

FINAL REPORT

Peace Fish and Wildlife Compensation Program Colloquium PEA-F21-W-3173

Prepared for:

Fish and Wildlife Compensation Program

Prepared by:

**Al Wiensczyk and Dr. Art Fredeen
Natural Resources and Environmental Studies Institute
University of Northern British Columbia**

March 31, 2021

Prepared with financial support of the Fish and Wildlife Compensation Program on behalf of its program partners BC Hydro, the Province of BC, Fisheries and Oceans Canada, First Nations, and public stakeholders.



Executive Summary

This project continues a long relationship between the Natural Resources and Environmental Studies Institute (NRESi) at UNBC and the Peace Region's Fish and Wildlife Compensation Program (FWCP) (previously B.C. Hydro) with the successful delivery of five research colloquium presentations. These presentations provided an education and outreach venue where we could discuss emerging research projects and the current state of knowledge on natural resource issues relating to the FWCP Peace region. The presentations provided an opportunity to develop relationships between UNBC and local stakeholders and to assess current FWCP information needs. The project addressed the FWCP's strategic objective of Community Engagement, to increase community engagement by building and maintaining relationships with stakeholders and aboriginal communities and aligns with Section 4.3 Stewardship & Education in the FWCP Peace Basin Plan.

Due to COVID19 restrictions all presentations were delivered online via Zoom Webinar. Dr. Scott McNay (Wildlife Infometrics Inc.) presented on "Navigating the uncertain and difficult road to restoration and recovery of Klinse-Za caribou", on November 18, 2020. The presentation was well attended with 117 people participating online. The topic presented was on a project funded by the Peace Region's Fish and Wildlife Compensation Program. The second presentation, which was also based on a Peace Region FWCP funded project was delivered on January 20, 2021. John Hagen (Independent consultant) presented on "Status and critical habitats for Bull Trout in the Williston Reservoir watershed". This talk was attended by 81 people. The third presentation occurred on February 10, 2021 and was delivered by Rich Weir (BC Ministry of Environment and Climate Change Strategy). His talk, to 84 attendees, was titled, "A tale of two populations: Why are fishers in the Peace different from 200 km away." His talk focused on the results of his Peace Region FWCP-funded research project. On March 10, 2021, Dan Kraus (Nature Conservancy of Canada) gave the presentation, "Dammed if we don't: Exploring opportunities to restore connectivity in rivers and streams and why it matters" to 82 attendees. It should be noted that '1' of these attendees was actually a grade 11 class from a high-school in Fort St John, BC. The final presentation was held on March 24, 2021. Dr. Eric Taylor (UBC) presented to 39 attendees on "Genomic analysis within *Salvelinus*; understanding speciation and information management." All of the presentations generated many questions and interesting post-presentation discussions. One of the benefits of the online delivery mechanism for these presentations was that attendees were able to join in from wherever they are located, with no need to travel to attend. In addition, we were able to have speakers present from wherever they were. For example, Dan Kraus

presented from his home in Ontario and Dr. Eric Taylor from his office at UBC in Vancouver. However, one of the challenges of this format is the lack of one-on-one attendee/speaker interaction that can sometimes occur following in-person presentations. Future presentation topics should continue to incorporate suggestions for presentation content from First Nations as well as continuing to include previously funded Fish and Wildlife Compensation Program – Peace Region project results. Twenty presentations have been delivered over the past 5 years of this project, 6 in Mackenzie, 5 in Fort St John, 4 in Prince George, and 5 online. Nine presentations were on Fish and Wildlife Compensation Program-funded research/community projects. Presentation topics included Caribou (3), Moose (1), Amphibians (1), Small mammals (2), General Wildlife (2), Birds (3), Fish (6), Mercury (1) and Dams (1). Future presentations should also include topics that educate stakeholders on emerging issues within the FWCP Peace Region landbase, including networking to UNBC faculty with research interests in the topic area, provide examples of fish and wildlife management from other jurisdictions that are directly applicable to the FWCP Peace Region landbase, and incorporate regionally appropriate topics for presentations in each of Prince George, Mackenzie, and Fort St. John. Participation by Fish and Wildlife Compensation Program Peace Region Board, First Nations Working Group and technical committee members should be encouraged.

Table of Contents

Executive Summary.....	2
Introduction	5
Goals and Objectives.....	5
Study Area.....	6
Methods.....	6
Results and Outcomes	7
Discussion.....	9
5-year project analysis	10
Recommendations	13
Acknowledgements.....	13
References	14
Confirmation of FWCP Recognition	15

List of Tables

Table 1. Five-year FWCP/NRESi colloquium presentation summary.....	11
--	----

List of Figures

Figure 1. Poster for the first presentation	15
Figure 2. Poster for the second presentation	16
Figure 3. Poster for the third presentation	17
Figure 4. Poster for the fourth presentation	18
Figure 5. Poster for the fifth presentation	19

Introduction

The Natural Resources and Environmental Studies Institute (NRESi) at UNBC has had a long relationship with the FWCP and previously B.C. Hydro to provide extension of knowledge concerning relevant topics in the FWCP Peace Region. Over the years, this project has hosted 20 lectures, providing the opportunity to share knowledge and creating networking opportunities. This project continues that relationship with the successful delivery of five presentations aimed at providing an education and outreach venue for building connections and developing relationships with those who have an interest in the area, as well as providing an opportunity to share knowledge and expertise that is being developed in or could be applied to the Peace region. Due to COVID19 travel and gathering restrictions, all presentations were delivered online using the Zoom Webinar® platform. Two of the five presentations were the delivery of those previously scheduled for 2019-20 project while the remaining three were new presentation topics. The presentation that was given addresses the need identified in the Peace Basin Plan – Section 4.3 Stewardship and Education, to increase community engagement by building and maintaining relationships with stakeholders and aboriginal communities, recognizing the important of engaging aboriginal communities, local stakeholders, and other interest groups to contribute toward making good decisions and delivering effective projects. The project also addresses the identified need to improve science and knowledge by allowing researchers to share and discuss their latest research findings with others with similar interests and thus foster productive interactions among the FWCP, the public, research consultants, and the academic community.

Goals and Objectives

The goal of this project is to share knowledge and information and to provide a venue for networking and open discussion of fish and wildlife research results and management implications which will help to improve the management of fish and/or wildlife in both the short- and long term. The project aligns with Section 4.3 Stewardship & Education in the FWCP Peace Basin Plan.

The objectives of the project were to;

- 1) Provide an important extension vehicle for the Peace Region's Fish and Wildlife Compensation Program;
- 2) Increase community engagement by fostering productive interactions and dialogue among the FWCP partners, the public, First Nations, industry, the consulting community, and academia;
- 3) Inform local communities and agencies on the best practices from other jurisdictions and communities regarding the strategic priorities of the Peace Region's Fish and Wildlife Compensation Program; and

- 4) Address the FWCP Peace Region's strategic objective of community engagement by supporting stewardship and education projects (Section 4.3 – Peace Basin Plan).

Study Area

As this project consisted of a series of three presentations, there is no study area for this project per se. All presentations were delivered online and so could be attended by anyone throughout the province provided that they had an internet connection. All presentations were also recorded and posted on the UNBC NRESi Video archive for future viewing by those interested.

Methods

Five mid-day (noon-1:30 pm) presentations were delivered successfully online using Zoom Webinar software. Two of the presentations were rescheduled presentations originally planned to be delivered in 2019-20. Three of the five presentation topics were chosen using the list of FWCP Peace Region funded projects and in consultation with the FWCP First Nations Working Group, the Peace Region FWCP manager, and the NRESi Steering Committee. The other two presentations were not based on FWCP Peace Region funded projects. All five presentations were based on themes that supported FWCP strategic research directions, while illustrating new and emerging themes within the scientific community as they apply to the FWCP Peace Region. The speakers were identified to address those themes and were contacted to determine their interest and availability. Once the presentation dates were determined the webinars were scheduled and invites sent to the speakers.

Events were advertised in the Natural Resource and Environmental Studies Institute's bi-weekly newsletter, and through posters (see section 10 for samples) hung at various locations on the UNBC Prince George campus. In addition, email announcements were circulated via NRESi and UNBC distribution lists which included students, faculty and staff, as well as subscribed members of the general public. Email announcements were also sent to the Fish and Wildlife Compensation Program Peace Region Board, technical committees and First Nations Working Group. Presentation announcements with event details were also shared via the Fish and Wildlife Compensation Program and the University of Northern British Columbia webpages and the FWCP LinkedIn page. In addition, the presentations were advertised in the Prince George Citizen online newspaper.

Results and Outcomes

A total of five presentations, two rescheduled from 2019-20, were delivered online via Zoom Webinar in 2020-21. Prior to each presentation, Ms. Chelsea Coady, the Peace Region Manager, made a brief presentation on the Fish and Wildlife Compensation Program.

The first online presentation took place on Wednesday, November 18, 2020. The theme of this presentation was caribou population restoration and recovery and featured Dr. Scott McNay (Wildlife Infometrics Inc.) who spoke about “Navigating the uncertain and difficult road to restoration and recovery of Klinse-Za caribou.” Scott provided information on why caribou habitat restoration is important, and what managers focus on when implementing habitat restoration. He also listed some of the many challenges that managers face, and provided an overview of the FWCP-funded Klinse-za habitat restoration project. A recording of Dr. McNay’s talk can be found at:

https://video.unbc.ca/media/FWCP-NRESi+talk+-+Nov+18th+-+Scott+McNay+-+Navigating+the+uncertain+and+difficult+road+to+restoration+and+recovery+of+Klinse-Za+caribou/0_it2v4bvf/19801 The presentation was well attended with 117 people participating online.

The second presentation, which was also based on a Peace Region FWCP-funded project was delivered on January 20, 2021. John Hagen (Independent consultant) presented on “Status and critical habitats for Bull Trout in the Williston Reservoir watershed” to an audience of 81 people online. In this presentation John described the differences between Bull Trout and the closely-related Dolly Varden, provided information on why Bull Trout is of such conservation concern across its range by identifying some known limiting factors, described a long-term study to address the lack of population data, and provided his opinions on what will be required to conserve Bull Trout in the Williston watershed. A recording of John’s talk can be found at: https://video.unbc.ca/media/FWCP-NRESi+presentation+Jan+20+2021+-+John+Hagen.mp4/0_adkpaujg/19801

The third presentation occurred on February 10, 2021 and was delivered by Rich Weir (BC Ministry of Environment and Climate Change Strategy). This presentation was originally scheduled for April 2020 in Fort St John but was postponed due to the COVID19 pandemic. His talk, to 84 attendees, was titled, “A tale of two populations: Why are fishers in the Peace different from 200 km away.” Rich provided information on fisher and their habitat requirements, and explained what is being done in the Peace and

Williston regions to conserve this species which is a vital part of forested ecosystems. The research project that formed the basis for his talk was funded, in part, by the Peace Region – Fish and Wildlife Compensation Program. A recording of his presentation can be found at:

https://video.unbc.ca/media/A+tale+of+two+populations+-+Why+are+fishers+in+the+Peace+different+from+200+km+awayF+-+Rich+Weir+-+BC+Ministry+of+Environment+and+Climate+Change+Strategy+-+Feb+10+2021/0_6ud257ro/19801

The fourth presentation was also a rescheduled presentation from 2019-20. On March 10, 2021, Dan Kraus (Nature Conservancy of Canada) gave the presentation, “Dammed if we don’t: Exploring opportunities to restore connectivity in rivers and streams and why it matters.” In his presentation, Dan described the importance of habitat connectivity for aquatic organisms such as migratory fishes. He presented examples of how barriers, such as culverts and dams, can compromise stock and species diversity, result in losses of annual recruitment, reduce production and harvests. Using examples from the Great Lakes Basin in Ontario and the United States and case studies from the Nature Conservancy of Canada, Dan described some of the approaches to mapping and prioritizing barrier removal, as well as the challenges and opportunities of reconnecting aquatic habitats. The recording of his presentation can be found at: https://video.unbc.ca/media/Dammed+if+we+don%E2%80%99t+-+Exploring+opportunities+to+restore+connectivity+in+rivers+and+streams+and+why+it+matters+-+Dan+Kraus%2C+Nature+Conservancy+of+Canada+-+March+10+2021/0_lq042xb9/19801

A total of 82 attendees joined in online to hear Dan’s presentation. It should be noted that ‘1’ of these attendees was actually a grade 11 class from a high-school in Fort St John, BC.

The final presentation was held on March 24, 2021. Dr. Eric Taylor (UBC) presented to 39 attendees on “Genomic analysis within *Salvelinus*; understanding speciation and information management.” Dr. Taylor provided information on the genus *Salvelinus* which consists of a complex of four species of char in Western North America. This genus of fish are important components of subsistence and recreational fisheries and are the focus of many conservation programs. Eric described his research on the use of genomic analysis to determine the level of hybridization between Arctic char and Dolly Varden in the contact zone between the two species. He also discussed the use of genomic analysis to inform fish passage decisions and monitoring programs for bull trout at the Site C Hydroelectric development. A recording of Dr. Taylor’s presentation can be found at:

<https://video.unbc.ca/media/Genomic+analysis+within+Salvelinus+->

[+understanding+speciation+and+informing+management+-+Dr.+Eric+Taylor+-+UBC+-+March+24%2C+2021+/0_xiz91tqp/19801](#)

All of the presentations in this series generated many questions and interesting post-presentation discussions.

Discussion

This project achieved the project's objectives of providing an important extension vehicle for the Peace Region's Fish and Wildlife Compensation Program, increasing community engagement by fostering productive interactions and dialogue among the FWCP, the public, First Nations, industry, the consulting community, and academia, and informing local communities and agencies on the best practices from other jurisdictions and communities regarding the strategic priorities of the Peace Region's Fish and Wildlife Compensation Program.

All five of the presentations were very well attended by a broad cross-section of the public representing various interest-areas (e.g., industry, academia, First Nations, government, general public) and generated many questions and interesting post-presentation discussions, thereby contributing to the Fish and Wildlife Compensation Program's strategic objective to build and maintain relationships with stakeholders and aboriginal communities.

The topics presented in this year's colloquium also addressed some of the objectives described in the Peace Basin Action Plans. The presentation by Dr Scott McNay on caribou research contributed to the achievement of Sub-Objective 2 in the Peace Basin, Upland Action Plan to maximize the population viability of caribou (Fish and Wildlife Compensation Program 2020a). Similarly, within the same action plan, the presentation by Rich Wier on fisher research contributed to the achievement of Sub-Objective 5 to maximize the viability of priority upland species (Fish and Wildlife Compensation Program 2020a). The other three presentations, John Hagen on Bull Trout, Dr. Eric Taylor on char species and Dan Kraus on aquatic habitat connectivity contributed to the achievement of Sub-Objective 4, maximize the population viability of bull trout, and Sub-Objective 5, maximize the population viability of priority aquatic species, of the Peace Region Rivers, Lakes, & Reservoirs Action Plan (Fish and Wildlife Compensation Program 2020b).

The major challenge that occurred this year was the switch to an online presentation format to accommodate the government's directives on refraining from gathering in groups and limiting travel.

The advantage of the online presentation format is that speakers and attendees can participate from anywhere, as long as they have an internet connection. Attendance at all of the presentations was much larger than had occurred in the past. However, this could also be related to the decision to hold the presentation during the day instead of in the evening. This was done to accommodate the presenter from Ontario so that they would not be presenting at 10-11 pm Eastern Time and in an effort to maintain consistency between presentations, all 5 presentations were held at noon on a Wednesday. It is unknown if this change in presentation start time negatively impacted the ability for some people to attend. A remediating factor however, was that all of the presentations were recorded and posted to the UNBC-NRESi video archive for future viewing by anyone who is interested and missed the live presentation. Another challenge with the online presentation delivery model was that we were not able to determine the sectors represented by the attendees as there was no sign-in sheet. However, because attendees had to send an email to obtain the presentation passcode there is a record of who requested the code. In the future, it may be possible to have attendees self-register online for the talk and have a data field for affiliation/organization. A third challenge with the online delivery format is that there was no opportunity for one-on-one interaction between attendees and the presenters. Based on past experience this opportunity is often where the relationship building occurs. And finally, all presentations were 'based' in Prince George and so there was minimal contact with the members of the smaller communities (Mackenzie and Fort St John) where we normally host the in-person presentations. It is hoped that in future years we will go back to the model of delivering the presentations in these two locations combined with an on-line viewing option.

5-year project analysis

One of the approval conditions for this year's project was to conduct an analysis of the previous 5 years of FWCP funded colloquium presentations delivered under this project. The following table provides a summary of the requested information. Over the past five years, 20 presentations have been delivered to audiences of varying sizes. Six presentations were delivered in Mackenzie, 5 in Fort St John, 4 in Prince George and 5 online only (due to the Covid19 pandemic). Nine presentations were on Fish and Wildlife Compensation Program-funded research/community projects. Presentation topics included Caribou (3), Moose (1), Amphibians (1), Small mammals (2), General Wildlife (2), Birds (3), Fish (6), Mercury (1) and Dams (1). The demographics of the attendees varied by location. For the Mackenzie and Fort St John presentations, attendees from the forest industry, government, the consulting community and the general public dominated while for the Prince George presentations the dominate

Table 1. Five-year FWCP/NRESi colloquium presentation summary.

Date/Location	Speaker	Title/Subject	# participants	FWCP-funded project
2020-21				
November 18, 2020 Online	Dr. Scott McNay	Navigating the uncertain and difficult road to restoration and recovery of Klinse-Za caribou.	117	Yes
January 20, 2021 Online	John Hagen	Status and critical habitats for Bull Trout in the Williston Reservoir watershed.	81	Yes
February 10, 2021 Online	Rich Wier	A tale of two populations: Why are fishers in the Peace different from 200 km away.	84	Yes
March 10, 2021 Online	Dan Kraus	Dammed if we don't: Exploring opportunities to restore connectivity in rivers and streams and why it matters.	82	No
March 24, 2021 Online	Dr. Eric Taylor	Genomic analysis within <i>Salvelinus</i> ; understanding speciation and information management.	39	No
2019-20				
December 3, 2019 Mackenzie	Brian Patterson	A summary of bat research in Northeastern British Columbia.	40	Yes
2018-19				
November 27, 2018 Mackenzie	Dr. Mark Shrimpton	One fish, two fish, red fish, lots of fish: Where did they come from and what are they doing?	24	Yes
February 21, 2019 Fort St John	Dr. Roy Rea	You cannot love softwoods and hate hardwoods... Considerations for moose in forest management.	60	No
April 11, 2019	Dr. Steve McAdam	White Sturgeon in BC: Moving from recruitment failure to restoration.	76	No
2017-18				
November 21, 2017 Mackenzie	Mark Thompson	Amphibian Landscapes in Northern BC: Research Techniques and Conservation Management.	20	Yes
April 12, 2018 Fort St John	Mark Phinney	Efforts by industry to reduce impact on migratory birds in northeastern BC.	47	No

January 11, 2018 Prince George	Dr. Charles Krebs	Is Wildlife Management Still Possible?	120	No
2016-17				
November 30, 2016 Mackenzie	Dr. Kari Stuart-Smith Ryan Bichon	Forest Management and the <i>Migratory Bird Convention Act</i> in Interior BC. 20 years of bird banding at Mugaha Marsh.	30	No Yes
March 8, 2017 Fort St John	Dr. Scott McNay George Desjarlais	Caribou of the Williston Basin: What do we know of their status after 50 years of reservoir flooding and 30 years of study? Missing Wildlife: A First Nations' perspective.	25	Yes No
March 22, 2017 Prince George	Dr. Steven Cooke	Exposing the secret lives of fish.	40	No
2015-16				
February 25, 2016 Mackenzie	Dexter Hodder	Using meso-carnivores as a measure of change in forest ecosystems: A case study from the John Prince Research Forest.	22	No
March 4, 2016 Fort St John	Dr. Mark Shrimpton	A Tale of three fish: A migrant, an invader, and a resident.	30	Yes
March 21, 2016 Prince George	Dr. Karen Kidd	Local through global influences on mercury in fish.	60	No

audience group represented was from academia. For the online presentations we are not able to determine the make-up of the audience.

Recommendations

It is recommended that this project be continued in the future. Future presentation topics should continue to incorporate suggestions for presentation content from First Nations as well as continuing to include previously funded Peace Region Fish and Wildlife Compensation Program project results. Presentations should also include topics that educate stakeholders on emerging issues within the FWCP Peace Region landbase, including networking to UNBC faculty with research interests in the topic area, provide examples of fish and wildlife management from other jurisdictions that are directly applicable to the FWCP Peace Region landbase, and incorporate regionally appropriate topics for presentations in each of Prince George, Mackenzie, and Fort St. John. Participation by Fish and Wildlife Compensation Program Board, First Nations Working Group and technical committee members should be encouraged. Future delivery model should include a combined in-person presentation in the communities of Mackenzie and Fort St John with an online viewing option for those unable to attend in person. Tracking of attendee organization/industry should be done so as to better understand measurable outcomes from this project.

Acknowledgements

Thanks to the Peace Region's Fish and Wildlife Compensation Program for the financial support for this project.

References

Fish and Wildlife Compensation Program. 2020a. Peace Basin. Upland Action Plan. BC Hydro. 33 pp. <https://fwcp.ca/app/uploads/2020/08/Action-Plan-Peace-Region-Uplands-Aug-11-2020.pdf>

Fish and Wildlife Compensation Program. 2020b. Peace Region. Rivers, Lakes, & Reservoirs Action Plan. BC Hydro. 44 pp. <https://fwcp.ca/app/uploads/2020/08/Action-Plan-Peace-Region-Rivers-Lakes-Reservoirs-Aug-11-2020.pdf>

Confirmation of FWCP Recognition






<p>Presented By: UNBC's Natural Resources & Environmental Studies Institute</p> 	<h2>PUBLIC PRESENTATION</h2> 
	<h3>Navigating the uncertain and difficult road to restoration and recovery of Klinse-Za caribou</h3> <p>Guest Presenter: Dr. Scott McNay Senior Wildlife and Forest Ecologist Wildlife Infometrics Inc.</p> <p>Presentation Summary:</p> <p>While there are no examples of caribou populations that have been fully recovered from near extirpation, that is the objective shared by Canada, British Columbia, and two First Nations communities for the Klinse-Za caribou herd. Having used direct population management to successfully avert extirpation of the herd in the short-term, restoration of human-altered caribou habitat is now the fundamental management action being used to achieve a self-sustaining population. But the way to achieve the necessary restoration is fraught with uncertainty and socio- and economic-challenges. I will discuss why restoration is so fundamental to recovery, what habitat restoration actually is, what some of the implementation challenges have been, what we have accomplished so far, and what is left to achieve.</p> <p>Scott is the Senior Wildlife and Forest Ecologist at Wildlife Infometrics Inc. in Mackenzie, BC where he implements and manages wildlife research and inventory projects for the firm. Scott is a registered professional biologist in both AB and BC, a registered professional forester in BC, and holds a PhD in forest wildlife ecology. Throughout his 30+ year career, Scott has championed the use of habitat supply modeling and adaptive management as tools to resolve difficult problems in the integrated management of wildlife resources. During the past 20 years, Scott's interest has focused on the challenge of recovering threatened populations of woodland caribou leading to work with many herds across northern BC and one in AB.</p>
<p>Wednesday Nov 18, 2020</p> <p>12:00 noon</p> <p>Online</p> <p>www.unbc.ca/nres-institute/colloquium-webcasts</p>	<p>All are welcome to participate. No registration required.</p> <p>The Natural Resources & Environmental Studies Institute at UNBC, together with its partners, invite those with interest in learning more about caribou population and habitat management, to participate in this online presentation and discussion.</p>
	<p>This event is funded by the Fish & Wildlife Compensation Program (FWCP). The FWCP is a partnership between BC Hydro, Fisheries & Oceans Canada, First Nations, Public Stakeholders and the Province of BC, to conserve and enhance fish and wildlife in watersheds impacted by existing BC Hydro dams.</p> 

Figure 1. Poster for the first presentation






<p>Presented By: UNBC's Natural Resources & Environmental Studies Institute</p> 	<h1 style="text-align: center;">PUBLIC PRESENTATION</h1> 
	<h2 style="text-align: center;">Status and critical habitats for Bull Trout in the Williston Reservoir watershed</h2> <p style="text-align: center;">Guest Presenter: John Hagen Independent Consultant</p>
<p style="text-align: center;">Wednesday Jan 20, 2021</p> <p style="text-align: center;">12:00 noon</p> <p style="text-align: center;">Online</p> <p style="text-align: center;">www.unbc.ca/nres-institute/colloquium-webcasts</p>	<p style="text-align: center;">Presentation Summary:</p> <p>The Bull Trout is a priority species for the Fish and Wildlife Compensation Program – Peace Region, whose aim is to compensate for impacts of the construction of W.A.C. Bennett Dam on fish and wildlife populations. The focus of my presentation is the state of Bull Trout knowledge in the Williston Reservoir watershed. I begin by addressing the question: what is a Bull Trout? This is an important question to many in Northern BC outside of the fish biology community, given that the Bull Trout and closely-related Dolly Varden were not discriminated taxonomically until recently. I then address the question of why the Bull Trout is of such conservation concern across its range by identifying some known limiting factors. Prior to 2012, an acute lack of population data limited FWCP's ability to initiate conservation actions for Bull Trout in the Williston Reservoir watershed. In this presentation, I describe a long-term study undertaken by FWCP since then to address this lack of population data, make use of the study results to draw conclusions about Bull Trout conservation status (health), and offer some personal opinions about what will be required to conserve Bull Trout in the watershed.</p> <p>John Hagen is an independent fisheries consultant living in Prince George, BC. He specializes in the biology and management of native salmonid species which are of conservation concern. Since finishing graduate studies at the University of British Columbia in 2000, he has worked extensively with FWCP, the Government of BC, and BC First Nations on studies of Bull Trout, Arctic Grayling, interior Fraser River steelhead trout, and Cutthroat Trout populations. A species of particular interest is the Bull Trout, with which John has nearly 30 years of experience.</p>
	<p style="text-align: center;"><i>All are welcome to participate. No registration required.</i></p> <p>The Natural Resources & Environmental Studies Institute at UNBC, together with its partners, invite those with interest in learning more about caribou population and habitat management, to participate in this online presentation and discussion.</p>
	<p>This event is funded by the Fish & Wildlife Compensation Program (FWCP). The FWCP is a partnership between BC Hydro, Fisheries & Oceans Canada, First Nations, Public Stakeholders and the Province of BC, to conserve and enhance fish and wildlife in watersheds impacted by existing BC Hydro dams.</p> 

Figure 2. Poster for the second presentation






<p>Presented By: UNBC's Natural Resources & Environmental Studies Institute</p> 	<h1 style="text-align: center;">PUBLIC PRESENTATION</h1> 
 <p style="text-align: center;">Wednesday Feb 10, 2020</p> <p style="text-align: center;">12:00 pm</p> <p style="text-align: center;">Online</p> <p style="text-align: center;">www.unbc.ca/nres-institute/colloquium-webcasts</p>	<h2 style="text-align: center;">A tale of two populations: Why are fishers in the Peace different from 200 km away?</h2> <p style="text-align: center;">Guest Presenter: Rich Weir Carnivore Conservation Specialist BC Ministry of Environment and Climate Change Strategy</p> <p style="text-align: center;">Presentation Summary:</p> <p>Known to have among the fastest burst speed of any land mammal in North America and an unequaled ability to prey on porcupines, fishers are a housecat-sized carnivore that live around us in the forests of central and northern BC. Fishers are one of the rarest mammals in the Peace and Williston regions, but they play a key role in low-elevation forests throughout these areas. Come hear Rich Weir talk about this fascinating species and learn about what is being done in the Peace and Williston regions to conserve this vital part of our forested ecosystems.</p> <p>Rich Weir is the Carnivore Conservation Specialist for the Ministry of Environment and Climate Change Strategy in Victoria. Fascinated with 'all the little killers' since an undergraduate student, Rich is has done field studies on fishers across BC over the past 30 years and is a leading expert on the species.</p>
	<p style="text-align: center;"><i>All are welcome to attend. No registration required.</i></p> <p style="text-align: center;">The Natural Resources & Environmental Studies Institute at UNBC, together with its partners, invite those with interest in learning more about fisher, the role they play in our forested ecosystems and what is being done to conserve this species. to attend this presentation and discussion.</p>
	<p>This event is funded by the Fish & Wildlife Compensation Program (FWCP). The FWCP is a partnership between BC Hydro, Fisheries & Oceans Canada, First Nations, Public Stakeholders and the Province of BC, to conserve and enhance fish and wildlife in watersheds impacted by existing BC Hydro dams.</p> 

Figure 3. Poster for third presentation




<p>Presented By: UNBC's Natural Resources & Environmental Studies Institute</p> 	<h1 style="text-align: center;">PUBLIC PRESENTATION</h1> 
<p style="text-align: center;">Wednesday March 10, 2021</p> <p style="text-align: center;">12:00 pm</p> <p style="text-align: center;">Online</p> <p style="text-align: center;">www.unbc.ca/nres-institute/colloquium-webcasts</p> 	<h2 style="text-align: center;">Dammed if we don't: Exploring opportunities to restore connectivity in rivers and streams and why it matters</h2> <p style="text-align: center;">Guest Presenter: Mr. Dan Kraus Senior Conservation Biologist Nature Conservancy of Canada</p>
	<p style="text-align: center;">Presentation Summary:</p> <p>Ecological connectivity and wildlife corridors are often considered for terrestrial wildlife, but in many places in Canada it is our aquatic ecosystems that are most impacted by habitat fragmentation. Migratory fishes that depend on access to spawning and nursery habitats are often impeded by dams and other obstructions, including road-stream crossings. These barriers can compromise stock and species diversity, result in losses of annual recruitment and reduced production and harvests. Fragmentation of aquatic habitat connectivity can also impact nutrient flows, riparian processes and spread invasive species. Fortunately there are many actions that can help us to better understand and improve aquatic habitat connectivity. Using examples from the Great Lakes basin and case studies from the Nature Conservancy of Canada, Dan will explore some of the approaches to mapping and prioritizing barrier removal and the challenges and opportunities of reconnecting aquatic habitats.</p>
	<p>Dan is the Senior Conservation Biologist with the Nature Conservancy of Canada's national office. He is an expert on Canadian biodiversity and conservation and has recently written reports on a variety of topics including freshwater Key Biodiversity Areas in Canada and species at risk legislation. Dan also co-authored biodiversity conservation strategies for all four Canadian Great Lakes, co-led the first conservation assessment of Great Lakes islands, and prepared the State of the Great Lakes indicator on aquatic habitat connectivity. His current projects include developing Canada's first list of nationally endemic species, a review of biodiversity in Canadian cities, and an assessment of biodiversity, threats and conservation responses across southern Canada. Dan often shares his passion about nature and the importance of conservation, and his editorials have appeared in media across Canada. He is a councillor on the Canadian Society for Ecology and Evolution, a member of the IUCN Species Survival Commission, Deputy Chair of the Committee on the Status of Species at Risk in Ontario and was a founding board member of the Ontario Invasive Plant Council. In his spare time, he is currently researching the socio-ecological drivers of wildlife extinction and recovery at the University of Waterloo. Prior to NCC, Dan worked with Parks Canada and as an environmental consultant. Dan lives at the headwaters of Bronte Creek in the Lake Ontario watershed where he enjoys chopping wood and raising happy chickens.</p>
<p style="text-align: center;">All are welcome to participate. No registration required.</p> <p style="text-align: center;">The Natural Resources & Environmental Studies Institute at the University of Northern British Columbia, together with its partners, invite those with interest in learning more about aquatic habitat connectivity to participate in this online presentation and discussion.</p>	
<p>This event is funded by the Fish & Wildlife Compensation Program (FWCP). The FWCP is a partnership between BC Hydro, Fisheries & Oceans Canada, First Nations, Public Stakeholders and the Province of BC, to conserve and enhance fish and wildlife in watersheds impacted by existing BC Hydro dams.</p> 	

Figure 4. Poster for the fourth presentation






<p>Presented By: UNBC's Natural Resources & Environmental Studies Institute</p> 	<h1 style="text-align: center;">PUBLIC PRESENTATION</h1> 
 <p style="text-align: center;">Wednesday Mar 24, 2021</p> <p style="text-align: center;">12:00 noon</p> <p style="text-align: center;">Online</p> <p style="text-align: center;">www.unbc.ca/nres-institute/colloquium-webcasts</p>	<h2 style="text-align: center;">Genomic analysis within <i>Salvelinus</i>: understanding speciation and informing management</h2> <p style="text-align: center;">Guest Presenter: Dr. Eric Taylor Professor of Zoology, UBC</p> <p style="text-align: center;">Presentation Summary:</p> <p>In western North America, char (fishes of the genus <i>Salvelinus</i>) consist of a complex of four species whose study has provided many insights into systematics, biogeography, ecology, and evolution. These fishes are also important components of subsistence and recreational fisheries and the focus of many conservation programs. It is now well-established that sympatric Dolly Varden and Arctic char, as well as sympatric bull trout and Dolly Varden, maintain strong reproductive isolation despite some interbreeding. Our lab is using genomic data to test hypotheses about the drivers of speciation in these species with a focus on Arctic char and Dolly Varden, and also to better understand the contact zone between two subspecies of Dolly Varden. Genomic analyses are also serving to inform fish passage decisions and monitoring programs for bull trout at the Site C Hydroelectric development.</p> <p>Eric Taylor is a professor of Zoology and Director of the Fish Collection at the Beaty Biodiversity Museum where he also served as museum Director from 2013-2020. He studies the patterns, and processes promoting the origins and persistence of biodiversity and the application of such knowledge to conservation, especially in fishes. He graduated with a PhD in Zoology from UBC in 1989, spent two years as a postdoctoral fellow at Dalhousie University, then 1.5 years as a visiting research fellow at the Pacific Biological Station before returning to UBC in 1993. Between 2000 and 2018, he was involved with, or a member of, COSEWIC (the Committee on the Status of Endangered Wildlife in Canada) and its Chair between 2014 and 2018. In 2016, he was elected as a Fellow of The Royal Canadian Geographical Society. Autumn 2021 will see the release of his book <i>Rivers Run Through Us: A Natural and Human History of Great Rivers of North America</i> (Rocky Mountain Books).</p> <p style="text-align: center;">All are welcome to participate. No registration required.</p> <p style="text-align: center;">The Natural Resources & Environmental Studies Institute at UNBC, together with its partners, invite those with interest in learning more about char and genomic analysis, to participate in this online presentation and discussion.</p>
	<p>This event is funded by the Fish & Wildlife Compensation Program (FWCP). The FWCP is a partnership between BC Hydro, Fisheries & Oceans Canada, First Nations, Public Stakeholders and the Province of BC, to conserve and enhance fish and wildlife in watersheds impacted by existing BC Hydro dams.</p> 

Figure 5. Poster for the fifth presentation