
29th Annual Cape Cod Natural History Conference



Saturday, March 7, 2026

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Conference Agenda

Presentation Abstracts



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Conference Agenda

- 8:30 Registration and refreshments
- 9:00 Welcome by Melissa Lowe, Sanctuary Director, Wellfleet Bay Wildlife Sanctuary
- 9:10 **Cold Brook Eco-Restoration: Otters, Odonates & Opportunities for All Ages**
Michael Lach, Executive Director, Harwich Conservation Trust (HCT)
- 9:30 **Barnstable Clean Water's Marstons Mills River Bog Eco-Restoration**
Luke Cadrin, Field Operations Manager, Barnstable Clean Water Coalition (BCWC)
- 9:50 **Bayview Bogs: Healing the Landscape, Healing the Community**
Julianne Busa, PhD, PWS, Senior Resilience Scientist, Fuss & O'Neill, Inc.
- 10:10 **Climate and Atmospheric Influences on Water Quality in Cape Cod National Seashore's Freshwater Ponds**
Caitlin Sughrue, (American Conservation Experience (ACE) Aquatic Ecology Assistant) and Sage Hellberg, (Association to Preserve Cape Cod (APCC) Pond Monitoring Technician); Cape Cod National Seashore
- 10:30 BREAK (20 minutes) - View poster presentations
- 10:50 **Bogs to Brook Trout: Rebuilding Coldwater Habitat on the Childs River**
Michael Palmer, Restoration Ecologist, Association to Preserve Cape Cod (APCC)
- 11:10 **Sounds of Cape Cod Fishes**
Rodney Rountree, The Fish Listener
- 11:30 **Partnering with Commercial Fishermen to Conduct a Benthic Survey of Nantucket Shoals**
Natalie Jennings, Research Biologist, Coonamessett Farm Foundation (CFF)
- 11:50 LUNCH BREAK in cafeteria (50 minutes) - Desserts provided.
- 12:40 **Resilience in Action: The Return of Eelgrass to Edgartown Great Pond, Martha's Vineyard**
Owen Porterfield (Scientific Program Manager) and Kendall Rudolph (Science Engagement Manager), Great Pond Foundation (GPF)
- 1:00 **Restoring Critical Water Resources Cape-wide: The Cape Cod Water Resources Restoration Project**
Martha Craig, Program Manager, Cape Cod Conservation District
- 1:20 **Building Coastal Resilience on Nantucket Through Monitoring and Living Shorelines**
Emily Junkins, PhD, Coastal Wetlands Research Ecologist, Nantucket Conservation Foundation
- 1:40 BREAK (20 minutes) - View poster presentations
- 2:00 **Martha's Vineyard Butterflies: History, Status, and Trends**
Matt Pelikan, Community Naturalist, BiodiversityWorks
- 2:20 **Implementing a Nationwide Mammal Monitoring Project on Martha's Vineyard**
Silas Beers, Wildlife Technician, BiodiversityWorks
- 2:40 **Drone Based Methods for Tracking and Characterizing Marine Megafauna with a Focus on White Sharks off the Coast of Cape Cod**
Kristian Sexton, Scientist and Engineer, Moosh Systems, LLC
- 3:00 Closing Comments
-

Poster Presentations

Poster Presentations will be displayed in the lobby during breaks and the lunch hour and available for review and discussion. Poster Presentations include:

Opening the Restoration Toolbox at Wellfleet Bay Wildlife Sanctuary and Beyond

Ian Ives, Sanctuary Manager, Mass Audubon

Michelle Eckman, Director of Evaluation, Mass Audubon

The Invasive Plant Brigade: Building Community and Capacity for Invasive Plant Management on Martha's Vineyard

Robyn Graygor, Biodiversity Technician, BiodiversityWorks

Effects of Environmental Changes on Sound Production of Striped Cusk-Eels in Wellfleet Harbor

Tyler Pelt, Undergraduate Student, University of Massachusetts Amherst (UMass Amherst)

Understanding Seasonal Thresher Shark (*Alopias vulpinus*) Strandings on Cape Cod

Kathy Miller, Volunteer, New England Coastal Wildlife Alliance (NECWA)

Cold Brook Eco-Restoration: Otters, Odonates & Opportunities for All Ages

DESCRIPTION: The nonprofit Harwich Conservation Trust (HCT) led the Cold Brook Eco-Restoration Project to transform a retired cranberry bog into a wildlife oasis thanks to municipal, state, and federal partners. The project goals included improving water quality, creating a diversity of healthy habitats to foster biodiversity, and enhancing visitor experiences. These goals were achieved by rewilding a mile of stream, sculpting in four ponds, restoring 44 acres of wetland habitat, and establishing a half-mile wheelchair accessible All Persons Trail, inviting people of all abilities and ages to experience the beauty of nature. Cold Brook now flows freely through the 66-acre Robert F. Smith Cold Brook Preserve for the first time in over a century, starting in spring-fed Grassy Pond and traveling under Bank Street through the Preserve and to Saquatucket Harbor on Nantucket Sound.

Thanks to expertise and collaboration of ecological restoration practitioners, scientists, and funders, the Cold Brook Eco-Restoration Project earned two top statewide awards in 2025. These honors included the inaugural Conservation Excellence Award from the Massachusetts Land Trust Coalition and the Grand Conceptor Award from the American Council of Engineering Companies of Massachusetts. For the Grand Conceptor Award, the Cold Brook Eco-Restoration Project was first among a field of 37 nominations including Logan Airport's international terminal, entire buildings, bridges, and other infrastructure projects in New England, New York City, and Saudi Arabia.

This "green infrastructure" success serves as an inspiring model of cooperation and innovative eco-restoration for coastal resilience in a climate-changing world. The presentation includes a project overview about why retired cranberry bogs offer eco-restoration opportunities, unexpected wildlife sightings, unusual raptor behavior, an example of rebounding biodiversity, and educational opportunities for all ages. To learn more about the Cold Brook Project and HCT's other eco-restoration efforts, visit harwichconservationtrust.org, click Save Land, and click Eco-Restoration Projects.

PRESENTER: Michael Lach, Executive Director, Harwich Conservation Trust

COLLABORATORS: Massachusetts Division of Ecological Restoration, U.S. Fish & Wildlife Service, Town of Harwich, Inter Fluve, SumCo Eco-Contracting, and a variety of consultants and scientists over a 15-year period

BIOGRAPHICAL INFORMATION: Mike was raised on the Cape and after seeing dramatic changes to natural wonders he explored and enjoyed as a kid, started on a path of land preservation to help protect our shared quality of life. Since 2000, he has worked in partnership with dedicated citizens and environmental professionals including 19 years with The Compact of Cape Cod Conservation Trusts and 26 years with Harwich Conservation Trust. In 2023, the Association to Preserve Cape Cod honored him with its Esther K. Snyder Award for Environmental Protection Excellence. In 2024, the Cape Cod Museum of Natural History honored Mike with its Nature's Ambassador Award for protecting Cape Cod's nature.

CONTACT: Michael Lach (mike@harwichconservationtrust.org)

Barnstable Clean Water's Marstons Mills River Bog Eco-Restoration

DESCRIPTION: Barnstable Clean Water Coalition is restoring 63 acres of retired cranberry bogs back into natural wetlands to improve the water quality in the Three Bays watershed. Learn about the capacity of wetlands to reduce nutrients, specific design strategies to improve water quality as well as the monitoring undertaken to track changes over time.

PRESENTER: Luke Cadrin, Field Operations Manager, Barnstable Clean Water Coalition

BIOGRAPHICAL INFORMATION: Luke is a Cape Cod native who grew up watching the annual migration of the Herring, which helped foster his appreciation of the natural world. This motivated him to earn his degree in Biology from Saint Michael's College, and he now works as the Field Operations Manager for Barnstable Clean Water Coalition.

CONTACT: Luke Cadrin (lcadrin@bcleanwater.org, 774-238-6820)

Bayview Bogs: Healing the Landscape, Healing the Community

DESCRIPTION: Cape Cod Conservation District, Cape Cod Healthcare, and the Massachusetts Division of Ecological Restoration have partnered together to restore Bayview Cranberry Bogs in West Yarmouth to a healthy wetland ecosystem. The Bayview Bogs restoration project will restore nearly 47-acres of former cranberry bogs by removing the agricultural berms and water control structures that currently block tidal exchange with Lewis Bay to restore tidal connectivity, recreate healthy functioning freshwater wetlands, and allow for a gradual transition to salt marsh as sea level rises. Alongside the restorative mission for the landscape, Bayview Bogs offers a unique opportunity to enhance the healing mission of the hospital by offering staff, patients, and family members a tranquil place for contemplation and reflection and to take advantage of the therapeutic benefits of nature. Bayview Bogs will also be open to the larger community as a resource for passive recreation, offering a loop walking trail and boardwalks that will allow residents from the adjoining neighborhoods to experience the restored wetlands and watch them evolve and grow over time.

PRESENTER: Julianne Busa, PhD, PWS, Senior Resilience Scientist, Fuss & O'Neill, Inc.

COLLABORATORS: Michael Soares (Senior Wetland Scientist), Andrew Bohne & Allyson Fairweather (Landscape Architects), Fuss & O'Neill; Cape Cod Conservation District; Cape Cod Hospital; Massachusetts Division of Ecological Restoration (Mass DER)

BIOGRAPHICAL INFORMATION: Julie is a Professional Wetland Scientist and Certified Senior Ecologist who leads Fuss & O'Neill's Ecological Restoration Technical Practice Team. Julie serves as co-lead of the Massachusetts Ecosystem Climate Adaptation Network (MassECAN) Slow the Flow Working Group and is the Chair of the Easthampton Conservation Commission.

CONTACT: Julianne Busa (julianne.busafando.com, 413-333-5469)

Climate and Atmospheric Influences on Water Quality in Cape Cod National Seashore Freshwater Ponds

DESCRIPTION: The freshwater ponds and lakes of Cape Cod National Seashore provide a valuable opportunity to document climate- and atmospheric-driven change over the last several decades. Due to their hydrologic isolation, oligotrophic or mesotrophic states, proximity to the coast, and their biological diversity, these systems are highly sensitive to the dynamic nature of our environment. Since the 1980s, water quality parameters, including temperature, clarity, phytoplankton biomass, pH and nutrients, have been measured in ponds and lakes along the Cape Cod coast. Nutrients include dissolved inorganic nitrogen and phosphorus, total nitrogen and phosphorus, and the anions, sulfate and chloride. High nutrient concentrations are indicative of eutrophic status as well as potential for resource degradation, and anions can be used to examine the linkages between the ponds and their surroundings, both marine and atmospheric. These measurements contribute to the understanding of essential pond processes and water quality deterioration. Air quality improvements have led to significant increases in precipitation pH, and decreases in rainwater sulfate and nitrate concentrations, as measured at Site MA01, National Atmospheric Deposition Program, Truro, MA. Over the past decades, pond waters have shown higher temperatures, lower acidity, and decreased water clarity in response to atmospheric shifts in air quality and rising air temperatures. In recent years, there has also been a profound increase in the occurrence of harmful cyanobacteria blooms, suggesting a shift towards cyanobacteria dominance of the phytoplankton and poorer water quality. Global ecosystem change is ubiquitous across the coastal landscape, and this and other long-term, multi-decadal datasets can provide useful insight into the incipient threats of rising temperatures and pH on both a local and broader coastal scale.

PRESENTERS: Caitlin Sughrue, Aquatic Ecology Assistant (1, 3) and Sage Hellberg, Pond Monitoring Technician (1, 2)

COLLABORATORS: Rocheleau, C. (1, 3), Fisher, M.A. (1, 4), Button, K.L. (1, 5), Feuerhake, S.M. (2), Smith, S.M. (1), Fox, S.E. (1)

(1) Cape Cod National Seashore, National Park Service; (2) Association to Preserve Cape Cod; (3) American Conservation Experience; (4) Conservation Legacy; (5) Northeast Coastal and Barrier Network, Inventory and Monitoring Program, National Park Service, RI

BIOGRAPHICAL INFORMATION: Caitlin Sughrue is an Aquatic Ecology Assistant at Cape Cod National Seashore (CCNS), through American Conservation Experience. Caitlin first came to the Cape for a Scientists in Parks (SIP) internship with CCNS, where she monitored kettle pond water quality. After her SIP term, she worked for the Nantucket Land and Water Council as the seasonal Eelgrass Program Manager. Caitlin holds a bachelor's degree in Biology and Marine Science from the College of William and Mary.

Sage Hellberg is a Pond Monitoring Technician working with both CCNS and Association to Preserve Cape Cod. Sage primarily monitors kettle pond water quality within the Seashore, but also assists on other natural resource projects. Previous experience includes wildlife monitoring, endangered species protection, and habitat restoration. Sage has spent most of her life on the Cape and is passionate about protecting coastal communities.

CONTACT: Caitlin Sughrue (cesughrue@gmail.com), Sage Hellberg (sage.hellberg@gmail.com)

Bogs to Brook Trout: Rebuilding Coldwater Habitat on the Childs River

DESCRIPTION: The Childs River in East Falmouth and Mashpee has been reshaped for centuries—from mill works to retired cranberry bogs and legacy warm-water impoundments that fragmented habitat, restricted fish passage, and eroded coldwater function. A major restoration completed in fall 2021 set out to reverse these legacies by improving fish passage, reopening upstream habitat, and re-establishing natural channel and floodplain processes. This talk presents the brook trout response over multiple years of pre- and post-restoration monitoring. In the first seasons after construction, brook trout quickly began using newly reopened upstream reaches, with observations indicating expanded distribution, stronger occupancy of restored habitats, and early evidence of successful reproduction in areas that were previously limited or inaccessible. Taken together, these observations suggest that addressing historic barriers and warm-water impoundment legacies in coldwater streams can deliver rapid, encouraging gains for coastal brook trout. The presentation concludes with key takeaways for monitoring and design, and a brief overview of similar coldwater restoration projects underway across Cape Cod.

PRESENTER: Michael Palmer, Restoration Ecologist, Association to Preserve Cape Cod

COLLABORATORS: Jordan Mora (Lead Ecologist and Science Advisor) and April Wobst (Restoration Program Manager / MassBays Regional Coordinator), APCC

BIOGRAPHICAL INFORMATION: Mike Palmer is a restoration ecologist with the Association to Preserve Cape Cod (APCC), where he leads efforts to restore freshwater systems across Cape Cod. His work focuses on cranberry bog restoration, coldwater habitat improvements, fish passage, and volunteer-based river herring monitoring - integrating science, community engagement, and ecological resilience. Prior to joining APCC, Mike spent nearly two decades as a fisheries scientist with NOAA, leading stock assessments for Gulf of Maine groundfish at the Northeast Fisheries Science Center in Woods Hole. He holds a bachelor's degree in marine science from the University of Maine and a master's in fisheries oceanography from the University of Alaska Fairbanks.

CONTACT: Michael Palmer (mpalmer@apcc.org, 508-619-3185 x311)

Sounds of Cape Cod Fishes

DESCRIPTION: A wide diversity of fishes found in the freshwater and marine habitats in and around Cape Cod were recorded in various studies over the last 25 years. Freshwater fishes include brown, brook and rainbow trout, and the white sucker. Anadromous alewife sounds were recorded at herring runs. Estuarine and marine fishes recorded include the striped cusk-eel, striped and northern searobins, oyster toadfish, northern puffer, spot, weakfish, tautog, Atlantic cod, haddock, pollock, cusk, blue runner, and rough scad. Despite this effort, the soundscape of Cape Cod includes many biological sounds of unknown origin. Unfortunately, attempts to record the soundscape during daylight hours are greatly hampered by nearly constant noise from recreational motor boats. Thus, most of the fish sounds were recorded at night when boating activity is greatly reduced. Examples of many of these fish sounds will be provided and the importance of documenting the underwater soundscape will be discussed.

PRESENTER: Rodney Rountree, The Fish Listener

BIOGRAPHICAL INFORMATION: Dr. Rountree received his Ph.D. from Rutgers University in 1992, since then he has conducted research on salt marshes, groundfish food habits, and has become a leader in passive acoustic applications to fisheries, ecology, and conservation. See <http://www.fishecology.org> for more information.

CONTACT: Rodney Rountree (rrountree@fishecology.org, 508-566-6586)

Partnering with Commercial Fishermen to Conduct a Benthic Survey of Nantucket Shoals

DESCRIPTION: Atlantic surfclams (*Spisula solidissima*) are an ecologically and economically important species on Nantucket Shoals, yet their habitat remains difficult to characterize using traditional sampling approaches alone due to the areas dynamic nature. In this study, we integrated fishing-based surveys with underwater imagery and seafloor mapping tools to better document the benthic environment associated with surfclam populations. Video footage was collected during active fishing tows, with additional imagery obtained using drop cameras and multibeam sonar. These visual methods allowed direct observation of seafloor conditions and associated organisms, providing complementary information to conventional survey data. Imagery revealed a range of bottom types, including sandy and pebble substrates, shell-covered areas, and regions with increased structural complexity. A diverse assemblage of benthic and demersal organisms was observed, including crabs, sea stars, fishes, and other invertebrates. This project was conducted in collaboration with commercial fishermen, whose knowledge of local seafloor features and navigation condition was essential for field operations. Fishermen helped guide sampling locations and deployment strategies based on their experience working on Nantucket Shoals. This partnership illustrates how scientific research can be strengthened through collaboration with fishing communities, integrating technological tools with local ecological knowledge. By documenting seafloor characteristics and biological communities using imagery-based approaches, this work contributes to a more complete understanding of surfclam habitat and supports the development of flexible, field-tested survey methods for dynamic coastal environments.

PRESENTER: Natalie Jennings, Research Biologist, Coonamessett Farm Foundation

COLLABORATORS: FV Seafox and FV Tom Slaughter

BIOGRAPHICAL INFORMATION: Natalie leads and supports cooperative fisheries research to characterize benthic habitats, reduce incidental bycatch, and seasonally assess commercially important species important to New England. She got her master's degree from SMAST in 2015 with a degree in Fisheries Oceanography with a specialization in living marine resource management and fishing gear technology.

CONTACT: Natalie Jennings (njennings@cfarm.org, 302-547-9912)

Resilience in Action: The Return of Eelgrass to Edgartown Great Pond, Martha's Vineyard, MA

DESCRIPTION: Edgartown Great Pond (EGP) is one of Martha's Vineyard's 16 ecologically rare Great Ponds, whose preservation and restoration are fundamental to the Island's long-term sustainability. EGP is unique for its recent return of vibrant eelgrass meadows, which are largely absent in neighboring ecosystems. As such, EGP can act as a model for cultivating ecosystem resilience for the Cape and Islands.

Great Pond Foundation (GPF) is a local 501(c)3 non-profit organization that leads in water quality monitoring research within the Island's coastal ponds. Since 2016, GPF has conducted an ecosystem monitoring program, collecting high resolution water quality data and documenting changes in eelgrass abundance and distribution over time. In the late 2010s, eelgrass meadows, the gold standard for ecosystem health, returned to the Pond following a decade of community-lead restoration. Unfortunately, the health of the ecosystem was disrupted in the summer of 2022 when a sharp rise in nitrogen levels induced a widespread phytoplankton bloom that restricted light availability at the pond floor. This, combined with abnormally low salinity levels, resulted in the near complete disappearance of eelgrass by the end of the season. After 2 years of improved water quality, the summer of 2025 saw the return of eelgrass to the pond, highlighting the resilient nature of the seagrass in the face of ecosystem stress and suboptimal water quality.

This talk will present the story of EGP's eelgrass meadows in the context of water quality research going back a decade, as well as watershed mitigation and management activities. Data show the close relationship between eelgrass and key quality metrics including nutrient inventories, water clarity, and salinity levels. These trends not only highlight the resilience of this coastal ecosystem and its eelgrass beds but provide guidance on what needs to change if eelgrass is to once again flourish.

PRESENTER: Owen Porterfield (Scientific Program Manager) and Kendall Rudolph (Science Engagement Manager), Great Pond Foundation (GPF)

COLLABORATORS: The Edgartown Board of Health and Edgartown Shellfish Department

BIOGRAPHICAL INFORMATION: Owen was born and raised on Martha's Vineyard and developed an appreciation for the island's unique ecosystems at an early age. He earned his BS from UMass Amherst in 2023 with a focus in environmental quality and natural resources. After graduating, Owen returned to the Vineyard to work for GPF and is currently the Scientific Program Manager for the organization's ecosystem monitoring programs.

Kendall earned her Bachelor of Science from Iowa State University in Animal Ecology, focusing in Fisheries and Aquatic Sciences. Since graduating, she has become an integral part of Great Pond Foundation as the Science Engagement Manager, leading in microscopy, grant writing, and piloting phycocyanin monitoring for GPF's MV CYANO program

CONTACT: science@greatpondfoundation.org, 508-627-7222

Restoring Critical Water Resources Cape-wide: The Cape Cod Water Resources Restoration Project

DESCRIPTION: The Cape Cod Water Resources Restoration Project (CCWRRP) is a landmark Congressionally-approved cooperative watershed initiative aimed at restoring degraded important natural ecosystems on Cape Cod through tidal restoration to salt marshes, improvements to migratory fish passages (herring runs), and stormwater remediation adjacent to important shellfish beds. Through the CCWRRP, nearly \$100 million in Federal dollars from the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) has been secured since 2010 for more than 85 projects Cape-wide. Over 30 projects have been completed under CCWRRP with participation from all fifteen (15) towns within Barnstable County. The CCWRRP currently has over 65 active projects under agreement with NRCS and all 15 Cape towns. The Cape Cod Conservation District (CCCD) helps manage these projects, acting as the liaison between NRCS and the Towns, supporting locally-led conservation and local, regional, state and federal partnerships. Partnership is a key to successful restoration projects. Over 30 projects Cape-wide have been completed under the CCWRRP since 2010. Over 65 priority projects are currently active, in various states of design, including fish passage improvements, salt marsh restoration and stormwater remediation. Several important priority projects were implemented this past year, including the improvements to the herring run at Stony Brook in Brewster and the construction of a stormwater remediation project along Standish Way in West Yarmouth. The Stony Brook Fish Passage Improvement project should finish construction during early Spring 2026. Other upcoming restoration projects are slated for implementation in Spring 2026, including important stormwater projects in Bourne, Barnstable and Yarmouth, with additional projects anticipated in Fall 2026. The Herring River Restoration Project in Wellfleet is also under construction, with critical milestones approaching. An update will be provided on all active projects. The Towns, together with CCCD and NRCS have also identified additional priority projects for future funding.

PRESENTER: Martha Craig, Program Manager, Cape Cod Conservation District

COLLABORATORS: Karissa Collins (Fish Passage Project Manager), Patrick Temple (Salt Marsh Project Manager), Simone Wright (Stormwater/Shellfish Project Manager), Cape Cod Conservation District

BIOGRAPHICAL INFORMATION: Martha has a M.S. from the Virginia Institute of Marine Science at the College of William and Mary and has worked as a wetland scientist for over 35 years. She has worked on coastal restoration projects in Massachusetts for the past 20 years, including salt marsh restoration projects across the Cape.

CONTACT: Martha Craig (martha.craig@usda.gov, 508-439-9980)

Building Coastal Resilience on Nantucket Through Monitoring and Living Shorelines

DESCRIPTION: As Nantucket's largest landowner, the Nantucket Conservation Foundation (NCF) stewards and protects over 9,000 acres of land and coastline, representing nearly one-third of the island. The long-term health and resilience of Nantucket are directly linked to the condition and function of surrounding natural systems, particularly salt marshes and coastal dunes. These coastal ecosystems provide essential services including nutrient and pollutant filtration, sediment capture, shoreline stabilization, seasonal habitat, and overall support of coastal biodiversity. In the face of accelerating sea level rise, climate change, and increasing human influence, NCF conducts long-term monitoring and applied research to better understand ecological change and to inform active management strategies that maintain ecosystem function and resilience. These efforts combine baseline monitoring with targeted restoration and experimental projects designed to test nature-based solutions to coastal hazards. Current projects include the installation of oyster reefs and living shorelines to reduce wave energy, enhance sediment retention, improve water quality, and support marine habitat, as well as the establishment of a comprehensive salt marsh monitoring program to track vegetation, elevation, and environmental conditions over time. This presentation demonstrates how the installation of an oyster reef for coastal resilience increased marsh surface elevation through the trapping of sediment, enhanced biodiversity compared to a nearby reference site, and reduced wave velocity in the surrounding area. Results from this project illustrate the potential for oyster-based living shorelines to provide multiple ecological and protective benefits. In addition, ongoing salt marsh monitoring efforts are highlighted to show how long-term datasets are being used to identify trends, assess vulnerability, and guide restoration and adaptive management strategies across Nantucket's coastal systems.

PRESENTER: Emily Junkins, PhD, Coastal Wetlands Research Ecologist, Nantucket Conservation Foundation

COLLABORATORS: Jen Karberg, PhD (Coastal Ecology Project Manager) and Jisun Reiner (Coastal Ecology Research Technician), Nantucket Conservation Foundation; Tara Riley (Shellfish and Aquatic Resources Manager), Division of Shellfish and Aquatic Resources

BIOGRAPHICAL INFORMATION: **Emily Junkins** is a microbiologist and coastal wetlands research ecologist at the Nantucket Conservation Foundation. She earned her PhD from the University of Oklahoma and completed postdoctoral research at UC Santa Barbara as a Whitman Fellow at the Marine Biological Laboratory in Woods Hole. Her work focuses on salt marsh monitoring and restoration, emphasizing microbial controls on nutrient fluxes and coastal wetland function and resilience on Nantucket.

CONTACT: Emily Junkins (ejunkins@nantucketconservation.org, 205-223-9758)

Martha's Vineyard Butterflies: History, Status, and Trends

DESCRIPTION: With documentation extending back for about a century, the butterflies of Martha's Vineyard (a total of 82 species) are better known than most other groups of insects. The island's butterfly fauna, reflecting the Vineyard's geographic isolation and unique mix of natural communities, is distinctive in terms both of the species that are present and the ones that are absent. And it is a fauna that has changed significantly over time (and continues to change). Drawing on historical sources as well as my own checklist project begun in 1997, I will describe the current state of this interesting fauna, summarize its history, and discuss how it is responding to climate change and altered land use patterns.

PRESENTER: Matt Pelikan, Community Naturalist, BiodiversityWorks, Inc.

BIOGRAPHICAL INFORMATION: A year-round Vineyard resident since 1997, Matt Pelikan is a versatile naturalist who has led or participated in numerous surveys and checklist projects, community science efforts, and conservation programs. Current interests include Orthoptera, bees, and the fly families Syrphidae and Asilidae. Matt writes frequently about Vineyard conservation and ecology for local and regional publications and since 2002 has contributed a twice-monthly natural history column to the *Martha's Vineyard Times*. In his current position with BiodiversityWorks, he presents frequently on Vineyard wildlife and coordinates the Martha's Vineyard Atlas of Life, an ongoing, community-powered survey of Vineyard biodiversity.

CONTACT: Matt Pelikan (mpelikan@biodiversityworksmv.org, 774 521-7795)

Implementing a Nationwide Mammal Monitoring Project on Martha's Vineyard

DESCRIPTION: Snapshot USA is a national mammal monitoring project that began in 2019 using crowd-sourced camera trap data and an AI-driven photo processing platform to track mammal distribution and abundance across North America. The camera traps are set, monitored, and collected in September and October by biologists and community scientists across all 50 states. Participating groups are now deploying 263 unique camera arrays, only eight of which are in Massachusetts. BiodiversityWorks joined Snapshot USA in 2021 to begin long-term monitoring of mammals on the island of Martha's Vineyard where several Massachusetts carnivore species are not present. Each fall, following the Snapshot USA methods for deployment, we set and tend 36-45 camera traps in three trapping arrays in three towns. We collaborate with 7th and 8th grade science students in 12 classes from four schools to promote STEM learning and career mentoring. Our camera traps collect at least 400 trap nights of images, which we upload to Wildlife Insights where AI identifies mammals in the images. Students, volunteers, and our staff review the AI output and correct identifications where needed. Our camera traps have captured images of 9 of the 16 terrestrial mammal species known to be present on the island and an additional 22 species of birds. The data are included in an annual journal publication with all collaborators as co-authors. BiodiversityWorks' cost to run these camera trap arrays, work with science students and volunteers, and finalize the data is \$11,000 annually however, an entirely volunteer led effort to maintain one array would be much less expensive.

PRESENTER: Silas Beers, Wildlife Technician, BiodiversityWorks

COLLABORATORS: Liz Olson (Assistant Director/Wildlife Biologist) and Luanne Johnson (Director/Wildlife Biologist), BiodiversityWorks

BIOGRAPHICAL INFORMATION: Silas graduated from Virginia Tech in 2021 with a B.S. in Wildlife Conservation and subsequently joined BiodiversityWorks as the year-round Wildlife Technician in 2022. In this position Silas assists with all of the organization's varied wildlife projects and programs.

CONTACT: Silas Beers (sbeers@biodiversityworksmv.org, 434-466-8654)

Drone based methods for tracking and characterizing marine megafauna with a focus on white sharks off the coast of Cape Cod

DESCRIPTION: Low-cost drones can provide an effective platform for the study and characterization of marine animals. We present methods that allow for both the continuous tracking of animals and the determination of animal lengths across a range of flight parameters. We also provide a thorough estimation of measurement errors while at the same time introducing methods to correct for errors in reported aircraft altitude and heading. Methods are validated using both ground-based markers and tracking data from free swimming white sharks off the coast of Cape Cod which includes the simultaneous tracking of individual sharks by two drones as the aircraft undergo changes in altitude, gimbal angle, heading and position. The resultant tracks are seen to be highly congruent (mean distance between measured positions: 4.3 m (95% CI 0 to 10)) and length measurements demonstrate a high level of precision (95% CI -8 to 8%) with accuracy confirmed using ground-based markers. The methods introduced allow flexibility in data capture while still providing accurate information, with the potential to both expand the use of and enhance the value of drone-based data for the quantification of animal behaviors and characteristics. These methods have already been put to use towards the understanding of white shark nearshore behavior off the coast of Cape Cod and could also be used for the analysis of right whale population demographics in the region. (based on recent publication: <https://www.nature.com/articles/s41598-025-31975-2> with potential to include new data on white shark behavior)

PRESENTER: Kristian Sexton, Scientist and Engineer, Moosh Systems, LLC

COLLABORATORS: Elise F. Danko (Cooper Union); Nicholas Cheung, Robert W. Holt, and Austin Boesch (Moosh Systems); Alexandra Eva DiGiacomo (Stanford University)

BIOGRAPHICAL INFORMATION: Kristian Sexton grew up surfing and sailing the waters of Cape Cod. He completed his PhD in engineering at Dartmouth College and has extensive experience with optical systems through various positions in both academia and industry. Kristian is now focused on the development and use of drone-based methods for the study and detection of great white sharks.

CONTACT: Kristian Sexton (moosh.systems@protonmail.com, 774-722-7844)

Opening the Restoration Toolbox at Wellfleet Bay Wildlife Sanctuary and Beyond

DESCRIPTION: Salt marshes are biologically rich natural communities that exist between the high tide and low tide line in places with low wave energy. Massachusetts coastal communities depend on salt marshes for storm protection, pollution filtering, and habitat for many birds, fish, and other wildlife. Most of Massachusetts' carbon storage comes from salt marshes. Unfortunately, over the past century we've lost over 40% of our original salt marshes to human development, sea level rise, and other impacts. Thanks to recent scientific discoveries, we now better understand how past actions—such as agricultural ditches and embankments—continue to harm modern salt marshes. Ecological restoration can help heal past damage and prepare salt marshes to withstand climate change and continue to thrive into the future. Mass Audubon is currently leading salt marsh restoration projects at Wellfleet Bay and across Cape Cod with a focus on the environmental justice communities of Barnstable, Eastham and Dennis. In addition to the restoration projects, Mass Audubon has been collaborating with their partners on community engagement efforts. Learn about these efforts and the different restoration techniques being used to improve marsh health and coastal resilience.

Please come by to share your perspectives and experiences with *how your community comes together to organize or participate in decision making processes around coastal resilience and related issues. What is challenging about engaging across differences within the communities you are connected to? What helps overcome those challenges?*

PRESENTER: Ian Ives (Sanctuary Manager, Mass Audubon) and Michelle Eckman (Director of Evaluation, Mass Audubon)

COLLABORATORS: Sara Grady, Senior Coastal Ecologist, Mass Audubon

BIOGRAPHICAL INFORMATION: Ian is the Sanctuary Manager at Long Pasture, Ashumet Holly, Barnstable Great Marsh, and Skunknett River Wildlife Sanctuaries. His job responsibilities include management of the sanctuaries and staff, community outreach, advocacy, environmental stewardship and education. He holds a Master's degree in Conservation Biology from Antioch University – New Hampshire. Ian has a strong background in wetland restoration and endangered species management and is leading environmental advocacy and conservation projects across the Cape to protect rare wildlife and threatened natural resources they depend on.

Michelle Eckman is the Director of Evaluation in Mass Audubon's Education Department. Michelle has been serving as the co-coordinator of the community engagement efforts associated with the salt marsh restoration project in Eastham, Barnstable, and Dennis. Michelle has over 15 years of community engagement experience in the areas of environmental education, environmental justice, and climate justice. She earned her Master's degree in Biology with a minor in Experimental Statistics from New Mexico State University.

CONTACT: Ian Ives (iives@massaudubon.org, 508-556-7800), Michelle Eckman (meckman@massaudubon.org, 781-259-2100)

The Invasive Plant Brigade: Building Community and Capacity for Invasive Plant Management on Martha's Vineyard

DESCRIPTION: The Invasive Plant Brigade (IPB) is a volunteer-powered labor cooperative organized by the Natural Neighbors program at BiodiversityWorks. The IPB coordinates invasive plant removal services and outreach on Martha's Vineyard. Through a time-exchange model, volunteers contribute hours removing invasive plants from another participant's property and earn equivalent assistance on their own land. Guided by our trained staff naturalist(s), the working groups gain hands-on experience identifying invasive plants, using removal equipment, and navigating other invasive plant management responsibilities. The IPB primarily tackles infestations on our volunteers' private properties to help homeowners gain control over their infestations and reduce spread into wild areas. This poster will explore the formation of the IPB, what we've learned along the way, and act as a blueprint for establishing similar programs elsewhere to support native biodiversity and climate resilience.

PRESENTER: Robyn Graygor, Biodiversity Technician, BiodiversityWorks

COLLABORATORS: Rich Couse (Natural Neighbors Program Director) and Luanne Johnson, (Director/Wildlife Biologist), BiodiversityWorks

BIOGRAPHICAL INFORMATION: Robyn joined BiodiversityWorks after receiving a bachelor's degree in environmental studies and journalism from SUNY Purchase in May 2025. As a Biodiversity Technician, Robyn helps property owners steward their lands for native biodiversity by teaching them how to manage invasive plants and recommending beneficial landscape features.

CONTACT: Robyn Graygor (rgraygor@biodiversityworksmv.org, 508-338-2939)

Effects of Environmental Changes on Sound Production of Striped Cusk-Eels in Wellfleet Harbor

DESCRIPTION: Many species of fish produce sound during competitive behavior, feeding, spawning, or other major life history events. These sounds can be used to discover spatial and temporal patterns of species occurrence and behavior through acoustic monitoring efforts. The striped cusk-eel (*Ophidion marginatum*) is one of these sound-producing species that occurs off the coast of Cape Cod and contributes substantially to the local soundscape. The objective of this study is to document the temporal occurrence of cusk-eel sounds in Cape Cod Bay throughout the year and investigate whether characteristics of their sounds fluctuate with environmental changes. We use passive acoustic data from a recorder that has been deployed in Wellfleet Harbor since 2014, recording almost continuously, and environmental data (dissolved oxygen, temperature, salinity) from a sensor deployed in the same area. Analysis of two separate years of data (2020 and 2023) revealed that cusk-eel vocalizations were detected from late April to late September in both years, with the highest calling activity and intensity occurring between June and August. During these months, calling activity reached a peak each evening in a chorus of many overlapping calls, which continued throughout the night. We are currently using environmental data to assess potential effects of low dissolved oxygen (hypoxia) events reported in the area on cusk-eel call parameters. Both the widespread coastal presence and consistent vocal production during the summer of striped cusk-eels suggest that their calls may have potential to be used as an acoustic indicator for low dissolved oxygen events.

PRESENTER: Tyler Pelt, Undergraduate Student, University of Massachusetts Amherst

COLLABORATORS: Laela Sayigh, PhD, (Senior Research Specialist) and Xavier Mouy, PhD, (Assistant Scientist), Woods Hole Oceanographic Institution (WHOI)

BIOGRAPHICAL INFORMATION: Tyler is a fourth-year undergraduate at the University of Massachusetts Amherst, pursuing a Bachelor's in Environmental Science and the Five College Coastal and Marine Science Certificate. He is completing his thesis on cusk-eel sounds in Wellfleet Harbor, which he began working on as a guest student at Woods Hole Oceanographic Institution this past summer.

CONTACT: Tyler Pelt (tylerjpelt@gmail.com, 978-802-0577)

Understanding Seasonal Thresher Shark (*Alopias vulpinus*) Strandings on Cape Cod

DESCRIPTION: Strandings of Atlantic common threshers (*Alopias vulpinus*) are common events each fall and early winter along the northern shores of Cape Cod. These medium-sized (15-20') predatory sharks migrate north to Cape Cod each spring and summer to feed on schooling fish and squid, with fall being peak shark season. Thresher sharks have a sickle-shaped tail, often as long as their bodies, used like a whip to stun prey. Most individuals strand dead, but necropsy results and occasional live strandings show that many sharks are alive at the time they come ashore. Causes for strandings include navigational errors, injury, illness, or environmental factors. Although sharks are cold-blooded (ectothermic), thresher sharks exhibit endothermy, allowing them to survive cold fall waters. Necropsies indicate that most strandings are healthy individuals that made navigational errors while migrating south to wintering areas. The Cape's unique geography creates a hook-like trap for migrating marine species. Thresher sharks often find themselves in dangerous areas, such as shallow harbors, coves, or tidal flats. If beached, it quickly dies from lack of oxygenated water over its gills. Rescuing any live shark is difficult, but rescuing a thresher shark offers additional challenges given its long tail that can whip around the entire body. Most stranded individuals have been males, though the reason is unclear since both sexes have similar migratory routes. These questions indicate how little is known and why observations of live thresher sharks and necropsies of carcasses provide opportunities to learn more about the biology and life history of this species.

PRESENTER: Kathy Miller, Volunteer, New England Coastal Wildlife Alliance (NECWA)

COLLABORATORS: Carol "Krill" Carson, NECWA Founder & President/ Bridgewater State University Senior Visiting Lecturer; John Chisholm, Adjunct Scientist, New England Aquarium

BIOGRAPHICAL INFORMATION: Kathleen Miller is a retired art educator and children's librarian, and lifelong thalassophile who washed ashore on the Cape in 2020. Kathy volunteers for NECWA, Mass Audubon Wellfleet Bay Wildlife Sanctuary, Cape Cod Museum of Natural History, Brewster Pond Coalition, and Brewster Dog Park. Kathy has been attending Cape Cod Natural History Conferences for over 15 years and she happily resides in Brewster with her husband Jeff and best pal and guide "Thor".

Carol "Krill" Carson is the founder and president of NECWA, an all-volunteer nonprofit based in south coastal Massachusetts. A marine biologist and educator, Krill focuses on protecting marine habitats and the species that depend on them. Through wide-ranging community and research partnerships, she and her team rescue and study ocean sunfish and torpedo rays, the "marine misfits" that frequently strand each fall and early winter on Cape Cod.

John Chisholm has nearly four decades of experience as a fisherman and scientist. He has documented white shark occurrences in the Atlantic since the late 1970s and continues to maintain a database of sightings. His research includes spiny dogfish, sand tiger, porbeagle, and basking sharks, with current emphasis on shark diversity, ecology, and the use of technology to understand migratory and predatory behavior.

CONTACT: Krill Carson (krillcarson@mac.com, 508-369-8303); Kathleen Miller (kapjm29@gmail.com, 860-483-1426); John Chisholm (jchisholm@neaq.org, 508-245-9512)
