiative	Karilyn Alex	Okanagan Nation Alliance
A brief history of the kł cpəl'k' stim' hatchery 2014-2018	Dan Stefanovic	Okanagan Nation Alliance
Okanagan Nation Alliance's Skaha Lake Sockeye Salmon Reintroduction Program	Ryan Benson	Okanagan Nation Alliance
An assessment of impacts of the 2010 Testalinden Dam breach on aquatic food webs and planktivores (<i>Oncorhynchus nerka</i> and <i>Mysis diluviana</i>) at Osoyoos Lake, British Columbia, Canada	Athena Ogden	Fisheries and Oceans Canada
Have invasive mysids (<i>Mysis diluviana</i>), altered the capacity of Osoyoos Lake, British Columbia to produce Sockeye Salmon (<i>Oncorhynchus nerka</i>)?	Kim Hyatt	Fisheries and Oceans Canada
The five H's (hydro, hatcheries, habitat, harvest, health) of Okanagan anadromous fishes	David Duvall	Grant County Public Utility District
Results from large-scale experiments to test the effectiveness of stream restoration: is restoration working and can we increase restoration effectiveness?	Stephen Bennett	Utah State University



Contributed posters

Date: Tuesday, March 20th, 6:00 PM to 8:00 PM

Location: Ballroom – Salon A

Title	Presenter	Affiliation
Investigating mystery <i>O. nerka</i>: comparative analysis of three non-anadromous <i>O. nerka</i> populations	*Quinn Moldestad	University of Washington, Bothell
Rainbow Trout (<i>Oncorhynchus mykiss</i>) habitat utilization in Lake Spokane, Washington	*Shawna Warehime	Eastern Washington University
Implications of food type on the effectiveness of a syringe method for gastric lavage of Largemouth Bass	*Brian Lanouette	Washington State University
Impacts of temperature on life history strategies of invasive Eastern Brook Trout (<i>Salvelinus fontinalis</i>)	*Kaeli Davenport	Eastern Washington University
Seven years of monitoring and evaluating Rufus Woods Lake Rainbow Trout supplementation	Jeff Caisman	Confederated Tribes of the Colville Reservation
temperature effects on consumption: bioenergetic implications for management of Dungeness and Graceful Crabs	*Grace Workman	University of Washington School of Aquatic and Fishery Sciences
Using stable isotopes to investigate the trophic status of an invasive crayfish in a temperate, oligotrophic lake	*John Loffredo	Washington State University



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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, March 19th
Lunch	<u>EXECUTIVE ROOM 1</u> WA-BC Executive Committee and AGM Planning Committee Lunch Meeting (11:00 AM – 1:00 PM)
Afternoon	<u>FOYER</u> Registration (1:00 – 5:00 PM) <u>BALLROOM - SALON A</u> Trade Show Exhibitor & Poster Set Up (1:00 – 5:00 PM) <u>Vineyard 2</u> Beginner R Workshop (1:30 – 4:30 PM)

Morning & Lunch	Tuesday, March 20th
Morning	<u>FOYER</u> Registration (7:00 AM – 5:00 PM) <u>BALLROOM – SALON B</u> Breakfast (7:00 – 8:00 AM) Welcome and Plenary Session (8:00 AM – 11:00 AM)
8:00-8:05	Welcome from Conference Chair: Gabriel Temple
8:05-8:15	Opening Ceremony: Jordan Coble
8:15-9:00	Plenary Speaker: Jordan Coble
9:00-9:45	Plenary Speaker: Paul Kariya
9:45-10:00	<u>BALLROOM – SALON A</u> Morning Break (Coffee & Tea Service)
10:00-11:00	<u>BALLROOM – SALON B</u> Film Screening: "A River Film"
11:00-12:30	<u>COAST CAPRI HOTEL PARKING LOT</u> Spawning Run / Carcass Crawl
12:30-1:20	<u>BALLROOM – SALON B</u> Lunch



Afternoon & Evening	Tuesday, March 20th continued	
Afternoon	<u>VINEYARD 3</u> Hatchery reform progress and innovation Chair: Todd Pearsons	<u>VINEYARD 4</u> River connectivity: technical, cultural and biological aspects of fish passage and reintroduction Chair: Andy Peters
1:20-1:40	Andy Appleby: The HSRG and hatchery reform in the Pacific Northwest	Michael Zimmer: The importance of salmon to the Syilx – past, present, future
1:40-2:00	Todd Pearsons: Teaming to achieve hatchery reform in a Columbia River hatchery	Stephen Smith: Anadromous fish reintroduction in the Upper Columbia River Basin - an overview
2:00-2:20	Catherine Willard: Trade-offs associated with implementation of hatchery reform recommendations for the Wenatchee Summer Steelhead Program	Casey Baldwin: Life cycle modeling of reintroduction scenarios for summer/fall Chinook upstream of Chief Joseph and Grand Coulee dams
2:20-2:40	Gregory Mackey: Trade-offs in genetic and ecological risk and enhancement benefits in a Steelhead conservation program	Andy Peters: Recent developments in temperature and algae control
2:40-3:00	Casey Baldwin: Integration of hatchery and harvest to achieve population objectives using hatchery reform principles for summer/fall Chinook in the Okanogan	Phil Peterson: PIT tag technology: a flexible tool for fish passage and reintroduction projects
3:00-3:20	<u>BALLROOM – SALON A</u> Afternoon Break (Coffee & Tea Service)	
3:20-3:40	Bill Bosch: Hatchery reform in Yakama Territories	Steve Dearden: Flexible, adaptable upstream passage for reintroduction
3:40-4:00	Brian Missildine: Hatchery reform in Washington State	Paul James: Using a Major Highway Construction Project to Improve both Transportation and Stream Connectivity – The I-90 Case Study
4:00-4:20	Paul Kline: Implementing hatchery reform in the state of Idaho	Nathan Zorich: Use of adult Pacific Lamprey passage structures at Bonneville Dam
4:20-4:40	Peter Graf: Trade-offs in multi-objective hatchery mitigation programs: you can have your fish and eat them too (but not as many as you may want)	Christopher Clark: Response of juvenile Chinook Salmon, Steelhead, and other salmonids to wood placement in Interior Columbia Basin streams
4:40-5:00	Panel Discussion	
5:00-6:00	<u>VINEYARD 4</u> Student/Mentor Panel & Mixer	
6:00-8:00	<u>BALLROOM – SALON A</u> Trade Show Social & Poster Session	



Morning & Lunch	Wednesday, March 21st	
Morning	FOYER Registration (7:30 AM – 5:00 PM) BALLROOM – SALON B Breakfast (8:00 – 9:00 AM)	
Morning	VINEYARD 3 Methods for communicating results, probability, risk, and uncertainty to managers and the general public Chair: Ann-Marie Huang	VINEYARD 4 Sockeye Salmon in the Pacific Northwest Chair: Jeff Fryer
9:00-9:20	Mark LaRiviere: Lake Washington Sockeye Salmon Program – opportunities and challenges	
9:20-9:40	Tim Hoffnagle: North Fork Skokomish River Sockeye Salmon Program: beginnings...	
9:40-10:00	Mike LaPointe: What is causing declines in the annual returns of Fraser River Sockeye Salmon?	
10:00-10:20	BALLROOM – SALON A Morning Break (Coffee & Tea Service)	
10:20-10:40	Ann-Marie Huang: Communicating results to the decision makers. Lessons learned: the good, the bad, and the intractable	*Elissa Sweeney-Bergen: Divergence of the condition of Sockeye Salmon fry among lake and river rearing habitats
10:40-11:00	Gottfried Pestal: Theory and practice of risk communication	Kim Hyatt: Productivity responses of Barkley Sound salmon to climate variation and change impacts in the Pacific Ocean
11:00-11:20	Greg Courtice: Assessing localized habitat changes: an alternative to habitat suitability index models	Howard Stiff: Pacific salmon responses to climate variation and change in freshwater ecosystems
11:20-11:40	Erika Anderson: Communicating results with sport salmon head recovery letters	Craig Wightman: Developing and implementing adaptation strategies through upgrading and re-purposing existing in-stream infrastructure for conservation and sustainable production of salmon originating from the Somass watershed in British Columbia
11:40-12:00	Panel Discussion	Paul Kline: Snake River Sockeye Salmon recovery – historical perspective and progress towards meeting recovery objectives
12:00-1:20	BALLROOM – SALON B WA-BC Chapter Business Lunch All AGM attendees are welcome!	



Afternoon & Evening	Wednesday, March 21st continued	
Afternoon	<p align="center"><u>VINEYARD 3</u> Contributed papers Chair: Benjamin Cross</p>	<p align="center"><u>VINEYARD 4</u> Sockeye Salmon in the Pacific Northwest (continued) Chair: Jeff Fryer</p>
1:20-1:40	Orlay Johnson: History of salmon marine netpen aquaculture in Washington State	Joshua Murauskas: What can we say after thirty years of PIT-tagging Sockeye Salmon?
1:40-2:00	*Colin Bailey: Holy smolts it's time to go! Modelling age at seaward migration in juvenile steelhead	Jeff Fryer: Possible adaptation of Columbia Basin Sockeye to a warming climate
2:00-2:20	Samantha Wilson: Phenological mismatch reduces survival in wild Steelhead Trout (<i>Oncorhynchus mykiss</i>) population	Daniel Selbie: Long-term ecological change and associated environmental forcings in critical freshwater nursery habitat for Okanagan Basin Sockeye Salmon (<i>Oncorhynchus nerka</i>): A comparative paleolimnological study of Wenatchee Lake, WA, USA, and Osoyoos and Skaha lakes, BC, Canada
2:20-2:40	*Michael Arbeider: Dynamic prey landscapes for four fishes foraging in the Skeena River estuary	Brian Saluskin: Yakama Nation Sockeye Project
2:40-3:00	*Brian Lanouette: Balancing seasonal food web interactions to manage Kokanee production in a mixed fishery	Andrew Matala: Genetic monitoring of Sockeye Salmon reintroductions: informed opportunities and adaptive management
3:00-3:20	<u>BALLROOM – SALON A</u> Afternoon Break (Coffee & Tea Service)	
	<p align="center"><u>VINEYARD 3</u> The future of Bull Trout populations and management in BC and WA Co-Chairs: Nikolaus Gantner, Shawna Warehime, and Rachel Chudnow</p>	<p align="center"><u>VINEYARD 4</u> Sockeye Salmon in the Pacific Northwest (continued) Chair: Jeff Fryer</p>
3:20-3:40	Nikolaus Gantner: Climate change influence on Upper Fraser Watershed and Bull Trout habitat	Steve Dearden: Passage pilot for Sockeye reintroduction at Cle Elum using the Whooshh Fish Transport System
3:40-4:00	Todd Newsome: Bull Trout in the Yakima Basin: a proposal to prevent future declines	Yongwen Gao: Stable isotopic comparison between otoliths of Chum Salmon and Sockeye Salmon
4:00-4:20	Nathan Furey: Predator-prey interactions between Bull Trout and juvenile Sockeye Salmon in Chilko Lake, British Columbia	
4:20-4:40	Katy Jay: Evaluating the effectiveness of fish passage operations for resident Bull Trout at a flood storage dam in Southeastern British Columbia	
4:40-5:00	*Rachel Chudnow: Hierarchical Bayesian meta-analysis to characterize cross-population variation in the stock-recruit relationship for Bull Trout (<i>Salvelinus confluentus</i>)	



Afternoon	Wednesday, March 21 st continued
5:30-7:30	<u>BALLROOM – SALON B</u> Silent Auction
6:00-9:00	<u>BALLROOM – SALON B</u> Banquet and Entertainment

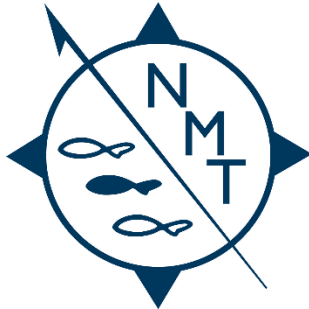
Morning & Lunch	Thursday, March 22 nd
Morning	<u>FOYER</u> Registration (7:30 – 9:00 AM) <u>BALLROOM – SALON A</u> Continental Breakfast (8:00 – 9:00 AM)
Morning	<u>VINEYARD 4</u> Okanagan salmon restoration Chair: Chad Fuller
9:00-9:20	Karilyn Alex: Okanagan River restoration initiative
9:20-9:40	Dan Stefanovic: A brief history of the kł cpəlk' stim' hatchery 2014-2018
9:40-10:00	Ryan Benson: Okanagan Nation Alliance's Skaha Lake Sockeye Salmon Reintroduction Program
10:00-10:20	Athena Ogden: An assessment of impacts of the 2010 Testalinden Dam breach on aquatic food webs and planktivores (<i>Oncorhynchus nerka</i> and <i>Mysis diluviana</i>) at Osoyoos Lake, British Columbia, Canada
10:20-10:40	<u>BALLROOM – SALON A</u> Morning Break (Coffee & Tea Service)
10:40-11:00	Kim Hyatt: Have invasive mysids (<i>Mysis diluviana</i>), altered the capacity of Osoyoos Lake, British Columbia to produce Sockeye Salmon (<i>Oncorhynchus nerka</i>)?
11:00-11:20	David Duvall: The five H's (hydro, hatcheries, habitat, harvest, health) of Okanagan anadromous fishes
11:20-11:40	Stephen Bennett: Results from large-scale experiments to test the effectiveness of stream restoration: is restoration working and can we increase restoration effectiveness?
11:40	CONFERENCE ENDS Trade Show/Poster Teardown

See you in 2019!

Right: 2017/2018 WA-BC Chapter of AFS Executive Committee



Thank you, Donors & Exhibitors!



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Judy Vanderveen
Wildlife Artist



Venue Map – Coast Capri Hotel

