Apostle Islands 50th Anniversary Resource Stewardship Symposium

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Apostle Islands National Lakeshore 50th Anniversary Resource Stewardship Symposium Final Agenda

March 30-31, 2021 Day 1 - March 30

Time	Presentation Title	Presenter(s)
9:30-9:50	Welcome	Lynne Dominy, Superintendent, Apostle Islands NL and Alan Brew, Director, Sigurd Olson Environmental Institute
9:50-10:25	A Retrospective - Research and Resource Management at Apostle Islands NL	Julie Van Stappen, Apostle Islands NL
10:25-11:00	Fifty Years of Cultural Resource Research at Apostle Islands NL	Dave Cooper, Apostle Islands NL
11:00-11:10	Break	
11:10-11:35	Human presence on the Landscape: 50 years of Archeology at the Apostle Islands	Dawn Bringelson, Midwest Archeological Center
11:35-12:15	Traditional Ecological Knowledge	Dylan Jennings, Great Lakes Indian Fish and Wildlife Commission
12:15-1:00	Lunch	
1:00-1:35	Apostle Islands Flora	Sarah Johnson, Northland College
1:35-2:25	Past, Present and Future of Fire in the Apostle Islands	Kurt Kipfmueller, University of Minnesota and Damon Panek, Apostle Islands NL
2:25-2:50	Our changing lake: emerging water resource issues in the Apostle Islands	Brenda Lafrancois, National Park Service
2:50-3:00	Break	
3:00-3:25	The Earth is not flat - and neither is the Lake! Underwater landscapes of the Apostle Islands	Jay Glase, National Park Service
3:25-3:50	Past, Present and Future of Fisheries Management in the Apostle Islands	Brad Ray, Wisconsin Department of Natural Resources
3:50-4:00	Logistics and housekeeping	Kyleleen Cullen, Apostle Islands NL
7:00-7:45	Gaylord Nelson: Mover, Shaker, Deal-Maker	Bob Mackreth, NPS, Apostle Islands NL (retired)

Day 2, March 31

Time	Presentation Title	Presenter(s)
9:30-9:35	Logistics and housekeeping	Kyleleen Cullen, Apostle Islands NL
9:35-10:00	A Singing Wilderness: Songbirds of the Apostle Islands	Ted Gostomski, NPS Great Lakes Inventory and Monitoring Network
10:00-10:25	Past, Present, and Future of Piping Plovers in the Apostle Islands	Sumner Matteson, Wisconsin Department of Natural Resources
10:25-10:50	Amphibians of the Apostle Islands	Gary Casper, Great Lakes Ecological Services
10:50-11:00	Break	
11:00-11:25	New insights into the dynamics of Apostle Islands carnivore communities	Tim Vandeelen and Morgan Farmer (presenter), Department of Forest and Wildlife Ecology, University of Wisconsin - Madison
11:25-11:50	Longitudinal Trends and Ecology of the small mammal community of the Apostle Islands NL	Erik Olson, Northland College
11:50-12:15	Are the Apostle Islands a refugia for a recently re- colonized forest carnivore? American martens on the Apostle Islands	Matt Smith, Department of Forest and Wildlife Ecology, University of Wisconsin - Madison
12:15-1:00	Lunch	
1:00-1:45	Not-so-Great Expectations: A vulnerability assessment for terrestrial ecosystems in Apostle Islands National Lakeshore	Stephen Handler, Northern Insti- tute of Applied Climate Science and Peggy Burkman, Apostle Islands NL
1:45-2:30	Resiliency and Vulnerability of Apostle Islands Coastal Wetlands	Sarah Johnson and Matt Cooper, Northland College
2:30-2:40	Break	
2:40-3:05	Through the Eyes of 4th Graders	Steve Ballou, Apostle Islands NL
3:05-3:40	Under the Surface and Zaaga'igan Ma'iinganag (Lakewolves): Creating immersive life-long and life-saving connections between teens and Apostle Islands National Lakeshore	Ian Karl, Northwest Passage Ltd. and Toben Lafrancois, Northland College and Northwest Passage Ltd.
3:40-4:00	Symposium Wrap-up	Lynne Dominy, Superintendent, Apostle Islands NL

Biographies and Abstracts

Welcome and Introduction

-Lynne Dominy, Superintendent, Apostle Islands National Lakeshore and Alan Brew, Sigurd Olson Environmental Institute Executive Director, Northland College

Presenters' Biographies

Lynne became the superintendent of Apostle Islands National Lakeshore in Wisconsin, on the southern shore of Lake Superior in 2019. As a steward of this great lakes landscape, Lynne supports an exceptional team of managers and staff focused on

operating and stewarding this national lakeshore. Her 30 years in the NPS includes various positions held at Acadia NP, Little Bighorn NM, Bandelier NM, Point Reyes NS, Grand Canyon NP, and Carlsbad Caverns NP. Lynne loves working with skilled and passionate NPS teams and park partners to communicate the importance of our sites and to engage communities and visitors in their stewardship. She enjoys creative problemsolving and working with staff to find real solutions to management issues. Lynne cares deeply about Tribal and community relationships and values the importance of creating the next generation of park stewards through youth engagement. Lynne has a deep passion for our nation's water resources- our relationship to them for navigation, survival, recreation, and relaxation. She is an avid kayaker, photographer, and swimmer so she spends as much time as possible in and on the water.



Alan Brew is director of the Sigurd Olson Environmental Institute and an English professor at Northland College. He was introduced to the Apostle Islands twenty years ago while co-leading a nature writing program for high school students that included paddling to Oak and Stockton Islands in a 36-foot birch bark canoe. Paddling among the Islands is now an integral part of his life on the Big Lake.



A Retrospective - Research and Resource Management at Apostle Islands National Lakeshore - Julie Van Stappen, Apostle Islands NL

Abstract

The Apostle Islands are a homeland, a place of adventure, solace and beauty, a fascinating natural laboratory, habitat for diverse plant and animal communities, a refuge for those that are rare, and a place of national significance. Over time there have been many who have worked tirelessly and passionately to learn, understand, and uncover secrets of this "special collection of islands."

During this presentation, I will provide an overview of the history of natural resource management and research at the national lakeshore over the past 5 decades – highlighting changing issues and needs; the collaborative relationship between the park, researchers, and partners; explain how technology has transformed our ability to read the pulse of the resource; share a few stories not told by other presenters; and to say thank you to all who have cared for and will continue to steward our Apostle Islands.

Presenter's Biography

For more than 30 years, Julie has had the great honor to work with dedicated and passionate staff, researchers, and partners in the resource management and stewardship of Apostle Islands National Lakeshore. Prior to her current position as Chief of Resource Management, she was the Branch Chief of Natural Resource Management and prior to that, the park's Natural Resource Management Specialist. Her first NPS job was as a seasonal at Glacier National Park. This is where her dream of working for the National Park Service in resource management began. She's also worked at the Pacific-West Region, Olympic National Park, the NPS geologic resource division, and the Midwest Regional Office. She received her MS in Natural Resources from the University of Wisconsin, Stevens Point and BS in geology from the University of Wisconsin, Oshkosh.



Fifty Years of Cultural Resource Research at Apostle Islands -David Cooper, Apostle Islands NL

Abstract

The earliest evidence of human presence on the Apostle Islands dates to approximately 5,000 years ago when seasonal fishers utilized the cluster of islands that we call the Apostles and that the Ojibwe people call the Wenabozho Islands. From these early peoples to the park visitors of today, successive generations have left their imprint on the islands, resulting in a rich tapestry of cultural resources and human experiences. This presentation will look at the Lakeshore's half century of efforts to study, understand, and steward these resources as well as the constant interplay between the island landscape, Lake Superior, and the islands' human inhabitants.

Presenter's Biography

David Cooper is Apostle Islands National Lakeshore's cultural resource manager and archaeologist. He has also served as archaeologist and Chief of Resource Management for Grand Portage National Monument, ten years as State Underwater Archaeologist for the Wisconsin Historical Society, and Underwater Archaeologist for the US Navy. He has done archaeological work across the United States, as well as in Great Britain and the Caribbean. His academic training includes undergraduate work at UW-Madison and University of Warwick (UK), and graduate work at East Carolina University. He has worked for the National Park Service for 22 years and lives in Bayfield, WI.



Human Presence on the Landscape: 50 years of Archeology at the Apostle Islands - Dawn Bringelson, Midwest Archaeological Center

Abstract

Archaeological investigations at the Apostle Islands National Lakeshore started in earnest shortly after the Lakeshore was designated in the early 1970s. Investigations have continued in the intervening years. This talk will share the stories of human use of the islands that archaeological work has illuminated for us thus far. The archaeological record at the Apostles is diverse, including sites related to fishing, logging, farming, and occupation from 5000 years ago to the mid-20th century. The information gained through archaeological excavations helps us appreciate the many ways in which people have shaped the natural environment throughout the past. As we look to the future of the Lakeshore, this knowledge will inform preservation planning and further study for the archaeological treasures of the Apostles.

Presenter's Biography

Dawn worked for the NPS Midwest Archaeological Center from 1998 to 2019 as an Archaeologist, providing support to parks across the region. She has worked closely with Apostle Islands National Lakeshore since 2007, both as a field researcher and

compliance advisor. Her work in the Apostles has been especially valuable to her, highlighting the intersection of natural and cultural resources and the joy of collaborating with park staff on management issues. She moved to the NPS National Historic Landmarks program in 2020 and has recently joined Yosemite National Park's resource management division. She is taking lessons learned in the Apostles with her. Dawn earned degrees in Anthropology from the University of Nebraska-Lincoln and the University of Washington.



Traditional Ecological Knowledge

- Dylan Jennings, Great Lakes Indian Fish and Wildlife Commission

Abstract

Traditional Ecological Knowledge is all around us. In some circuits it's a trending buzzword. What is TEK? How does it relate to scientific knowledge? Traditional knowledge is embedded within the very fabric of our existence as Anishinaabeg. Come learn a little about Ojibwe history in the upper Great Lakes and how these knowledge systems have been both maintained and revitalized to help many tribal nations with environmental relationships and environmental decision-making.

Presenter's Biography

Dylan Bizhikiins Jennings is a member of the marten clan. He graduated from the University of Wisconsin Madison with degrees in Anthropology, Archaeology, Environmental Studies, and American Indian Studies. Jennings is set to complete his Masters degree from the University of Wisconsin Madison Nelson Institute in spring 2021. Jennings is a Bad River Tribal Member and a former Tribal Council Member for the Bad River Band of Lake Superior Ojibwe, where he served two consecutive terms as an elected official. He served as an appointed representative for the EPA region 5 Tribal Operations Committee (RTOC). Currently Dylan resides in Odanah, and works as the Director of Public Information for the Great Lakes Indian Fish & Wildlife Commission. The job requires him to be fluent and up to date with tribal news and issues. He also serves as a writer, photographer and editor for the Mazina'igan newspaper.

Bizhikiins presents at many public engagements and schools throughout the Midwest on topics ranging from: traditional subsistence, sovereignty, tribal environmental

perspective, cultural immersion, Ojibwemowin, Tribal Historic Preservation, food sovereignty, Ojibwe curriculum, and cultural identity. Bizhkiins is also an adjunct instructor at Northland College in the American Indian Studies Department where he teaches Introduction to Ojibwe language and culture. He also serves as an appointed member of the Wisconsin Governor's Task Force on Climate Change. Bizhikiins has been a recent recipient of the National Center for American Indian Enterprise Development "40 under 40" award and a recipient of the UW Madison Nelson Institute Rising Star Alumni award.



Apostle Islands Flora

- Dr. Sarah E. Johnson, Northland College

Abstract

Situated at the transition from northern hardwoods to sub-boreal forest, the Apostle Islands National Lakeshore's vegetation is a signature of both broad-scale physiographic processes and localized coastal and maritime influences. A variety of human uses and stewardship is also key to the natural history and vegetation patterns in the park. Diverse physical landforms and a variety of habitats contribute to the high total plant diversity of 810+ species documented within the Lakeshore. In this talk, I will provide a virtual tour of the predominant or unique plant communities and species in the park, and I'll share insights about some of the changes that have occurred, as well as stories of resilience.

Presenter's Biography

Sarah Johnson is an Associate Professor of Natural Resources, the Sigurd Olson Professor of Natural Sciences, and faculty affiliate with the Mary Griggs Burke Center for Freshwater Innovation at Northland College. Sarah received a PhD in Botany from UW-Madison and has worked in the Great Lakes region or in coastal systems for 20 years, starting with an internship with the Apostle Islands National Lakeshore. She is a plant ecologist who researches vegetation change and teaches field botany, wetlands, and other natural history courses.



Past, Present and Future of Fire in the Apostle Islands (part 1) Tree-Ring-Derived Fire History for Stockton Island's Tombolo

- Kurt Kipfmueller, University of Minnesota

Abstract

We reconstructed fire history from fire-scarred red pine stumps collected on Stockton Island tombolo to better understand the fire history of the landform. The mean interval between historical fires was ~31 years, though there were many short interval fires detected across the tombolo, particularly in the barrens portion of the landform. Widespread fires occurred in 1827, 1854, and 1868 and impacted much of the tombolo forest. Additionally, a fire in 1925 burned much of the tombolo forest and the barrens. The barrens appears to have experienced more frequent, but patchier fires, than the pine forests over the 1800s that may have contributed, in part, to the lower density of current trees. Increment core sampling indicated most red pine trees established following the fires of 1868 or 1925, although there are older trees that predate these fires scattered across the tombolo forest and within the barrens. Fires on the tombolo are contemporaneous with Anishinaabeg use of the landscape and are attributed here to fire maintenance of blueberry habitat. The high frequency of fires in the barrens likely reflects these historical land use practices and is supported by place-based knowledge held within the local Anishinaabeg community.

Presenter's Biography

Kurt Kipfmueller is an Associate Professor of Geography, Environment, and Society at the University of Minnesota-Twin Cities. His research focuses on the reconstruction of forest dynamics and disturbance using tree-ring analysis techniques (dendrochronology). He is particularly interested in developing a better understanding

of the relationships between fire, climate, and people in Great Lakes red pine forests. He received a bachelor's degree in Geography and Earth Science from Central Michigan University, a master's degree in Geography from the University of Wyoming, and a Ph.D. in Geography from the University of Arizona.



Past, Present and Future of Fire in the Apostle Islands (part 2) -Damon Panek, Apostle Islands NL

Abstract

"For generations, Native people in the Great Lakes region utilized prescribed fire to improve habitat, increase blueberry production, and clear the understory of vegetation. These frequent, low-intensity fires promoted fire adapted and dependent ecosystems. The medicines, species abundance and diversity, and foods created are what our Anishinaabe culture is rooted in. Our way of seeing the world was developed here around this lake and with fire," said Damon.

"Damon integrates Ojibwe culture, language, and history into the park's education and interpretation curriculum to provide visitors with a unique way of experiencing the islands," said lakeshore superintendent, Lynne Dominy. "He is also the fire management coordinator for the park and has been able to integrate the traditional cultural practice of landscape burning into the park's priorities. The overall goal of this integration is to restore a cultural practice and connection to the landscape of the islands."

Presenter's Biography

Damon Panek is an enrolled member of the Mississippi Band of White Earth Ojibwe and works as a park ranger for the National Park Service at Apostle Islands National Lakeshore. There, he integrates Native cultural ideas, values, and language into the park's education and interpretation curriculum to give park visitors a unique way to connect with the resources. While serving as the Fire Management Coordinator he spearheaded an effort to reintroduce prescribed fire to an island landscape that Native Americans had managed for centuries. At home, he's usually busy with cultural life ways such as ricing, fishing, sugaring, hunting, lacrosse stick making, and Ojibwe language revitalization efforts. He has amazing kids and grandkids that inspire him everyday.



Our changing lake: emerging water resource issues in the Apostle Islands -Brenda Moraska Lafrancois, National Park Service

Co-authors and contributors (alphabetically): Jon Barge, Harvey Bootsma, Sandra Brovold, Anne Cotter, David VanderMeulen, Joshua Delvaux, Jay Glase, Sarah Grosshuesch, Chelsea Hatzenbuhler, Joel Hoffman, Mark Hove, Toben Lafrancois, Shania Leask, Roselynd Lin, Michael McCartney, Christy Meredith, Elizabeth Minor, Greg Peterson, Sara Okum, Erik Pilgrim, Kaitlin Reinl, Robert Sterner, Anett Trebitz, Benjamin Turschak, and Barry Wiechman

Abstract

Unique among the world's waters, Lake Superior lays an impressive foundation for our collective experience of the Apostle Islands. The lake is big, omnipresent, and seemingly resistant to change. However, a closer look reveals a variety of emerging issues and threats. High lake levels and increasingly intense storms have caused significant coastal erosion and damage to coastal resources. Historic rainfall events have delivered excess nutrients and sediments to the lake, affecting its clarity and interacting with warming water temperatures to cause unprecedented blooms of harmful algae. Discoveries of invasive mussel infestations and microplastics pollution have underscored the lake's susceptibility to more widespread Great Lakes stressors. During the last 50 years, challenges to Great Lakes' health (e.g., species invasions, water quality degradation, water quantity threats, etc.) have been met with a mix of policy improvements and sustained management actions. The emerging water resource threats identified here emphasize Lake Superior's continued vulnerabilities but also present new opportunities for its protection.

Presenter's Biography

Brenda Lafrancois is a regional aquatic ecologist with the National Park Service. Although she works with parks throughout the Midwestern U.S., she is fortunate to be stationed along the shores of Lake Superior. Brenda received her BS in **Biology/Aquatic Sciences from** UW-La Crosse and her PhD in Ecology from Colorado State University. She's been working for the National Park Service since 2002, and lives in greater Cornucopia with her husband, daughter, and dog.

The Earth isn't Flat, and Neither is the Lake

-Jay Glase, National Park Service (NPS) Co-authors: Lara Bender, Brenda Lafrancois, Ted Gostomski, Jamie Hoover, Nathaniel Penrod, Ulf Gafvert

Abstract

In the upper Great Lakes region, the NPS protects diverse coastal environments in Lakes Michigan and Superior. Until recently, very little information existed with respect to the bathymetry, geomorphology, or benthic habitat features of these areas. Since 2010, NPS and partners have developed high resolution benthic habitat maps for six coastal parks in the Great Lakes, using a novel combination of LiDAR, multi-beam sonar, and satellite imagery. In addition to high resolution bathymetry, we collected photo and video imagery to validate substrate and benthic features documented in our mapping efforts. In 2018, we began a pilot project at Apostle Islands using tools such as the Benthic Terrain Modeler to further describe lake floor habitat in several areas of the Apostles. With this work we show features of the underwater landscape with detail previously not shown in bathymetric maps of the area. In pilot study areas, we use these details to further describe specific habitat features in an attempt to estimate areas that may be suitable for invasive dreissenid or native mussels. Our goal is to ultimately use these tools for habitat descriptors of other species or to show habitat quality and suitability in areas where changes may be occurring due to impacts from coastal and upland erosion or other stressors. Importantly, this effort provides new opportunities for the NPS to engage with partner agencies and participate more fully in Great Lakes habitat assessment initiatives and coastal management and restoration efforts.

Presenter's Biography

Jay has been the NPS Midwest regional fishery biologist since 2002. Jay has been stationed

in Ashland since 2011 and before that at Isle Royale headquarters in Houghton, Michigan. Jay works primarily with parks in the upper Great Lakes area but also occasionally works with other Midwest region parks or on national fisheries issues within NPS. Prior to his time at NPS, Jay was with the U.S. Fish and Wildlife Service for 10 years where he worked on salmon and steelhead restoration efforts in Northern California. He's a long-time-ago graduate of Northland College and Humboldt State University and is one of those affected by the Lake Superior bungee effect.

Past, Present, Future of Fisheries Management in The Apostle Islands - Brad Ray, Wisconsin Department of Natural Resources

Abstract:

Fish are an important part of the local culture and fisheries management has faced many challenges over the past 50+ years. Declines in fisheries due to invasive species and over-harvest began in the 1950's and by the formation of the Apostle Island National Lakeshore in 1970 the fish populations were at historic lows. Fisheries management successfully focused on Lake Trout restoration goals thorough cooperative management of all users in Wisconsin waters of Lake Superior. Current management is focused on monitoring and setting safe harvest limits for fisheries through fisheries management activities and has been shown to be successful. However, new challenges are emerging and will direct fisheries management for the future.

Presenter's Biography

Brad Ray is the WDNR Lake Superior Team Supervisor working as part of the team where he started his career as an intern 20 years ago. Originally from Omaha, Nebraska, Brad earned his B.S. from Northland College, where his passion for fisheries began. He continued his education at the University of Minnesota-Duluth with research focused on the spatial and temporal trends in lake trout diets in Lake Superior from 1986-2001.

He later received a Ph.D. from Virginia Tech studying largemouth bass recruitment issues in trophy reservoirs. Prior to his return to the shores of Lake Superior, Brad served as an Associate Professor of Fisheries at the University of Tennessee at Martin.

"Gaylord Nelson: Mover, Shaker, Deal-Maker" -Bob Mackreth, NPS(retired), Apostle Islands NL

Abstract:

Gaylord Nelson, who served both as Senator from Wisconsin and Governor of the state, is often described as "the father of the Apostle Islands National Lakeshore." The characterization is apt, but barely scratches the surface in conveying the difficulties involved in transforming a dream dating to the late nineteenth century to reality in the turbulent 1960s.

During eight years of proposals and counter-proposals, debate, maneuver, and compromise, Nelson faced and overcame obstacles including procedural bottlenecks, local resistance, Native American suspicion, and a National Park Service that often seemed indifferent at best to the idea. As one close observer noted, the creation of the Apostle Islands National Lakeshore "involved the presidential administrations of Kennedy, Johnson, and Nixon, resulted in twelve bills and bill drafts being written and rewritten... and produced thousands of pages of congressional testimony and hearing records."

The phrase "professional politician" has become a common reproach in modern campaign rhetoric, but a reassessment of the term may be in order. Without Gaylord Nelson's unmatched political acumen and years of commitment to public service, the Apostle Islands National Lakeshore would not exist.

Presenter's Biography

Bob Mackreth retired as Cultural Resource Management Specialist at Apostle Islands National Lakeshore in 2005 after a 27-year NPS career. He is currently active as a Executive Board member of the Apostle Islands Historic Preservation Conservancy and the Coalition to Protect America's National Parks.

A Singing Wilderness: Songbirds of the Apostle Islands

-Ted Gostomski, National Park Service, Great Lakes Inventory & Monitoring Network

Abstract

People have been describing bird populations in the Apostle Islands since at least the early 1940s. The first real count of breeding birds occurred in 1977, then the National Park Service began formal monitoring in 1990. There have been slight changes in monitoring methods since that time, but the top three most abundant species have stayed fairly consistent. The most current analyses show the national lakeshore maintains high species diversity and a greater number of increasing species than decreasing ones. These are all good signs, but monitoring helps us keep an ear out for troubling changes in the island soundtrack.

Presenter's Biography

Ted Gostomski coordinates songbird monitoring at nine national park units in Minnesota, Wisconsin, Indiana, and Michigan for the NPS Great Lakes Inventory and Monitoring Network. His involvement with bird surveys in the Apostle Islands began in 1996, and he continues to conduct the survey on the Mainland Trail every year.

Past, Present, and Future of Piping Plovers in the Apostle Islands - Sumner Matteson, Wisconsin Department of Natural Resources

Abstract

Piping plovers were first documented nesting on Long Island in the Apostle Islands in 1974, and one to two pairs continued to nest on Long Island through 1983. Then, after an absence of 15 years that coincided with a regional collapse of the population, a rebound started in 1998, but with no more than one pair recorded nesting in the Apostle Islands most years until 2006. Coinciding with a regional resurgence of the population, breeding numbers in the Apostles began to increase. From 2006 to 2020, three to six pairs of piping plovers have nested in the Apostle Islands, with pairs fanning out to two additional islands as high water levels and severe storms have eroded available breeding habitat on Long Island. Partnerships with tribal, state, and federal officials have been key to monitoring piping plovers in the islands.

Presenter's Biography

Sumner Matteson has worked for the Wisconsin Department of Natural Resources for the past 40 years as a non-game biologist, conservation biologist, and avian ecologist. He wrote the state's recovery plan for the Trumpeter Swan and directed the reintroduction of Trumpeter Swans in the state for 25 years. He has also focused much of his career on the ecology and management colonial waterbirds, including all four of the state's endangered terns. In the Apostle Islands, he has conducted colonial waterbird and shorebird surveys on all the islands (and along the Wisconsin shore of Lake Superior) every 5 years since 1974. During this period, he first discovered Piping Plovers nesting on Long Island and Chequamegon Point (in 1974) and has returned annually to document their occurrence there while observing a small increase in nesting numbers and distribution in the AINL. His talk will focus on the conservation history and future of this beach and dune obligate in the islands.

Amphibians of the Apostle Islands

- Gary Casper, Great Lakes Ecological Services

Abstract

This presentation will review the amphibian diversity and biogeography in the Apostle Islands, and describe the park's acoustic monitoring program. The Apostles support 6 species of salamanders and 7-9 species of frogs. One species (Common Mudpuppy) is restricted to Lake Superior and its river mouths. Amphibian diversity on the islands is influenced by available habitat, island size, and colonization events. Some species like Central Newt and Mink Frog are restricted to islands with lagoons. The distribution of Eastern Red-backed Salamander is particularly interesting in being absent from many islands with suitable habitat. The acoustic monitoring program was established in 2014 and is tracking phenology, occupancy and abundance metrics at 10 sites. So far no significant trends have emerged but Cope's Gray Treefrog and Northern Leopard Frog are the rarest species, and Boreal Chorus Frog remains unconfirmed.

Presenter's Biography

Gary Casper has been studying amphibians in the Lake Superior Basin for over 30 years. He helped develop and continues to analyze data for the Apostle Islands amphibian monitoring program. Gary has two university affiliations, is an editor for two scientific journals, and has an extensive publishing record. His latest book is a Field Guide to the Amphibian Eggs and Larvae of the Great Lakes.

New insights into the dynamics of Apostle Islands Carnivore Communities

- Tim Van Deelen and Morgan Farmer (presenter), University of Wisconsin - Madison

Abstract

While protected areas are often considered strongholds for wildlife populations, recent research in protected areas has highlighted that both human activity (i.e. presence) and footprint (i.e. structures) can influence wildlife. To determine how human activity and footprint affect the spatiotemporal activity of wildlife on the Apostle Islands National Lakeshore, we monitored the carnivore community for five years (2014-2018) using camera traps. We found that all structure types had a negative impact on carnivore community relative abundance, except for campgrounds, which were positively related. However, the community level response was likely driven by the response of individual carnivore species, especially those that were most common (e.g., black bears). Responses of individual carnivore species to anthropogenic structures varied depending on structure type, with canids and mustelids generally exhibiting negative associations with most human structures. When examining the seasonal effects of human activity and footprint (i.e., when park visitation is relatively high or low), we found differences between the seasonal and aseasonal models, suggesting that seasonal variation in human activity influences carnivore activity. We also compared carnivore nocturnality along a gradient of anthropogenic activity, but our results indicate that the carnivore community did not become more nocturnal with increasing anthropogenic activity as expected. However, the carnivore community did display spatial avoidance of current, historical, and private anthropogenic structures, and that avoidance was intensified when park visitors were more prevalent. Our study indicates that human footprint and seasonal variation in activity can influence wildlife activity within protected areas.

New insights into the dynamics of Apostle Islands Carnivore Communities (continued)

- Tim Van Deelen and Morgan Farmer (presenter), University of Wisconsin - Madison

Presenters' Biographies

Tim Van Deelen is a professor in the Department of Forest and Wildlife Ecology and has worked there since 2004. Tim is also faculty director for GreenHouse, an undergraduate learning community interested in sustainable living housed in a dorm named for Aldo Leopold and is chair of the Environmental Conservation master's degree program in UW's Nelson Institute for Environmental Studies. Prior to this, Tim worked as a research scientist for the Illinois Natural History Survey and the Wisconsin Department of Natural Resources. He is a 1995 Ph.D. graduate of Michigan State University's department of Fisheries and Wildlife with a master's degree from the University of Montana and a bachelor's degree from Calvin College. Tim's professional interest is

the conservation of wildlife populations in the face of human influences and he has worked on several species including black bears, wolves, deer, badgers, sandhill cranes, turkeys, and flying squirrels. With his background in working for state management agencies, Tim also brings expertise to designing and using monitoring systems that bridge the gap between researchers and the information needs of conservation agencies. Tim collaborates with an active group of graduate students and is author/coauthor of >90 peer reviewed papers and book chapters on various aspects of wildlife biology.

Morgan Farmer is a PhD student working with Dr. Tim Van Deelen and Dr. David Drake on the UW Urban Canid Project. She first started working with coyotes during her undergraduate at the University of California – Berkeley, where she completed an

independent senior thesis looking at how habitat use of urban coyotes was affected by habitat characteristics and recreation. After completing her undergraduate education, she moved to Wisconsin to complete a MS degree at UW – Madison with Dr. Tim Van Deelen. Her research focused on competition and island biogeography as drivers of spatiotemporal activity and the effects of anthropogenic activity and structures on the carnivore community of the Apostle Islands National Lakeshore. Her current research focuses on urban canids and their interactions with each other, their environment, and with humans.

Longitudinal Trends and Ecology of the small mammal community of the Apostle Islands National Lakeshore - Dr. Erik Olson, Northland College

Abstract

As part of the first ever comprehensive survey of the mammal community of the Apostle Islands archipelago, we documented changes in distribution of small mammals since the establishment of the Apostle Islands National Lakeshore in 1970. Using recent data, we also described trends in abundance and multiple aspects of small mammal species ecology. We trapped small mammals from 20 of the 22 islands of the archipelago (2017-2020) and compared those results to historical (1961-2004) records. Small mammal community diversity was driven by island size and less so by island isolation, regardless of variation over time. Since the establishment of the Lakeshore, Microtus pennsylvanicus distribution declined significantly, while Sorex cinereus distribution increased significantly, and Peromsyscus spp. colonized at least three islands, potentially through human-facilitated dispersal (i.e., boating, kayaking). Myodes gapperi remained widespread and abundant, making them an ecologically important aspect of the archipelago's mammal community. Habitat, parasitism, predation, and Myodes gapperi abundance and body condition interact to shape the ecology of Myodes gapperi within the archipelago. Canada yew, Taxus canadensis, appears to play an important role in shaping these ecological interactions. Long-term changes in small mammal populations across the archipelago likely reflect reduction of human extractive activities following the establishment of the national lakeshore and the corresponding succession of vegetative communities. Our work suggests that the small mammal communities of the archipelago have changed since the establishment of the national lakeshore 50 years ago. Moreover, island size appears to be an important factor mitigating small mammal community dynamics over time, and Canada yew may be an important habitat feature for small mammal species of the Apostle Islands National Lakeshore.

Presenter's Biography

Erik Olson is Associate Professor of Natural Resources at Northland College. Erik received his MS and PhD from the University of Wisconsin - Madison and his BS from the University of Wisconsin - Stevens Point. Currently, his research focuses on three projects: 1) Canopy Ecology of Temperate Forests – a project examining the habitat-use of the upper canopy, 2) JaguarOsa – a long-term wildlife monitoring project in two Costa Rican National Parks, and 3) Great Lakes Island Ecology - focusing on the ecology of the Apostle Islands National Lakeshore archipelago.

Are the Apostle Islands a refugia for a recently recolonized forest carnivore?

-Matt Smith, Department of Forest and Wildlife Ecology, University of Wisconsin - Madison

Abstract

Rapid environmental change is reshaping ecosystems and driving species loss globally. Carnivore populations have declined and retracted rapidly and have been the target of numerous translocation projects. Identifying refuges, locations that are resistant to environmental change, should improve population recovery and persistence. American martens (Martes americana) were extirpated across much of the Great Lakes region by the 1930s and, despite multiple translocations beginning in the 1950s, martens remain of regional conservation concern. Surprisingly, martens were rediscovered in 2014 on the Apostle Islands of Lake Superior after a putative absence of >40 years. To identify the source of martens to the islands and understand connectivity to the mainland, we collected genetic data on martens from the archipelago and from all regional reintroduction sites. In total, we genotyped 483 individual martens, 43 of which inhabited the Apostle Islands. Martens on the Apostle Islands were abundant (densities 0.42-1.46/km2) and genetically like mainland sub-populations. We detected some regional gene flow, but in an unexpected direction: individuals moving from the islands to the mainland. Our findings suggest that the Apostle Islands were naturally recolonized by progeny of translocated individuals and now act as a source back to the reintroduction sites on the mainland. We propose that the Apostle Islands, given its protection from disturbance, complex forest structure, reduced carnivore competition, and maintenance of historical snowpack conditions make this region a potential refugia for a forest carnivore.

Presenter's Biography

Matt is a graduate research assistant in the Pauli lab at the University of Wisconsin where his dissertation research focuses on understanding the ecology of martens on the Apostle Islands. Broadly, he is interested in understanding how environmental change impacts population dynamics, genetics, and connectivity, in addition to, understanding the role biotic interactions play in species persistence. His current project on the Apostle Islands has reconstructed the colonization history of martens to the islands and future work will address population viability and how marten diet is shaped by competitive interactions. He employs a variety of techniques but has focused on applying noninvasive genetic methods to address questions in conservation biology.

Not-so-Great Expectations: A vulnerability assessment for terrestrial ecosystems in Apostle Islands National Lakeshore -Stephen Handler, Northern Institute of Applied Climate Science and Peggy Burkman, Apostle Islands NL

Abstract

How might climate change affect Apostle Islands National Lakeshore? It's a simple question with lots of potential answers! This presentation will describe a recently published climate change vulnerability assessment for the terrestrial ecosystems throughout the park. Peggy Burkman will describe why the park felt it was necessary to complete this vulnerability assessment, and she'll also cover some of the important context of the Apostle Islands landscape that might cause climate change to play out differently than on the mainland. Stephen Handler will explain how the assessment was completed and share some of the results and remaining questions.

Presenters' Biographies

Stephen Handler is a climate change specialist with the USDA Forest Service Northern Research Station and Northern Institute of Applied Climate Science. His main role with NIACS is to coordinate the Northwoods Climate Change Response Framework, which involves building partnerships, assessing climate change risk, and working with forest managers and landowners to develop real-world projects to adapt and prepare for future change. Stephen moved to Houghton, MI, in 2011 and loves being a Yooper.

Peggy Burkman is the Biologist at Apostle Islands National Lakeshore (2002) with former experience as a wildlife biologist, fire ecologist, and landscape ecologist in the U.S. Fish & Wildlife Service, and the Forest Service. Peggy coordinates several long-term monitoring projects in the park, works with researchers to address various questions, and maintains healthy vegetation through exotic plant management and restoration efforts. She fell in love with Lake Superior during her youth and has spent her life in the Great Lakes.

Resiliency and Vulnerability of Apostle Islands Coastal Wetlands -Dr. Matt Cooper and Dr. Sarah Johnson, Mary Griggs Burke Center for Freshwater Innovation, Northland College

Abstract

The Apostle Islands National Lakeshore supports several types of coastal and interior wetlands including lagoons, bogs, freshwater estuaries, marshes and peatlands that provide many important ecological functions. We investigated wetland hydrology, geomorphology, vegetation, macroinvertebrates, and fish to identify communities or wetland types that are most at risk of climate-related impacts. The interaction between Lake Superior water levels and hydrologic connectivity between the wetlands and the lake influence how these wetlands will respond to changing conditions. For example, the hydrology of wetlands located behind semipermanent sand barriers responds quickly to intense rain events whereas wetlands with open connections to Lake Superior are influenced more by storm and seiche-driven fluctuations than heavy precipitation events. Floral and faunal communities inhabiting the park's coastal wetlands must be adapted to these different water level patterns. Because various climaterelated drivers (e.g., storm and seiche intensity vs. intense precipitation events) are at play, the park's wetlands will likely respond in differing ways. For example, as lake levels shifted from a 15-year below-average period (1998-2013) to above-average depths in 2014, the plant community response was more dynamic among coastal wetland types lacking a sphagnum peat mat. The Lakeshore's peatlands have so far exhibited resilience to changes in hydrology, but sustained monitoring may capture a time lag in peatland response. The relatively remote location of Apostle Island wetlands makes them important reference systems, though climaterelated factors are likely to alter these systems in unique ways.

Presenters' Biographies

Sarah Johnson is an Associate Professor of Natural Resources, the Sigurd Olson Professor of Natural Sciences, and faculty affiliate with the Mary Griggs Burke Center for Freshwater Innovation at

Northland College. Sarah received a PhD in Botany from UW-Madison and has worked in the Great Lakes region or in coastal systems for 20 years, starting with an internship with the Apostle Islands National Lakeshore. She is a plant ecologist who researches vegetation change and teaches field botany, wetlands, and other natural history courses.

Matt Cooper is a Research Assistant Professor at Central Michigan University and teaching faculty at Muskegon Community College. Matt received his BS and MS from Grand Valley State University and PhD from the University of Notre Dame. He has worked in Great Lakes coastal wetlands for many years and is one of the project managers for the Great Lakes Coastal Wetland Monitoring Program, a long-term program funded by the US EPA that is tracking the condition of over 1,000 wetlands across the Great Lakes.

Through the Eyes of Fourth Graders

-Steve Ballou, Apostle Islands NL

Abstract

Through the Eyes of Fourth Graders is a book written and illustrated by students about their experiences in the natural environments of the area. This presentation shares that journey, the experiences, lessons and most importantly, the thoughts expressed by young people through words and images. The objectives of environmental education programs are to develop participant awareness, sensitivity and the understanding of their affective relationship to the natural environment, usually through conceptual knowledge and personal experience. Recent, evidence-based studies suggest that experiences that forge emotional connections and encourage curiosity are most likely to succeed and have long-lasting influence that inspires environmentally responsible behavior and achieves environmental literacy. Environmental literacy gained through experiential participation is also thought to aid in the development of values, problem-solving skills, healthy cognition and emotional intelligence.

Presenter's Biography

Steve Ballou, is an Interpretive Ranger at Apostle Islands National Lakeshore where he has the privilege of connecting people to the wonders of the Islands and the Great Lakes Environment through educational and experiential outreach. As part of connecting the park and rangers to people Steve launched a kayak ranger program last summer that facilitated placed-based interaction with visitors along the mainland sea caves and not so unintentionally made his job that much more awesome.

A geologist by training, Steve previously worked in an academic setting and has served as a seasonal ranger in Yellowstone National Park for over a decade before coming to the Apostle Islands. He enjoys several silent sports and spends much of his time paddling among and enjoying the islands, and is excited and honored to share "Through the eyes of fourth graders" as part of the symposium.

Under the Surface and Zaaga'igan Ma'iinganag (Lakewolves): Creating immersive life-long and life-saving connections between teens and the Apostle Islands National Lakeshore. -Ian Karl, Northwest Passage Ltd. and Toben Lafrançois, Northland College and

-Ian Kari, Northwest Passage Ltd. and Ioben Lafrançois, Northland College a Northwest Passage Ltd.

Abstract

The Apostle Islands National Lakeshore (APIS) has personally impacted the lives of people across the nation. Lake Superior permeates nearly every aspect of Park visitor experience, forming the bonds between ecological, cultural, and deeply personal dimensions of the Park. Connections between our well-being and the protected waters of the Park are important but not always easy to access, maintain or articulate for all people. Under the Surface and Zaaga'igan Ma'iinganag (Lakewolves) are sister programs that provide literally immersive experiences to teens in the Apostle Islands. Northwest Passage, Ltd. is a youth mental health center devoted to outdoor experiences as one pillar among other traditional treatment modalities. Under the Surface is one of its signature programs, and has shared photographs of APIS throughout the nation. Zaaga'igan Ma'iinganag is a partnership between Bayfield High School and Northwest Passage. This program provides local teens the opportunity to explore their waters, their culture and themselves using the tools developed by Under the Surface. Together the programs are a unique and powerful realization of National Park Service goals to integrate personal connections, environmental education, and artistic expression into life-long relationships. Both programs have produced galleries that re-connect viewers to their own experiences in the Park. In this presentation, program directors Ian Karl and Toben Lafrançois highlight the photos and reflections from the Apostle Islands National Lakeshore's next generation of water protectors in celebration of it's 50th anniversary.

Presenters' Biographies

Ian Karl is the Experiential Programming Coordinator for Northwest Passage Ltd. Toben Lafrançois is a Research Associate at Northland College and the Associate Programming Coordinator for Northwest Passage Ltd.

Island Intersections

-Lucy Tyrrell, Bayfield Carnegie Library Poet Laureate

A community collaborative project associated with the Apostle Islands 50th Anniversary Resource Stewardship Symposium is being coordinated by Bayfield Poet Laureate Lucy Tyrrell. This project called "Island Intersections" promotes the intersection of art/poetry and science as another way to celebrate the 50th anniversary of the national lakeshore. One poet and one artist who have volunteered for the project are "assigned" to each participating scientist/resource presenter prior to the symposium. Poets and artists register to attend the symposium and listen to the presenter. Each presenter will provide an abstract/summary of their research or special knowledge to share with the respective poet and artist as background information and as a reminder of the presentation. Also artists and poets may refer back to the recorded presentations for additional inspiration or information.

After the symposium, poets and artists will respond creatively to the specifics of what they learned or heard about the Apostle Islands National Lakeshore's natural and cultural resources. Art and poems are due on May 1 and will be shared in an exhibit (both actual and virtual) at the Washburn Cultural Center (WCC) during June 2021. A program book of art, poems, and resource summaries will be printed and provided to participants. Funding for the exhibit and to defray the cost of printing the program book is generously provided by Chequamegon Bay Arts Council, Wisconsin Arts Board, Wisconsin Fellowship of Poets, Friends of the Apostle Islands, the Bayfield Carnegie

Library, and the Bayfield Poet Laureate program.

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