

Innovations in Invasive Species Management Conference

December 4-5th, 2024

The Gaylord Opryland Hotel and Convention Center

Nashville, Tennessee

www.invasivesfree.org/conference



Innovations in Invasive Species Management Conference 2024 Agenda

December 4th, 2024
Opryland Hotel and Convention Center
Bayou CD Ballroom

7:00am – 8:00am	Registration
8:00am – 8:05am	Presenter: Steven Manning <i>Welcome</i>
8:05am – 9:00 am	Keynote: Giovanni Polverino Assistant Professor at The University of Tuscia (Italy) Research Fellow at Monash University (Australia) & University of Western Australia <i>Bioinspired robotic predators to control an invasive fish species</i>
9:00am – 9:45am	Presenter: Jonas Schoelynck ECOSPHERE Research Group, University of Antwerp, Belgium <i>Invasion of the Chinese mitten crab: how bad is it and what can be done to stop them?</i>
9:45am – 10:00am	BREAK

10:00am - 10:45am	<p>Presenter: Bernd Blossey Professor, Department of Natural Resources and the Environment, Cornell University</p> <p><i>Looking forward by looking back: improving success in invasive species management</i></p>
10:45am - 11:30am	<p>Presenter: Dan Tompkins Project Manager: Science Strategy, Predator Free 2050</p> <p><i>New tools for invasive mammal eradication</i></p>
11:30am - 12:15pm	<p>Presenter: Richard Hall Director - Intrepid Solutions</p> <p><i>South Georgia Island - The Greatest Success: The world's largest rodent eradication</i></p>
12:15pm - 1:15pm	<p style="text-align: center;">LUNCH Bayou E Ballroom</p> <p>Caesar Salad with House Made Caesar Dressing, potato salad with bacon, Hamburgers and hot dogs with sliced cheese, lettuce, ketchup, mayo, mustard, fudge brownies, unsweet Iced tea, fresh brewed coffee and assorted hot tea. We will also have vegetarian and gluten free options available upon request.</p>
1:15pm - 2:00pm	<p>Keynote Presenter: Dr. Colin Lawton Head of Zoology, School of Natural Sciences, University of Galway, Ireland</p> <p><i>Game of Cones - grey squirrels and other invasive mammal species in Ireland</i></p>
2:00 - 2:30pm	<p>Presenter: Nicole Olmstead Planning and Conservation Manager, Navy Region Hawaii, JBPHH, Oahu</p> <p><i>Aquatic Invasive Species- the Rise of the Octocoral</i></p>
2:30pm - 3:15pm	<p>Presenter: Marcela Uliano da Silva, PhD Senior Bioinformatician - Wellcome Sanger Institute, Cambridge UK</p> <p><i>What genomics can (and cannot) do for the understanding and management of invasive species</i></p>
3:15 pm to 3:30pm	BREAK

3:30pm - 4:15pm	<p>Presenter: Nini van der Merwe Director - Intrepid Solutions</p> <p><i>We need to talk about Failure: Gough Island, a case study</i></p>
4:15pm-4:45pm	<p>Presenter: Patricia Greenberg Program Manager, Invasive Plant Management Program, FCPA</p> <p>Presenter: John Burke Branch Manager, Natural Resources Branch, FCPA Fairfax County Park Authority, Fairfax County, Virginia</p> <p><i>Bamboo Management Prioritization and Considerations - No Bamboo Left Behind</i></p>
4:45pm - 5:15pm	<p>Presenter: Jessica Spencer Invasive Species Biologist US Army Corps of Engineers</p> <p><i>Early Detection and Rapid Response to Giant Salvinia (<i>Salvinia molesta</i>) in the St. Johns River Basin</i></p>

5:30pm-6:30pm	<p>Opening night reception Located in the Delta Pavilion Hors d'oeuvres will be served and a cash bar available</p>
7:30pm - 8:30pm	<p>Evening Presentation located in Bayou CD</p> <p>Dwayne Estes Co-Founder & Executive Director Southeastern Grasslands Institute (SGI) & Center of Excellence for Field Biology</p> <p><i>The Prairie Preacher: Preserving Appalachia's Grasslands</i> Join us for an informal evening session with our special guest Dr Dwayne Estes, Co-Founder and Executive Director of the Southeastern Grasslands Institute and the Center for Excellence for Field Biology. Dr Estes will share a spot recently aired on PBS called Prairie Preacher, followed by open discussion.</p>

December 5th, 2024

Indoor Session 8:00am-12:00pm
Outdoor Session at the Warner Parks 12:00-4:45
Bayou CD Ballroom

8:00am - 8:15am	Presenter: Michael Ielmini National Invasive Species Program Manager, U.S. Forest Service Headquarters, Washington, D.C. <i>Wild Spotter Invasive Species Ambassador Training and Invasives Free USA</i>
8:15am - 8:45 am	Chuck Bargeron Director Center for Invasive Species and Ecosystem Health Warnell School of Forestry and Natural Resources University of Georgia <i>Connecting the Dots: Bugwood and EDDMapS Resources for Invasive Species Management</i>
8:45am-9:30am	Keynote Speaker: Stephen Enloe Professor and Extension Specialist UF/IFAS Center for Aquatic and Invasive Plants Department of Agronomy University of Florida <i>Perspectives on weed science, entomology, and biological control: Coming together for a common cause</i>
9:30am - 9:50am	Presenter: Katy Kilbourne Forest Health Specialist TN Dept of Forestry <i>Establishing a Weed Free Program in Tennessee</i>
9:50am - 10:05am	Break
10:05am-10:25am	Presenter: Dawn Slack Project Manager/Coordinator for the Indiana Invasives Initiative <i>Shifting Gears for Conservation: Empowering Private Landowners for Effective Habitat Management.</i>

10:25am - 10:50am	Presenter: Ana Manning Student, Lipscomb University <i>Hot water treatment methods on shallow rooted invasive herbaceous and forb species in temperate deciduous forests</i>		
10:50am - 11:15am	Presenter: Gino Graziano Invasive Plants Instructor University of Alaska Fairbanks, Institute of Agriculture Natural Resources and Extension <i>Understanding and managing aminopyralid persistence in the environment</i>		
11:15am - 11:35am	Presenter: Matt Mahler Mahler Enterprises LLC <i>Spot treatment and detection of invasive species via Remote aircraft</i>		
11:35am - 12:00 pm	Presenter: Scott Pratt President PMG Vegetation <i>Large Scale Treatments of Phragmites (<i>Phragmites australis</i>) in Wetlands Associated with the Great Salt Lake</i>		
12:00pm	Depart for Warner Parks (Bus Transportation Provided) Meet at the Delta Portico		
	Invasive Free at the WP Sheep Grazing, Backpack Applications, Hot Water Treatments, Volunteers		
12:30pm	Catered Home Cooked Meal by Swett's at the Hill Forest		
1:30pm - 4:00pm	Heatweed Station	Foamstream Station	Flaming Station
	Stump Stopper	Uprooter/Weed Wrench	RTV Sprayers
	Mulching Machines	Mechanical station	Green Shoots
	ATV Sprayers	Drone Spraying Demo	Mapping with Drones
	Grassland Restoration		
4:00pm - 4:45pm	Return to Opryland Resort Hotel		

5:00 pm to 6:00 pm

**Closing reception located at the Delta Pavilion
Hors d'oeuvres will be served and a cash bar available**

Speaker Abstracts and Biographies
(In alphabetical order by last name)

Presenter: Charles T Bargeron

Title: Director

Affiliation: Center for Invasive Species and Ecosystem Health, University of Georgia

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Presentation Title

“Connecting the Dots: Bugwood and EDDMapS Resources for Invasive Species Management”

Abstract

The Center for Invasive Species and Ecosystem Health (Bugwood) at the University of Georgia has spent the last 3 decades working with partners worldwide to create tools and make resources available for all areas of the invasive species and pest fields. Creating new tools, such as Bugwood Connect for creating partner networks, and updating long-term programs, like the Bugwood Image Database, has allowed people involved in the invasive species field to do their jobs more effectively. Collaborations with many different partners allows Bugwood to provide trusted resources through the various content systems, such as the slide-sharing database Bugwood Presents and the Regional IPM Centers Resource Database. Reporting invasive species is an essential part of management, and Bugwood has created tools for everyone, from the public in Wild Spotter and EDDMapS, to professionals with EDDMapS Pro, to participate in mapping. All these tools and more can be used by anyone in education, management, outreach, and more to augment their programs.

Speaker Biography

Chuck is the Director of the Center for Invasive Species & Ecosystem Health at the University of Georgia. Chuck has been with UGA for 25 years, during which time his work has focused on invasive species and information technology. He is the former Chair of the National Invasive Species Advisory Council and former President of the NAISMA. Chuck has been an invited speaker at over 350 regional and national conferences and co-authored over 67 journal articles and outreach publications.

Presenter: Bernd Blossey

Title: Professor

Affiliation: Department of Natural Resources and the Environment, Cornell University

Contact Information

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Presentation Title

"Looking forward by looking back: improving success in invasive species management"

Abstract

Long-term success in reducing impacts of introduced species has been elusive despite enormous efforts and money expended by funders, management agencies, and their staff. For the vast majority of control programs we have no evidence that short-term suppression of target introduced species results in ecological recovery. Where evidence has been collected, data suggest that control efforts, such as herbicide application, may worsen the living conditions for the species we wish to protect. Reasons for these problematic outcomes include poorly developed assessment protocols to make sure that the right stressors are being targeted and with the right tools. Furthermore, impatience and activism, lack of integration of control and restoration efforts, problematic funding structures (separating support for control, assessment, and restoration efforts), agency cultures and a continued gulf between academia and those charged with managing lands and waters contribute to poor outcomes. I will review the current state of what we know and what we do not know. A major insight, for example is, that there are no fundamental differences between native and introduced species - origin is not a trait. I will present ideas for a framework using facts not anecdotes and wishful thinking. I will present a roadmap for more enlightened and holistic management where the well-being of species and ecosystems is assessed and prioritized to guide management.

Speaker Biography

Bernd is a Professor at Cornell University directing the Ecology and Management of Invasive Plants Program in the Department of Natural Resources and the Environment. Bernd develops and implements biological weed control programs; among his target plants are purple loosestrife, garlic mustard, water chestnut, Japanese knotweeds and invasive *Phragmites*. An ever increasing focus of his team are impacts of multiple "stressors" including invasive and native plants, earthworms, slugs and deer on a wide range of native organisms. The ultimate aim of this work is to increase the conservation values of all lands through development of best management practices.

Presenter: Stephen F Enloe

Title: Professor and Extension Specialist

Affiliation: Agronomy Department/Center for Aquatic and Invasive Plants

Contact Information

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Presentation Title

“Perspectives on weed science, entomology, and biological control: Coming together for a common cause”

Abstract: Invasive plants comprise one of the greatest threats to natural ecosystems worldwide. Integrated pest management (IPM) concepts are foundational to successful invasive plant management, and the cultural, physical, biological and chemical tools of IPM are widely utilized. However, there has historically been some unease and even discord between the two key disciplines of invasive plant management, namely entomology and weed science. Although the author cannot point back to a singular event, the discord has been maintained through differences in several key areas. These include the philosophy of pest management practices, concepts of weed control, the maturity of the two disciplines, and limited funding for invasive plant IPM research. This discord has greatly hindered the advancement of IPM to the detriment of land managers and considerable gaps still exist in our knowledge of IPM for many invasive plants. This talk will explore these dividing issues and propose common ground that can lead to improved collaboration and science to address the ever-growing threat of invasive plants in natural ecosystems.

Biography: Dr. Enloe is a professor and extension specialist at the IFAS Center for Aquatic and Invasive Plants at the University of Florida. He has been involved with invasive plant research and extension for the past two decades and has worked throughout the western and southeastern United States on developing innovative management strategies for many of the worst invasive tree, shrub, vine, and herbaceous species in the US. Dr. Enloe earned his Ph.D at UC Davis in Plant Biology, a Master's degree in weed science from Colorado State University, and an undergraduate degree in Agronomy from N.C. State.

Presenter: Dwayne Estes PhD

Title: Co-Founder & Executive Director

Affiliation: Southeastern Grasslands Institute (SGI) & Center of Excellence for Field Biology
Clarksville, Tennessee

Contact Information

<https://www.segrasslands.org>

Presentation Title

"The Prairie Preacher: Preserving Appalachia's Grasslands"

Abstract

"The Prairie Preacher" follows Dr. Dwayne Estes, a botanist who earned his nickname for his passionate advocacy of grassland conservation. Once a child who found solace in nature, Estes now dedicates his life to saving America's most endangered ecosystem—Southeastern grasslands. Through the Southeastern Grasslands Institute (SGI), he works tirelessly to protect and restore these vital landscapes. Join us as we watch this PBS special follow by question and answers with Dr Estes

Brief Biography

Dwayne serves as co-founder and executive director at SGI (Clarksville, TN). Since 2016, he and his team have raised almost \$35 million to help conserve and restore southeastern U.S. grasslands. Dwayne's research interests include the flora, ecology, history, biodiversity, and biogeography of the Southeastern U.S. with emphasis on grasslands. He has published 25+ publications and co-authored the Guide to the Vascular Plants of Tennessee published in 2015 by the University of Tennessee Press. He enjoys mentoring his graduate students and working hand-in-hand with a dedicated SGI team. He has been active in building diverse support for Southeastern US grasslands conservation, including bringing together philanthropists, government agencies, non-profits, corporate and small-business partners, Native American tribes, private landowners and ranchers, historians, educators, and citizen scientists.

Presenter: Gino Graziano

Title: Invasive Plants Instructor

Affiliation: UAF, Institute of Agriculture Natural Resources and Extension

Contact Information

gagraziano@alaska.edu

Presentation Title

“Understanding herbicide persistence and non-target impacts from basal bark treatments with picolinic acid herbicides”

Abstract

Persistent herbicides are advantageous for long-term control of problem weeds if the herbicide does not hinder future planting of sensitive species. Aminopyralid and clopyralid are two persistent herbicides that structurally differ by only an amine group. What makes these herbicides persistent in the environment is poorly understood because both herbicides have properties that lead to leaching. We will present a study that measures the herbicides sorption and desorption at acidic soil pH levels relevant to high latitude regions and the pKa point of charge shifts. Basal bark treatments of invasive trees are designed to avoid non-target impacts from drift or overspray onto soil, and should be one option for use of persistent herbicides that are highly effective for control of target species. However, previous work in our lab has found that these herbicides may leak from roots of treated individual trees, and new data will be shown in this presentation of how applicators can manage non-target damage at plot scales.

Speaker Bio

Gino is an Invasive plant specialist with the Institute of Agriculture Natural Resources and Extension at the University of Alaska Fairbanks doing both research and extension outreach. His research has focused on control of various invasive plants, understanding herbicide persistence at high latitudes and how persistence affects non-target impacts and restoration to native vegetation.

Presenter: Patricia Greenberg

Title: Program Manager, Invasive Plant Management Program, FCPA

Presenter: John Burke

Title: Branch Manager, Natural Resources Branch, FCPA

Affiliation: Fairfax County Park Authority, Fairfax County, Virginia

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Fairfax County Park Authority

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Fairfax, VA 22035

Presentation Title

"Bamboo Management Prioritization and Considerations - No Bamboo Left Behind"

Abstract

In 2023, Fairfax County, Virginia, enacted an ordinance mandating landowners to control the spread of running bamboo across property lines. The ordinance presented a challenge and opportunity for Fairfax County Park Authority, the largest landowner in Fairfax County, to prevent the spread of running bamboo from parkland to private property. With over 250 acres of bamboo mapped on parkland, project site selection and prioritization became imperative. We will discuss FCPA's prioritization protocol for bamboo project site selection which accounts for ecological, social, and administrative elements of bamboo management as well as the challenges of managing bamboo on a countywide scale.

Speaker Biographies

John Burke manages the Natural Resources Branch, of Fairfax County Park Authority in Fairfax County, Virginia. John has worked in natural resources management for 15 years, with a focus on aquatics, invasive species management, and regulatory compliance. Recently, John has been working closely with ecologists, landscape architects, and urban foresters in Fairfax County to develop strategies and programs for ecological restoration and invasive plant management on public land.

Patricia Pearl Greenberg is the new Ecologist III/Invasive Plant Management Program Manager for the Park Authority. Recently, Patricia worked as an urban forester with DPWES's Urban Forest Management Division doing education and outreach as the Community and Urban Forest Coordinator. She holds a master's degree from George Mason University in environmental science and policy with a focus on urban forestry and ecological restoration. Her interest in invasive species sparked as an undergraduate in environmental studies at Eckerd College in Florida. Patricia's experience in Peace Corps, Panama increased her passion for sustainable, community-based ecosystem management and protecting the global forest. She is an ISA Certified Arborist, Wildland Firefighter for prescribed burns, and a Certified Pesticide Applicator. She also holds a certificate in

Ecological Restoration from the University of Minnesota. Patricia loves hanging out outdoors with her son and talking to friends and strangers about how to protect the Earth by supporting native species in their yards and living environmentally friendly lives.

Presenter: Dickie Hall

Title: Director

Affiliation: Intrepid Solutions

Contact Information

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Presentation Title

“South Georgia Island - The Greatest Success: The world’s largest rodent eradication.”

Abstract

The eradication of rodents from South Georgia Island by the South Georgia Heritage Trust (SGHT) was, and still is, the largest rodent eradication ever successfully completed. It eradicated 100% of rodents from the entire 865,000 acre island. Eradication of invasive species from islands is very different to the control of species on mainland and continental scale areas. Island ecosystems are some of the most rich and diverse, but also fragile environments in the world. They are home to species found nowhere else in the world outside of their island homes. Dollar for dollar, the eradication of invasives from island ecosystems is one of the best ways to conserve species. This presentation will briefly detail the main events of the SGHT rodent eradication of South Georgia, from planning to success.

Speaker Biography

Dickie is a Director of Intrepid Solutions, a company focused towards supporting remote field projects in challenging environments which he runs with his wife Nini. 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 as Base Commander on several Antarctic and sub-Antarctic bases. 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 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. He then moved on to the Royal Society for the Protection of Birds (RSPB) where he managed the logistics for a mouse eradication on the mid-Atlantic island of Gough. It is on this project that he met his wife, Nini. They are now based in the UK with their cocker spaniel, Juno.

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. Through their company, Intrepid Solutions, Dickie and Nini are focused towards supporting these projects.

Presenter: Michael (Mike) Ielmini

Title: National Invasive Species Program Manager

Affiliation: USDA Forest Service Headquarters

Contact Information

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Presentation Title

“Wild Spotter Invasive Species Ambassador Training and Invasives Free USA”

Abstract

The expansion of the invasive species research and management arena worldwide has helped to address the increasing problem of both aquatic and terrestrial invasive species. However, the invasive battles continue and overall effectiveness has declined under a burdensome and increasingly self-serving bureaucracy at all levels. Few organizations are able to meet new challenges. A lack operational capacity to detect, prevent, control, or eradicate invasive species severely undermines public and private sector environmental protection efforts. Funding sources at all levels are drying up, particularly at the federal levels, and the lack of capacity is still a significant reason why most organizations cannot succeed against the expanding threats. A further drain on resources by those who capitalize on the problem for monetary gain, has emptied public coffers.

The need to address these issues, fill gaps in public buy-in, and refocus work that provides on-the-ground results have led to a nationwide call for a major paradigm shift. The status quo has become stale and ineffective in many places; causing burn-out and backsliding. Invasive species specialists lack the skills and abilities to address the social, economic, and political aspects of the problem, and few programs have strong community engagement components to boost support. Promoting innovative approaches and better citizen science to build support at every level must be prioritized. The Wild.Spotter.Program was established to help fill some of these gaps across the invasive species sector, yet more needs to be done to shift the current paradigm and re-think the approach to managing invasive species. The scientific and management aspects of the invasive species world are fairly strong, but to reach a higher level of effectiveness we need to address the non-biological and social aspects to strengthen programs at a community level.

Through the Wild.Spotter.Invasive.Species.Ambassador training, resource professionals and invasive species managers are empowered with new ideas, innovative tools, and advanced approaches to work with communities and lead the public towards becoming more engaged in the problem. The end-point outcome of this is a paradigm shift away from more bureaucracy and valueless chatter – more about place-based community engagement and less about creating more bureaucracy. Ultimately, we can move the invasive species arena toward a more intelligent and effective design and establish and promote a network of community-based programs that can be networked under the umbrella of the **Invasives Free USA movement**. Join the movement and apply to become enrolled in the next Ambassador Class. Visit <https://invasivesfree.org/ambassadors>

Speaker Biography

Mr. Ielmini is a Wildlife Society Certified Wildlife Biologist with over 42 years of professional natural resources conservation experience at multiple levels, supporting many national and international committees, teams, and coalitions addressing aquatic and terrestrial invasive species, fish and wildlife biodiversity, and natural resource conservation policy within the U.S., and around the world. He has extensive expertise in invasive species ecology and management, wildlife conservation, forest and rangeland management, fish and wildlife subsistence management, conservation law enforcement, community-based capacity building, volunteer coordination and partnership development, environmental policy, and land management planning. He has provided technical and policy assistance to government and non-government organizations across five continents, and supported dozens of conservation programs to build capacity in local communities. Among his many roles, he has held several natural resources research and management positions in State Government, served 15 years with the U.S. Fish and Wildlife Service at multiple levels, coordinated legislative affairs issues (USFWS) and national litigation and appeals issues (USFS), and currently serves as the USDA Forest Service's National Invasive Species Program manager based in the Washington, D.C. headquarters.

Presenter: Katy Kilbourne

Title: Forest Health Specialist

Affiliation: Tennessee Department of Agriculture

Contact Information

Division of Forestry, Ellington Agricultural Center, Nashville, TN 37220, katherine.kilbourne@tn.gov

Presentation Title

“Establishing a Weed Free Program in Tennessee”

Abstract

In 2019, Tennessee Department of Agriculture partnered with the North American Invasive Species Management Association (NAISMA) to develop a weed free product market similar to those seen in the Western parts of the United States. The goal was not only to prevent the spread of invasive species but also open up new markets for Tennessee products so why don't we have any participants?

Speaker Biography

Katy oversees a range of projects aimed at protecting Tennessee's forests and forest products and is a partner with the Tennessee Invasive Plant Council. She works to prevent the spread of invasive species within commerce, assists with implementing the state firewood certification program and quarantine, organizes statewide and national insect, disease and plant surveys, and facilitates stronger collaborations among governmental, non-profit, and private industry to advance common objectives.

Presenter: Colin Lawton

Title: Head of Zoology

Affiliation: School of Natural Sciences, University of Galway, Ireland

Contact Information

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Presentation Title

"Game of Cones – grey squirrels and other invasive mammal species in Ireland"

Abstract

The island of Ireland, like other islands, has been impacted greatly by invasive species. The Eastern grey squirrel (*Sciurus carolinensis*) was deliberately introduced to the forests of Ireland at the beginning of the 20th century. As it spread, it had a devastating impact on the native Eurasian red squirrel (*Sciurus vulgaris*) through competition and disease, and on broadleaved forests and timber-growing enterprises through bark stripping. Successive surveys have mapped the spread of the invasive grey squirrel and shown a corresponding contraction in red squirrel distribution on the island. Various attempts to manage the grey squirrel populations and mitigate the problems they cause met with very limited success. There has been a recent reversal in fortunes of the two squirrel species however, following the recovery of another native mammal species, the pine marten (*Martes martes*). Predator naivety of this arboreal carnivore has led to severe reductions and regional eradication of the grey squirrel, and the subsequent return of the red. Grey squirrels remain in high numbers, however, particularly in large urban areas, and so the threat from this invasive animal continues. In this talk we will review the Irish squirrel story and consider how it informs the management of invasive mammals in Ireland, and further afield. We will also examine the contrasting fates of other invasive mammals that have arrived in Ireland in the last one hundred years, such as coypu (*Myocaster coypus*), muskrat (*Ondatra zibethicus*), greater white toothed shrew (*Crocidura russula*) and American mink (*Neogale vison*).

Speaker Biography

Colin is an Associate Professor and Head of Zoology in the University of Galway, where he teaches on animal ecology and conservation. His research interests include conservation ecology and management of invasive species. Since completing his PhD on the management of invasive grey squirrels in Ireland, he has broadened his focus to include several invasive species and their impacts on native ecosystems. Colin authored the most recent *Ireland Red List – Terrestrial Mammals*, and was co-leader on a horizon scan of potential invasive terrestrial species in Ireland.

Presenter: Matt Mahler

Title: Senior vice president of technology

Affiliation: Cedar Ridge Aviation

Contact Information

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Presentation Title

“Detection and Spot treatment of invasive species via remote aircraft”

Abstract

Abstract: The proliferation of invasive plant species, such as the Prickly Pear Cactus (*Opuntia* spp.) and Red Berry Juniper (*Juniperus pinchotii*), presents significant ecological and economic challenges in West Texas. These species disrupt native ecosystems, reduce biodiversity, and hinder agricultural productivity. Traditional methods of control, including manual removal and widespread chemical spraying, often prove labor-intensive, costly, and environmentally damaging. This presentation explores an innovative approach leveraging remote aircraft, particularly drones, for efficient detection and targeted treatment of these invasive species.

Utilizing advanced drone technology equipped with multi-spectral imaging sensors, we demonstrate the ability to accurately detect and map the distribution of Prickly Pear Cactus and Red Berry Juniper across varied terrains in West Texas. The presentation will detail the process of capturing high-resolution imagery to differentiate invasive plants from native vegetation through spectral analysis. Further, the implementation of precision spot-spraying techniques is discussed, illustrating how drones are used to apply herbicides directly to targeted plants with minimal collateral impact on the surrounding ecosystem

Speaker Biography

Matt Mahler is the Senior Vice President of Technology at Cedar Ridge Aviation, where he leads pioneering efforts in utilizing drone technology for environmental and agricultural applications. With over 10 years of experience intersecting aviation and environmental science, Matt has been instrumental in developing innovative strategies to address ecological challenges through advanced aerial solutions.

Matt's extensive work with government agencies along the southern border with Mexico underscores his commitment to invasive species management. He has collaborated closely with federal and state entities to combat the spread of the invasive Carrizo Cane (*Arundo donax*), a species known for its detrimental impact on native ecosystems and local economies. Through these collaborations, Matt has successfully implemented drone technology to map, monitor, and mitigate the proliferation of Carrizo Cane, significantly improving the efficiency and effectiveness of eradication efforts.

Presenter: Steven T Manning1, Ana E Manning 2

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2 Student, Lipscomb University, Nashville, TN 37215, ana@ipc.earth

Presentation Title

"Hot water treatment methods on shallow rooted invasive herbaceous species in temperate deciduous forests"

Abstract

The changing landscape of invasive plant management requires industry professionals to consider new technologies when developing their integrated pest management plans. Ms. Manning will discuss ongoing research being conducted with the Heatweed Hot Water Treatment tool. Ms. Manning has developed multiple research plots to test this treatment method on Microstegium vimineum and Vinca minor in the 3,000-acre Warner Parks located in Nashville, TN. Initial results show that Heatweeds® method provides a stable, consistent result on the weeds with active temperature regulation, which secures highly accurate water temperature.

Speaker Biography

Ana E Manning is a freshman at Lipscomb University located in Nashville Tennessee. Ms. Manning received the Myra Jackson Blair scholarship at the Blair School of Music at Vanderbilt University in 2023-2024. She is currently majoring in Biology, Piano and classical voice. Ms. Manning has spent the past 1.5 years researching the effectiveness of hot water treatment methods on shallow rooted invasive herbaceous and forb species in temperate deciduous forests.

Presenter: Nicole Olmsted

Title: Planning and Conservation Manager

Affiliation: Navy Region Hawaii, JBPHH, Oahu.

Contact Information

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Title of Presentation

"Aquatic Invasive Species- the Rise of the Octocoral"

Abstract

Aquatic Invasive Species have the potential to wreak havoc on native marine ecosystems. One species of particular concern is an octocoral called *Unomia stolonifera*. It is spreading in Pearl Harbor and must be stopped before it takes over the coral reefs in Hawaii. Upon its initial identification the Navy notified multiple agencies which later turned into a team, Hawaii Invasive Octocorals Working Group, dedicated to inform eradication efforts. A contract was awarded to include a pilot effort to remove these invasive octocorals as well as a Navy led effort to experiment with their mortality ex situ. In the lab, the Navy assessed mortality by desiccation and inundation to freshwater (separately) at various time intervals. Methods include manual removal and two different attempts to smother the octocorals. One method uses large tarps and sandbags, creating a lethal anoxic environment the other involves wrapping wharf pilings with industrial pallet wrap and tape. The removal efforts are concurrent with an outreach campaign that have not only reached the highest levels of Navy leadership, but non-military partnerships with local museums, universities and natural resources agencies. With the lab mortality trials, the results will advise Navy operators best management practices to avoid further spreading this species. Knowing what methods are successful and feasible is a crucial first step to controlling this invasive species and avoiding a much larger and more expensive issue. This presentation will discuss the initial results of the lab trials and removal efforts, highlight the successful partnerships that have been built with the active-duty units to support this effort, and funding.

Speaker Biography

Nicole Olmsted serves as Navy Region Hawaii's Planning and Conservation Manager. She leverages over 17 years of experience in invasive species management to help develop eradication strategies targeting aquatic invasive species in Pearl Harbor. Her dedication to island ecosystem conservation stems from her upbringing near the Channel Islands in southern California and residing on Guam and Oahu for the past decade.

Presenter: Giovanni Polverino, PhD

Title: Assistant Professor at The University of Tuscia (Italy)

Affiliation: Research Fellow at Monash University (Australia) & University of Western Australia (Australia)

Title of Presentation

Bioinspired robotic predators to control an invasive fish species

Abstract

Invasive species are a serious environmental problem, disrupting ecological communities, driving population declines and species extinctions, and costing billions of dollars every year. A major threat to freshwater biodiversity worldwide is the mosquitofish (*Gambusia holbrooki* and *affinis*), which is listed by the IUCN as one of the world's top one hundred worst invasive species. Yet attempts to eradicate mosquitofish from freshwater ecosystems have been largely unsuccessful, and remain an urgent environmental challenge.

In the last few decades, new technologies have brought promising tools to tackle until-now intractable invasions. An under-appreciated approach for controlling the invasive mosquitofish is to manipulate its behaviour. We know that behaviour plays a critical role during the invasion process, since behaviour determines the rate of spread, long-term survival and individual growth, and fitness outcomes, as well as severity of impact on native animals. What we do not know is whether and how the behaviour of mosquitofish can be artificially manipulated to mitigate its ecological success.

Recent studies underscore the extraordinary opportunity of using robots inspired by live predators to control the behaviour of invasive species and pests. In fact, state-of-the-art robots can mimic specific characteristics of live fish, infiltrate social groups, and interact with live animals in real time. Our research has contributed to the growth of this field, revealing that bioinspired robotic fish can be designed to selectively repel invasive mosquitofish – with detrimental physiological and fitness impacts that persist in the long term – and simultaneously benefit native species. Evidence from our most recent work show that bioinspired robots can selectively alter the behaviour, survival, and reproduction of mosquitofish, and mitigate their impact on the ecological communities they inhabit. Our ongoing work pioneers the use of bioinspired robotic predators to build a detailed profile of the developmental, ecological, and evolutionary vulnerabilities of the invasive mosquitofish, to translate this knowledge into the natural environment for future applications at a larger scale.

Speaker Biography

Gio is a first-generation university graduate. His expertise lies in behavioural ecology, evolutionary biology, ecotoxicology, and ethorobotics — using bioinspired robots to study animal behaviour. He has published 45 peer-reviewed articles, two preprints, one book review, and co-authored a IUCN

note for the EU commission on the management measures for controlling invasive *Gambusia* spp. His research appears in top-ranking international journals, including *Nature* (x 2) and his work has been reported widely in the popular press. Gio has built an international network of collaborators while working in Italy, the US, Germany, and Australia, receiving seven awards for his scholastic achievements. He is actively engaged in the supervision of junior researchers across multiple countries and teaches two courses for Bachelor and Master students at The University of Tuscia (Conservation Biology & Ecology of Nutrition and Ecotoxicology).

Presenter: Scott Pratt

Title: Owner

Affiliation: PMG Vegetation

Contact Information

scott@pmgvegetation.com, 435-760-2222, 121 E 11600 N, Richmond, UT 84333

Presentation Title

“Large Scale Treatments of Phragmites (*Phragmites australis*) in Wetlands Associated with the Great Salt Lake”

Abstract

The Great Salt Lake located is an important ecological feature in the Western United States. The 360,000 acres of wetlands associated with the lake are being invaded by Phragmites (*Phragmites australis*). Large-scale vegetation treatments of more than 14,000 acres per year are currently underway. This presentation shares management strategies, technology, and equipment successfully being used to manage this invasive species and restore native plant communities.

Speaker Biography

Scott Pratt is the president of PMG Vegetation. His team has been managing invasive species in western wetlands for over 20 years. They have partnered with non-governmental organizations, local, state and federal governments, hydroelectric companies, and private hunting clubs to restore wetlands in a wide range of scales.

Presenter: Jonas Schoelynck

Affiliation: ECOSPHERE Research Group, University of Antwerp, Belgium

Contact Information

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Telephone: 0032 3 265 22 52

Address: Universiteitsplein 1, 2610 Wilrijk, Belgium

Presentation Title

"Invasion of the Chinese mitten crab: how bad is it and what can be done to stop them?"

Abstract

The impact of the alien invasive Chinese mitten crab (*Eriocheir sinensis*, H. Milne-Edwards 1853) on aquatic ecosystems is a global concern. In Belgium high densities occur and the crabs have been implicated in the degradation of river ecosystems, particularly contributing to the loss of aquatic vegetation. Management measures were lacking because of the high cost and low efficacy of traditional catch methods like fyke nets. Now the tide has turned, with a new cost-effective and efficient crab trap that has been specifically designed to catch migrating Chinese mitten crabs.

In 2018 the first trap was strategically installed in Belgium on a fish passage in a lowland river (Kleine Nete River). Over the course of the past six years, the trap exceeded expectations, yielding remarkable catch numbers. In total, approximately two million Chinese mitten crabs were caught, with at its peak 700.000 crabs caught in one year. The trap is especially useful to catch juvenile mitten crabs that migrate upstream to freshwater habitats each spring. By intercepting these young crabs before they reach critical upstream areas, the trap greatly reduces their numbers and their impact in these areas. Additionally, the data obtained from the trap provides valuable insights into the population dynamics and ecology of the species.

Thanks to the promising results of this first trap, three more traps have been installed on various locations in Belgium to protect valuable freshwater habitats. Moreover, the launch of the European Interreg project 'CLANCY' extends this innovative approach to multiple European countries including Germany, France and Sweden.

This presentation gives an overview of how the species has come to spread in Europe, of their ecological and societal impact and of what can be done to reduce their numbers. The presented work is based on the PhD of Heleen Keirsebelik and several projects executed for the Flemish Environment Agency.

Speaker Biography

Jonas Schoelynck hold a PhD degree in Science from the University of Antwerp (2011) and was appointed Tenure Track Professor at the same university in 2020. He is leading the research group ECOSPHERE and is chair of the Erasmus Mundus Joint Master in Applied Ecohydrology (MAEH). He studies the interaction of plants and animals with biogeochemical and biogeomorphological processes

in aquatic ecosystems (lakes, rivers and wetlands). Most of his research is done in Belgium, the Netherlands and Poland, but he has also organized numerous expeditions to rivers and wetlands in Africa to study the role of hippos and papyrus wetlands on the global silicon cycle.

Presenter: Dawn R. Slack

Title: Project Manager/Coordinator

Affiliation: Indiana Invasives Initiative, Southern Indiana Cooperative Invasives Management (SICIM)

Contact Information

dawn@sicim.info, 931 216 8373

Presentation Title

“Shifting Gears for Conservation: Empowering Private Landowners for Effective Habitat Management.”

Abstract

Effective land management requires accountability by those that continually introduce nonnative and invasive species. Since research indicates that about 85% of the woody invasives in natural areas come from landscaped areas, effective land management must address landscape design, the use of nonnatives in landscapes and inspire private landowners to manage invasive species and use native plants. Avoiding the consistent introduction of nonnative and invasive species is the same as only suturing one inch of a twelve-inch laceration. The wound expands, it is likely to fail to heal and the potential for infection and scarring is great. Our job is to bring together experts and novices to empower private landowners for effective habitat management. We work with citizens, foresters, state parks, zoos, landscape/nursery professionals and more. We share information and provide tools so citizens can be part of the solution for healthy lands, waters, and wildlife. Over the past seven years we have written management plans or helped with the management of over 45,000 acres in Indiana and met with over 1,550 landowners. We have conducted over 1,330 outreach events and host an average of 165 Weed Wrangles a year. We partner to find money for private lands management outside of USDA funding and create local CISMAs for lasting work. This presentation will show some of our funding mechanisms and how we are providing \$252,000 to private landowners for invasive species management and providing funding to CISMAs.

Speaker Biography

Dawn Slack has been studying our natural resources for over 30 years as a botanist and biologist. She has worked for our military and state governments, as well as for profit and not for profit entities. Her work and military lifestyle has led her coast to coast in the U.S. and to Europe where she has been blessed to study and manage natural resources with many. She resides in Milton, Indiana where she works to share biological research and build local and effective collaboration for ecosystems.

Presenter: Jessica Spencer

Title: Invasive Species Biologist

Affiliation: U.S. Army Corps of Engineers

Contact Information

Jessica.e.spencer@usace.army.mil, 904-318-9110, 701 San Marco Blvd., Jacksonville, FL 32207

Presentation Title

“Early Detection and Rapid Response to Giant Salvinia (*Salvinia molesta*) in the St. Johns River Basin”

Abstract

Giant salvinia (*Salvinia molesta*, a federally listed noxious weed) was identified in a City of Jacksonville stormwater pond in fall of 2023. This population was over 150 miles from the closest known report of giant salvinia and the first located in the St. Johns River basin. Within days of the report, an EDRR response was triggered that included cooperative efforts between local, state and federal agencies. This presentation will describe how that response came together and the steps that were taken to assess, contain and control the population. It has been over a year since the last treatment and no additional plants have been detected. Monitoring of surrounding areas will continue until we are confident in declaring the population eradicated.

Speaker Biography

Jessica Spencer is an invasive species biologist who has worked for the Invasive Species Management Branch of the U.S. Army Corps of Engineers for over 15 years. She is also the co-chair of the First Coast Invasive Working Group and a member of the steering committee for the Everglades Cooperative Invasive Species Management Area. She has been the lead for an Early Detection Rapid Response (EDRR) effort with salt cedar in Northeast Florida and is now leading EDRR for giant salvinia in Jacksonville.

Presenter: Dan Tompkins

Title: Science Director

Affiliation: Predator Free 2050 Limited

Contact Information

PO Box 106040, Auckland 1143, New Zealand; dant@pf2050.co.nz

Presentation Title

New tools for invasive mammal eradication

Abstract

Predator Free 2050 – New Zealand’s mission to eradicate invasive possums, rats and mustelids impacting native biodiversity from the whole country - was launched in 2016 knowing that we do not yet have all of the tools and approaches that we need to get the job done in an affordable way. Here I present on the new tools made available to date (or soon to be available) that are helping drive achievement of the Predator Free 2050 mission, many of which have application for control of the same species in other countries, or invasive species management in general.

These new tools span improved toxins (including species selectivity), more efficient monitoring (including thermal and A.I.), more effective trapping and control (including self-resetting), better lures (supporting long-term device deployment), and more effective device communications.

While the efficiency and effectiveness of these tools and the technologies that they employ will further improve through refinement and best practice development, more cost-effective tools and approaches will be needed for meeting the challenge of eradication from the whole country.

I thus finish the presentation by outlining some of the new technologies that we are pursuing that, if successfully developed, may underpin the next generation of tools for scaling up pest eradication.

Speaker Biography

Dan is the Science Director at Predator Free 2050 Limited, with a current focus on science strategy and conservation outcomes. Past research includes understanding mammal community dynamics; demonstrating the efficacy of vaccination against TB in wildlife; exploring novel high-tech approaches to pest control; and showing how shared diseases contribute to native species declines.

Presenter: Prof Marcela Uliano da Silva

Title: 1. Senior Bioinformatician; 2. Associate Professor of Bioinformatics, Faculty of Biosciences and Aquaculture

Affiliation: 1. Tree of Life, Wellcome Sanger Institute, Cambridge, UK; 2. Nord University, Norway

Contact Information

mu2@sanger.ac.uk

Presentation Title

"What Genomics Can (and Cannot) Do for the Understanding and Management of Invasive Species"

Abstract

Genomics has become increasingly popular across biology, as the latest methods now produce high-quality genomes at reduced costs. In invasion biology, molecular markers are powerful tools for understanding and effectively managing invasive species. While reduced representation sequencing often provides sufficient guidance for management strategies, whole genome resequencing can add significant resolution to analyses, especially when the invasion history is complex or not well understood. In addition, reference genomes are essential when developing molecular control strategies, as they enable comprehensive assessments of the species' molecular profile, along with potential off-target effects and other safety considerations. In this talk I'll present the application of genomics to the study of the invasive golden mussel *Limnoperna fortunei* and sun corals (*Tubastrea*) in Brazil. In addition, I'll present the Darwin Tree of Life Project that is producing high-quality genomes for thousands of eukaryotes across Britain and Ireland, and how this resource can further advance the understanding of invasive biology.

Speaker Biography

Marcela is a senior bioinformatician at the Tree of Life at the Wellcome Sanger Institute in the UK and an Associate Professor of Bioinformatics at Nord University. She studies whole genome architecture and composition across the Tree of Life in the context of genome evolution, species adaptation, conservation and invasive biology. Marcela also develops bioinformatics pipelines to yield high-quality genome assemblies. She is a co-chair of the Justice, Equity, Diversity and Inclusion Committee of the Earth Biogenome Project.

Presenter: Nini van der Merwe

Title: Director

Affiliation: Intrepid Solutions

Contact Information

ninivdmerwe@gmail.com; 7 Beechside, Staindrop, Darlington, DL23PE, United Kingdom

Presentation Title

"We need to talk about failure: Gough Island, a case study"

Abstract

Invasive Species Eradication is complex and costly and can be years in the planning. Invasive Species Eradication on small islands in the middle of the South Atlantic Ocean, even more so! The Royal Society for the Protection of Birds spent over a decade and close to \$12million to eradicate invasive house mice from Gough Island, part of the Tristan da Cunha Island group. Despite meticulous planning and an incredibly dedicated team – less than 6 months after the final bait was dropped, mice were detected on the island. Project failure. What can be learned from this project, and how can we do better to ensure success going forward? Nini will discuss both insights into the external project review, as well as her personal experience of this failure.

Speaker Biography

Originally from the Western Cape in South Africa, Nini grew up with a great love for and appreciation of the natural environment. After finishing University, she lived abroad, and travelled extensively. Experience and knowledge gained during this time, saw her returning home entirely unsure of how, but convinced that she somehow wanted to dedicate herself to environmental conservation.

She started out with BirdLife South Africa as part of their Marine team, working on various fisheries and seabird bycatch projects. This led her to providing support to the Royal Society for the Protection of Birds' (RSPB) Gough Island Restoration Programme. It was on this project that she met her now husband, Dickie Hall. After the programme ran its course, the two relocated to the UK, and started their company: Intrepid Solutions. Their expertise lies in providing project and logistical support for remote location endeavours, with a focus on environmental and heritage conservation.

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The Center for Invasive Species and Ecosystem Health is a University of Georgia Extension and Outreach Center housed in both the **College of Agriculture and Environmental Sciences** and the **Warnell School of Forestry and Natural Resources**.

WHAT WE DO

The Center supports the advancement of invasive species management, forest health and integrated pest management through technological developments, program implementation, training, applied research, and public education at the state, regional, national, and international levels.

Products and services include:

- Websites Development & Hosting
- Smartphone Apps
- Content Management Systems
- Speaking Engagements
- Publications
- Data Management
- Product Maintenance
- Outreach & Events
- Technical Support

2023 IMPACT

116

WEBSITES

5 New
17 Modified
+14 in Development



45

SMARTPHONE APPS

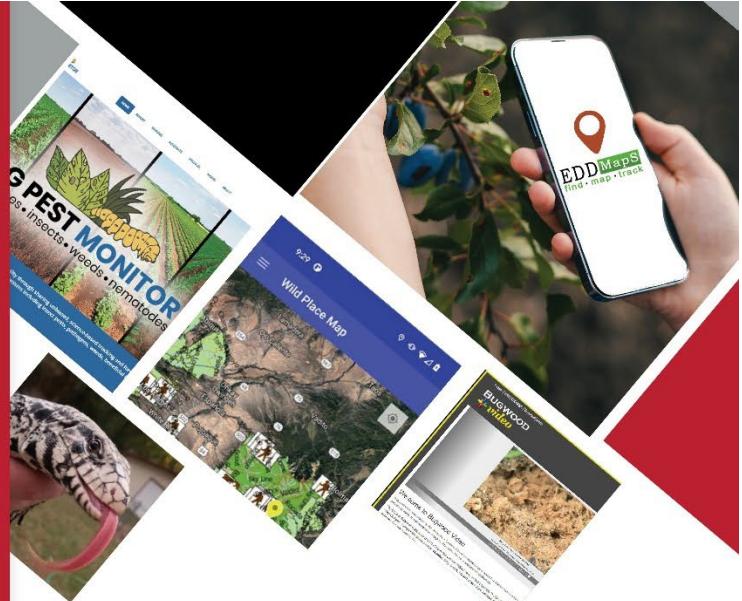
2 New
23 Modified



22

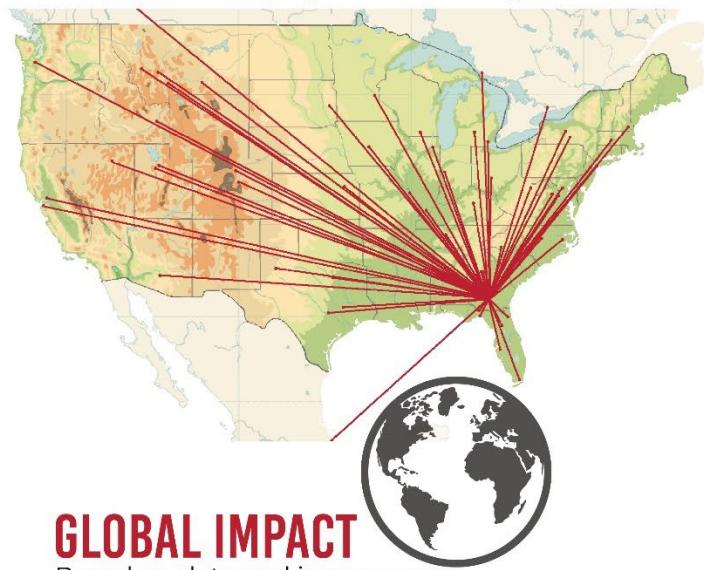
PUBLICATIONS

19 Guides
2 Book Chapters
1 Journal Article



PARTNERS

Scope of funded project in the last 5 years.



GLOBAL IMPACT

Based on data and image usage.

120 OUTREACH PRESENTATIONS

Invasive Species Detection,
Distribution, Public Awareness and Policy



4

EVENTS ORGANIZED

One-Day Virtual EDDMaps Summit
2 In-Person, Full-Day First Detector Workshops
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2-Day Strategic Planning for EDDMapS

246

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