



**Presenter Abstracts and Biographies
(In Alphabetical Order According to Authors Last Name)**

Presenter: Jennifer Andreas

“Potential biocontrol options for flowering rush management”

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Abstract

Flowering rush, *Butomus umbellatus* L., is an aggressive invasive plant that rapidly colonizes freshwater aquatic systems. It is becoming an increasing concern in many North American states and provinces and is poised to become a substantial problem in several major waterways, despite ongoing eradication efforts. Although appropriate chemical and mechanical control methods continue to be explored, they have thus far been relatively ineffective, creating concerns that the flowering rush populations will continue to expand and spread without restriction. In looking for possible alternative control methods, the Flowering Rush Biocontrol Consortium (FRBC) was formed and a biocontrol research and development program was initiated in 2013. Flowering rush is an excellent candidate for biocontrol because it is the sole genus and species within the family Butomaceae. This increases the probability of finding a host-specific biocontrol agent, and likely reduces the number of test plant species required for host-specificity testing. The FRBC consists of many state and provincial partners that have pooled resources to fund CABI Europe-Switzerland to conduct field surveys, host-specificity tests, and impact studies of potential biocontrol agents. Three potential biocontrol agents have been identified, including a rhizome- and leaf-mining weevil (*Bagous nodulosus*), stem/leaf-mining fly (*Phytoliriomyza ornata*), and white smut (*Doassansia niesslii*). Host-specificity tests have thus far indicated that *B. nodulosus* has a very narrow host range and final testing will likely be completed in 2019. Additional field surveys and host-specificity testing will continue for *P. ornata* and *D. niesslii*.

Speaker Bio

Jennifer Andreas is an Associate Professor with Washington State University Extension and lead of the Integrated Weed Control Project (IWCP). Jennifer started working in biological weed

control in 1998 at Agriculture and Agri-Food Canada - Lethbridge Research Centre while completing her undergraduate degree at the University of Lethbridge. She continued with biocontrol research at CABI - Switzerland and then completed a Master's of Science in Entomology at the University of Idaho, where she investigated the environmental safety of the houndstongue root weevil. In 2005, she joined WSU and shifted her focus onto biocontrol implementation and education and is the primary biocontrol resource for Washington State. In addition to this work, Jennifer leads the Flowering Rush Biocontrol Consortium and conducts research for several weed-biocontrol systems. To learn more, please visit:

www.invasives.wsu.edu.

Presenter: Chuck Bargeron

“EDDMAPS PRO – A New App For Professionals To Collect Invasive Species”

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Abstract

EDDMapS Pro is a new smartphone app that leverages existing resources, such as the EDDMapS website and I'veGot1, to allow land managers to track and monitor invasive plants infestations and treatments without cellular connectivity. Specifically, it is focused on four critical features currently missing from EDDMapS:

1. Ability to select an area of interest on a map through a web interface and download both the satellite imagery and EDDMapS points/polygons to their smartphones and tablets
2. Ability to view existing infestations (with background imagery) from smartphones and tablets where both the infestations and current location are displayed when users don't have cellular connectivity
3. Ability add new infestations including drawing polygons (with background imagery available) from a smartphone or tablet when users don't have cellular connectivity and sync back to EDDMapS when devices are back on cellular or WiFi connectivity
4. Ability to revisit/update existing infestations sites with treatment or size expansion/reduction from a smartphone or tablet when users don't have cellular connectivity and sync back to EDDMapS when devices are back on cellular or WiFi connectivity

EDDMapS Pro is an advanced version of the existing apps focused on implementing these much needed and requested features.

Speaker Bio:

Chuck has been with the University of Georgia for 18 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 development of 26 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 Vice-Chair in 2016. Chuck has been an invited speaker at over 80 regional and national conferences and co-authored over 20 journal articles and outreach publications.

Speaker: Shawna L. Bautista

“Innovative Invasive Species Management in the US Forest Service”

Invasive Plant Program Manager, Pacific Northwest Region, State & Private Forestry, USDA
Forest Service

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Abstract

Invasive species management in the US Forest Service includes all taxa and all lands, with each of three branches of the Forest Service (National Forest System, State & Private Forestry, and Research & Development) responsible for different aspects of the issue. The Forest Service has perhaps the strongest and most comprehensive policy direction for invasive species management of any federal agency and this policy includes the activities of all three branches of the agency. Our Research & Development branch is the only part of the organization authorized to conduct actual research. Invasive species are one of the strategic program areas within R&D. The State and Private Forestry branch provides technical and financial assistance to landowners and resource managers to help sustain the nation’s forests. It is within this branch that we engage and support State, County, private, federal and tribal partners to address taxa that threaten the health of forest lands. The National Forest System branch is the one that manages the National Forests and the most well-known operation of the agency. Many invasive species prevention and control projects are implemented on and by the National Forests, in cooperation with, literally, thousands of partners.

Within each of these branches, the Forest Service is conducting and researching innovative ways to address the threats posed by invasive species. Some examples that will be discussed include use of unmanned aerial systems to distribute biocontrol agents and inventory invasive plants, the use of eDNA to inventory aquatic invasive species, studying herbicide impacts to rare plants, Adopt a Trailhead, Trail and other citizen science programs, use of Ecological Site Descriptions and State and Transition models to inform management decisions, and more than 70 consecutive years of aerial survey of forested land in the Pacific Northwest.

Speaker bio:

Shawna Bautista is currently the Regional Pesticide Use and Invasive Plant Coordinator for the Pacific Northwest Region of the Forest Service in Portland, Oregon. She has been with the Forest Service for 29 years, starting as a Wildlife Biologist on the Angeles National Forest. It was on the Angeles NF that Shawna noticed the devastating effects of *Arundo donax* on endangered fish and bird habitat, and it sparked her passion for managing invasive plants. She received her B.S. in Wildlife Management from Humboldt State University and her M.S. in Zoology and Physiology from the University of Wyoming.

Presenter: Jim Bean

“Plateau Herbicide for Invasive Weed Control: Do you really know how to use it?”

Strategic Accounts Manager, BASF

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Abstract

Plateau is a state of the art herbicide for a variety of invasive weed control programs, including Cheatgrass, Medusahead and Leafy Spurge. After almost 20 years of use there are still many misconceptions of how and when to use Plateau to achieve the best control. This presentation will discuss the mode of action of Plateau, the history of Plateau development and provide the best timing and use rates to achieve control of these difficult invasive weeds.

Speaker Bio

Jim Bean is a graduate of West Virginia University with a B.S. in Forest Resources Management. For the last 39 years Jim has worked in vegetation management, including almost 10 years as a Transmission Forester for Appalachian Power Company and 29 years with BASF. Jim has held many positions with BASF including sales, sales management, and marketing. Jim currently lives in Cary, NC.

From 2004 to 2007, Jim worked with federal, state and local agencies and NGO's in the eastern U.S. to increase funding and to improve management of invasive weeds. Jim was a driving force behind the creation of CEIPSC - The Coalition for Eastern Invasive Plant Species Control

As Strategic Accounts Manager, Jim helps educate and serves customers in the Forestry, Rights of Way, Industrial Bareground, Roadside, Aquatics, Invasive Weed and Pasture / Rangeland markets across the U.S.

Presenter: Belle Bergner

“NAISMA Weed Free Forage and Gravel Certification Program: Supporting Multi-jurisdictional Cooperation for Weed Free Regulations”

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Abstract

Forage production and gravel pit properties can be large sources of weeds if they are not managed. To address this invasive species pathway, NAISMA has developed the only standards and training program for inspectors of producers of forage, mulch, and gravel pits in North America. Prevention of invasive species transport in forage, mulch, and gravel can be done quite effectively by training inspectors of production areas how to identify invasive species and follow specific standards of inspection. The WFFG standards provide a guideline to set minimum requirements for uniform participation of the various provinces and states in the program to ensure that forage, mulch, and gravel products are weed-free. The standards are designed to provide some assurance to multi-jurisdictional participants that forage certified through this program meets a minimum acceptable standard; to provide continuity between the various provinces and states in the program; and to limit the spread of federally listed noxious weeds through forage, mulch, and gravel. With currently 30 government partners in the US at the local and state-level and growing, this program is a model for how multi-jurisdictional cooperation can prevent the spread of invasive species.

Speaker Bio

Belle Bergner is the Executive Director of the North American Invasive Species Management Association based in Milwaukee, Wisconsin. NAISMA's programs include Weed Free Forage and Gravel Standards, PlayCleanGo, Mapping Standards, and Online Invasive Species Management Courses. Belle has 15 years of experience in nonprofit management and conference planning. Belle received her BA in Biological Sciences from Mount Holyoke College and her MS in Ecology and Evolution from the University of Pennsylvania with training in environmental management, law and policy. Her masters research focused on the impact of global warming on boreal forests. Prior to receiving her MS, Belle managed ecological research projects in Eastern forests and Midwestern prairie.

Presenter: Robert Blair

“Drones for agriculture and invasive species use”

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Abstract

Are you interested in drones for agriculture and invasive species use? You will learn that and more in this dynamic and user point of view session. Robert Blair is respected worldwide on his views of precision agriculture and agriculture drone use brought to you from the field level. How can UAS make a difference? Listen to the ways he has incorporated UAS onto his farming operation and around the U.S. Robert will also talk about the challenges facing agriculture and commercial UAS use and adoption, culminating in specific examples that can be used for invasive species control and mitigation. This is a don't miss session from one of the longest practicing commercial UAS operators in the United States.

Speaker Bio

Robert Blair is a consultant and a fourth generation farmer from Kendrick Idaho. The farm is situated on the edge of the rolling hills of the Palouse and not far from his Alma Mater the University of Idaho where he received his B.S. in Agriculture Business.

His journey with precision agriculture started in 2003 using a PDA for simple mapping. That evolved into all different types of equipment, including Unmanned Air Systems (UAS) in 2006. Robert is the first U.S. farmer to own and use a UAS. His vision and advocacy of these technologies helped him become the Precision Ag Institute's 2009 International Farmer of the Year. Robert has been on the leading edge of the precision agriculture utilization and is recognized as a domestic and global leader.

Robert received an Eisenhower Fellowship in 2011, taking him to South America for six weeks focusing on drones and precision agriculture. During the fall of 2012 he spent three weeks in Germany on a McCloy Fellowship for agriculture. In Idaho he was recognized as one of the most influential U of I College of Agriculture and Life Science (CALS) alumni, received the 2013 Governor's Award for Agriculture Technology and Innovation and was honored as a 2015 U of I CALS Distinguished Alumni.

Robert's vision and leadership ability has been recognized by the positions he has held including president of the Idaho Grain Producers Association, chairman of the National Association of Wheat Growers (NAWG) Research & Tech Committee, chairman of the U.S. Wheat/NAWG Joint Biotech Committee, Idaho Farm Bureau Federation county president, an initial member of Idaho's UAS steering committee, an initial advisory board member of the Drone World Expo, and a member of the AGree Conservation and Crop Insurance Task Force.

Presenter: Rachel Brooks

"Biological control of the invasive tree-of-heaven (*Ailanthus altissima*) and its progress towards registration"

Plant Pathology Ph.D. Candidate in the School of Plant and Environmental Sciences at Virginia Tech

Presenter: Douglas A. Burkett, PhD

“Invasive Plant Management in the DOD”

Environmental Biologist, Operations Division, Armed Forces Pest Management Board, Office of the Assistant Secretary of Defense (Energy, Installations and Environment) US Army Garrison Forest Glen, Silver Spring, MD

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Abstract

The U.S. Department of Defense (DoD) manages approximately 25 million acres of land across 525 installations, 344 of which have significant natural resources that require management through an Integrated Natural Resources Management Plan (INRMP). DoD's mission is to protect and defend our nation and its interests. Our installation natural resources and pest managers work to ensure that our soldiers, sailors, and airmen have the land, air, and water resources they need to conduct crucial testing, training, and operational activities. DoD requires high quality testing and training landscapes to conduct mission activities and must balance mission needs and environmental stewardship responsibilities through implementation of our primary land management driver, the Sikes Act. Non-native and other invasive species commonly impact the military's testing and training mission, force health protection, security, global movement of personnel and equipment, installation infrastructure, and natural resources. Presentation will provide a global overview of the most important invasive species impacting the Department of Defense.

Speaker Bio

Dr. Burkett is the Environmental Biologist at the Armed Forces Pest Management Board within the Office of the Assistant Secretary of Defense for Energy, Installations, and Environment in Washington DC. He is responsible for formulating policy guidelines and providing technical guidance for integrated pest management, invasive species, nuisance wildlife, and other biological / natural resources. In 2014, Dr. Burkett retired from 24 years on active duty in the Air Force as a medical entomologist. While on active duty, he served as the Chief of Conservation for the Air Force and worked various environmental issues on Air Force Ranges.

Presenter: Justin Bush

“Urban Forest Pest Readiness: Increasing Preparedness to Introductions of New Invasive Insects and Building Connections between Municipalities, State, and Federal Agencies”

Executive Coordinator, Washington Invasive Species Council

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Abstract

With Farm Bill funding provided by U.S. Department of Agriculture Animal and Plant Health Inspection Service Plant Protection and Quarantine, the Washington Invasive Species Council recently completed a project to improve response readiness for detections of new urban forest pests in Washington State. A multiagency work group was developed for the purpose of creating a readiness plan focusing on building relationships and formalizing a network and response framework between cities and state and federal agencies. Beyond creating a typical response plan, the project team developed a Playbook-style system, in print with web-based features, of an assessment and checklist of prioritized actions that provides municipalities the information to self-assess readiness to new invasive pests, and shares actions to assist municipalities to become more prepared. Notably, municipalities that meet readiness standards receive a “forest pest ready” designation and join a network of other “forest pest ready” municipalities. Finally, the project included a readiness tabletop exercise in two stages that tested readiness and gaps to response. Justin Bush will share an overview of this project, the process and timeline, results and outcomes of the project as a template to be replicated in other jurisdictions.

Speaker Bio:

Mr. Bush was hired as the Executive Coordinator to the Washington Invasive Species Council in 2016. Mr. Bush has been working on invasive species issues since 2008 with federal, state, regional, and local organizations including King County, Skamania County, and the Lady Bird Johnson Wildflower Center at the University of Texas at Austin where he managed the Texasinvasives.org statewide partnership. During these years, he has been involved in various projects to prevent, detect, and control both aquatic and terrestrial invasive species and is passionate about reducing the threat they pose to the economy, native species and ecosystem services.

Presentation 2

“Lake Roosevelt Enhanced Response Exercise: Taking Invasive Mussel Preparedness to New Heights and Building Connections between Tribes, State, and Federal Agencies”

Abstract

With funding provided by U.S. Bureau of Reclamation, the Washington Invasive Species Council recently completed a rapid response exercise to improve readiness for detections of invasive mussels in Washington State at Lake Roosevelt National recreation Area. A

multiagency exercise planning was developed for the purpose of exercising and improving a readiness plan focusing on an operations-focused response exercise involving tribes, state and federal agencies using the Homeland Security Exercise and Evaluation Program (HSEEP) doctrine.

While multiple discussion-based response exercises have occurred across the Western States, this project reached new levels of preparedness by focusing on field operations such as containment boom and curtain deployment, closures of boat launches, and rapid inspection and decontamination station deployment. Justin Bush will share an overview of this project, the process and timeline, results and outcomes of the project as a template to be replicated in other jurisdictions.

Presenter: James H. Castle

"Eradication of Flowering Rush using the Diver Assisted Suction Device (DASH)"

Wildlife Biologist, U.S. Army Corps of Engineers, Walla Walla District Burbank, WA

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Abstract

The introduction, natural history, description, management issues of Flowering Rush and the eradication method used with Divers and DASH; concluding with future of chemical and biological controls and their management. Flowering Rush (*Butomus umbellatus*) was first introduced into the North America in 1897. Two populations emerged from the Great Lakes. Populations moving west were thought to be from European origins whereas populations moving east originated from Asia. Flowering Rush tolerates a variety of shallow water and wetland habitats. These dense stands can displace native species and alter hydrologic flows and shelter predatory fish that may threaten ESA species in the Columbia and Snake River systems. Flowering Rush also creates an issue with navigation of both recreational and commercial vessels. Flowering Rush is a perennial monocot that can reach heights of 5 feet and spreads vegetatively. Presently there are no effective control for this plant with the exception mechanical removal using surface supplied divers with assistance of the Diver Assisted Suction Harvest (DASH) apparatus. The Tri-Rivers Natural Resource Office of the Walla Walla District, U.S. Army Corps of Engineers (USACE) has modified a DASH system that is 97% effective in removing Flowering Rush. Research is being conducted by the USACE Engineering Research and Development Center in the study of an effective agent and method for applying the agent to Flowering Rush in fluvial systems. Biological Controls are being studied by others and there may be an effective control emerging using an integrated approach with one or a combination of these methods.

Speaker Bio

Prior to joining the U.S. Army Corps of Engineers, Mr. Castle spent the past 25 years managing natural resources for several environmental consulting firms and working a number of positions with the federal government. Mr. Castle spent 6 years on active duty with the U.S Army Corps of Engineers as a construction and reconnaissance diver conducting projects and dives the world over. After the Army Mr. Castle remained in diving conducting research dives and later earned a B.Sc. degree from Humboldt State University in Integrated Biology and a M.Sc. Degree from Sonoma State University in Avian Behavioral Ecology and Conservation Biology. Mr. Castle is currently the Project Wildlife Biologist at the Tri-Rivers Natural Resource Office, Walla Walla District and Manages Habitat in 31 Habitat Management Units along 120 miles of the Lower Snake and mid- Columbia Rivers in eastern Washington State.

Presenter: Bryce Christiaens

“Utilizing Science Advisory Panels to Inform Invasive Species Management Decisions”

Chair, Montana Invasive Species Council

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Abstract

The Montana Invasive Species Council (MISC) was created to identify priority invasive species issues and make recommendations to improve prevention and management to Montana’s Governor, legislature and resource management agencies. In 2017, the Montana Legislature passed legislation directing the Montana Invasive Species Council to identify, coordinate, and maintain independent science advisory panels that “inform Montana’s efforts based on the current status, trends, and emerging technology as they relate to invasive species management in Montana.” In the two years since, MISC has conducted two science advisory panels. The first was to evaluate the use of environmental DNA (eDNA) for dreissenid mussel early detection and provide input and guidance to managers regarding its use. The second was to evaluate the feasibility of gaining approval to release *Mogulones crucifer* for biocontrol of houndstongue in the U.S. This presentation will focus on the process developed by MISC to conduct Science Advisory Panels, how topics were chosen and the results of each panel to date.

Speaker Bio

Bryce has been working on invasive species issues for 19 years, beginning as a research technician for the University of Montana’s Conservation Lands Program. He has been the weed district manager for the Missoula County Weed District since 2011, and currently serves as the Chair for the Montana Invasive Species Council.

Presenter: Shannon Clark

“Indaziflam effects on nontargets”

Postdoctoral Researcher, Colorado State University

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Abstract

Invasive winter annual grasses pose a major threat to native ecosystems by increasing fire frequency, degrading available wildlife and pollinator habitat, and decreasing native species diversity. Indaziflam is a newer herbicide option for pre-emergent control of winter annual grasses on rangeland and natural areas. Indaziflam has a mechanism of action not previously used in non-crop weed management, thus, there is limited information about the impacts of this active ingredient on native species when applied alone or in combination with other non-crop herbicides. The objective of this research was to evaluate native species tolerance to indaziflam and imazapic applied alone and with broadleaf herbicides. Replicated field plots were established at two locations in Colorado with moderate downy brome (*Bromus tectorum* L.) infestations co-occurring with a diverse mix of native forbs, shrubs and grasses. Species richness and abundance of the non-treated control plots were compared to plots where indaziflam and imazapic were applied alone and in combination with picloram and aminocyclopyrachlor. Species richness and abundance did not decrease when indaziflam or imazapic were applied alone; however, species abundance was reduced by treatments containing picloram and aminocyclopyrachlor. Species richness was only impacted at one site 1 year after treatment (YAT) by the broadleaf herbicide picloram. Decreases in abundance were mainly due to reductions in forbs that resulted in a corresponding increase in grass cover. Treatments including indaziflam were the only treatments which continued to provide downy brome control 2 YAT. Our data suggest that indaziflam will control downy brome for multiple years without reduction in perennial species richness or abundance. On sites with a remnant native plant community, the multi-year weed control provided by indaziflam may allow enough time to achieve native species recovery. If winter annual grasses are present with broadleaf weeds requiring the addition of herbicides like picloram or aminocyclopyrachlor, forb abundance could be reduced, and in some cases there could be a temporary reduction in native species richness.

Speaker Bio

Shannon Clark is a postdoctoral researcher at Colorado State University working in Dr. Scott Nissen’s lab. She completed her PhD at Colorado State University in Spring 2019. Her research focuses on evaluating herbicides for rangeland restoration, including invasive species management and impacts to nontarget species.

Presenters: Alison Cohan and Caleb Wittenmyer

“Forward Looking InfrRed (FLIR)-enabled UAV use for detecting ungulates and guiding on-the-ground hunts in The Nature Conservancy’s Maui Nui forest program”

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Abstract

As UAV technology continues to grow and improve, the ability of resource managers to utilize this technology for various management activities radically improves. The Nature Conservancy has been using UAV technology for several years focusing on mapping and monitoring vegetation. The Conservancy has also utilized thermal imaging technology to identify ungulate presence via helicopters. Both technologies, used for very different applications, have proven extremely useful in helping guide management decisions. The landscape of *hunting* and technology is changing with the advent of *UAV’s and thermal cameras*. Now that these two technologies can be combined, UAV’s are being used by TNC’s Maui Nui Forest Program to effectively aid in ungulate control activities. UAV’s paired with a thermal imaging camera can now be used to spot game, plan hunting strategies, and assist hunting efforts in real time.

Speaker bio

Alison Cohan is the Director for The Nature Conservancy of Hawaii's Maui Nui Forest Program. She has a Master of Applied Science degree in Environmental Policy and Management from the University of Denver with a focus on Natural Resource Management, and a Bachelor's degree in Animal Behavior from Southwestern University. Alison's Master's thesis focused on climate change adaptation of East Maui's montane wet forests. Alison has been involved in conservation activities on Maui for almost 20 years, working for the preservation and conservation of both marine and terrestrial ecosystems. She is currently focused threat abatement across 100,000 acres on East Maui and 50,000 acres on West Maui, leveraging resources through Watershed Partnerships and other strategic collaborations. Originally from Texas but drawn to the ocean at an early age, Alison is happy in nature whether 100' below the surface or 10,000' above.

Presenters: Sara Cowell and Susan Roe

“Canada’s Aquatic Invasive Species Regulations – Protect freshwater and marine ecosystems from the introduction or spread of Aquatic Invasive Species”

Authors

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Abstract (Pending management approval)

Aquatic Invasive Species (AIS) pose a serious threat to fish, fish habitat, use of said resources (i.e. fisheries, aquaculture, and recreational industries), and species at risk across Canada.

Preventing AIS from establishing in Canada can lower the costs associated with control and management; prevent reduced fishing yields; support tourism and related activities; prevent the spread of diseases; protect biodiversity; safeguard intrinsic ecosystems values and functions; and prevent further national and international introduction and spread.

The Government of Canada takes the issue of AIS very seriously and is committed to preventing the introduction and spread of AIS in Canadian waters through the implementation of the *Aquatic Invasive Species Regulations*. The *AIS Regulations* came into force in 2015 under the federal *Fisheries Act* to enable federal action and partnerships with provincial and territorial governments through a suite of regulatory tools. The *AIS Regulations* are a foundation to which new species can be added, prohibitions can be tailored, and enforcement powers can be used where there is risk and capacity.

In order for the *AIS Regulations* to be effective, nationally consistent understanding and uptake are required. NAISMA provides an opportunity to further promote the regulations to a wider and potentially international audience. This will be conveyed by providing an overview of the regulations and their main elements (i.e. prohibitions, lists of prohibited and controlled species, exemptions, ministerial measures and directions, and compliance and enforcement); identifying who should be familiar with them and what they need to know to be compliant and protect Canadian and subsequently international freshwater and marine ecosystems from the threats of AIS.

Speaker Bio

Sara Cowell is a National Aquatic Invasive Species Advisor for the Government of Canada’s Department of Fisheries and Oceans Canada. She works within the Aquatic Invasive Species National Core Program that implements the *Aquatic Invasive Species Regulations*.

Presenter: Marisa Deluccia

“PNW-IPC EDRR Citizen Science Invasive Plant Program”

Pacific Northwest Invasive Plant Council

EDRR Program Outreach Coordinator

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Abstract

After prevention, Early Detection Rapid Response (EDRR) is the most effective method to control the establishment and spread of new populations of invasive plants. Invasive species management is often constrained by time and resources. In 2012, the Pacific Northwest Invasive Plant Council (PNW IPC) developed an EDRR Citizen Science Invasive Plant Program in order to support county, state and federal management agencies working to locate and eradicate invasive species in Washington State. To date the PNW IPC’s EDRR program has trained hundreds of Citizen Scientists to identify target EDRR species and conduct surveys in natural areas on county, state and federal public lands in Washington and Oregon State. We will present how our volunteers have made measurable progress in the effort to detect report and eradicate priority invasive plants from public lands since 2012. We will also present other metrics of success, challenges and lesson learned.

Presenter: Stephen F. Enloe

“Hacking up the Hack and Squirt Paradigm in Natural Areas with Milestone and Method Herbicides”

Associate Professor Agronomy Department/Center for Aquatic and Invasive Plants, University of Florida

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Abstract

Hack and squirt is a widely used individual plant treatment technique for woody invasive plant control across the US. However, hack and squirt approaches have historically been developed within a silvicultural context for suppression of undesirable hardwoods. This has inevitably led to wide variation in effectiveness for many difficult to control invasive trees. Two newer herbicide chemistries, aminopyralid (Milestone) and aminocyclopyrachlor (Method) have recently been tested on numerous woody species using a modified hack and squirt technique called incision point application. This presentation will cover current research on several woody invaders using this technique. The history of its development, methodology, efficacy, and potential flashback issues will be discussed.

Speaker biography

Dr. Stephen Enloe has been involved with invasive plant research and extension for the past 15 years. He has worked throughout the western and southeastern United States, including California, Colorado, Wyoming, Alabama, and Florida. He is currently an associate Professor at the University of Florida Center for Aquatic and Invasive Plants and his current research focus is divided between upland and aquatic invasive plant issues. Dr. Enloe earned his PhD at UC Davis in Plant Biology, a Master's degree in weed science from Colorado State University, and an undergraduate degree in Agronomy from NC State.

Presenter: John F. Gaskin

“Using genetics for invasive weed management”

Botanist, USDA ARS Sidney, MT, john.gaskin@ars.usda.gov , 406.489.1384

Abstract

Invasive weed control, especially using biological control, often requires a thorough knowledge of invasive species identity, genetic population structure, systematic relationships, and how the invasive reproduces. These topics are often best answered by analyzing plant DNA. Here we discuss how genetic tools are used on plant invasions and give some examples of current genetic studies of invasive weeds, and how these studies can improve control methods.

Speaker Bio

I received a PhD in Evolution and Population Biology from Washington University in St. Louis. I currently manage a USDA Agricultural Research Service lab in Sidney, Montana. For the last 15 years the focus of my research has been the population genetics and molecular systematics of invasive plants. Specific goals of this research are to find out which genotypes of exotic plants are invading, where these plants originated from, which native and exotic species they are most closely related to, and where the invasive genotypes are distributed in North America. I also have a strong interest in hybridization and invasion, and how novel hybrids can influence invasion and resistance to biological control agents. Invasive taxa of interest include saltcedar, rush skeletonweed, hawkweeds, pepperweeds, common mullein, flowering rush, field bindweed, Russian olive and teasel.

Presenter: Gregg Goodman

“Overview of the Technical Advisory Group for Biological Control Agents of Weeds (TAG-BCAW)”

Senior Agriculturalist

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Abstract

I serve as the Executive Secretary for the Technical Advisory Group for Biological Control Agents of Weeds (TAG-BCAW). I plan to present an overview of this group including the mission; participating agencies; petition and test plant list submission procedures and processes; annual meetings, and current petitions in the regulatory pipeline. I also plan to present information on PPQ's structure and policies regarding biological weed control organisms and provide an overview of PPQ's approval and permitting processes.

Speaker Bio

Throughout his U.S. Federal career, Gregg has worked for the U.S. Dept. of Agriculture's Agricultural Research Service and Animal and Plant Health Inspection Service (APHIS), as well as the National Institutes of Health, and the Navy. He worked for a small biotechnology company for 5 years prior to his Federal service. He joined APHIS's Biotechnology Regulatory Services as a Biological Scientist/ Compliance Officer. He then joined APHIS's Plant Protection and Quarantine as an Export Specialist in 2006 and after worked on the Quarantine Policy Analysis and Support staff where he worked on quality management initiatives and later served as the National Postentry Quarantine Coordinator and the Senior National Seed Health System Accreditation Manager. He has been with the Pests, Pathogens, and Biocontrol Permits and Containment, Soil, and Federal Noxious Weeds Permits Branches since 2012. His responsibilities include making determinations for various plant pathogens and pests including weed and microbial biocontrol organisms, arthropods, mollusks, soil, foreign noxious weeds, earthworms, and plant growth enhancer/ soil amendment products. He also serves as the Executive Secretary for the interagency Technical Advisory Group for Biological Control Agents of Weeds. Gregg has a B.S. in Biological Sciences from the University of MD and a M.S. in Biotechnology from the Johns Hopkins University. He also holds a CPL from the Brookings Institution.

Presenter: Gino Graziano

“Choking out the chokecherry: effective basal bark treatments of *Prunus padus*, an invasive and toxic plant invading the Boreal forests of Alaska”

Invasive Plants Instructor, University of Alaska Fairbanks

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Abstract

Documented *Prunus padus* invasions in the boreal forest of Alaska are increasing annually, and are no longer isolated to Anchorage and Fairbanks. To control these infestations invasive plant managers need effective treatments that minimize impacts to surrounding vegetation. Off target impacts on vegetation in the root zone of invasive plants that were treated with herbicides applied with either cut stump, frill, or basal bark treatments are occasionally suspected. These treatments are often applied in order to reduce off target impacts. Little attention has been given to the potential for an herbicide to be released from the target plant into the environment. Our hypotheses are that directly applied herbicides could be released to the soil through decomposition of treated plant material, transfer through root to root contact, or leakage from roots. We conducted a study to determine if basal bark treatments of *Prunus padus* with aminopyralid results in off target impacts to sensitive species due to leakage from roots of treated trees. We previously reported results from laboratory trials that indicated aminopyralid residues were present in soils after basal bark treatments. These laboratory trials were coupled with field trials using 1X label rates of aminopyralid, triclopyr, and the combination of aminopyralid and triclopyr. We will present evaluations of efficacy of the field basal bark treatments, and observed non-target impacts which were present on some but not all treatments containing aminopyralid.

Speaker Bio

Gino works on various invasive plant research and education topics in Alaska for the Cooperative Extension Service. He has worked on invasive plant issues in Alaska since 2006 for various agencies. Presently he is working towards completion of a PhD studying herbicide fate with a focus on both northern climates and non-target impacts.

Presenter: Todd Hagenbuch

“Radiarc® Sprayers and the Ultra-Low Volume Thinvert® Spray System”

Vegetation Management Specialist, Arborchem Products

thagenbuch@arborchem.com, 570-401-7098

Abstract

Radiarc® Sprayers have been around for many years, but still are one of the best choices for broadcast weed/brush control for invasive plant managers. The Radiarc® Sprayers are equipped to spray as little as a 3-foot pattern all the way up to a 40-foot pattern. The Radiarc® Sprayer provides uniform coverage, consistent droplet size, and helps reduce drift. It can be arranged in a vertical or a horizontal position depending on what your project requires. The system can be equipped with an actuator so you can adjust the spray head on the fly. These work great on UTV's and can be paired with a Raven 440 to assure proper calibrated rates while traveling at varying speeds. Waldrum's Radiarc® Spray Heads and accessories are available through Arborchem Products.

The Ultra-Low Volume Thinvert® Spray System. The thin invert emulsion does not require 100% coverage on the leaf surface which allows for faster, more efficient applications with less end use product. Typical backpack sprayers applying water carrier range from 10-25 gallons per acre depending on target density. The Thinvert® System is generally 1/3 to 1/4 of the gallons used to treat the equivalent targeted area. That means typical Thinvert application with a backpack application vary from 3-7 gallons per acre. The greatest inefficiency in spray operation is filling time or non-spraying activities. If you can reduce your trips back to the nurse truck, you can be more productive in the field. The Thinvert spray pattern cannot be produced by just any nozzle, there are specialized Thinvert® spray nozzles that are found on Waldrum's Thinvert® Brush Gun for backpacks or the Widecast Thinvert® Spray Nozzle that works well on UTV set ups. Thinvert RTU serves as its own drift control agent and surfactant. The proprietary Thinvert RTU Carrier and Thinvert Pre-mixes (herbicides pre-mixed in Thinvert® RTU to your specification) are available through Arborchem Products.

Biography

Todd Hagenbuch graduated from Penn State University with a B.S. in Forest Science. Throughout his career he has focused on Right of Way weed management, working with contractors, DOT's, Utilities, and Forestry Applicators all over the Mid-Atlantic and Mid-West. Todd is currently the vegetation management specialist for Arborchem Products, the makers of the Radiarc Sprayers and the Ultra-Low Volume Thinvert® Spray System.

Speaker: Dickie Hall

“SGHT Habitat Restoration Project - The World's Largest Rodent Eradication”

Project Director

SGHT Habitat Restoration Project

South Georgia Heritage Trust

Abstract

In 2018, the South Georgia Heritage Trust (SGHT) declared the Sub-Antarctic island of South Georgia rodent free for the first time in over 200 years. A globally important nesting site for seabirds, South Georgia also has two endemic bird species which were being pushed towards extinction by the rodent invaders. SGHT, a tiny charity from Scotland, undertook the world's largest rodent eradication to date using helicopters to spread poison bait across this remote island. In a race against the retreat of glaciers which divide the island, SGHT's baiting was completed in three phases between 2011 and 2015. In 2018 an island-wide survey proved South Georgia to be free of rats and mice. Thanks to this mammoth undertaking, the island is now returning to its natural state.

Dickie Hall, SGHT's Habitat Restoration Project Director, will speak about the eradication and the challenges encountered.

Speaker Bio:

Originally from Manchester, Dickie graduated from Salford University with an Environmental Science degree and soon joined the British Antarctic Survey. This launched a ten year career working in Antarctica. Initially employed as terrestrial biologist, he moved into management roles including Base Commander at Rothera and Bird Island, South Georgia. After returning to the UK in 2011 and working for the Scottish Environmental Protection Agency, the draw of the 'South' proved too strong and he gained his first island eradication experience, working as Field Assistant for Phase Two of the South Georgia Heritage Trust's Habitat Restoration project, the world's largest rodent eradication to date.

Dickie returned to South Georgia in 2013, spending a year as BAS Base Commander at King Edward Point, and then rejoining SGHT for Phase 3 of their baiting operations. He was promoted to Deputy and later Project Director which saw him organise Phase 4, the final return to South Georgia to carry out intensive monitoring which demonstrated that the baiting was successful and the island was indeed free of rodents. Dickie believes that the restoration of island habitats is a crucial step towards turning back the tide of man's negative influences on our fragile ecosystems. He also relishes the challenge of tackling projects in demanding environments with complicated logistics. When not working in remote locations Dickie resides in the UK and enjoys running, cycling and exploring the British countryside with his partner Rachel.

Presenter: Jason Hanley

“The Hawaii and Pacific Islands Invasive Species Strike Team Model – An Invasive Species Tool to Protect National Wildlife Refuges”

Invasive Species Strike Team Leader, U.S. Fish and Wildlife Service, National Wildlife Refuge System, Waialua, Hi

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Abstract

Within the National Wildlife Refuge System (NWRS), the economic cost of managing non-native species has been estimated in excess of \$336 million and is the fastest growing component of the Refuge Operations Needs System. Invasive species management has resulted in tremendous strain on ever decreasing annual refuge operations budgets and staffing.

To offset the tide, Congress appropriated funds in 2004 for the creation and implementation of U.S. Fish and Wildlife Service (USFWS) Invasive Species Strike Teams (ISST), following the example of Exotic Pest Management Teams, a similar program implemented by the National Park Service in 1999. The primary function of the ISSTs is to provide a mechanism for early detection and rapid response (EDRR) to incipient infestations of highly invasive species in an effort to achieve eradication.

Established in 2006, the Hawaii and Pacific Islands Invasive (HIPI) ISST program accomplishes EDRR projects using inventorying and monitoring techniques to detect, control, treat, and eventually eradicate invasive species. The ISST also provides technical expertise and support to NWRS staff for prioritization of invasive species targets and methods of control using Integrated Pest Management principles. In 2004, the Department of Interior joined forces with the University of Hawaii to establish the Pacific Islands Cooperative Ecostudies Unit (CESU) to emphasize working in collaboration among Federal agencies, universities, and partner institutions. The agreement has led to the creation of invasive species committees and watershed partnerships, which the HIPI ISST program uses extensively throughout the HIPINWRC to address invasive species priorities focused on protecting Hawaii's ecosystems from invasive species encroachment.

Since 2008, CESU cooperators have inventoried over 5,000 acres of Refuge lands in the HIPINWRC and have been responsible for the early detection of many new invaders and outlier populations.

Lastly, the HIPI ISST conducts outreach and education by funding internships through programs such as the Hawaii Youth Conservation Corps and Pacific Internship Programs for Exploring Science to educate young adults about invasive species and provide a pathway to employment in conservation jobs. In 2016, a total of nine interns were funded through the program.

In 2016, personnel from HIPI ISST program surveyed 1,115 acres across five national wildlife refuges. A total of 17 acres and 16,285 stems were treated.

Speaker Bio

Jason Hanley is the Invasive Species Strike Team Leader in Hawaii and the Pacific Islands for the National Wildlife Refuge System Program within the U.S. Fish and Wildlife Service. He received a B.S. in Marine Science from Richard Stockton State College. Jason has focused on prevention, eradication, early detection and rapid response, and control of invasive species for over 14 years.

Presenter: Mark A. Heilman, Ph.D.

“Selective management of invasive watermilfoils utilizing ProcellaCOR Aquatic Herbicide”

Senior Aquatic Technology Leader, SePRO

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Abstract

In early 2018, the US Environmental Protection Agency approved the reduced-risk aquatic herbicide ProcellaCOR® (a.i. florypyrauxifen-benzyl). ProcellaCOR has excellent activity on a variety of North American aquatic invasive plants, and is particularly effective on invasive watermilfoils including Eurasian watermilfoil (*Myriophyllum spicatum*), hybrid Eurasian accessions (*M. spicatum* X *M. sibiricum*), variable watermilfoil (*M. heterophyllum* – exotic in certain US states), and parrotfeather (*M. aquaticum*). The new arylopicolinate herbicide reduces use rates by several orders of magnitude versus older spot herbicide strategies for invasive watermilfoil management without restrictions on water use for drinking, swimming, and fishing. Research studies prior to registration and initial operational use following registration have confirmed excellent, short-exposure (as little as 6 – 12 hours) activity on invasive watermilfoils with little or no impact to most common NA native aquatic plant species such as pondweeds (*Potamogeton* spp.), naiads (*Najas* spp.), tapegrass (*Vallisneria americana*), and bulrush (*Schoenoplectus* spp.). In this paper, results from multiple field projects with ProcellaCOR for invasive watermilfoil management will be reviewed including pre- and post-treatment quantitative point-intercept vegetation surveys and herbicide dissipation monitoring.

Speaker Bio

As Senior Aquatic Technology Leader for SePRO, Dr. Heilman leads the company’s research and development efforts to bring forward new technologies for managing water resources. He also directly assists many public and private natural resource managers in the U.S. and some international colleagues with challenging projects managing aquatic invasive species with an emphasis on aquatic plants. Dr. Heilman received his Ph.D. in Aquatic Ecology from the University of Notre Dame in 1999. He received the APMS Outstanding Research and Technical Contributor Award in 2013. He is a Past President of the Northeast Aquatic Plant Management Society (NE APMS) and President of the national APMS in 2019-2020.

Presenter: Paul Heimowitz

“Walking the Talk: Agency Policy to Prevent New Invasions From Field Activities”

Invasive Species Coordinator

U.S. Fish and Wildlife Service - Pacific Region, Ecological Services Program

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Abstract

From regulations addressing ballast water management to education campaigns aimed at reducing movement of pest-infested firewood, government agencies promote prevention as the most cost-effective strategy in the fight against invasive species impacts. But actual policies to reduce invasive species spread by agency activities are less apparent. Executive Order 13751 (and its predecessor, E.O. 13112) provides an overarching expectation for federal agencies to “refrain from authorizing, funding, or implementing actions that are likely to cause or promote the introduction, establishment, or spread of invasive species...” (with an associated set of caveats). Absent a national directive at the Bureau or Department level that steps down that expectation, the U.S. Fish and Wildlife Service (USFWS) Pacific Region - which includes Oregon, Washington, Idaho, Hawaii, and the Pacific Islands - adopted a regional bioinvasion prevention policy in 2016. The policy requires individual USFWS programs (e.g., National Wildlife Refuge System) to develop specific guidelines that address seven general invasive species risk-reduction strategies for employee-led field activities. It also establishes similar stipulations for contractors, partner organizations receiving USFWS funding, and parties for which USFWS provides regulatory oversight (e.g., permit recipients). This presentation will review the policy’s key elements, describe its bottom-up genesis via the Region’s cross-program invasive species team (and its associated “universal responsibility” philosophy), and discuss challenges experienced during policy development and implementation. It also will explore the dilemma of evaluating prevention program effectiveness relative to tracking how invasive species were not moved or introduced to new areas. Finally, it will address the evolution of a culture of invasive species prevention over time.

Speaker Bio

Paul Heimowitz has worked in the U.S. Fish and Wildlife Service’s Pacific Region Office for the past 16 years. In his current role, he coordinates invasive species management and policy efforts within the Ecological Services Program, and also leads the Region’s inter-disciplinary invasive species team. Paul’s career also includes positions with the Oregon State University Sea Grant Program and Washington Department of Ecology.

Presenters: Joel Helm and Matt Moran

"Securing DoD Mission efficiencies and biodiversity by Aggressively Managing Invasive Species on Remote Pacific Islands"

Joel Helm: Natural Resources Program Manager, United States Air Force, Pacific Air Forces Regional Support Center, 611th Civil Engineer Squadron, joel.helm.1@us.af.mil

Matt Moran: Natural Resources Specialist, Office of Surface Mining Reclamation and Enforcement

Abstract

Wake Island Airfield is located approximately 2300 miles from the Island of Oahu and is currently managed by the United States Air Force (USAF), more specifically the Pacific Air Forces Regional Support Center (PRSC). The airfield is located on Wake Island, however the USAF managed property extends and includes emergent portions of both Peale and Wilkes Islands. The atoll's overall emergent size amounts to approximately 740 hectares across the three aforementioned islands. While managed by the predecessor Command, the 15th Wing out of Hickam Air Force Base, the islands arrestor tape system was compromised by invasive rodents. Military aircraft were grounded as a result of this invasive species interaction and arrestor barrier repair parts were flown out immediately from Joint Base Pearl Harbor Hickam. This unique mission impact identified a military need for the complete removal of both the Polynesian Rat (*Rattus exulans*) and Asian House Rat (*Rattus tanezumi*). In 2012, the PRSC, in conjunction with the United States Fish and Wildlife Service and private contractors, conducted an island wide rodent eradication effort, using both aerial and ground based baiting. The 2012 effort successfully removed *Rattus tanezumi* from the entire atoll, however, complete eradication was not achieved and today, *Rattus exulans* still persists on Wilkes and Wake Islands. The successful removal of both rat species from Peale island in 2012, has stimulated the execution of follow on restoration actions. Peale Island restoration actions have included herbicide treatments targeting *Casuarina equisetifolia*, *Opuntia sp*, *Agave americana*, and *Leucaena leucocephala*. Concurrent with focused invasive plant removal actions in 2016 and 2017, a native plant nursery was erected in 2017 and the rearing of young native plants has since ensued. This presentation will summarize 1) the complexities of the 2012 Rodent Eradication Project, 2) follow on efforts to remove the persisting species *Rattus exulans*, and 3) Peale island restoration efforts conducted post rodent eradication.

Speaker Bio:

Joel Helm is the current Natural Resources Program Manager for the Pacific Air Force Regional Support Center's 611th Civil Engineer Squadron. His primary role for the United State Air Force is to execute and manage environmental projects depicted within Integrated Natural Resource Management Plans for remote airfields and radar sites in the State of Alaska, Hawaii, and the unincorporated territory of Wake Atoll. Joel has spent the last 15 years supporting federal, state, and private entities with the management of various natural resources in Japan, Canada, and his personal favorite, the United States of America.

Speaker Bio

Matt Moran is a Natural Resources Specialist for the Office of Surface Mining Reclamation and Enforcement. He received an M.S. in Environmental Science at Pace University and a B.S. in Biological Science at Florida State University. Matt has worked for the OSMRE, USAF, USFS, NPS for the last 20 years focused on wildlife management, protection of Threatened and Endangered Species, restoration/reclamation of federal lands, and invasive species management in Tennessee, Alaska, Wyoming, and the Pacific.

Presenter: Hariet L. Hinz

“Weed biocontrol agents in the pipeline for the western USA”

Country Director, CABI Switzerland

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Abstract

Classical biological control of weeds can be one of the most cost-effective, sustainable and environmentally safe methods to control invasive weeds. Nevertheless, due to increased risk aversion, the number of new agents being released declined steadily since the end of the 1990s. In the USA, not one single release permit was granted between 2012-15. Since then, the backlog of petitions has somewhat declined with two agents each approved for release in 2016 and 2017. However, the official time line for the approval process is still extremely long with an estimated 2-4 years.

In this presentation I will give an overview of recently released weed biological control agents in North America, agents that are currently in the review process and agents which will be petitioned in the near future with emphasize on the western U.S. I will also review current time lines and requirements for the approval of weed biocontrol agents, as well as specific challenges connected to certain weed families (e.g. Brassicaceae). Although weed biocontrol has gained momentum again, I believe that continuous stakeholder pressure will be necessary to further improve the regulatory process in the U.S.

Speaker Bio

My training is in horticulture, pest management, applied entomology and ecology, which provides an ideal background for my main research interest, classical biological weed control. I have 26 years of experience in this area, including studies on the biology, host specificity and impact of herbivorous insects, the population biology of plants, invasion ecology, and mechanisms underlying the host-finding and host-choice behaviour of insects. For the last 12 years, I have been the Leader of the Biological Weed Control Programme at CABI in Switzerland. This role involves managing 15 ongoing weed biological control projects, mainly for the USA and Canada, but also New Zealand and Australia. Since 2002 I am an Affiliated Professor at the University of Idaho. In 2015 I have been appointed Director of our operation in Switzerland.

Presenter: Andrew Howell, Graduate Research Assistant, North Carolina State University
“Autonomous Robotics for Identification and Management of Invasive Aquatic Plant Species”

Co-authors: Maharshi Patel, Shaphan Jernigan, Rob Richardson, Scott Ferguson, and Gregory Buckner

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Abstract

Invasive aquatic plant species can expand rapidly throughout water bodies and cause severely adverse economic and ecological impacts. While mechanical, chemical, and biological methods exist for the identification and treatment of these invasive species, they are manually intensive, inefficient, costly, and can cause collateral ecological damage. To address current deficiencies in aquatic weed management, this paper details the development of a small fleet of fully autonomous boats capable of subsurface hydroacoustic imaging (to scan aquatic vegetation), machine learning (for automated weed identification), and herbicide deployment (for vegetation control). These capabilities aim to minimize manual labor and provide more efficient, safe (reduced chemical exposure to personnel), and timely weed management. Geotagged hydroacoustic imagery of three aquatic plant varieties (Hydrilla, Cabomba and Coontail) is collected and used to create a software pipeline for subsurface aquatic weed classification and distribution mapping. Employing deep learning, the novel software achieves a classification accuracy of 99.06% after training.

Speaker bio

Andrew Howell is a PhD student and graduate research assistant at North Carolina State University in the Department of Crop and Soil Sciences, under the direction of Dr. Rob Richardson. He received his BS in Crop Production, and MS in Crop Science at NC State where he focused on the early detection, mapping, and monitoring of invasive submersed vegetation focusing on traditional sampling regimes and boat-based remote sensing technologies. For his PhD research, Andrew is investigating the utilization of unmanned systems in aquatic and non-cropland vegetation management and how these platforms will contribute in making prompt and informed management decisions. Andrew's passion is for the outdoors and spends most of his free time in the field or wading trout streams.

Presenter: Aimee Hurt

“Innovative applications of conservation detection dogs to manage invasive species while protecting native species and habitats: practical considerations and case studies”

Director of Operations, Working Dogs for Conservation (WD4C)

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Abstract

This presentation provides an overview of the ways that conservation detection-dog handler teams are successfully being enlisted to gather baseline or supplementary data about, manage and protect native and/or threatened species and associated habitats from infiltration by invasives.

Lessons learned (or in progress) are offered around the detection of dreissenid mussels, invasive weeds like Dyer’s woad, Argentine ants and pollinator scent targets like bumble bee nests. Factors which make some targets easier to detect than others, or which can make detection more difficult once outside the initial controlled training scenario are frankly considered. The motivations for (and value of) assessing the feasibility of using detection dogs on a particular scent target even if only to rule out their use, or make a narrow deployment recommendation, are further elaborated upon.

Possible lines for collaborative R&D inquiry (e.g., what makes some plant targets easier than others for dogs to find?) and ways of ‘value-adding’ to survey efficacy while increasing cost-effectiveness (e.g., simultaneously seeking several related scent targets like wildlife scats or invasive and native plants; training a dog to multiple, complimentary scent targets) are outlined. Examples of ‘multi-purpose’ targets (e.g., Kincaid’s lupine, whorled milkweed) through which detection offers additional insight on the occupancy of species of interest and on the overall quality of the surveyed habitat are recounted.

The role of conservation dogs as ambassadors that facilitate educational outreach and have the ability to make even the most improbable of targets or mitigation strategies more alluring to the general public is showcased through several cases. Commonly encountered misconceptions relative to what can or might not be achievable using dog-handler teams, ways to most effectively use the teams in relation to other available tools and/or the study objectives, and the types of dogs that can do this work are also touched upon.

Speaker Bio

Aimee Hurt received a B.A. in Biology from the University of Montana, with emphasis on zoology, ecology, and entomology. Awarded a Fellowship to study the ability of dogs to differentiate the scats of black and grizzly bears, she discovered that dogs can indeed distinguish the scats of these two closely-related species. Aimee has worked with conservation dogs since 1998 and is passionate about training, field work and dog rescue. Her professional interests include studying the potential of canine olfaction, perfecting laboratory discrimination experiments, and ensuring that dog-handler teams remain highly trained and consistent in their work. She is one of the co-Founders of Working Dogs for Conservation.

Presenter; Clancy Jandreau

“Strategies for Restoring Grasslands Invaded by Ventenata dubia”

Conservation Lands Research Coordinator, Missoula Parks and Recreation

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Abstract

Ventenata (*Ventenata dubia*) is an invasive winter annual grass that has been introduced to the arid and semiarid grasslands of the Pacific Northwest. As the demonstrated impact of this invasive grass becomes clear, land managers are scrambling to find effective management tools to control its rapid spread. Recent studies have suggested the herbicide indaziflam (Esplanade ©, Bayer) could prove to be a potent tool in the management of invasive winter annual grasses including cheatgrass (*Bromus tectorum*) and ventenata (Sebastian et al. 2016). Application rates of indaziflam are supposedly non-lethal to resident perennial plants, but have been shown to reduce recruitment by killing dicot and monocot germinants for 2 or more years (Sebastian 2017). In areas dominated by non-native annuals with few native perennials, this can be problematic as indaziflam application may create bare ground for an extended time which may promote secondary invasion, increased soil erosion, and/or complicate effective restoration of the site. Effective restoration protocols following application of indaziflam are largely unknown. In order to increase our knowledge of restoration options, we initiated two studies in the fall of 2018. We are testing different planting strategies, planting grass and forb plugs before and after spraying indaziflam, and different seeding timings after indaziflam application. We will collect first year results in the summer of 2019. The results of these studies will contribute to land manager’s toolbox for managing ventenata in areas of depauperate grassland habitat.

Presentation 2

“Integrating Control of Spotted Knapweed by Exploiting its Life Cycle”

Abstract

In the intermountain west, spotted knapweed (*Centaurea maculosa*) is a well-established and widespread invasive plant. A variety of treatment options have been developed to manage knapweed including herbicides, seasonal grazing, and multiple species of biocontrol insects. Although herbicide applications often effectively reduce knapweed abundance in the short-term, repeat applications adversely impact non-target native species (Crone et al. 2009; Ortega and Pearson 2010;2011) or invite secondary invasion of herbicide tolerant species (Rinella et al. 2009). Grazing and biocontrols also show limited success by, for instance, reducing seed production (Shelet et al. 2004); however, knapweed populations continue to persist despite these pressures. Thoughtfully integrating different control methods at different times in knapweed’s life cycle could offer one method for achieving longer lasting control while reducing unintended impacts. For the past four years, Missoula’s Conservation Lands Management Program has been investigating an integrated approach to knapweed control using repeated sheep grazing, established biocontrol insects, and limited herbicide application. We hypothesized that, spraying once following successive years of grazing with well-establish biocontrol insects, will capitalize on reduced knapweed seed banks, kill remaining adult

knapweed, and provide longer term knapweed control with reduced side effects versus grazing or spraying alone. In 2014, we established 20 paired plots in grazed and ungrazed knapweed populations. Half of the paired plots were sprayed with aminopyralid in the fall of 2014 and half were left unsprayed. We have returned to the plots for the next four years to record vegetative characteristics for both knapweed and native species on site. Preliminary results indicate: 1) repeated grazing has suppressed seedling production in knapweed populations, 2) knapweed treated with herbicide is recovering at similar rates regardless of grazing history, and 3) knapweed with a history of grazing, but not treated by herbicide increased sharply in abundance when grazing was removed. These results underscore the complexity in managing intractable knapweed populations. Additional and more detailed population modeling and analysis will provide further understanding of how knapweed populations are responding to our treatment combinations.

Speaker Bio

Clancy Jandreau is the Conservation Lands Research Coordinator for the City of Missoula Parks and Recreation Department. In this position, Clancy is responsible for conducting and coordinating research and monitoring to support the adaptive management of Missoula's more than 4,300 acres of Conservation Lands. Projects include everything from conducting baseline floristic inventories, to monitoring overwintering elk, to surveying recreationists, and researching effective invasive species control strategies. Clancy holds a B.S. in Wildlife Biology from Colorado State University and an M.S. in Resource Conservation from the University of Montana. He lives in Missoula, Montana and spends his time hunting, fishing, and exploring Montana's many rivers and mountains

Presenter: Sheilah Kennedy

“Portable Invasive Species Rinse off Reclaim and Decontamination System”

Owner/Operator S-K Environmental, Okanogan, Washington

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Abstract

S-K Environmental’s Portable Invasive Species Rinse off Reclaim and Decontamination System provides the strongest prevention tool available utilizing the specific DOTWASH System components and the only weed wash/decontamination system that has incorporated the Electro-static system, (ESS) providing 95-98% seed elimination.

Speaker Bio

Sheilah has been involved with all aspects of invasive species. 15 Years as Noxious Weed Control Coordinator for Okanogan County, Washington State. Developing integrated invasive species programs and projects between private landowners, State, Federal and Tribe. Past President and previous Board Member for North American Weed Management Association (when it was NAWMA). Coordinated the first Weeds Across Borders established successful working projects between Okanogan County and two Weed Districts in Canada. Working to educate State and Federal Legislators is always a top priority, testifying several times before Congressional Committees in WA DC as well as State Legislative work sessions and Committees. Utilizing the experience gained over the years, I shifted towards research, development, providing effective, efficient and quality prevention equipment to prevention the introduction of invasive species.

Please visit my webpage <https://s-k-enviro.com> to review the various projects, work and scientific decontamination testing projects with Dr. Craig Ramsay, APHIS and Colorado State University.

Presenter: John Lampe

“Novel electronic dispenser for precision applications of herbicide sprays and foam”

Founder of Green Shoots, LLC, Saint Paul, Minnesota

john@greenshootsonline.com

Abstract

This presentation focuses on a new ultra-low pressure electronic dispenser for herbicides. Ultra-low pressure (below 15 psi) has been used in the commercial spray coatings industry to increase “transfer efficiency,” i.e., increase the amount of spray material that adheres to the target as opposed to the amount released into the broader environment. The new ultra-low pressure electronic dispenser for herbicides releases slower spray drops of a larger, more uniform size. The new dispenser also can be used for creating herbicide foams which can be dabbed and wiped on target weeds. This new technology can increase target adhesion; reduce spray drift and off-target harm; and decrease power demands on the dispenser.

Speaker Bio

John founded Green Shoots, LLC, in 2011. Green Shoots develops and markets precision devices for control of invasive plants. John has presented at numerous conferences: Upper Midwest Invasive Species Conferences, Midwest-Great Lakes Society for Ecological Restoration Chapter Meetings, and North Central Weed Science Society Meetings. He is a licensed pesticide applicator. For more than two decades John has helped restore ecosystems burdened with invasive species – much of that work has been as a volunteer.

Presenter: James Leary PhD

“Bio-Economic Models Prioritizing East Maui Watershed Protection Against Miconia Invasion”

Assistant Professor, Aquatic Plant Management, Agronomy Department, Center for Aquatic and Invasive Plants

University of Florida, Institute of Food and Agricultural Sciences

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Speaker Bio

James Leary is new Assistant Professor in the Center of Aquatic and Invasive Plants at the University of Florida. Prior to this appointment, he served the last decade as a Specialist in invasive plant species management with the University of Hawaii, stationed on the beautiful island of Maui. He was born and raised in Michigan, earning a BS degree in Horticulture and Chemistry at Michigan State University. He relocated to Hawaii, earning his MS and PhD degrees in Horticulture and Molecular Ecology, respectively, at the University of Hawaii at Manoa. His mission is to extend knowledge and technology contributing to efficient and effective invasive plant species management in natural and managed landscapes.

Presenter: Chris Looney

“Haunted by cane toads? Beliefs and attitudes about classical biological control in Washington State”

Entomologist; Washington State Department of Agriculture

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Abstract

What will they eat after they eat all the pests? Will they sting or bite me? What’s going to control *them*? Researchers and practitioners involved in classical biological control (CBC) programs routinely hear questions like these from all sectors of the public, ranging from dental hygienists to conservation biologists. Such questions and other comments seem to simultaneously encompass enthusiasm for and mistrust of CBC programs. However, few studies have investigated where such concerns come from or how best to address misinformation. We conducted an online survey in Washington State to help capture the range of attitudes and beliefs about CBC. Information on survey respondents’ educational background, experience with invasive species management, and their level of knowledge about biological control agent testing and approval were all assessed. Results from 420 participants indicated that there is broad support for CBC, although respondents frequently conflated the practice with other "biological control" strategies. Many respondents reported knowing of CBC agents that had negative environmental impacts, but the examples they provided similarly conflated CBC with a range of other practices, or even other invasive species. Survey results also indicated that the regulatory structure surrounding modern CBC is unknown to many respondents, suggesting that some ambivalence towards CBC could stem from a lack of information. These results indicate that improving public communication about classical biological control, including emphasizing modern success stories, may be a good way to directly combat erroneous beliefs. We hope to expand this survey to all of the United States to determine if the attitudes and beliefs represented in the Pacific Northwest population are shared across the country.

Speaker Bio

Chris received an MS in Entomology from Washington State University in 2000, and a PhD in Environmental Science from the University of Idaho in 2007. He joined the Washington State Department of Agriculture in 2009, where he manages the Olympia Entomology Laboratory. The WSDA Entomology Lab provides identification services for Washington stakeholders, supports exotic pest surveys across the state, and conducts research on exotic insect species.

Presenter: Cadance Lowell, PhD and Jon Jackson

“NatureZap DE Technology” “Natural area pest plant control with Directed Energy -- Keep aliens away!!”

Cadance Lowell, Central State University Department of Agricultural Sciences
John Jackson, Global Neighbor, Inc

Biographies

Dr. Cadance Lowell is a Professor and Chair of Agricultural Sciences at Central State University, Wilberforce, OH. As part of the land-grant mission of the University, Dr. Lowell maintains a research program in non-chemical weed control. Working with Global Neighbor, Inc. researchers and students are using directed energy as an integrated pest management strategy to kill weeds with non-ionizing light with location and duration controlled by integrated sensors and robotics. Directed energy has shown promise in non-specific vegetation control including weeds such as dandelions, crabgrass, ragweed, and Japanese Knotweed. Testing in vegetation control in woodlots and fields have shown promise in controlling herbaceous and small woody undergrowth.

Dr. Lowell received a B.S. in Botany from Duke University, a M.S. in Botany from the University of Florida, Gainesville, and a Ph.D. in Horticulture from the University of Florida, Gainesville. She did post-doctoral work with the USDA in Peoria, IL as a biochemist in soybean oligosaccharide carbon partitioning before joining Central State University.

Jon Jackson is a startup experienced engineer/entrepreneur who founded Global Neighbor, Inc (GNI) where they introduced chemical free weed control solutions, announced the introduction of the first SmartSpray that detects and automatically sprays weeds with organic or traditional herbicides while the user mows the lawn. With startup Greenfield Solar, Jon led the engineering effort to introduce high concentrated solar power (HCSP) with field sites in Taiwan and Ohio. He is a hands on engineer with an MBA whose 34 years of experience includes small, medium and large companies.

GNI has received 3 SBIR's to progress their version of directed energy for plant control. Prototype systems include automated detect and treat small herbaceous and woody undergrowth, manually operated hand held units with operating distances of inches as well as large scale units operating over many feet. Additionally, ongoing work is showing promise for controlling diseases in tree bark, controlling citrus greening in certain conditions, aquatic invasive plant and algae control.

Presenters: Catherine S. Jarnevich and Terri Hogan,

“INHABIT: a web application to deliver habitat suitability models and bridge the scientist-practitioner divide”

Catherine S. Jarnevich, jarnevichc@usgs.gov, U.S. Geological Survey, Fort Collins Science Center, 2150 Center Ave Bldg C, Fort Collins, CO 80526, 970-226-9439

Terri Hogan, terri_hogan@nps.gov, National Park Service, 1201 Oakridge Drive, Suite 200, Fort Collins, CO 80525, 970-267-7306

Catherine S. Jarnevich (Research Ecologist)¹, Terri Hogan (Invasive Plant Program Manager)², Peder Engelstad (Research Associate)³, Ian Pearce (Research Ecologist)¹, Jennifer Sieracki (Invasive Plant Program Lead)², Helen R. Sofaer (Research Ecologist)¹, Julia Sullivan (Student contractor)¹, Nicholas Young (Research Associate)³

¹ U.S. Geological Survey, Fort Collins Science Center, Fort Collins, CO

² National Park Service, Natural Resource Stewardship and Science, Fort Collins, Fort Collins, CO

³ Colorado State University, Natural Resource Ecology Laboratory, Fort Collins, CO

Abstract

The National Park Service (NPS) mission to preserve unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations must be accomplished while addressing the range of challenges that land managers face today. This includes the impacts of invasive species on native plant and animal communities and ecosystem function. However, the NPS is hampered by the scope of the invasive species problem compared to available resources to combat invasive species. Habitat suitability models for invasive species can provide practitioners with information to advise watch lists and target population searches. While many suitability models exist, there is often a divide between researchers creating these models and practitioners who may find them useful in informing land management actions. We have formed a scientist-practitioner partnership to create national models for several high priority species that are integrated into the Invasive Species Habitat Tool (INHABIT), a web application displaying visual and statistical summaries of nationwide habitat suitability models. The models are based on aggregated occurrence data and a species-specific set of predictors from a library of nationwide predictors that we assembled. The models are built following a common protocol, promoting model repeatability and credibility. Managers provide feedback both on the models and on INHABIT's features through various outlets. The content and functionality of INHABIT are designed to provide practical information leading to enhanced land management actions, including mapped products with interactive thresholds to define suitability based on management objectives (with field-device compatible download options), information on modeled environmental relationships, and tabular proximity summaries to inform management area watch lists. Based on comments and suggestions of practitioners, INHABIT is actively evolving to help bridge the gap between scientists and practitioners to help land managers make strategic decisions about where to focus limited resources to best address invasive plant control. We are specifically looking for input from attendees during the conference to help make this tool as useful as possible to land managers.

Presenter Bios

Catherine Jarnevich

Catherine Jarnevich is a research ecologist with the USGS Fort Collins Science Center, where she has worked since 2000. She obtained her PhD in ecology from Colorado State University. Her research has focused on investigating the patterns of invasions and predicting and mapping invasive species distributions.

Terri Hogan

Terri Hogan is a plant ecologist and the national lead for the NPS Invasive Plant Program that addresses threats posed by invasive plant species to NPS resources. In this capacity, she also oversees the NPS Exotic Plant Management Team program that provides “boots-on-the-ground” invasive plant management support and expertise to parks. She also has natural and cultural resource management experience in national parks and has worked on landscape scale collaborative efforts. Terri has been working in the field of botany and plant ecology for nearly 30 years having begun her career focusing on rare plant species in the southeastern U.S.

Education: M.S. in Botany (Ecology Track), University of Florida, and B.S. in Biology (Emphasis in Botanical Studies), Middle Tennessee State University

Presenter: John D. Madsen

“Using aquatic herbicides to manage the West’s invasive aquatic plant species”

Research Biologist, USDA ARS Invasive Species and Pollinator Health Research Unit,
University of California-Davis, Plant Sciences Department

jmadsen@ucdavis.edu, Davis, CA

Abstract

The western United States possesses vast vistas of open land and clean waters. Closer inspection reveals that these lands and waters are often infested with invasive plant species. While natural resource managers are familiar with the challenges and issues with terrestrial plant management, they are largely unaware of aquatic plant problems and management solutions. New reduced risk herbicides may often be used to control problematic species, while legacy herbicides also provide opportunities to manage aquatic weeds when used in innovative ways. These concepts will be examined in depth with four scenarios: using reduced risk herbicides to manage the Sacramento / San Joaquin River Delta waterhyacinth; using submersed diquat application to control flowering rush; application of imazapyr and imazamox to emerging flowering rush in drawn-down areas of a reservoir; and management of submersed weeds in areas of high water exchange in reservoirs and tidal estuaries. However, aquatic herbicides have a number of regulatory compliance issues in the West, including herbicide registration, NPDES permitting, irrigation water restrictions, and geographically-based endangered species mitigation requirements. Regional concerns regarding pesticide safety also figure more prominently in aquatic applications than is often the case with terrestrial use. However, herbicide technology can be used to effectively control invasive weeds, allowing improved access to water use, free movement of water for irrigation or flood control, and improving habitat for fish and wildlife.

Speaker Bio

Dr. John D. Madsen is Research Biologist with the US Department of Agriculture, Agricultural Research Service, Invasive Species and Pollinator Health Research Unit on the campus of University of California-Davis. Previously, he was a faculty member at Mississippi State University for ten years, and a Research Biologist with the US Army Engineer Research and Development Center. Dr. Madsen has been involved in research on the ecology and management of invasive aquatic plants around the United States of America for over 25 years. He has over 100 peer-reviewed journal articles on the biology, ecology, and management of aquatic plants. Dr. Madsen has a Bachelor of Science degree from Wheaton College, Wheaton, IL, and Master of Science and Doctor of Philosophy degrees in Botany from the University of Wisconsin-Madison.

Presenter: Steven Manning

“Introduction to the newest Tools and equipment for Managing Invasive Species”

President, Invasive Plant Control, Inc. www.invasiveplantcontrol.com

steve@ipc-inc.org, 615-969-1309

Abstract:

Steven Manning will open the toolbox and outline examples of effective treatments for integrated management of invasive plants including herbicide application methods, manual, mechanical and cultural control. Steve will highlight the good the bad and the ugly learned from more than 25 years of on the ground experience controlling invasive plants in the United States. This includes equipment highlights, effective and ineffective selective and non-selective control methods, the consequences of proper hiring practices, and associated costs.

“The Power of Art Over Argument”

Abstract:

Reaching the non-scientific world in the quest to educate society on the impacts of invasive species can be a difficult task. Most scientists don't have the background or knowledge to effectively reach people in a manner that truly changes attitudes. Many years ago Paul Harvey coined the phrase “Art over Argument” noting that if you want to convince the unconvinced, don't call to arms, call to art. Artists are time proved experts at transplanting hearts into the heartless. Steven Manning will take this idea and show how by infusing various forms of art into invasive species educational campaigns land managers can have a long term impact on the non-scientific community and their unfamiliarity about invasive species.

Presenter Bio

Steven Manning has spent the past 25 years working on invasive species. He is founder and President of Invasive Plant Control, Inc. (IPC). IPC was created to extend internationally its dedication to the control of invasive species utilizing a revised IPM approach and has successfully controlled hundreds of invasive species for a wide variety of land managers including federal, state, municipal and private landowners throughout the world. Mr. Manning also designs and implements multiple training courses and workshops worldwide with topics ranging from “Invasive Species in Ports of Entry” to “On the Ground Control Techniques.” IPC invests heavily in educational and awareness activities annually. Mr. Manning has been an instructor for the USFWS's National Conservation Training Center's Field Techniques for Invasive Plant Management Course for the past ten years. Mr. Manning is also heavily involved with local, state and international industry development projects including Volunteer Based Early Detection Networks. In 2012 IPC introduced a suite of software and web based tools dedicated to environmental needs. Manning is co-author to, Miller, J.H.; Manning, S.; Enloe, S.F. 2010 “A field guide for the management of invasive plants in southern forests” was published by the U.S. Department of Agriculture Forest Service, Southern Research Station. (<http://www.srs.fs.usda.gov/pubs/36915> <http://wiki.bugwood.org/Invplantmgmt>). He is the acting President of the Pacific Northwest Invasive Plant Council Current Vice President of the Mid Atlantic Invasive Plant Council, recent co-chair of the NMFWA's Invasive Species Working Group and serves on the board of the North Carolina Invasive Plant Council.

Presenter: Bryce Maxell

“Predicted Habitat Suitability Modeling for Invasive Species and Biocontrol in Montana”

Program Coordinator, Montana Natural Heritage Program

bmaxell@mt.gov; 406-444-3989; Helena, Montana

Additional Contact: Jasmine Reimer, State Noxious Weed Coordinator/Program Manager, Montana Department of Agriculture, jreimer@mt.gov, 406-444-3140, 302 N. Roberts, Helena, MT 59620

Abstract

Predicted habitat suitability models for invasive species can be used to indicate the relative risk posed to various landscapes within a management jurisdiction. Similarly, predicted habitat suitability models for biocontrol species can be used to guide releases to areas where agents are most likely to establish successful populations. Modeling landscape-level habitat suitability of invasive species and biocontrol agents in Montana is done by using presence-only data on state listed noxious weeds and popular biocontrol species that are housed in databases at the Montana Natural Heritage Program. Using presence-only data in conjunction with pseudo-absences and 19 statewide biotic and abiotic layers models can be constructed using the Maxent maximum entropy algorithm. Presence-only data is filtered to ensure spatial and temporal accuracy and reduce spatial auto-correlation. A k-folds cross validation methodology is employed using ten folds for model training and validation (90% of the data for training and 10% for testing). The ten estimated models are averaged to produce a map of 90-meter pixel logistic values ranging from 0-1. When enough training data is available, continuous output is reclassified into non, low, moderate, and optimal habitat suitability classes and the 90-meter pixels are aggregated into 1-square mile hexagons to ensure that models are informative to management decisions and used at the landscape scale. Natural resource managers can view model outputs and download model write ups from the Montana Natural Heritage Program's websites <http://mtnhp.org>.

Speaker Bio

Bryce Maxell grew up surrounded by a variety of farm animals and spent many hours dogsledding in the mountains of Utah. He completed a B.S. in Biology and a B.A. in Economics at the University of Puget Sound in 1994 where he studied the demography of kelp species in the Puget Sound and was an NAIA All-American swimmer. After his undergraduate degree, he received a Thomas J. Watson Fellowship for a yearlong independent study of the natural history of Australia and New Zealand in 1994 and 1995. Bryce completed his Ph.D. in Fish and Wildlife Biology in the Wildlife Biology Program at the University of Montana in 2009 where he completed a state-wide status assessment of, and constructed predicted habitat suitability models for, Montana's amphibian and reptile species and examined the population demographics of Columbia Spotted Frogs. Between 1996 and 2015, Bryce conducted field inventories for a variety of animal species in Montana. During his time in Montana he has authored or coauthored three books, a dozen peer reviewed publications, and 35-plus professional reports on amphibians, reptiles, bats, small terrestrial mammals, birds, terrestrial mollusks, and fish. Bryce is passionate about making biological information available to resource managers and the general public so that Montana's plants, animals, and terrestrial and aquatic communities can be appreciated by current and future generations and is excited to lead Heritage Program staff in this endeavor.

Presenter: Thomas Moorhouse

“Curly-leaf Pondweed Newly Arrived in the Waters Next to the Coeur d’Alene Resort”

Aquatic Pest Control Adviser (or Manager)
Clean Lakes, Inc.

Contact Information

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208-929-2757

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Abstract

Curly-leaf Pond (*Potamogeton crispus*) is a serious submersed aquatic invasive plant pest in the USA with origins in Eurasia, Africa and Australia, and was recorded initially on the east coast in the mid 1800’s. Since then the plant has spread throughout most of the United States and was first observed in lake Coeur d’Alene in July 2018. Several nearby lakes are infested and it is thought the plant was transported by recreational boaters into the lake at a high use launch ramp next to the Coeur d’Alene Resort. A management response is currently being led by the hydropower company, Avista Corporation, Clean Lakes, Inc. as the aquatic plant control contractor, with financial support from the Coeur d’Alene Resort and in cooperation with the Idaho State Department of Environmental Quality and Idaho State Department of Agriculture. Actions taken to date will be discussed.

Speaker Bio

Mr. Moorhouse’s professional experience in aquatic ecosystem restoration and maintenance and project manager spans 24 years and includes aquatic invasive species monitoring, control and eradication plans, and development and implementation of water quality monitoring programs. Mr. Moorhouse has implemented lake management and invasive species projects from planning through implementation phases with a variety of clients and collaborators that include federal, regional, state agencies, and water districts such as the Idaho State Department of Agriculture, the Florida Fish and Wildlife Commission, the US Army Corps of Engineers, United States Agency for International Development, various California water districts and Universities, as well as with counties, cities, and local organizations. Mr. Moorhouse has also implemented and overseen Compliance Monitoring Programs (CMP) for impairments to local lake and creek systems. Mr. Moorhouse has more than 28 years of development and private sector experience, including program management, technical coordination, monitoring and evaluation, natural resource, and account management. He is a graduate of Virginia Polytechnic Institute and State University and is Past President of the Western Aquatic Plant Management Society, a Past Director of the California Lake Management Society, and is and continues to be a member of those organizations as well as the California Weed Science Society, the Aquatic Plant Management Society and the North American Lake Management Society.

Presenter: Jon Morton

John Morton Kenai USFWS (Host a session on the tension between managing invasives and translocating species to places they've never occurred before to facilitate climate adaption)

Speaker Bio

B.S. Wildlife Science, Mississippi State University; Has worked for the Invasive Species Management Branch of USACE Jacksonville District since 2005 on various invasive species and wetland restoration projects throughout Florida and the southeastern U.S. Interests with UAS include mapping and analysis of natural area communities; invasive species detection and monitoring; and exploring emerging technologies in auto-classification of high resolution imagery.

Speaker: Todd Neel

“Integrating New Tools and Technologies; Pesticide Policy, and Risk Assessment in the U.S. Forest Service”

Intermountain and Northern Regions, State & Private Forestry, U.S. Forest Service, Missoula, MT

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Abstract:

Decisions regarding the application of pesticides to National Forest lands are driven by a combination of best available science; U.S. Forest Service (USFS) policy, and the National Environmental Policy Act (NEPA). For pesticides commonly used by the USFS in its management activities, Human Health and Ecological Risk Assessments (HHERAs) are prepared. In these documents, the process of risk assessment is used to quantitatively evaluate the probability (i.e. risk) that a pesticide use might pose harm to humans or other species in the environment. The USFS incorporates relevant information from the HHERA into environmental assessment documents prepared for pesticide projects, in order to guide decision-making and to disclose to the public potential site-specific environmental effects. Currently the USFS makes 48 HHERAs available to National Forests and their partners.

The USFS also supports the development of new pesticide products and registrations through the USFS Pesticide Impact Assessment Program (PIAP), which started as one element of the National Agricultural Pesticide Impact Assessment Program (NAPIAP), a USDA-wide effort to develop pesticide use and effects data, and to fill data gaps in support of EPA registrations. When NAPIAP was disbanded in 1998 the Forest Service saw a continuing need to develop pesticide use and effects data to support USFS programs and NEPA analysis of forest management projects involving pesticide application. The mission of the PIAP is to support studies that develop use and effects data for priority forestry pesticides. PIAP studies generate data and findings in support of continued registration by the U.S. Environmental Protection Agency of forestry uses for pesticides.

Presenter: Rebecca (Becky) Niemiec, PhD

“Motivating Landowners to Recruit their Neighbors for Invasive Species Control”

Assistant Professor, Human Dimensions of Natural Resources Department

Colorado State University

Rebecca.Niemiec@colostate.edu

Abstract:

Encouraging motivated landowners to not only manage invasive species on their own property but also recruit and coordinate efforts with their neighbors may enhance the effectiveness of invasive species management on private lands. Landowners may only engage in such recruitment if they believe that their neighbors care about managing invasive species, will positively respond to their recruitment efforts, and are likely to take action to manage invasive species. We designed a series of microinterventions based on social psychology research that can be added to community outreach meetings to change these beliefs to encourage landowner engagement in recruitment of others. The microinterventions included neighbor discussion, public commitment-making, collective goal setting, and increased observability of contributions to invasive species control. We report on the results of a field experiment, which tested whether adding these microinterventions to traditional knowledge-transfer outreach meetings changed those beliefs so as to encourage landowners in Hawaii to recruit and coordinate efforts with their neighbors for invasive species management. Analysis of pre- and post- surveys of residents found that, compared with the traditional outreach approach, the microinterventions altered a subset of beliefs that landowners had about others in their community. These microinterventions motivated reputationally minded landowners to recruit and coordinate with other residents to manage the invasive fire ant across property boundaries. Our results suggest integration of these microinterventions into existing outreach approaches will encourage some landowners to facilitate collective invasive species management across property boundaries.

Presenter: Jenifer Parsons

“The Columbia River Basin Cooperative Weed Management Area – an interstate and international framework for flowering rush control in the Pacific Northwest”

Natural Resource Scientist, Washington Dept of Ecology (presenting); Jennifer Andreas, Washington State University; Justin Bush, Washington Invasive Species Council

Contact information for presenting author: Jenifer.parsons@ecy.wa.gov, 509-457-7136, Washington Department of Ecology, 1250 W Alder St, Union Gap, WA 98903

Abstract

Flowering rush (*Butomus umbellatus*) is an invasive aquatic plant that thrives in a wide range of habitats. In the Northwestern US and Southwestern Canada it has been introduced in various locations, with the most abundant populations high in the Columbia River watershed. These locations with well-established flowering rush are providing propagules for downriver invasions. Due to the interstate and international nature of the Columbia River watershed, the groups trying to manage this plant felt that coming together as a cooperative to pool resources and plan for strategic control was imperative to success. In 2016, the Washington Invasive Species Council applied for and received a grant from the National Fish and Wildlife Foundation Pulling Together Initiative to move forward in creating a plan. With the funding, a Cooperative Weed Management Area was formed for the entire Columbia River watershed, a flowering rush summit was held, and a plan has been created. The plan establishes priority areas for both control work and research needs. Next steps include using the plan to apply for additional funding to bolster research and control efforts.

Speaker Bio

Jenifer Parsons has been monitoring aquatic invasive plant populations for the Washington Department of Ecology since 1994.

Presenter: Curtis Pearce, Uprooter Founder and CEO

“Love the Lever: Multiplying the Force Against Invasive Plants”

Owner/Operator, Uprooter

541-226-9872, TheUprooter.com

Abstract

US Patent holder and manufacturer of Uprooter, Curtis Pearce, will be speaking on the benefits and effectiveness of using mechanical methods in removing invasive plant species. Using leverage tools can multiply your individual strength for success in mechanical removal and reinforce community participation. He'll share his personal experience with organizing a volunteer Weed Wrangle work event in Oregon last spring, engaging community partners to take action against the problem of Scotch broom. Join Curtis on Friday for a field demonstration and uproot some of Nashville's invasives!

Biography

Curtis Pearce, the owner of Uprooter, launched his product in January 2014 following the Weed Wrench opt-out. Having spent 3 years working for Tom Ness at The Weed Wrench Company, he learned what improvements would better meet the needs of customers and developed his patented woody plant pulling tool, the Uprooter. Proud to be the manufacturer of a USA made product, Curtis and his wife build Uprooters to be shipped world-wide. Curtis has worked in the manufacturing industry for over 15 years and holds an Associate Degree in Industrial Welding Technology. Curtis is passionate about educating the community on land stewardship, removing invasive plant species, and restoring native landscapes. He and his wife have enjoyed partnering on local Let's Pull Together events, hosting a Weed Wrangle, and creating the annual Riparian Restoration rafting trip on the Wild & Scenic Rogue River.

Presenter: Tony Pernas

“Invasive animals in the Everglades, where do we go from here!”

Supervisory Botanist, Big Cypress National Preserve, National Park Service, Ochopee, Florida
tony_pernas@nps.gov, Cell: (305)815-8849

Abstract

Invasive animals such as Burmese pythons, Argentine black and white tegus, bullseye snakeheads and Nile monitor lizards are potential game changers for the Everglades. They are drastically altering the native fauna of the Everglades and can potentially lead to the collapse of the ecosystem.

The Everglades Cooperative Invasive Species Management Area (ECISMA), was established in 2006 and is a formal partnership of federal, state, and local government agencies, tribes, individuals and various interested groups that manage invasive species within the greater Everglades. ECISMA partners have developed a wide range of initiatives and management efforts to deal with invasive animals in the Everglades including trapping, shooting, amnesty programs, contests and monetary incentive programs. The presentation will give an overview of the invasive animal problem in the Everglades and discuss methods that have been utilized By ECISMA partners to management this serious threat.

Speaker Bio

My career has focused on invasive plant and animal management. I started my career in 1988 as a Resource Management Specialist with the US National Park Service at Big Cypress National Preserve in south Florida. From 1999 to 2000 I worked as the Supervisory Botanist for Everglades National Park. In 2000 I was instrumental in establishing the Florida/Caribbean Exotic Plant Management Team. I have served as the team’s coordinator since its inception until August, 2015. In August, 2015 I began my current position as Supervisory Botanist of Big Cypress National Preserve.

From 1998-2000 I was President of Florida Exotic Pest Plant Council and of the National Association of Exotic Pest Plant Councils. Since 2006, I have been the Co-Chair of the Everglades Cooperative Invasive Species Management Area (ECISMA).

Presenter: Harry Quicke

“Depleting the Seed Bank – Key to Restoration of Annual Grass Infested Lands”

Western Stewardship and Development Manager, Vegetation Management, Bayer Environmental Science.

Contact information: Email harry.quicke@bayer.com Phone 970-833-0494

Abstract

Western natural areas and rangeland are undergoing catastrophic degradation through invasion of annual grasses such as downy brome (cheatgrass), ventenata and medusahead. In addition to direct competition for resources, these grasses provide the fine fuel that allows for an increase in the frequency and size of wild fires. In addition to societal disruption and health effects from smoke, the increased fire frequency can eliminate desirable perennial grass, forb and shrub species. There is an urgent need to slow the spread of invasive annual grasses and to restore degraded areas. Trials across the west document that a single application of indaziflam herbicide results in multiple years of annual grass control, providing a new opportunity to start depleting the annual grass seed bank. Remnant desirable perennial species respond quickly to removal of the annual grass component.

Speaker Bio

PhD in Forest Science. Twenty years of experience developing pest management tools for crop and non-crop uses. Currently working with Universities and agencies across the western USA to develop new tools for restoration of annual grass infested rangelands. This focus is efficacy for control of annual grass and other weeds, response of desirable species, habitat quality changes for wildlife and pollinators, impact on wildfire risk through thatch depletion and restoration of conifer production areas.

Johnny Randall

“In my lifetime: From introduction and lag phase to invasion”

NC Botanical Garden

Presenter: Johan Kristian Rud

“Invasive plant species management - Leading the non-chemical way”

Founding owner, Heatweed Technologies – The weed control company
Agronomist, NMBU, MSc Mechanical Engineering, NTNU
Johan.Rud@heatweed.com, (+47) 99960 9999

Abstract

Heatweed Technologies is Europe’s leading supplier of technology and machinery for non-chemical weed control in public spaces and is represented in 15 different countries and counting. Heatweed’s vision is to set new standard for non-chemical weed control in the green sector. The first patent for hot water weed control was established in the US in 1884, but it took more than 100 years before this method was revisited. Heatweed Technologies has more than 35 years of experience in weed control in all its forms. As a result, Heatweed was the first company to introduce hot water as a method for weed control in Europe and is still leading in innovative weed control technology, offering high-capacity machines with world patented sensor technology.

Physics of weeds is important when it comes to developing the most efficient and cost-effective technology. Based on this, Heatweed developed the acclaimed Invasive Species Reduction Program. The Invasive Species Reduction Program has been developed by Heatweed based on the PhD study done by the Norwegian University of Life Science between 2016-2018 on controlling the species *Heracleum Mantegazzianum*, *Impatiens glandulifera* and *Fallopia Japonica*. This program allows municipalities and land owners to monitor reduction of invasive plant species in real-time via an app during a three-year treatment cycle. Plants like Giant Hogweed, Japanese Knotweed, Police Helmet, *Crassula Helmsii* and many other unwanted species are being treated with the Heatweed Method® by contractors in both Scandinavia and the Benelux countries. This presentation will cover alternative thermal methods for weed control in urban areas, the cost of various methods and the results of such treatments.

Speaker Bio

Johan is 23rd generation land- forest- and farm-owner living on the family farm. He is also an agronomist and a mechanical engineer which means that he has been connecting the knowledge from plant science with his interest for developing machinery to make farming more efficient and productive. During the last 30 years part of his farm fields have been kept for research and studies of new plant species and weeding methods.

In 2012 Johan founded Heatweed Technologies in Scandinavia and the Heatweed Method® and machinery became the preferred method for non-chemical weed control in all Scandinavian countries within three years.

In Spring 2017 Heatweed Technologies bought up the largest non-chemical weed control provider in Europe, Wave Weed Control and have grown to become Europe’s largest non-chemical weed control provider. Today, still majority owner, Johan acts as the CTO. 15% of the company’s turnover is invested in research and development projects. Heatweed is today part of 7 different pan-European research projects.

Presenter: Stephanie Sardelis¹

“ eDNA: Bridging the Gap Between Science and Management”

Aquatic Invasive Species National Advisor, Fisheries and Oceans Canada

Co-Authors: Laureen Janusz², Martina Beck³, Olivier Morissette⁴,
Chantal Vis⁵, Susan Roe¹

Organization(s): ¹ Fisheries and Oceans Canada, ² Manitoba Department of Sustainable Development, ³ British Columbia Ministry of Environment and Climate Change Strategy, ⁴ Ministère des Forêts, de la Faune et des Parcs du Québec, ⁵ Parks Canada Agency

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Abstract

Detecting aquatic invasive species (AIS) in a timely manner can greatly improve the chances of preventing their spread, establishment and harm to species at risk or species of commercial importance. Environmental DNA (eDNA) sampling and analysis are developing quickly as sensitive tools that can efficiently and cost-effectively complement traditional early detection and monitoring methods for AIS. However, some natural resource managers lack confidence in eDNA technology due to ambiguous results and inadequate communication between researchers and managers. This leads to uncertainty regarding the application of eDNA results in real-time management actions, including rapid response to invasions. As a result, natural resource managers may choose to undervalue or discount eDNA results entirely for fear of sacrificing management integrity and public interest. To bridge this gap between science and management, we suggest the implementation of two critical tools: (1) reporting standards for communicating eDNA results, and (2) a policy statement providing guidance on responding to positive detections. In particular, the policy statement incorporates learning from provincial and territorial experience responding to eDNA positive detections and provides managers with support in decision-making, despite the still-improving practices of eDNA sampling and analysis. The National Aquatic Invasive Species Committee (NAISC) under the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM) has lead the initiative for both tools, and their effectiveness now relies on widespread sharing and uptake by national collaborators. For example, standardized reporting protocols and defined terminology must be promoted across federal, provincial, territorial, cross-border and external partners, researchers, and stakeholders. This will allow managers at all levels of government to incorporate eDNA results into the weight of evidence for determining the presence or absence of AIS. ICAIS provides a unique forum to engage both managers and scientists to promote collaboration across disciplines towards action against the threats of aquatic invasive species. (*Preferred presentation format: Oral*)

Speaker Bio

Stephanie Sardelis is a National Aquatic Invasive Species Advisor for the federal department of Fisheries and Oceans Canada, and is the secretariat for the federal, provincial and territorial National Aquatic Invasive Species Committee. Stephanie has a Master's from Columbia University in Conservation Biology, where she conducted research in partnership with the Wildlife Conservation Society.

Presenter: Samantha Simon

Executive Director, Emergency and Domestic Programs
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture

Dawn Slack***“Indiana Invasives Initiative – Engaging on a County by County Basis to Build Capacity for Conservation”***

Director of Stewardship, and Project Coordinator for the Indiana Invasives Initiative
The Nature Conservancy and Southern Indiana Cooperative Invasives Management Group

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Abstract

Recognizing that protecting our land and waters requires the support of the masses, Indiana is focusing on educating, engaging, empowering and collaborating with landowners across the state through a five-year funded partnership to develop cooperative invasive species management areas (CISMAs) in every county to build capacity for conservation.

Research is increasingly available about the impacts invasive species have, but this information is often unavailable to many of the very individuals and entities responsible for the spread of invasive species. Efforts by organizations and individuals that manage invasive species, are often-unrecognized and occur singly – not concerted. In addition, state and federal resources to manage invasive species are limited. Indiana seeks to resolve some of the indifference, lack of resources, and lack of knowledge about the impact of invasive species through a focus on landowners and a unity of resources at the county level. The goal of this project is to have each county represented by a cooperative invasive species management area (CISMA) in 5-6 years. Each CISMA will focus on education of and then effective action by local citizens and landowners to work collaboratively with existing expert entities on invasive species management and native species restoration. We are already observing that an increase in the overall knowledge base about native and invasive species increases a desire to bolster conservation efforts and identifies local resources to meet such focused goals and objectives.

This session will present the triumphs and struggles of 2 years of work on the project. It will share the plan, the number of CISMAs developed, the partnership with Weed Wrangle, the local resources uncovered and the movement that is stirring to increase capacity for conservation.

Speaker Bio

Dawn has a bachelor's in Biology from Drury University in Springfield, MO, and a master's in Biology with a focus in plant taxonomy and stream health from Austin Peay State University in Clarksville, TN. She was a professional consulting biologist for many years before holding the Wildlife Science Supervisor position with the IN Department of Natural Resources, Fish and Wildlife Division and her current position, Director of Stewardship for The Nature Conservancy. She is also Chair for the Indiana Plant Advisory Committee for the Indiana Invasive Species Council and the Project Coordinator for the Indiana Invasives Initiative for the Southern Indiana Cooperative Invasives Management group.

Presenter: Erin Stocksclaeder

“Prioritizing Limited Resources for Restoration Ecologist”

Ecologist, Fairfax County Park Authority, Estock@fairfaxcounty.gov

703 324-8681, Fairfax VA

Abstract:

Those of us in the natural resources field are often faced with the issue of having to make tough decisions on where to utilize limited resources. The Fairfax County Park Authority (FCPA) has over 20,000 acres of natural area, almost all of which has some coverage of invasive plants. With a limited annual budget, the FCPA needed a system to decide where to dedicate this limited funding. The Non-Native Invasive Assessment and Prioritization (NNIAP) survey is used to assign a numerical value to parcels based upon ecosystem health, disturbance, invasive plant density and treatment feasibility, as well as prior public involvement. This has allowed the FCPA to focus on “protecting the best” instead of a scattershot method that had little lasting impact. The NNIAP is a comprehensive approach that is realistic and strategic. The surveying began in earnest with summer interns in 2012, and in 2018 all parkland was scored using the NNIAP. Surveying on 2019 will focus on the parcels that were among the first to be surveyed to see how scores have changed in the 6 years. We expect scores to go up in areas that have received treatment and scores to go down in areas that have not received treatment. This will underscore the importance of early intervention when it comes to managing invasives.

Speaker bio:

Erin Stocksclaeder is an Ecologist with the Fairfax County Park Authority, in Fairfax VA. She manages the Invasive Management Area (IMA) program which focuses on habitat restoration through volunteer engagement and community outreach. Erin began working for the Park Authority in 2010, immediately after receiving her Bachelor of Science in Environmental Science and Biology from State University of New York (SUNY) Brockport. In 2015 Erin received her Master of Science from George Mason University in Environmental Science and Policy. She is a Certified Ecologist through the Ecological Society of America.

Presentation 2

“More Than Pulling Weeds, Habitat Restoration with Volunteers”

Abstract:

Those of us in the natural resources field are often faced with the issue of having to make tough decisions on where to utilize limited resources. The Fairfax County Park Authority (FCPA) has over 20,000 acres of natural area, almost all of which has some coverage of invasive plants. With a limited annual budget, the FCPA needed a system to decide where to dedicate this limited funding. The Non-Native Invasive Assessment and Prioritization (NNIAP) survey is used to assign a numerical value to parcels based upon ecosystem health, disturbance, invasive plant density and treatment feasibility, as well as prior public involvement. This has allowed the FCPA to focus on “protecting the best” instead of a scattershot method that had little lasting impact. The NNIAP is a comprehensive approach that is realistic and strategic. The surveying began in earnest with summer interns in 2012, and in 2018 all parkland was scored using the NNIAP. Surveying on 2019 will focus on the parcels that were among the first to be surveyed to see how scores have changed in the 6 years. We expect scores to go up in areas that have

received treatment and scores to go down in areas that have not received treatment. This will underscore the importance of early intervention when it comes to managing invasives.

Presenter : Sonja Stutz

“The challenges of synchronisation in plant and insect phenology for conclusive results of host-specificity tests: the case study of a biocontrol agent on common tansy”

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Abstract

Common tansy, *Tanacetum vulgare*, is a perennial plant native to Eurasia that has become an increasing weed problem in pastures, riparian areas and forest margins across the northern USA and Canada. The plume moth *Platyptilia ochrodactyla* is currently being studied as a potential biological control agent for *T. vulgare*. *Platyptilia ochrodactyla* has a rather unique life cycle: females oviposit into the flower heads of *T. vulgare* where the early instar larvae are overwintering. The larvae leave the flower heads the following spring and burrow mines into newly growing shoots. No-choice oviposition and larval development tests revealed that *P. ochrodactyla* can develop on several congeneric species, including the North American native *Tanacetum camphoratum* and *T. huronense*. A common next step in evaluating the risk of non-target attack in the field would be to expose target and non-target species simultaneously under multiple-choice conditions to ovipositing females. However, since the congeneric non-target species flower several weeks earlier than the target weed, *P. ochrodactyla* may not experience a choice-situation under natural conditions. Early flowering non-target species may either be safe from attack by *P. ochrodactyla* or, if *P. ochrodactyla* become reproductively active before any *T. vulgare* are flowering, they may accept nontarget species that would not be accepted if flowering *T. vulgare* were present. To further evaluate the risk of non-target attack by *P. ochrodactyla* we therefore conducted a series of open-field tests where we either exposed non-target species to a natural population of *P. ochrodactyla* or artificially synchronized *P. ochrodactyla* with the flowering period of non-target species. The results of these open-field tests will be presented in conjunction with observations on the phenology of *P. ochrodactyla* and of the target and non-target species.

Speaker Bio

Sonja Stutz is a research scientist with CABI in Switzerland. She did her PhD at CABI and the University of Fribourg, Switzerland investigating the potential invasion mechanisms of oxeye daisy in North America. She is now working on several biological control projects for North America, Australia and New Zealand. This work includes field surveys in Europe and Asia as well as host range and impact studies of potential biological control agents for oxeye daisy, common tansy, perennial pepperweed and lesser calamint.

Presenter: Samantha Tank

***“Utilizing an adaptive management approach for invasive species management:
Implementing the Phragmites Adaptive Management Framework “***

Authors

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Abstract

Effectively managing invasive species is a significant challenge that requires constant learning and adaptation, as well as meaningful engagement of the broader management community which includes federal and state partners, conservations organizations, and private landowners. Non-native *Phragmites australis* is a serious invader that has colonized over 60,000 acres of Great Lakes coastline and many inland areas. Control efforts are widespread, yet effectiveness may vary due to infestation level, application methods, environmental conditions, and other factors. Thus, the *Phragmites* Adaptive Management Framework (PAMF) was developed by the Great Lakes *Phragmites* Collaborative (<https://www.greatlakesphragmites.net/>) as a program designed to reduce uncertainty and increase the efficiency of *Phragmites* control using adaptive management. Through a systematic approach, PAMF partners with *Phragmites* managers across the basin to refine best management practices and provide site-specific management guidance. PAMF is now in its third iterative cycle and has widespread participation across the Great Lakes basin. This presentation will focus on reflections and findings from implementing an adaptive management approach to invasive *Phragmites* management.

Speaker Bio

Samantha is a program specialist at the Great Lakes Commission (GLC) where she coordinates the *Phragmites* Adaptive Management Framework (PAMF). In her current position, Samantha works binationally to engage land managers, agencies, and private citizens to support their efforts managing invasive *Phragmites*. She has a Master's and Bachelor's in Fisheries and Wildlife from Michigan State University.

Presenter: Professor Dan Tompkins

“Predator Free New Zealand”

Project Leader Science Strategy, Predator Free 2050 Ltd

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Abstract

In 2016, the New Zealand government announced a national goal of eradicating introduced predatory mammals critically threatening native biodiversity (brushtail possums, rats and stoats) from the country by 2050. The goal was subsequently adopted as a lead commitment of the ‘Honolulu Challenge on Invasive Species’ launched by the International Union for Conservation of Nature (IUCN). Four interim 2025 goals were established to drive momentum towards the goal: (i) suppress predators on a further 1 million hectares; (ii) eradicate predators from blocks of at least 20,000 hectares without the use of fences; (iii) eradicate predators from island nature reserves; (iv) achieve a breakthrough science solution capable of eradicating at least one small mammal predator.

Predator Free 2050 Limited was formed to coordinate partnership approaches to large landscape projects and breakthrough science. It aims to supercharge local and regional efforts to scale up predator suppression and eradication, working closely with community groups and regional and city councils, and to focus research efforts to achieve a breakthrough science solution capable of eradicating at least one small mammal predator by 2025. The company’s first tranche of projects will enable over \$100 million of predator control and eradication operations. These are being implemented in rural provincial landscapes, major cities, inhabited islands and forests. The company is required to attract co-funding at a ratio of 2:1 and has exceeded this target, in large part through the support of regional councils and philanthropic trusts which have embraced the PF2050 mission.

The peer-reviewed science strategy for PF2050 Ltd was constructed with the aim of complementing existing research efforts to give the best chance of achieving the 2025 science goal. PF2050 Ltd is now investing across four research programmes: ‘Environment and Society’ is exploring social and cultural views on predator eradication; ‘Best Use of Existing Approaches’ is testing whether currently employed tools and approaches can eradicate at the landscape scale; ‘Exploring New Approaches’ is addressing knowledge gaps regarding risk, benefit and the technical feasibility of new genetic approaches, to enable an informed consideration of their potential; ‘Computer Modelling’ is developing shared tools that all communities and agencies contributing to PF2050 can use to design, monitor and improve predator management for their goals and environment.

The need for the PF2050 programme was driven home by the NZ Parliamentary Commissioner for the Environment’s report ‘Taonga of an Island Nation: Saving New Zealand’s Birds’. This report, released in 2017, highlighted the fact that over 80% of native bird populations are in decline, primarily due to the impacts of introduced predators. Public support to address this issue is high; a 2017 survey reported that 84% of Wellingtonians support ridding NZ’s capital of such predators and 69% are willing to be actively involved.

Speaker Bio

Dan Tompkins leads the science strategy for Predator Free 2050, New Zealand's initiative to eradicate invasive predators for the benefit of native biodiversity, as the Project Manager Science Strategy of Predator Free 2050 Ltd. Dan is an Honorary Professor at the University of Otago, New Zealand, and member of the International Union for Conservation of Nature (IUCN) Task Force on Synthetic Biology and Biodiversity Conservation. An ecologist and epidemiologist by training, with degrees from Cambridge University and the University of Oxford, Dan's past research includes: exploring novel high-tech approaches to pest control (including the 'Trojan Female Technique' approach to fertility control); understanding the interactions among species in the New Zealand mammal pest community; demonstrating the efficacy of oral BCG vaccination for TB control in brushtail possums; and demonstrating the role of shared diseases in native species declines.

Presenter: Kateri Tonyan

“Challenges of Invasive Species Management on Department of Defense Properties”

Supervisory Natural Resource Specialist

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Avon Park Air Force Range, 29 South Blvd, Avon Park, FL 33825

Abstract

Invasive plants are not unique to public lands but managing invasive species on Department of Defense properties involve unique challenges. This public land has military personnel training, public use, budgetary restraints, fellow natural resource staff projects, and more. Juggling military personnel visiting from all over the country (and the world), active prescribed fire programs, limited staffing, general public fighting for their right to hunt, we will be discussing the many challenges we face at our specific Department of Defense properties and how we overcome those challenges to have successful outcomes within our programs.

Speaker Bio

Kateri Tonyan is the Supervisory Natural Resource Specialist at Avon Park Air Force Range. Kateri received her Bachelors of Environmental Science from Eastern Illinois University where she concentrated in botany. She has been working with invasives species for 10 years throughout the United States including Illinois, Tennessee, North Carolina, Texas and Florida.

Presenter: Morgan Valliant

“Evaluating the Ecological Impacts of Common Buckthorn in Montana”

Conservation Lands Manager, Organization: Missoula Parks and Recreation
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Abstract

Common buckthorn (*Rhamnus cathartica*) is a large shrub native to Europe that aggressively invades wetter habitats in the Northeast and northern Midwest of the United States, where it has been declared a noxious weed in several states (Knight et al. 2007). In the more arid West, buckthorn exists in scattered populations that reflect a legacy of horticultural plantings and possibly also the early invasion stages of a high-impact exotic. However, buckthorn’s status is unclear in the West, where it remains largely unstudied. In 2016, the USDA Rocky Mountain Research Station and Missoula’s Conservation Lands Management Program, with funding from the Montana Noxious Weed Trust Fund, gathered data to quantify buckthorn’s effects on native riparian plant communities in Montana to inform the Montana State noxious species listing process. We conducted vegetation surveys of populations in and around Missoula, Helena, Bozeman, and Billings that were representative of invasions in western and eastern Montana. We used these data to evaluate the relationship between buckthorn invasion and native riparian vegetation at differing strata, including woody species in the understory and overstory as well as herbaceous species. We found significant negative correlations between buckthorn cover and native vegetation cover indicative of impacts at all strata, but particularly in the overstory. Importantly, these declines in native cover were also correlated with the age of buckthorn individuals within plots, suggesting that negative effects of buckthorn built as invasion progressed. Understory cover of buckthorn similarly increased with time since invasion across study areas. Our results suggest that 1) buckthorn populations in Montana significantly impact native vegetation, and 2) these populations are actively spreading. While it appears that buckthorn is largely restricted to riparian habitats in Montana (we did not formally evaluate this), the fact that we find evidence for significant impacts on native plants across study areas in the Yellowstone, Gallatin, Missouri, and Bitterroot-Clark Fork drainages suggests that buckthorn has the ability to invade and impact many riparian habitats in the state. Based on this research, common buckthorn was declared a noxious weed by the State of Montana in 2017.

Speaker Bio

Morgan Valliant has been restoring native habitats on public and private lands in Western Montana for 20 years. He holds a B.S. in Biology from the University of Montana and an M.S. in Botany from Washington State University. Currently, Morgan is the Conservation Lands Manager for the City of Missoula and manages over 4300 acres of public natural areas. These natural areas are adjacent to a City of 70k people and are often introductory points for new invasive species. Missoula’s Conservation Lands Program frequently conducts research on novel techniques for invasive species control, habitat restoration, and Jedi mind control of public recreationists.

Presenter: Ben van Staden

Senior Manager – Green Jobs | People and Conservation Programme, Working for Water Programme,
South Africa

Presenter: Teagan Ward

“Whatcom Boat Inspections: Preventing the spread of aquatic invasive species in Whatcom County, Washington”

Aquatic Invasive Species Program Coordinator
City of Bellingham

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Abstract

The Lake Whatcom Management Program began implementing the Whatcom Boat Inspection Program in 2012 to prevent the introduction of zebra and quagga mussels and other aquatic invasive species to Whatcom County waters. To date, the program has conducted over 50,000 watercraft inspections at Lake Whatcom and Lake Samish.

The program has not only helped to prevent the spread of additional aquatic invasive species to these local lakes, it has also helped to increase community awareness regarding the threats that aquatic invasive species pose to Washington waters and how to prevent their spread.

This presentation will provide an overview of the Whatcom Boat Inspection Program highlighting outreach efforts, inspection results, and lessons learned from 2012 through 2019.

Speaker Bio

Teagan Ward is the Aquatic Invasive Species (AIS) Program Coordinator for the City of Bellingham. She developed the City’s AIS prevention program and has overseen its implementation since 2012. Additionally, she is a member of the Interjurisdictional Coordinating Team, a staff group that coordinates Lake Whatcom Management Program activities which aim to improve lake water quality by jointly implementing programs affecting the Lake Whatcom Watershed. She has worked for the City of Bellingham since 2009. Teagan has an undergraduate degree in Biology from Carleton College and a graduate degree in Environmental Management with an emphasis in water resource management from Duke University’s, Nicholas School of the Environment.

Presenter: Raymond Willard, PLA

***“Applying Transportation Asset Management to Highway Roadsides
Invasive Species Prevention through Improved Land Use Planning and Management”***

State Roadside Asset Manager

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Abstract

The best overall protection against invasive species starts with cultural recognition of the value of environmental stewardship when planning and managing land use. In developing land-based systems to support human existence and prosperity, environmental impacts are often overlooked or overrated. It is the responsibility of government to find a sustainable balance between the operational needs of human society, and protection of the natural environment, and to provide examples that demonstrate this balance, through the effective and efficient management of public lands.

This presentation will show how the Washington State Department of Transportation (WSDOT) would like to use the state’s highway roadsides as an example of best management practices for land use, and is using asset management planning to make a case for improving the environmental condition of the state’s roadside right of way. WSDOT recently published (June 2019) a transportation asset management plan, which identifies and quantifies operational and ecological metrics for planning, tracking, and measuring outcomes of the work involved with highway roadside land use and vegetation management. To support this asset management plan, the agency has developed a coordinated set of maintenance management tools for roadsides including:

1. Documented annual performance measures for roadside maintenance (since 1996)
2. Annually updated and mapped statewide inventory of all planned roadside maintenance work units (since 2005)
3. Mobile technology application for recording geographically referenced work accomplishment and cost data (since 2017)

While some of WSDOT’s roadside assets are currently being maintained in a relatively good state of repair, others are being neglected due to lack of maintenance resources. This presentation will show how WSDOT intends to use these planning tools and technology to make a business proposal for funding to maximize operational and environmental sustainability, and achieving a state of good repair in the management of approximately 100,000 acres of roadside right of way throughout Washington State.

WSDOT's asset management plan is based on the distinction between two major types of roadside areas with dramatically different long-term management strategies:

1. Operational (everything within the first 20 to 30 feet from traffic)
2. Non-operational (everything else – all corridors and interchanges where there is right of way width beyond what is required for traffic operations, and all environmental mitigation sites)

Functional objectives and maintenance requirements in the Operational Right of Way are consistent and mostly standardized throughout the state – Maintenance activity in this area is routine and easily planned. In the Non-operational Right of Way, objectives and required maintenance are dictated by surrounding land use and native ecosystems, and many sites require long-term restoration effort or working in partnership with neighbors and volunteers. Management of the Non-operational Right of Way is challenging due to the varied site conditions throughout the state, and due to the fact that this work is often put off year after year when funding is tight.

This presentation will show how the agency would go about restoring all the environmentally deficient roadsides in the state over a 10 year period, and discuss the projected life-cycle costs and benefits. In conclusion, it will be shown how the business model for land use asset management being created by WSDOT for roadsides could be effectively applied to other types of public lands, as well as in commercial land use ventures and even by private property owners.

Speaker Bio

Ray holds a Bachelor of Landscape Architecture from the University of Washington and is a licensed Landscape Architect in Washington State. For the past 25 years Ray has worked on directing and developing WSDOT's roadside vegetation management program. He has also represented WSDOT on the Washington Invasive Species Council since its inception in 2006 and currently serves as the council chair.

At the national level, Ray has helped establish an active network of roadside managers from around the country, to facilitate ongoing research and discussion of best management practices. He currently acts as Research Coordinator for the Transportation Research Board's Standing Committee on Roadside Maintenance Operations, and also served as president of the National Roadside Vegetation Management Association in 2003.

Presenter: Thomas Woolf

“Montana’s Aquatic Invasive Species Program: Show us your Mussels”

Aquatic Invasive Species Bureau Chief, Montana Fish Wildlife and Parks

Thomas.woolf@mt.gov, 406-444-1230, Helena, MT

Abstract

Invasive mussels were detected in Montana in late 2016 resulting in a rapid expansion of the state’s AIS program. The issue captured the interest of politicians and the public throughout the west and resulted in significant increases federal and state funding. Two years following the detection, the program in Montana has begun to stabilize and no new evidence of mussels has been found. Maintaining interest and support for the issue will be critical for sustaining the AIS effort.

Speaker Bio

Thomas Woolf has worked on aquatic invasive species issues for nearly twenty years, most recently with the Idaho State Department of Agriculture developing and implementing Idaho’s AIS program. In 2017 he started as the AIS Bureau Chief for Montana Fish Wildlife and Parks and currently manages the state’s aquatic invasive species program.

Weed Wrangle Short Talks

Presenter: Cayce McAlister

Garden Club of America

“Organizing a Weed Wrangle in your State”

Poster Presentations