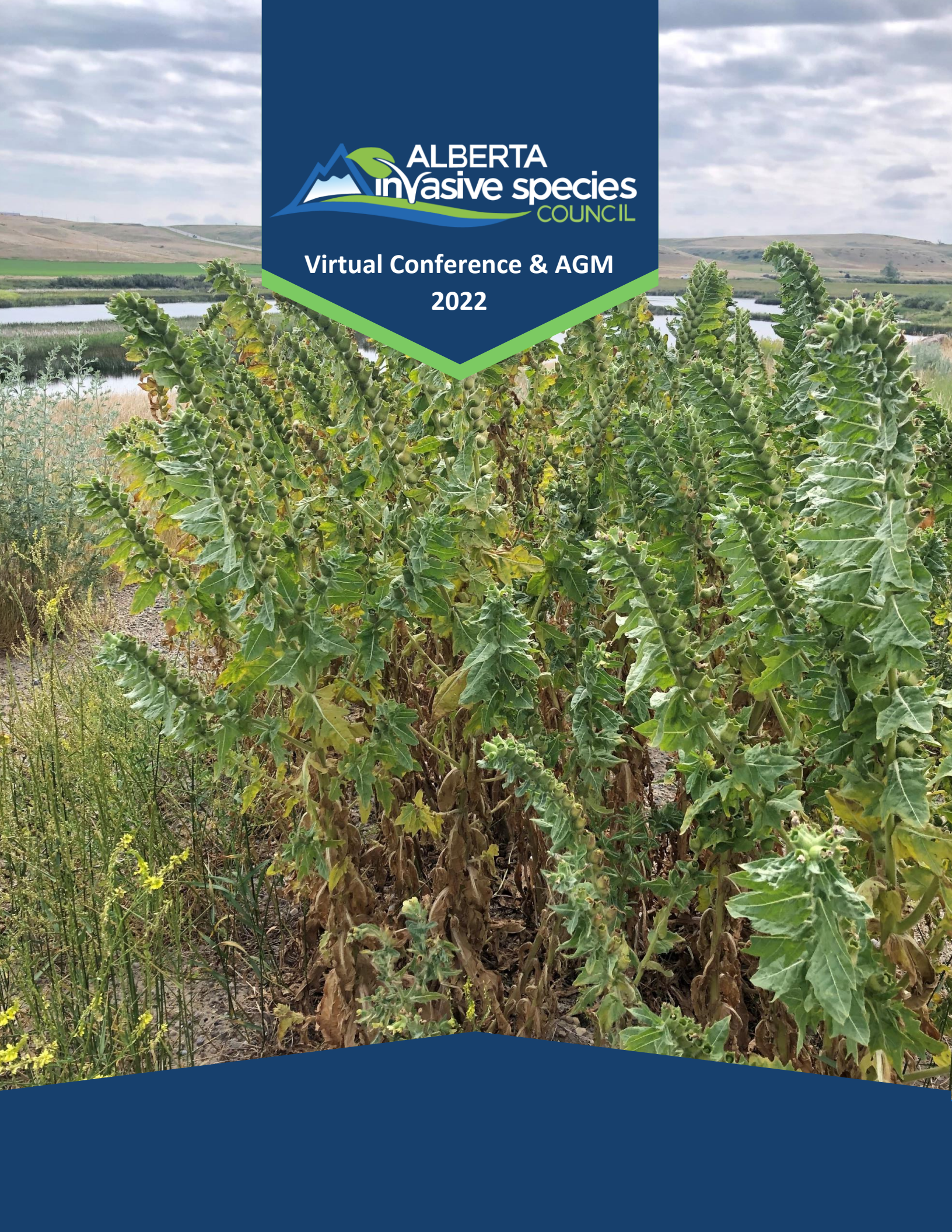




**Virtual Conference & AGM
2022**





Thanks for attending the Alberta Invasive Species Council's 9th Annual General Meeting and Conference!

We hope you enjoy a variety of talks this year with topics including aquatic and terrestrial invasive species, biocontrol, invasive species economics and so much more! These sessions are scheduled to run each morning from March 14-18th, 2022 throughout the week for 3 to 4 hours. On March 16, we will be hosting an EDDMapS Pro training portion in the afternoon. Certified pesticide applicator credits will be offered.

Thank you for joining us virtually this year and we can't wait to see you in person in the future!



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Alberta Certified Weed Free Forage



Contaminated hay is one-way invasive plants are spread across the province, between provinces and around the world. To address this, the [North American Invasive Species Management Association](#), has set industry guidelines and minimum standards for certified weed free products recognized across North America.

The AISC is thrilled to have received funding from the Canadian Agriculture Partnership to help promote and revitalize this important program. It is our intention to work with producers, municipalities, and the province to facilitate, promote and revitalize the Alberta Certified Weed Free Forage program resulting in more weed free forage on the market in Alberta.

If you are a producer interested in having your forage certified weed free, contact the [AISC](#) or your [local Weed Inspector](#). Inspectors have the authority to certify portions of fields or even fields with weeds present, provided that no invasive plant propagules will enter the baled forage. Inspections must be conducted within ten days of cutting, if the crop is not cut within ten days of cutting, a new inspection must be conducted to certify the forage as weed free.

If you are interested in purchasing Certified Weed Free Forage, see the [AISC webpage](#) for a list of producers or contact the AISC by phone (587 999 0954) or email (info@abinvasives.ca).

Applicator Credit Instructions

Please review the following to receive Certified Pesticide Applicator Credits:

1. See the [agenda](#) for sessions that are approved for pesticide applicator credits.
2. In order to receive a pesticide applicator credit, you must do the following:
 - a. Be present for the **entirety** of the session. See below for credit classes and concepts.
 - b. Answer **all** polling questions.
 - c. Complete this [Google Form](#) (**once only**).
 - d. Log onto Zoom with the **same first and last name** that you entered in the Google Form.

Session Name	Presenter & Title	Concept Covered	Classes	Sub-concepts	Date
Aquatic Invasive Species	Tracking spatio-temporal dynamics of whirling disease in Alberta using paleo-eDNA Alyssa Turnbull, MSc Candidate, University of Alberta Estimated versus Actual Costs of Zebra Mussel Mitigation: A Tri-State Case Study (Montana, South Dakota, & Kansas) Dr. Nanette Nelson	Pest Management	Aquatic	Aquatic invasive species characteristics, management and IPM	March 14
Don't Let It Loose	Emergency Response for Prevention: Moss Ball Nicole Kimmel, Alberta Environment and Parks Pet Store Certification Program Paige Kuczarski, AISC	Pest Management	Aquatic	Aquatic invasive species characteristics, management and IPM	March 14
Invasive Plant Prevention and Management	Looks Can be Deceiving Chris Neeser, Alberta Agriculture and Forestry Reducing the Impact of Industrial Development in Native Grassland; an Overview of Current Mitigation and Ongoing Challenges Marilyn Neville, Gramineae Services Ltd	Pest Management	Aerial, Agriculture, Industrial, Forestry, Landscape, Aquatic	Weed characteristics, management and IPM	March 15
Wild Boar at Large	Wild Boar at large in Alberta: Why should you Squeal on Pigs? Charlotte Shipp, Alberta Pork Wild Boar Response in Woodlands County Dawn Fortin, Woodlands County Demo of the Wild Boar at Large Eradication Program's Remote Monitored Corral Traps Alberta Agriculture and Forestry & AISC	Pest Management	Exterior Rodent Control	Vertebrate pest management, characteristics and IPM	March 16
EDDMapS Pro Training Session –	EDDMapS 2022 – Where we are and where we are going	Pest Management	Aerial, Agriculture,	Weed characteristics, management and IPM	March 16

<p>How to use the app to track and manage invasive plants</p>	<p>Chuck Barger, University of Georgia EDDMapS Pro Use Jerry Caldwell, US County Weed Programs EDDMapS Pro in the Municipality of Crowsnest Pass Lindsey Davidson, Agricultural Fieldman, Municipality of Crowsnest Pass ISMTrack (Invasive Species Management Tracking) within EDDMapS Monika Chandler, Minnesota Department of Agriculture</p>		<p>Industrial, Forestry, Landscape, Aquatic</p>		
<p>Costs of Managing Invasive Species</p>	<p>Examining the Impacts of Invasive Species on Canadian Municipalities; 2021 Survey Lauren Bell, Invasive Species Centre Helping to Build the Business Case for Investment: A Cost-Benefit Analysis of Invasive Phragmites Colin Cassin, Invasive Species Centre</p>	<p>Pest Management</p>	<p>Aquatic</p>	<p>Weed characteristics, management and IPM</p>	<p>March 17</p>
<p>IPM and Prevention</p>	<p>Invasive Vegetation Management in Fish Creek Provincial Park Emma Stroud, Friends of Fish Creek Provincial Park Society Biological Invasion Costs Reveal Insufficient Proactive Management Worldwide Dr. Ross Cuthbert, Queen’s University Belfast</p>	<p>Pest Management</p>	<p>Aerial, Agriculture, Industrial, Forestry, Landscape, Aquatic</p>	<p>Weed characteristics, management and IPM</p>	<p>March 17</p>
<p>Update on Biocontrol</p>	<p>Update on AISC’s Biocontrol Program Paige Kuczarski and Megan Evans, AISC The Latest on the Newest Weed Biocontrol Agents at AAFC, Lethbridge. An Overview of the Research on Biocontrol Agents for Common Tansy and Oxeye Daisy Dr. Rosemarie De Clerck-Floate, Agriculture and Agri-Food Canada</p>	<p>Pest Management</p>	<p>Aerial, Agriculture, Industrial, Forestry, Landscape, Aquatic</p>	<p>Weed characteristics, management and IPM</p>	<p>March 18</p>

Conference Details

March 14, 2022
Session Sponsor:



Renu-L-Tech Environmental has been in business for 25 years. They provide vegetation control on oilfield, industrial, road ways, canals, and pastures. They are located in Strathmore, Alberta. Renu-L-Tech Environmental services clients in Alberta, and Saskatchewan. Our team of licenced applicators can design a vegetation management plan that is right for you.

Conference Welcome and Announcements – 8:30AM to 8:40AM

Annual General Meeting (AGM) – 8:40AM to 9:40AM

- 2021 AGM Minutes
- Chair Report
- Financial Report
- Appointment of Auditor
- Operations Report
- Elections of Directors
- Big EDD Award

--- 5 MINUTE BREAK ---

Tracking spatio-temporal dynamics of whirling disease in Alberta using paleo-eDNA – 9:45AM to 10:30AM

Alyssa Turnbull, M.Sc. Candidate, University of Alberta

Alyssa Turnbull is an Environmental Health Master's student under the supervision of Dr. Patrick Hanington. Alyssa's research focuses on the invertebrate host of *Myxobolus cerebralis*, the parasite that causes whirling disease. This host, the tiny pink worm *Tubifex tubifex*, is critical for the transmission and range expansion of whirling disease in the province of Alberta and throughout Canada. Alyssa's research aims to understand why some *T. tubifex* can serve as good hosts to *M. cerebralis*, while others are not, and to determine whether *T. tubifex* compatibility can be used to predict future invasions of this parasite.

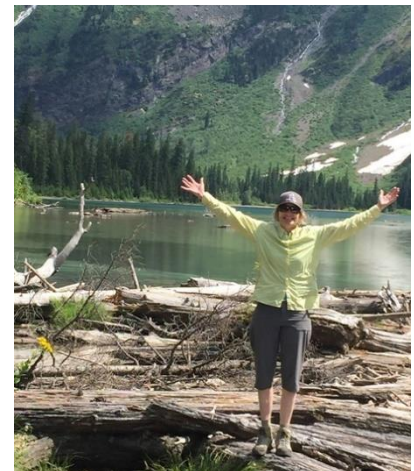


Alyssa's background is a BSc in Biology including special lab work around Ecology and Parasitology which sparked her passion for further research in these fields.

Estimated versus actual costs of zebra mussel mitigation: a tri-state case study (Montana, South Dakota and Kansas) – 10:30AM to 11:15AM

Dr. Nanette Nelson, Flathead Lake Biological Station

Since their introduction in 1988, dreissenid mussels have spread widely across North America with 32 states reporting positive detections. Despite a coordinated effort among federal and state agencies, tribes and local watershed groups, dreissenid mussels continue to spread westward with one of the most recent detections of mussel larvae occurring in a Montana reservoir in November 2016. The specter of dreissenid mussels establishment in Montana's waterbodies was the motivation behind the state funding a study to enumerate the potential economic damages of these invasive mussels.



A product of the 2019 Montana study was an economic model that was designed to allow other states to estimate potential mussel-induced mitigation costs using readily available water withdrawal data. The goal of this current research is to ground truth assumptions made in the development of an economic model that estimates the potential costs to surface water users should dreissenid mussels successfully invade a state's lakes and rivers. Synthesizing current mitigation cost data to confront the economic model with actual mitigation costs from two Midwestern states – Kansas and South Dakota – can improve the accuracy of economic damage estimates by incorporating information on the extent of damages from established populations of zebra mussels.

Nanette Nelson is an environmental economist working at the Flathead Lake Biological Station. Her primary research interest is non-market valuation – eliciting individuals' willingness to make trade-offs

for goods and services not traditionally sold in markets. She has used the contingent valuation method, choice experiments, hedonic real estate, and recreational trip models to estimate values of clean water, reduced nutrient pollution in surface water, and preventing aquatic invasive species introduction. In the AIS sphere, Nanette has estimated the economic damages associated with dreissenid mussels in Montana and neighboring states. Of late, she has engaged in the ongoing dialogue of best practices for benefit-cost analysis as it applies to rule-making aimed at reducing green house gas emissions that contribute to climate change. Specifically, she is interested in the topics of distributional consequences and social equity.

--- 5 MINUTE BREAK ---

Emergency response for prevention: moss (marimo) balls – 11:20AM to 12:05PM

Nicole Kimmel, Alberta Environment and Parks

Imported moss balls into Alberta were carrying invasive zebra mussels in March of 2021. Government staff worked quickly to remove this threat from retail shelves and provide guidance on proper disposal to reduce the potential for release to Alberta waters. Import restrictions have lifted in July and all importers are now responsible to ensure the moss balls are mussel free. A collaborative national response plan is under development for “organisms in trade” to capture the lessons learned and establish improved communications for similar response events. Hear full details of efforts and future improvements.



Nicole Kimmel received a B.Sc. of Environmental Conservation Sciences from the University of Alberta in 2000 with a Specialization in Wildlife and Rangeland Sciences. She began working with invasive plants upon graduation, as a research assistant. After 10 years in research, her role evolved to Weed Specialist, for an additional 7 years of employment. In 2018, she moved to Environment & Parks as the Aquatic Invasive Species (AIS) Specialist. There she supports the five elements of the AIS program (Policy & Legislation, Education & Outreach, Monitoring, Watercraft Inspections/Decontamination and Response). Nicole has over 21 years of service with the Government of Alberta.

AISC's pet store recognition pilot program – 12:05PM to 12:30PM

Paige Kuczmariski, Alberta Invasive Species Council

The threat of invasive species continues to grow as new species are introduced every year. There are two main methods of introduction: accidental transportation and intentional release by people releasing aquarium pets, plants and water. The 'Don't Let it Loose' campaign is a nationwide program used to create awareness of the issue of releasing pets into the wild. The AISC believes that the pet trade industry is a primary target for providing this messaging to staff who work with aquarium species as well as to those that purchase them. This presentation will cover the pilot objectives, deliverables and partnerships.



Paige Kuczarski graduated in 2017 with a BSc in Biological Sciences from MacEwan University where she was first introduced to invasive species through efforts with various research projects on garlic mustard and forest tent caterpillars. Soon after, Paige started a position with Alberta Agriculture where she focused on a flowering rush control project and creating the coveted 'Aquatic Invasive Species Pocket Guide'. Since then, contracts as a Whirling Disease Technician and an Aquatic Invasive Species Technician have brought her all over the province for fieldwork as well as allowed her knack for creating punny education and outreach methods to grow. After four years working with the provincial government, she joins the AISC as a social media and Invasive Species Technician in 2021.

March 15, 2022
Session Sponsor:



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education and customer engagement. They strive to please our clients in a working partnership to eliminate and reduce vegetation growth in undesired areas.

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Welcome and Announcements – 8:30AM to 8:40AM

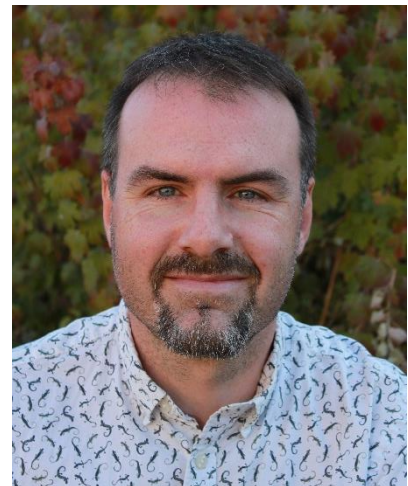
PANEL: Regional invasive species programs, legislation, enforcement and priorities – 8:40AM to 10:30AM

Invasive species: the situation in Saskatchewan

Chet Neufeld, Saskatchewan Invasive Species Council

An overview of the current invasive species outlook in Saskatchewan. The presentation will start with a review of the provincial legislation and broad priorities, then dig deeper into some of the larger projects that are helping to achieve provincial objectives. Recent successes and challenges, as well as where current initiatives might lead will be discussed.

Chet Neufeld is the Executive Director of the Native Plant Society of Saskatchewan, founder and current Treasurer of the Saskatchewan Invasive Species Council and one of the co-founders of the Canadian Council on Invasive Species. He has worked for Agriculture Canada, Environment Canada, and has consulted with various agencies. His work has included projects dealing with climate change and native grasses, restoration of native prairie, rare plant surveys, seed bank studies, and invasive species management. He specializes in plant ecology and is also a Professional Agrologist with the Saskatchewan Institute of Agrologists.



British Columbia – tools and partnerships to prevent the spread

Gail Wallin, Invasive Species Council of British Columbia

From a suite of behaviour change programs to devoted partnerships with local governments, Indigenous groups, tourism operators, keen youth volunteers and others, the Invasive Species Council of BC is working at a grassroots level to help address the growing public concern around the devastating effects invasive species can have on our precious natural spaces. We explore some of the impacts associated with species like the Japanese beetle, giant hogweed, knotweeds, invasive ants and others and look at some of the tools available to prevent their introduction and spread.

Gail Wallin has been involved with the Invasive Species Council of BC since inception and is responsible for overall management and board communications. Gail is an experienced facilitator for industry and government on complex resource management and land use planning issues across BC. Gail calls Williams Lake home where she enjoys time outdoors and traveling.



Montana invasive species overview

Bryce Christiaens, Montana Invasive Species Council

An overview of invasive species programming in Montana, including legislation, and emerging priorities.

Bryce Christiaens has spent the last 23 years working on invasive species issues in Montana. He currently serves as the chair of the of the Montana Invasive Species Council, and works as the manager for the Missoula County Weed and Aquatic Invasive Species Districts.



--- 5 MINUTE BREAK ---

--- 25 MINUTE BREAK OUT SESSION ---

Looks can be deceiving – 11:00AM to 11:45AM

Chris Neeser, Alberta Agriculture and Forestry

Many plant species have look-alikes with which they can easily be confused. To mistake a prairie rose (*Rosa arkansana*) for a prickly wild rose (*Rosa acicularis*), may be of little consequence, but this is not so if the plant in question is regulated as noxious or prohibited noxious. For example, confusing Japanese

barberry (*Berberis thunbergii*) with common barberry (*Berberis vulgaris*) can be more than just a mere embarrassment when you are a bylaw officer charged to enforce the Weed Control Act. In this presentation I will review regulated plants that are easily confused with non-regulated plants and provide key diagnostic features for each. I will also provide a few tips on how to take good pictures for plant identification.

Chris Neeser has obtained his B.Sc. in Agriculture (Major in Botany) in 1990 and his M.Sc. in Plant Science in 1992, both from McGill University. He obtained a Ph.D. in Agricultural Production and Agroecosystems in 1997 from the University of Guelph. Following a postdoctoral position at the University of Nebraska (1998-2000) Chris joined the Government of Alberta at the Crop Diversification Centre South in Brooks, where he started out as the Weed Scientist for Fruit, Vegetable and Special crops. In 2002 he became leader of the Fruit and Vegetable Research Program. In 2007 he returned to weed science with the mission to assist the Pest Surveillance Section with weed mapping and weed management related research. Following recent changes in the department of Agriculture, Forestry and Rural Economic Development, his duties have now shifted to assurance and monitoring of weed populations. His current work is primarily concerned with the mapping and early detection of weeds.



Reducing the impact of industrial development in native grassland; an overview of current mitigation and ongoing challenges – 11:45AM to 12:15PM

Marilyn Neville, Grassland Restoration Forum

Minimizing and managing surface soil disturbances during industrial development in native grassland has been a priority for land managers in Alberta since the early 1990s. This presentation will provide an overview of the current principles and guidelines developed to assist landowners, public land managers and industry during the planning, approval, development and end of life reclamation closure processes associated with native grassland projects.

Examples of recent construction, reclamation and revegetation mitigation methods will be provided with insight into what works, where and when and the pitfalls to be avoided. The presentation will also address current native seed supply and will illustrate what to look for when examining Certificates of Seed Analysis for native seed lots. Opportunity for questions will be provided and recommendations for future improvement welcomed.

Semi-retired, Ms. Neville is President of Gramineae Services Ltd. with more than 30 years of experience as a field-based reclamation and native grassland revegetation specialist. During this time, she has been engaged by industry as a field based environmental inspector, and assisted in the design, and



supervision of numerous native grassland reclamation projects in Alberta and Saskatchewan. She has been fortunate to have participated in the long-term monitoring of these projects. The later part of her long career was spent contributing to the tools, guidelines and best management practices for working in native grassland developed by AEP, including the current AEP minimal disturbance principles and guidelines. She and her husband have a sheep ranch in the Willow Valley at the base of the Livingstone Range.

March 16, 2022
Session Sponsors:



Cortex Management Inc. is an industrial vegetation control company, dedicated to your business. They work with land, maintenance and operations managers in a multitude of industries. Vegetation control is usually a reactive and overlooked aspect of site maintenance. While they work to help you get the job done now, they also want to help you plan for the future. Proactive planning for clients allows them to deliver timely and efficient management programs. This approach ensures managers have few surprises in terms of product, service, delivery and budget.

Welcome and Announcements – 8:30AM to 8:40AM

Maintaining sustainable honey bee populations, an overview of the Alberta Bee Act – 8:40AM to 9:45AM

Samantha Muirhead, Alberta Agriculture and Forestry

Born and raised in Alberta, Samantha graduated from the University of Alberta in 2003 with a Bachelor of Science – Specialization in Animal Biology. Throughout her degree, she developed a keen interest for everything insect and parasite related. In 2004, the Alberta government hired her to work with her favorite insect as an apiculture research assistant.

Since then, she has been a part of countless research projects and surveillance programs aimed at bee health in Alberta. Projects ranged from Nosema control methods, to Varroa mite treatments, to supplementary feeding and honey quality. She also worked as an apiculture inspector for the province, ran her own colonies for a number of years, and supervised the Bee Health Assurance Team until 2019 when she became the Provincial Apiculturist for Alberta.



--- 5 MINUTE BREAK ---

Wild boar at large in Alberta: why should you ‘Squeal on Pigs’? – 9:50AM to 10:25AM

Charlotte Shipp, Alberta Pork

For many Wild Boar are unknown or potential game in Alberta so why are we at Alberta Pork so concerned about wild boar and hunting of wild boar at large in Alberta? This presentation will provide an overview of wild boar populations in Alberta and why their numbers are causing growing concern for industries like Alberta Pork and what measures industry are taking to support the eradication of this invasive species in Alberta.

Charlotte Shipp has worked for Alberta Pork for 15 years in various capacities throughout the organization. For the last 5 years, Charlotte has served producers in her current role of Industry Programs Manager. In this role, Charlotte liaises with producer, government and industry to develop programming to support producers and to roll out of key initiatives on-farm and within industry.



Wild boar response in Woodlands County – 10:25AM to 11:00AM

Dawn Fortin, Woodlands County

Wild boar at large have been a problem in Woodlands County for the past decade. This talk will summarize the response to this issue that Woodlands County has taken.

Dawn Fortin was raised on a farm in the Westlock area. Dawn received her Bachelor of Science degree majoring in Biology from the University of Alberta Augustana Campus and then continued her education at Olds College where she graduated with a diploma in Land Resource Management. She began her career in the agriculture industry as a Weed Inspector/Sprayer at Mountain View County and progressing to the Assistant Fieldman position. Dawn spent some time as the Agricultural Fieldman at Kneehill County after which she took a four-year hiatus from the Fieldman roll to instruct at Olds College in the Land Sciences Department. Dawn's next move brought her closer to home to Woodlands County where she has been the Manager of Agriculture Services since 2001. Dawn currently resides in the hamlet of Fort Assiniboine with her three fur babies (2 dogs and a cat). Dawn is very actively involved in the family farm near Westlock which is celebrated the Century Family Farm in 2018.



Demo of the wild boar at large eradication program's remote monitored corral traps – 11:00AM to 11:30AM

AISC and the Wild Boar at Large Eradication Program

The AISC will show a video of a demonstration of the Wild Boar at Large Eradication Team's remotely monitored corral traps. The video will provide an overview of the eradication program, its history and objectives.

A panel will follow with all related speakers.



--- 30 MINUTE LUNCH BREAK ---

LONSBURY

Applications Ltd.

Lonsbury Applications Ltd. is a complete commercial and residential weed management company operating in both Alberta and BC. They can help you with land reclamation; excavation and skid steer, brush and timber clearing; fertilizing and seeding; tree pruning; aggregate; sanding and snow removal. Lonsbury Applications Ltd. is SECOR certified and maintains current subscriptions to ISNetwork and Avetta. Lonsbury Applications Ltd. equipment consists of numerous trucks with sprayers, RTV's equipped with sprayers, tracked skid steer, excavator, numerous trailers/dump trailers, backpack sprayers and miscellaneous equipment. We have several skid steer and excavator attachments, and all our equipment is in first class condition.

EDDMapS 2022 – where we are and where we are going – 12:00PM to 12:35PM

Chuck Barger, University of Georgia

This talk will give an overview of EDDMapS including the website and smartphone apps. This will help introduce the program and its benefits for the other talks in this session.

Chuck Barger is the Director of the Center for Invasive Species and Ecosystem Health at the University of Georgia. Chuck has been with the University of Georgia for 22 years where his work focuses on invasive species and information technology. He has a B.S. and M.S in Computer Science. Websites that he designed have been featured twice in Science Magazine and have received over 1.7 billion hits since 2002. Chuck developed the infrastructure behind Bugwood Images which runs the ForestryImages.org and Invasive.org websites.

Recently, Chuck has focused on mapping invasive species and tools for Early Detection and Rapid Response using EDDMapS and smartphone applications. He has led the development of 73 smartphone applications including the first apps for the U.S. Forest Service and National Park Service. He was appointed to the National Invasive Species Advisory Council in 2013 and elected as Chair in 2017. Chuck has been an invited speaker at over 300 regional and national conferences and co-authored over 62 journal articles and outreach publications. Chuck is the past president of the North American Invasive Species Management Association.



Using the EDDMapS Pro app – 12:35PM to 1:10PM

Jerry Caldwell, US County Weed Programs

This talk will go through the various functions and options of the app including photo recreation, project areas, weed locations, revisits, navigating and more!

Jerry Caldwell is the Tooele County Weed Supervisor in Utah. He is also the current president of the Utah Weed Supervisors Association and has been involved in the EDDMapS Pro app since its beginning.



--- 5 MINUTE BREAK ---

EDDMapS Pro in the Municipality of Crowsnest Pass – 1:20PM to 1:55PM

Lindsey Davidson, Municipality of Crowsnest Pass

This presentation will describe our experience utilizing EDDMapS Pro for data collection and analysis in the Municipality of Crowsnest Pass. The usability and key functions will be described from the point of view of a municipal weed inspector. Both features found useful and challenging will be highlighted as well as the strategies and practices which were implemented to maximize the practicality for our program. Moreover, case studies will serve to demonstrate the major accomplishments that were supported by EDDMapS Pro in 2021.

Lindsey Davidson is a long-time resident of southwestern Alberta and currently serves as the Agricultural Fieldman for the Municipality of Crowsnest Pass. Although relatively new to this role, Lindsey has over ten years of experience providing agricultural and environmental services in a municipal setting. Lindsey holds a bachelor's degree in Agriculture from the University of Lethbridge. When not waging war on invasive species, Lindsey can be found spending time with friends, family, dogs, and horses in the mountains of southwest Alberta. Her greatest appreciation is for the natural environment, with a close second being for craft beer.



ISMTrack (Invasive Species Management Tracking) within EDDMapS – 1:55PM to 2:15PM

Monika Chandler, Minnesota Department of Agriculture

ISMTrack is a tool for documenting invasive species management. Management activities such as mechanical or chemical controls can be recorded in detail. Management records can include weather conditions, images and expenses. Data are easily summarized and shared with partners.

Monika Chandler is fascinated by plants and their communities. She has a MS in Applied Plant Science from the University of Minnesota. She has worked for the Minnesota Department of Agriculture for over two decades. Her focus is invasive plant management. She is interested in using technology to reduce workloads and improve outcomes.



--- 30 MINUTE PANEL DISCUSSION ---

March 17, 2022
Session Sponsor:



Invasive Species Centre

The Invasive Species Centre is a not-for-profit organization that connects stakeholders, knowledge and technology to prevent the introduction and spread of invasive species that harm Canada's environment, economy and society.

Welcome and Announcements – 8:30AM to 8:40AM

Examining the impacts of invasive species on Canadian municipalities; 2021 survey – 8:40AM to 9:25AM

Lauren Bell, Invasive Species Centre

Municipalities across Canada are at the forefront of invasive species prevention, control, and management. In 2021, the Invasive Species Centre, in collaboration with Environment and Climate Change Canada and the Invasive Alien Species National Committee, hosted a nation-wide municipal expenditures survey to assess the cost, priorities and economic impacts of invasive species in Canada. This presentation will examine the findings from the data analysis conducted by Dr. Richard Vyn, explore lessons learned and discuss the shared impacts felt by municipalities dealing with invasive species.

Lauren Bell is the Invasive Species Program Manager at the Invasive Species Centre. Lauren oversees the implementation of science, outreach and partnership programs at the Centre. Lauren has been at the ISC since 2016 and has led the coordination of several invasive species projects, including facilitating the ISC's community action programming through the EDRR Network, the zooplankton diagnostics lab, and many more. Lauren currently coordinates the National EDDMapS Working Group, and sits as the Canadian representative on Board of Directors for the Midwest Invasive Plant Network.



Helping to build the business case for investment: a cost-benefit analysis of invasive Phragmites – 9:25AM to 10:10AM

Colin Cassin, Invasive Species Centre

Invasive Phragmites is one of Canada's most costly invasive species. The plant is well established throughout the Great Lakes Basin, and continues to spread into adjacent jurisdictions at an increasing rate. Although ecological costs of this species have been well documented, the socio-economic costs, which often facilitate scaled action, have been understudied. In this presentation the Invasive Species Centre will describe a recently completed cost benefit analysis which quantifies the financial burdens inflicted by Phragmites, and the many financial benefits a Phragmites-free landscape could realise. This presentation will also describe a collaboration between the Invasive Species Centre, Nature Conservancy of Canada and Quantified Ventures which seeks to apply conservation finance models to enable more diversified investment opportunities which could serve as a model for financing scaled invasive species action.



Colin Cassin is the Invasive Species Policy Manager at the Invasive Species Centre, where he strives to deliver positive environmental and social change through more effective invasive species collaborations. He manages a variety of projects including ISC's efforts under the Canada Nature Fund in Alberta, Saskatchewan and Manitoba. Colin holds a M.Sc in Ecology & Evolutionary Biology from University of Toronto and B.Sc in Restoration Ecology from Trent University. Colin works out of Peterborough, Ontario.

--- 25 MINUTE OPEN DISCUSSION ---

--- 5 MINUTE BREAK ---

Invasive vegetation management in Fish Creek Provincial Park – 10:45AM to 11:30AM

Emma Stroud, Friends of Fish Creek Provincial Park Society

The Friends of Fish Creek is a non-profit organization in Fish Creek Provincial Park, Calgary, one of the largest urban parks in North America. Through an enhanced partnership with Alberta Environment and Parks, the Friends have endeavored to create a vegetation management plan for the park, working collaboratively with the community, volunteer citizen scientists, and professional partnerships. The Alberta Invasive Species Council has supported the development of several management strategies, including biocontrol release and monitoring and the creation of a citizen scientist Weed Watch volunteer program. This StoryMap presentation will highlight the many strategies used in the fight against invasive species in Fish Creek, and the enormous role volunteers play in our organization.

Emma Stroud is a University of Calgary alumni who has focused her work in terrestrial and aquatic ecology. Through eight years of volunteer work, field experience, and working with industry, she has refined her interests in conservation and restoration, narrowing her focus onto the non-profit sector. Exploring tide pools, creeks, wetlands, and rivers have always been favorite pastimes, making the reality of working in Fish Creek an exciting opportunity. During her position with the Friends of Fish Creek, she has coordinated the invasive species management program and transferred data collection to a digital platform, using geospatial data to carry out environmental monitoring programs in the field.



Biological invasion costs reveal insufficient proactive management worldwide – 11:30AM to 12:00PM

Dr. Ross Cuthbert, Queen's University Belfast

The global increase in biological invasions is placing growing pressure on the management of ecological and economic systems. However, the effectiveness of current management expenditure is difficult to assess due to a lack of standardised measurement across spatial, taxonomic and temporal scales. Furthermore, there is no quantification of the spending difference between pre-invasion (e.g. prevention) and post-invasion (e.g. control) stages, although preventative measures are considered to be the most cost-effective. Here, we use a comprehensive database of invasive alien species economic costs (InvaCost) to synthesise and model the global management costs of biological invasions, in order to provide a better understanding of the stage at which these expenditures occur. Since 1960, reported management expenditures have totalled at least US\$95.3 billion (in 2017 values), considering only highly reliable and actually observed costs — 12-times less than damage costs from invasions (\$1130.6 billion). Pre-invasion management spending (\$2.8 billion) was over 25-times lower than post-invasion expenditure (\$72.7 billion). Management costs were heavily geographically skewed towards North America (54%) and Oceania (30%). The largest shares of expenditures were directed towards invasive alien invertebrates in terrestrial environments. Spending on invasive alien species management has grown by two orders of magnitude since 1960, reaching an estimated \$4.2 billion per year globally (in 2017 values) in the 2010s, but remains 1–2 orders of magnitude lower than damages. National management spending increased with incurred damage costs, with management actions delayed on average by 11 years globally following damage reporting. These management delays on the global level have caused an additional invasion cost of approximately \$1.2 trillion, compared to scenarios with immediate management. Our results indicate insufficient management — particularly pre-invasion — and urge better investment to prevent future invasions and to control established alien species. Recommendations to improve reported management cost comprehensiveness, resolution and terminology are also made.



Dr Ross Cuthbert is a Leverhulme Early Career Fellow at Queen's University Belfast. He completed a PhD in invasive species and pest management. Previously he held a Humboldt Postdoctoral Fellowship at GEOMAR Helmholtz Centre for Ocean Research Kiel in Germany. He is also a Research Associate at the South African Institute for Aquatic Biodiversity.

March 18, 2022

Welcome and Announcements – 8:30AM to 8:40AM

Update on AISC's biocontrol program – 8:40AM to 9:25AM

Paige Kuczmariski, Alberta Invasive Species Council

Beginning with a brief overview of the Alberta Invasive Species Council (AISC) Biocontrol Release Program, the presentation will then zero in on an overview of the 2021 field season results and the current biocontrol agents offered by the AISC for 2022.



The latest on the newest weed biocontrol agents at AAFC, Lethbridge – 9:25AM to 10:20AM

Dr. Rosemarie De Clerke-Floate, Agriculture and Agri-Food Canada

An overview of the research on biocontrol agents for common tansy and oxeye daisy.

Dr. Rose De Clerke-Floate has been studying the use of foreign insects in the biological control of invasive plants for 30 years in her position as a Research Scientist with Agriculture and Agri-Food Canada in Lethbridge. She is an import herself to western Canada, having grown up in a small town in Northern Ontario, where she began developing her interests in entomology and botany. This led her to obtaining a M.Sc. in Biology at the University of Saskatchewan (1987) and a Ph.D. in Botany from Northern Arizona University (1991). Now she is mentoring the next generation of biological control researchers, while working on the next bunch of invasive plants of concern to Canadian agriculture (e.g. oxeye daisy, common tansy).



--- 5 MINUTE BREAK ---

An overview of chronic wasting disease and mule deer management in Alberta – 10:25AM to 11:10AM

Dr. Anne Hubbs, Alberta Environment and Parks

Chronic wasting disease (CWD) threatens members of the deer family throughout western North America, with widespread ecological, social and economic repercussions. Managing hunter harvest is the primary means of wildlife agencies to slow the prevalence and spread of CWD. However, few studies have evaluated the effectiveness of this approach. To address this knowledge gap, Alberta Fish and Wildlife, in collaboration with four western States, conducted a retrospective meta-analysis of harvest and CWD data for male mule deer for 36 wildlife management units. This presentation will discuss whether harvest management can be an effective tool to control CWD, key considerations, and current research about the disease.




Dr. Anne Hubbs is a Senior Wildlife Biologist for Alberta Environment and Parks. During her 20-year career with the government, she has contributed to big game management, species at risk recovery, decision-making science, population modeling and disease management. She has worked as an area biologist throughout the province, and with Policy Branch as the Big Game Specialist for Alberta. She is the Alberta Bighorn Sheep representative for North America and co-chair of the Alberta Remote Camera Steering Committee. Prior to her career with the government, she conducted research in Europe and worked as a consultant for the Ontario government. She earned her Master's in Ecology from the University of Toronto and PhD in Zoology from the University of Western Ontario. She is the co-author of recent publications on chronic wasting disease and harvest management.

Exploration of the 2016 Yellowstone River fish kill and proliferative kidney disease in wild fish populations – 11:10AM to 11:55AM

Adam Sepulveda, United States Geological Survey


Proliferative kidney disease (PKD) is an emerging disease that recently resulted in a large mortality event of salmonids in the Yellowstone River (Montana, USA). To understand why the Yellowstone River fish kill occurred, we used molecular and historical data to evaluate evidence for several hypotheses: the causative parasite *Tetracapsuloides bryosalmonae* a novel invader, the fish kill associated with a unique parasite strain, and/or the outbreak was caused by unprecedented environmental conditions. We found that *T. bryosalmonae* is widely distributed in Montana and have documented occurrence of this parasite in archived fish collected in the Yellowstone River prior to the fish kill. *T. bryosalmonae* had minimal phylogeographic population structure, as the DNA of





parasites sampled from the Yellowstone River and distant water bodies were very similar. These results suggest that *T. bryosalmonae* could be endemic in Montana. Due to data limitations, we could not reject the hypothesis that the fish kill was caused by a novel and more virulent genetic strain of the parasite. Finally, we found that single-year environmental conditions alone are insufficient to explain the cause of the 2016 Yellowstone River PKD outbreak. Other regional rivers where we documented *T. bryosalmonae* had similar or even more extreme conditions than the Yellowstone River and similar or more extreme conditions have occurred in the Yellowstone River in the recent past, yet mass PKD mortalities have not been documented in either instance. We conclude by placing these results and unresolved hypotheses into the broader context of international research on *T. bryosalmonae* and PKD, which strongly suggests that a better understanding of bryozoans, the primary host of *T. bryosalmonae*, is required for better ecosystem understanding.

Adam Sepulveda is a Research Zoologist with the USGS Northern Rocky Mountain Science Center in Bozeman, MT, where he has been employed since 2010. He completed a PhD at University Montana Missoula. His research program focuses on aquatic invasive species risk assessment and early detection in the West. He has been conducting research on environmental DNA for aquatic invasive species surveillance since 2011, including field sampling methods, lab analytical techniques, statistical inference, and decision support.



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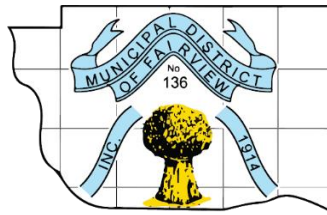


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