Science & News from the Rhode Island Natural History Survey Rhode Island Natural History Survey

Marine Mammals of Rhode Island: Science Says That Wind Farms Are Not Killing Whales

By ROBERT D. KENNEY

You might wonder how I decide which species to feature next in these profiles of the marine mammals from our region. Sometimes I'm just trying for a little diversity—a baleen whale one time, a seal the next. More often there is something interesting going on that suggests a choice, such as the increase in numbers and likely pupping of gray seals at Block Island (Fall 2022), or the split of bottlenose dolphins along the East Coast into two species (Spring 2023). I was intending to feature the humpback whale (*Megaptera novaeangliae*) for this issue (one was spotted next to the Saunderstown Yacht Club on May 23rd). But I quickly got side-tracked, along with many other scientists and conservationists, by a disinformation campaign that has been blaming whale deaths on offshore wind development.

Unusual Mortality Events

When the numbers of dead animals of any marine mammal species increase significantly above the "normal" range, the National Marine Fisheries Service (NMFS) declares it to be an Unusual Mortality Event (UME), triggering a defined series of responses. The UME process is managed by a working group established under federal law as a response to the deaths of more than 740 bottlenose dolphins between Florida and New Jersey in 1987–1988. An Atlantic Coast humpback UME that began in January 2016 is still ongoing.¹ From January 2016 through August 2023, 208 dead humpbacks were recorded between Maine and Florida, with the largest numbers in Massachusetts (41), New York (43), New Jersey (29), Virginia (31), and North Carolina (27). The average for 2016–2022 was 25, which is more than double the typical average of about 11 per year, and 2023 is going to beat the average since it's already at 33 (Fig. 1).

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Since the process was initiated in 1991, there have been 72 declared UMEs.² At present there are three active UMEs in the U.S. Atlantic in addition to the humpback one. A North Atlantic right whale UME began in 2017, caused by entanglement and vessel strikes. A manatee UME in Florida began in 2021, caused by starvation due to extensive die-off of seagrass. And a UME involving harbor and gray seals occurred in Maine in summer 2022, caused by infectious disease (believed to be avian influenza). There are also two inactive UMEs where closures are pending. A minke whale UME that began in 2017 was suspected to be caused by a combination of entanglement and disease. Finally, a 2018–2020 multi-species seal UME was determined to be caused by infectious disease (phocine distemper virus).

A cause for the humpback UME has not yet been determined. About half of the animals necropsied so far showed evidence of collision with ships or entanglement in fishing gear, but there is not enough funding available for carcass retrieval or for full necropsies on all that are discovered. Many carcasses are too decomposed when first discovered for careful investigation and sampling, so the cause of death can be determined only if there is something really obvious, like shattered bones from a ship strike. Some previous humpback mortalities have been linked to exposure to natural biotoxins—both saxitoxin (produced by a dinoflagellate) and domoic acid (produced by diatoms). Research is

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continuing, however in many cases a cause for a given UME cannot be determined.



Figure 1. Humpback whale strandings³, Maine to Florida, 2011–2023 (2023 is only through August). The red bars show the years of the declared UME; the orange bars are the five preceding years. (Based on data from the NMFS UME website cited in note 1)

Of the 208 dead whales counted so far in the current humpback UME, there were nine in Rhode Island—two in 2016, three in 2017, one in 2019, three in 2022, and one in 2023. Note that the three in 2017 might really be only two. Kim Gaffett, naturalist with The Nature Conservancy on Block Island (and former board member and past president of RINHS) is convinced that the stinky, rotten whale on the beach at Mohegan Bluffs in September was the same animal as the really stinky, really rotten one that stranded at Ballard's Beach in October—washed out by one storm and back in by another. We'll never know for sure; it would have needed viable DNA samples from both to know if they were the same whale. But it was the first one in 2017 that sparked the most interest and biggest response, and gave us a hint of what was to come in 2023.

On Friday, 16 June 2017, a dead humpback whale was discovered on the rocks at Beavertail State Park in Jamestown. There was some concern at first that it was the whale seen alive earlier that week just off the seawall at Narragansett Pier, but it was soon clear that they were two separate whales. Mystic Aquarium sent a stranding-response volunteer to identify, photograph, and measure the carcass (9.7 m long, or just under 32 feet), but they did not start a necropsy because that would make them responsible for the substantial costs of disposal. As Mystic, NMFS, R.I. DEM, and other groups discussed how to proceed, the weather turned bad and prevented any action for several days—while print, television, and digital media were filled with news of the stranding.

About a week after the stranding, a popular blog called *Newport Buzz* published a column entitled "Block Island wind farm may have killed young humpback whale."⁴ It had been posted by Christian Winthrop. but was a copy of an article written by Andrew Follett and published a little earlier by *The Daily Caller*, a conservative website founded by Tucker Carlson from Fox News (at the time) and Neil Patel, former adviser to Dick Cheney. (*The Daily Caller* encourages readers to re-post their articles elsewhere.) Other than simple statements like there being a dead whale on Jamestown, most of the information in the article was exaggerated, inaccurate, or just plain wrong.

There was a flurry of emails around the URI Bay Campus, and a brief response correcting some of the most egregious errors, signed by myself and Prof. Jim Miller, a bioacoustics expert from the URI Ocean Engineering Dept., was sent to and subsequently published by *Newport Buzz.*⁵ So just how many errors could there be in a short column of only 450 words? With apologies to Elizabeth Barrett Browning—let me count the ways.

"Noise from the turbine allegedly hampers the sonar that whales use to navigate." Humpbacks and other baleen whales do not echolocate; only toothed whales (e.g., sperm whales and dolphins) do.

"Ordinary operations noises from offshore wind turbines can travel immense distances underwater." Dr. Miller and his colleagues monitored the sound produced by the Block Island Wind Farm (BIWF) turbines after they started operating in December 2015. At only 50 meters away, the sound is so low that it cannot be detected above background noise unless there is no wind blowing and no boat passing in the vicinity. At greater distances, a whale could not hear the turbines even on the quietest days.

"Water magnifies sounds, so underwater the pile driver's noise can reach levels up to 220 decibels. Putting this number into perspective, 150 decibels of sound can burst human eardrums, and 185 to 200 decibels is the range usually considered to be the threshold for causing human death." Although water transmits sounds better than air does, it does not magnify them. And the decibel (dB) is not an absolute measurement; it is a measure of difference from a standard level, on a logarithmic scale. Sound measurements in air and underwater use different reference levels, and the much higher density of water means that it takes more energy to create a sound of equivalent intensity. The correction factor to go between air and water is about 61.5 dB, so the underwater pile-driver source level of 220 dB would be equivalent to 158.5 dB on the in-air scale.⁶

(continued on page 4)

President's Corner: Best BioBlitz EVER!

I have been reflecting back to June and the Survey's annual, signature event—Rhode Island BioBlitz. It's an event that never disappoints and continues to build the Survey's reputation by bringing science to the community. It has been both exciting and gratifying to work in partnership with the Narragansett Tribal Office of Environmental Protection and Natural Resources management in orchestrating the largest (almost 400 participants!), and arguably the best Rhode Island BioBlitz EVER! (Check out the articles and photos beginning on page 13.) Taking place on 1,200 acres of mostly wooded land within the Narragansett Indian Reservation off Route 2 and Old Mill Road in Charlestown, the parcel includes rare Atlantic white cedar swamp, biodiverse coastal plain ponds, and unusual pitch pine-scrub oak woods, and features culturally and historically important landmarks and sites. The predominantly undeveloped land yielded over 1,200 species in a 24-hour period,



Lou Perrotti, President, Board of Directors

including two species of ants never before found in RI and several very rare animal species. The traditional foods included with dinner, the storytelling, and the traditional dance that was shared with us makes my heart smile! I'm confident that a memorable time was had by all and the Survey looks forward to this event being the first in a long line of collaborations with the Tribal Natural Resources Department and the Narragansett Tribe. Lastly, my sincere thanks to our long-term BioBlitz sponsors the Roger Williams Park Zoo and Largess Forestry for their many years of support for this amazing annual event.

I cannot recognize and thank the Survey staff, David Gregg and Kira Stillwell, enough for their exceptional efforts in making this year's BioBlitz the record-breaking event that it was, not to mention all they do on a daily basis to keep the Survey moving forward as the amazing organization that it is. Together they continue to build a portfolio of interesting projects and programs, keeping us relevant to our membership. I would also like to thank my fellow Directors, both past and present, for their dedication and their support of our mission. Lastly, thanks to all of you who continue to support the Survey through memberships, donations, and by participating in our events and programs.

Speaking of which . . . keep an eye out for announcements of our Fall and Winter program slate! Last Wednesday Tea each month (in person or virtually) is a great way to engage in some natural history conversation, and Rhode Island Natural History Week is right around the corner in November. We encourage all our members and all Rhode Islanders to join in recognizing the importance of this week. We value each one of you and look forward to many more years of celebrating the notable biodiversity and natural history of our great state together.

Finally, I would like to say thank-you and farewell to board members James Waters, Howie Ginsberg, and Scott Buchanan who all stepped down this year. We appreciated all you have done for the Survey and wish you great discoveries wherever you go from here, although Howie isn't going anywhere (just turn to page 6 to see the first in his planned series of articles on Rhode Island's bees). I hope you'll join me in offering a warm welcome to new board members Nelle Couret, Ben Gagliardi,

and Joanne Riccitelli. We look forward to working with them and know they will help take the Survey to the next level. (See page 19 for profiles of the departing and new board members.)

Whales and Wind Farms (continued from page 2)

Pile-driving during construction of a wind farm does produce very loud sounds that are capable of disturbing whales or even causing hearing damage if they are close enough (from <10 m to 3–4 km depending on species, location, type of pile-driver, etc.), but mitigation measures were in place during BIWF construction to minimize impacts (e.g., no pile-driving during November–April when North Atlantic right whales are most likely to be present; protected species observers searching for marine animals nearby and stopping the pile-driving if any whales are seen). Furthermore, that dead humpback on Beavertail could not have heard any of the BIWF pile-driving. A 32-foot whale in June 2017 would have been born in the West Indies around January 2016. Pile-driving for the BIWF was completed just before Halloween in 2015.

Recent events

In December of 2022, a small group of Rhode Island residents incorporated a new non-profit called Green Oceans. What soon became obvious was that their mission is to block development of offshore wind (OSW) facilities anywhere near their community. Green Oceans is based in Little Compton-the third wealthiest community in the state, and three of Green Ocean's six directors own large oceanfront properties there. They are using whales in their campaign against wind farms-publishing multiple letters to the editor, op-eds, and a white paper. Similar groups have sprung up in Nantucket, Long Island, New Jersey, and probably other states as well-all opposing OSW development and at least some of them supported financially by groups associated with the fossil fuel industry, climate denial, and antigovernment libertarianism. Some of materials published by these groups cite the 2017 Newport Buzz column as "scientific" evidence that wind farms harm whales (one reason for making such a big deal about it here). Many citizens are now convinced that OSW is hurting whales because of the torrent of misinformation telling them exactly that.

Many people from the scientific and conservation communities have been kept busy trying to counter the rampant misinformation that Green Oceans and other similar groups have been disseminating. A group of undergraduate students from the Climate and Development Lab at Brown University produced a report analyzing the range of deceptive tactics being used by Green Oceans in their campaign.⁷

One very frequent tactic is to use the word "take," always with the scare quotes, to mislead readers into thinking that federal regulators are issuing permits to the OSW developers that allow killing whales and other marine mammals.

Take is the term used in both the Endangered Species Act and Marine Mammal Protection Act to define the full range of prohibited activities, from killing to injuring to simple disturbance to removing a souvenir from a dead seal on the beach or feeding a fish to a dolphin. Opponents will add up all the allowable takes in the Incidental Harassment Authorizations that have been issued or proposed for OSW projects, then post something with the total numbers, but never clarify that (1) zero lethal takes are being permitted, (2) some tiny proportion (i.e., 0.25%) are "Level A" harassment that might include non-serious injury, primarily from the pile-driving (which did not start until June 2023 for the new wind farms), (3) by far the most, 99.75%, are "Level B" harassment, or temporary disturbance, and (4) the permitted takes are an upper limit, with permittees required to take mitigation actions to reduce their likelihood as much as possible. But those large numbers then get translated somewhere else to headlines like "Offshore Wind Industry Gets License To Kill Right, Sperm & Humpback Whales With Impunity."

The numbers of humpback whale strandings in the mid-Atlantic states this past winter have provided these groups and their allies with an opportunity to blame OSW development, even though the recent strandings represent a continuation of the UME that started in 2016. Since very few turbines had been installed already (five in the BIWF and two off Virginia), these opponents placed the blame on the highresolution geophysical (HRG) surveys being done for characterization of the bottom sediments at the proposed windfarm sites. Sometimes the opponents conflate the HRG acoustic sources with very much louder sources such as naval sonar or the seismic air-guns used in oil exploration. In other cases they construct fanciful scenarios where the HRG surveys deafen the whales and/or panic them into shallow water where they strand, or are hit by ships, or encounter fishing gear and become entangled.

Given the lack of any evidence that OSW has any link to the on-going humpback UME, what could the explanation(s) be? First of all, note that the UME does not represent something unprecedented—mortality rates were significant prior to 2016 (Fig. 1). There was a single-year spike of 21 dead whales in 2013, and the 10 mortalities in 2021 were below the pre-UME average. Even an increase in anthropogenic mortalities could have an underlying natural explanation, e.g., whales changing their distribution in response to climate-related shifts in prey patterns into places where they might be more likely to occur in areas of un-regulated fisheries or in heavily trafficked shipping lanes. This appears to be precisely what occurred with the North Atlantic right whale UME. Their prey resources shifted as ocean waters in our region warmed, and some whales switched their summer feeding grounds from the Gulf of Maine to the Gulf of St. Lawrence. The apparent result was 17 dead whales in 2017 and 10 in 2019, with vessel strikes and entanglement the only causes shown by necropsy results.⁸ Numbers in the other years were low and consistent with the years before 2017.

Assuming for the moment that there is no disease or biotoxin involved in the present humpback whale UME, there are several factors that could be implicated. A group called the Citizens Campaign for the Environment held a "Whale Tales and Whale Facts" webinar on 5 April 2023 to counter some of the misinformation being disseminated (see https://www.youtube.com/watch?v=35bPuWhY4eM for the recording). Some of the potential factors presented by experts at the webinar include the following.

Shipping traffic in and out of the port of New York and New Jersey has increased dramatically. Total cargo levels increased from 2010 by 53% to 2016 and by 132% to 2022.⁹ The largest single-year increase was between 2020 and 2021, when the pandemic changed our buying patterns.

The humpback population has been growing, and their numbers in the mid-Atlantic have increased dramatically. Gotham Whale is a research organization from Staten Island that collects data from whale-watching boats working off New York Harbor. They recorded 260 humpback individuals in 2022, mostly juveniles, compared with only 5 a decade earlier. Juveniles have no reason to migrate to the West Indies in winter with the adults for calving and mating (fasting for the entire trip)—they simply go to where they can find food during the colder months. And juveniles are more likely than adults to get hit by ships or entangled because of their inexperience. Scott Kraus, who directed the right whale research program at New England Aquarium for many years, often called it the "teenage driver syndrome."

The Atlantic menhaden (*Brevoortia tyrannus*) is a schooling fish related to the herrings that is one of the preferred prey species of humpback whales and other marine mammals in the mid-Atlantic (see the article on p. 11). Their abundance has increased substantially because of stricter fishery management. For example, large-scale purse-seine fishing for menhaden was banned in state waters by New York in 2019. More fish equals more whales, and a higher likelihood of whales encountering fishing gear and risking entanglement.

The loudest sound sources used in the HRG surveys are capable of disturbing whales and disrupting their behaviors (think of the neighbor's lawn-mower or leaf-blower on Sunday morning), but only within relatively short distances, typically less than 200 m.¹⁰

Over 200 dead humpback whales in seven and a half years is unfortunate and saddening. Nevertheless, there is no

evidence for any link between the humpback UME, or any other whale mortalities, and OSW development.

Notes

- https://www.fisheries.noaa.gov/national/marine-lifedistress/2016-2023-humpback-whale-unusual-mortality-eventalong-atlantic-coast
- (2) https://www.fisheries.noaa.gov/national/marine-lifedistress/active-and-closed-unusual-mortality-events
- (3) The definition of "stranding" under the Marine Mammal Protection act includes both dead whales on the beach and floating in the ocean, even if never recovered.
- (4) http://www.thenewportbuzz.com/block-island-wind-farm-mayhave-killed-young-humpback-whale/12245
- (5) http://www.thenewportbuzz.com/uri-researchers-block-islandwind-farm-highly-unlikely-to-have-caused-whales-death/12376
- (6) Readers who are interested in much more about underwater sound should check out the Discovery of Sound in the Sea (DOSITS) website (https://dosits.org/), which provides scientific information about marine acoustics in a way that makes it accessible to the general public.
- (7) http://www.climatedevlab.brown.edu/home/discourses-ofclimate-delay-in-the-campaign-against-offshore-wind-a-casestudy-from-rhode-island
- (8) https://www.fisheries.noaa.gov/national/marine-lifedistress/2017-2023-north-atlantic-right-whale-unusual-mortalityevent
- (9) https://www.panynj.gov/port/en/our-port/facts-and-figures.html
- (10) Ruppel, C.D., T.C. Weber, E.R. Staaterman, S.J. Labak, and P.E. Hart. 2022. Categorizing active marine acoustic sources based on their potential to affect marine animals. Journal of Marine Science and Engineering 10(9):1278. Open access paper https://doi.org/10.3390/jmse10091278.

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(R.D. Kenney)

Bees of Rhode Island: Goldenrod Bees

By HOWARD S GINSBERG

This is the first of what will be a regular series of profiles of bees of Rhode Island.—Eds.

One of the striking natural features of early fall in the Northeast is the extensive cover of yellow goldenrod flowers in open fields. Walking out on the field, you can see abundant honey bees and bumble bees foraging on the flowers. The most common bumble bee species on goldenrods in Rhode Island is *Bombus impatiens*, the common eastern bumble bee, which is overall the most abundant bumble bee in the state (Varkonyi 2022). Honey bees and bumble bees are highly social, and they are able to exploit this abundant latesummer resource because of their large populations, which have built up over the summer. However, this phenomenon is historically novel (Ginsberg 1981).

Honey bees are not native to North America (they were introduced by the colonists) and most of the extensive goldenrod fields are in fact old farm fields that had been abandoned after human use. Before settlement by the colonists, these sites had mostly been covered with forests. Goldenrods, which are native to North America, were formerly more widely distributed, and there are several species of native solitary bees that had adapted through evolutionary time to forage on them. These critters are less conspicuous than honey bees and bumble bees (which are giants compared to most bee species), but if you look closely, you can see these diminutive bees foraging on the goldenrods and asters of late summer and fall in Rhode Island. I'd like to introduce a few of these species, and talk a little about their fascinating life histories.

Perdita octomaculata (Andrenidae)

Perdita octomaculata is a tiny black bee (about 7 mm in length) with bright yellow markings (Fig. 1). We know of only 2 species of *Perdita* in Rhode Island, but this genus is highly speciose out west, with numerous species that specialize on a variety of flowering plants. Rothwell and Ginsberg (2019) found this species foraging on seaside goldenrod (*Solidago sempervirens*) on Napatree Point, a sandy coastal site at the southwestern corner of Rhode Island, which makes sense because *P. octomaculata* nests in sand. The species is not restricted to coastal sites; my thesis

advisor, George Eickwort, studied *P. octomaculata* nesting in a sand quarry in central New York state (Eickwort 1977).



Figure 1. *Perdita octomaculata* (Andrenidae). Top: side view; Bottom: front view (all photos with this article are by Sam Droege, used by permission).

Sand-nesting requires some interesting adaptations. These bees have just one generation per year. They overwinter as post-defecating larvae (prepupae), pupate during the summer, and later emerge as adults, typically in August (Eickwort 1977). The females excavate nests that consist of burrows in the sand with lateral extensions that end in small cells. Each cell is provisioned with a pollen/nectar mass, an egg is laid, and the cell and lateral burrow are then sealed with sand. The provision mass has all of the nutrients needed for the larva to develop to the adult stage. This is important because of the sandy nesting substrate, which is friable, and the nests are often buried or destroyed by the effects of wind or animal movement. If a female bee returns from a foraging trip and cannot find her nest because the opening has been obscured or destroyed, she then just excavates another nest and starts anew. Meanwhile, the larvae in the abandoned cells have all that they need to develop and emerge as adults the following year. Bees tend to specialize in pollen collection, and *P. octomaculata* forages for pollen predominantly on goldenrods and sometimes on asters, but it will visit a variety of other flowers for nectar.

Andrena asteris, A. hirticincta (Andrenidae)

Bees of the genus Andrena are sometimes called "miner" bees because they nest in the soil. They are all solitary species that dig burrows in the ground, but nest architecture varies considerably, with diverse configurations of lateral burrows and distributions of cells. They provision each cell with a pollen/nectar mass with enough nutrients for larval development. The female lays an egg, and then seals the cell. Andrena larvae typically develop in the cell, pupate, and overwinter as adults. They are solitary, with just one generation per year. This is a large genus with over 50 species known from Rhode Island. Many emerge in the spring, when they forage on forest flowers that bloom before the tree canopy closes, and several others emerge in late summer. Many of these bees are generalists in their pollen foraging, but there are numerous specialist species as well (Fowler 2016). Andrena hirticincta (Fig. 2, top) is one of the late-summer species, and it specializes on goldenrods.

Identification of these bees can be tricky, with many species looking pretty much alike. The genus is distinguished by large facial foveae, which are oval depressions on the face, just in from the eyes. However, the foveae are often obscured by hairs and can be difficult to see on a specimen moving around on a flower (Fig. 2, bottom). *Andrena hirticincta* is a moderate-sized bee (about 12 mm in length; larger than *Perdita* but far smaller than a honey bee), and is covered with pale hairs (Fig. 2, top). This bee is abundant in the Northeast, extending to the Midwest and into Canada.

Colletes simulans, C. compactus, C. kincaidii (Colletidae)

Several species of *Colletes* are known from Rhode Island, and like *Andrena*, some of them of them are active in the spring (Batra 1980) and others in late summer and fall. These are solitary bees with just one generation per year, and they vary in their degree of specialization in floral foraging. Among the most common of the spring species is *Colletes inaequalis*, which nests in large aggregations in disturbed soil (such as on roadsides). Numerous bees can be seen swarming around the nest site, which consists of numerous circular holes in the ground with a small mound of excavated material (a "tumulus") around each hole. In fact, the swarming bees are nearly all males, who are look-



Figure 2. *Andrena* species (Andrenidae). Top: *A. hirticincta*, side view; Bottom: *Andrena* face with facial foveae hidden by hairs.

ing for mates. As solitary bees, each hole is the entrance to an individual nest, and only one female nests in each. I have excavated nests of this species, and the main burrow can extend nearly a meter deep. The females excavate laterals off the main burrow, build a cell at the end of each lateral, provision it with a moist mixture of pollen and nectar, lay an egg, and then seal the cell and fill the lateral with soil. Bees of the genus *Colletes* are sometimes called "cellophane bees" because of the distinctive coating of the cells; a polyester-type membrane that effectively seals the cell.

A few species of *Colletes* are active in late summer, includeing *C. simulans*, which specializes on goldenrods and asters (Fowler 2016). Three species (*C. simulans, C. compactus,* and *C. kinkaidii*) have been collected on seaside goldenrod, *S. sempervirens*, at Napatree Point (Rothwell and Ginsberg 2019). *Colletes* are moderate-sized black bees with pale hairs (Fig. 3). They have unique features that allow identification of the genus, but these structures are not easily visible on an active bee in the field. The glossa (tongue) of bees in the family Colletidae is distinctive in that it is bilobed at the end (Fig. 3, bottom); in other bees the glossa comes to a point. The female *Colletes* bees use this bilobed tongue to apply the cell-lining material, which is produced in the Dufour's gland in the bee's abdomen. The wing venation of the genus *Colletes* is unique (three submarginal cells and an arched second recurrent vein), but these features are difficult to see, except under the microscope.



Figure 3. *Colletes compactus* (Colletidae). Top: side view; Bottom: face with bilobed glossa extended.

Identifying wild bees

Identification of wild bees can pose significant problems. Some species are easily recognized, but many are very difficult to identify, even when magnified. Species of the genus *Andrena*, for example, are notoriously difficult to distinguish. Fortunately, there are online resources for identification of wild bees, especially in the eastern US. I generally go first to the Discover Life website (www.discoverlife.org), which uses a tabular approach to identification of many organisms, including bees. The website includes detailed descriptions, drawings and photos, and up-to-date information about classification and distribution. The BugGuide website (bugguide.net) and iNaturalist (inaturalist.org) also have information and photos that can be useful. Even with these resources, many wild bees require an expert for reliable identification. I have been working with URI colleagues to compile a list of the bees of Rhode Island, and currently we have identified about 250 species known from the state. In this series, the "Bees of Rhode Island," I hope to provide information about several of these species, describe some of the interesting characteristics of their diverse lifestyles and behaviors, and help naturalists to find and appreciate these diminutive and fascinating creatures.

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(Wikimedia Commons)

Long-term Outcomes of Salt Marsh Tidal Restorations in Rhode Island

By THOMAS E. KUTCHER and KENNETH B. RAPOSA

This article is an extract from the full report produced by the Rhode Island Natural History Survey's wetlands project, which has been on-going since 2014—working closely with the Rhode Island Dept. of Environmental Management. An updated version of the full report submitted to RI DEM in 2021 will be posted to the resources library on the Survey website, and a peer-reviewed journal article was published recently (Kutcher and Raposa 2023).—Eds.

Salt marshes are valuable coastal ecosystems, but many have been degraded by roads, railways, and other infrastructure that restrict tidal flow and impound watershed runoff, causing shifts in chemistry, physical structure, and vegetation and animal communities. Tidal restoration is a common ecological management practice that involves restoring daily tidal flow to tide-restricted salt marshes in order to restore native vegetation and habitat functions. Biological communities may take one or more decades to recover following tidal restoration, but outcomes are seldom assessed on that timescale.

Table 1. The eight marshes where tidal flows were restored, andthe control marsh, listed from north to south and showing thecodes used in Fig. 1.

Marsh Name	Code	Town	Area (ha.)
Walker Farm	WALK	Barrington	6.2
Jacobs Inner	JAIN	Warren	2.7
Silver Spring	SILV	Bristol	4.4
Coggeshall	Control	Portsmouth	20.0
Potter Pond	POTT	Portsmouth	0.9
Duck Cove	DUCK	North Kingstown	2.4
Gooseneck Cove	GOOS	Newport	8.5
Sachuest Mid	SAMI	Middletown	3.5
Galilee Inner	GAIN	Narragansett	38.0

We assessed the long-term outcomes of eight tidal restorations in Rhode Island (Table 1, Fig. 1, Fig. 2) by sampling plant and nekton (fish and other macroscopic swimming animals) communities using the original methods and stations from pre-restoration monitoring. We additionally assessed the current conditions of the restoration marshes against surrounding unrestricted salt marshes using data from a rapid assessment method that we have developed and a simple crab-burrow count.

Vegetation recovery was variable at the restoration marshes, with some marshes gaining native species concurrent with the loss of the invasive tall reed Phragmites australis, signaling recovery, while others continued to lose native vegetation cover. However, relative to an unrestricted control marsh that, over the same time period, showed vegetation shifts indicating inundation stress, our findings suggest that restoration actions promoted vegetation recovery at all of the restoration marshes. Fish density responded positively to tidal restoration, but overall, nekton communities shifted away from fish abundance and starkly toward domination by the grass shrimp Palaemonetes pugio at the restoration and control marshes, suggesting ambient habitat degradation. Together, the time-series vegetation and nekton data suggest that while restoration actions promoted biological recovery, ambient inundation stress has worked to counteract it.



Figure 1. Locations of eight mature tidal-restoration marshes and the control marsh (Coggeshall) in Rhode Island. See Table 1 for the full names of the marshes.

According to our rapid index of marsh integrity, current marsh integrity was highly variable across the restoration marshes (Fig. 3). Integrity index scores were not significantly different on average between restoration and reference marshes, but the cover of *Phragmites* was higher and the cover of meadow high marsh was lower for restoration marshes, suggesting incomplete recovery. We found that integrity increased with the degree of adaptive management following restoration, as well as the age of restoration.



Figure 2. Aerial photo and site delineation (the red outlined area) of one of the restored marshes, the Galilee Inner marsh.

Coupled with modest evidence that vegetation recovery also increased with restoration effort and age, our findings suggest the importance of adaptive management and recovery time in restoration success. Additionally, in order to ensure recovery, salt marsh restoration practitioners in southern New England and elsewhere may need to shift their methods and expectations to accommodate prevalent, increasing inundation stress. Our study methods highlight the utility of strictly standardized long-term vegetation and nekton monitoring in assessing salt marsh restoration outcomes, and demonstrate how rapid assessment data collected across a broad set of reference wetlands can add valuable context to restoration findings.

Literature Cited

Kutcher, T.E., and K.B. Raposa. 2023. Assessing long-term outcomes of tidal restoration in New England salt marshes. *Journal of Environmental Management* 338:117832.

Thomas Kutcher is the Wetlands Scientist with the Rhode Island Natural History Survey and **Kenneth Raposa** is the Research Coordinator of the Narragansett Bay National Estuarine Research Reserve.



Figure 3. IMI scores (Index of Marsh Integrity, in parentheses) and relative proportions of IMI salt marsh cover types from 30 representative unrestricted salt marshes (Reference marshes), the marsh used as a Control marsh for vegetation and nekton analyses, and 8 Restoration salt marshes in Rhode Island. The IMI scores for Reference marshes are aggregated into quartiles, where the upper quartile (green scores) represents least-degraded salt marshes and the lower quartile (red scores) represents most-degraded salt marshes. The Restoration marshes are listed in descending order of IMI score.

Atlantic Menhaden (*Brevoortia tyrannus*) Species Profile

BY CYNTHIA L. GRAY

Editors' Note: The following is extracted, with permission, from a report prepared in 1992 for the Narragansett Bay Estuary Program and jointly funded by the National Marine Fisheries Service. The full report with references can be found at https://www.nbep.org/technical-resources, along with profiles of several other Rhode Island fish species. The references in the original report are three decades or more out of date, therefore have been omitted here.

Introduction

The Atlantic menhaden (*Brevoortia tyrannus*; common names: pogy, mossbunker, bunker; Fig. 1) is a schooling, plankton-feeding, migratory fish that is common along the US East Coast and in Narragansett Bay. The species is one of the most abundant prey species for many marine predators, and continues to support one of the largest commercial fisheries in our region by tonnage of landings.



Figure 1. Atlantic Menhaden (*Brevoortia tyrannus*). From Annual report of the Forest, Fish and Game Commission of the State of New York (1899); public domain.

Stock and Range

Atlantic menhaden occur in coastal and inland tidal waters along the Atlantic coast of North America from the Gulf of St. Lawrence to northern Florida, mainly within 25 km of the coast and in larger bays and sounds. Recoveries of tagged fish confirm that Atlantic menhaden comprise a single stock that intermixes during the winter in ocean waters south of Cape Hatteras, North Carolina. Atlantic menhaden stratify along the coast by age and size during late spring and summer, with their age and size increasing from south to north. In Rhode Island, menhaden use Narragansett Bay and its tributaries, Little Narragansett Bay and the Pawcatuck River, coastal ponds, and marine waters closest to shore. All of these serve as nursery areas for eggs, larvae, and juveniles. Adult menhaden use these same waters as they migrate along the coast.

Abundance in Rhode Island Waters

Atlantic menhaden appear to have a split spawning season in Narragansett Bay, with eggs and larvae in May through August and again in late October. In Mt. Hope Bay, larval abundance declined precipitously in the mid-1970s as menhaden were replaced by anchovies, predominantly the bay anchovy *Anchoa mitchilli*. In Narragansett Bay, juvenile Atlantic menhaden ("peanut bunker" to local fishermen) are usually present from April to November, with peak abundance from June to mid-September.

Life History

The Atlantic menhaden, is a schooling, plankton-feeding clupeid (herrings and their kin) that makes extensive seasonal migrations, moving north during spring and south during fall. Spawning of Atlantic menhaden occurs chiefly at sea—closer to shore in the northern part of its range. Atlantic menhaden spawn every month, although most spawning appears to be during the fall and winter.

Larvae of Atlantic menhaden are transported by oceanic currents into the estuaries along the coast at an age of 1–2 months, when they metamorphose into juveniles and undergo extensive changes in their feeding and digestive structures. Larvae move toward low-salinity areas upon entering estuaries, and prejuveniles are dependent on low-salinity marsh habitats and river shoals for nurseries. After menhaden have transformed from prejuveniles to juveniles, they seek higher salinities.

Schools of juvenile menhaden move out of the estuary into the sea in the fall. Schooling by size is a behavioral characteristic displayed by Atlantic menhaden that seems innate from late larval stage to old age.

Habitat

Atlantic menhaden spawn pelagic eggs in continental shelf waters, and in bays and estuaries in the northern part of their range. Larval Atlantic menhaden use estuaries and are most abundant in surface strata. Juvenile menhaden use rich inshore coastal waters and estuaries as nursery areas for more than half of their first year before returning to the sea. Adult menhaden occupy bays, sounds, and estuaries from oceanic salinities to the uppermost limits of brackish water.

Reproduction

Atlantic menhaden are heterosexual and oviparous (egglaying) with broadcast fertilization. Atlantic menhaden spawn primarily in the evening or at night. The number of ova per female increases with fish length, with individual estimates ranging from 40,000 to 700,000 ova. Simultaneous maturation of two groups of ova within the ovaries suggests that an individual female may spawn more than once during a single season.

Growth and Development

Some Atlantic menhaden are sexually mature at age 1, ranging in size from approximately 180 to 280 mm. Most females by age 2 (195–320 mm) and all females of age 3 (over 300 mm) and older are mature. Age 6 and 7 fish occur frequently; 8-, 9-, and 10-year-olds are uncommon; and 12-year-old fish are rare.

Food and Feeding

Atlantic menhaden larvae are selective carnivores and voracious feeders that begin to feed on individual zooplankters four days after hatching. Prey items for larval Atlantic menhaden are mainly copepods, with selective predation on the larger estuarine zooplankters. The diet of juveniles shifts from copepods to diatoms and flagellates. Diatom genera in their diets include *Pleurosigma, Navicula, Nitzschia, Cyclotella, Melosira, Amphora, Gyrosisma*, and *Surirella*; and flagellates eaten include *Peridinium, Gymnodinium*, and *Polykrikos*.

Adult menhaden feed solely by filtration, with the rate of particle filtration of specific size and shape a function of the mouth area, the swimming speed of the fish, food particle concentration, and the mechanical efficiency of the gill rakers. Adult menhaden's minimum-size threshold for filtration of particles is around 15 μ m, with the consequence that a substantial portion of the phytoplankton will be unavailable to them.

Predators and Competitors

Predators of Atlantic menhaden eggs include chaetognaths, fish larvae, mollusks, and salps. Both yolk-sac and first-feeding larval Atlantic menhaden are consumed by the copepod *Anomalocera ornata*. The copepod *Centropages typicus* ingests Atlantic menhaden yolk-sac larvae, but not first-feeding larvae.

All large carnivorous sea mammals, fishes, and sea birds are potential predators of menhaden. Bluefish (*Pomatomus saltatrix*) is the principal natural predator. Predators include

whales, dolphins, porpoises, and several species of fishes, including pollock (*Pollacius virens*), whiting (*Merlucius bilinearis*), and striped bass (*Morone saxatilis*). In 2008, Rutgers professor H. Bruce Franklin published a book entitled *The Most Important Fish in the Sea: Menhaden and America*. NOAA Fisheries has begun implementation of ecosystem-based fishery management, which recognizes that managing mammals and larger fish requires managing their food species. The most apparent competitors with menhaden are other filter-feeders—herrings, anchovies, mullets, oysters, mussels, barnacles, and tube worms.

Environmental Effects

Schools of Atlantic menhaden have measurable effects upon the estuarine waters of Narragansett Bay by their feeding, respiration, and excretion. Levels of chlorophyll can be low within the schools due to fish predation on phytoplankton. Dissolved oxygen values tend to be lower and levels of ammonia higher within the school areas than outside. Most fish kills in Rhode Island occur in schools of menhaden (Fig. 2), which by their sheer volume have the ability to carry oxygen depletion beyond the normal levels of oxygen consumption.



Figure 2. Hypoxia/anoxia-caused fish kill of mostly menhaden in Greenwich Bay, August 2003. Photo by Chris Deacutis.

Cynthia Gray was a Marine Biologist at the Rhode Island Department of Environmental Management, Division of Fish & Wildlife, Marine Fisheries Section.

Executive Director's Journal: Why BioBlitz?

By DAVID W. GREGG

A number of years ago a communications consultant who the Survey hired to help with our mission statement and strategic plan said, half-jokingly, that maybe we should just change the name of the whole organization to "Rhode Island BioBlitz." Every member or project partner who he had interviewed mentioned BioBlitz as a favorite Survey activity and said how much they enjoyed it. While we didn't take that advice, he's right that if you've been to a Rhode Island BioBlitz you have a good idea of what the Natural History Survey is all about.

As of this past June, the Natural History Survey has organized 24 Rhode Island BioBlitzes, one a year since 2000. BioBlitz visited a new site every year except one: the first event was held at Roger Williams Park in Providence and so was the 20th BioBlitz. In the early years, we sought out BioBlitz sites that had buildings or other infrastructure to use for Science Central—something with tables and chairs, a roof, bathrooms, and electricity. There was the Natural History Museum at that first Roger Williams Park BioBlitz, meeting rooms at Norman Bird Sanctuary in 2001 and Audubon's Eppley Preserve in 2002, and full-on outdoor centers at URI's Alton Jones Campus in 2004 and Mount Hope Farm in 2005. As far as facilities went, the lowliest were at Pardon Gray Preserve in Tiverton in 2003 where we had two 20 x 20-foot tents and the land trust's trailhead pavilion built into a ruined stone building.



Selected photos from BioBlitz 2023 (see page 21 for more).

In 2008, Westerly Land Trust invited us to blitz their Grills Preserve. The property had amazing BioBlitz potential: a big chunk of late successional shrubland and dry forest, the bank of the Pawcatuck River, riverbank wetland, a bog, rocky cliffs, and more. Unfortunately, there were no facilities there besides a small, gravel parking lot. Roger Williams Park Zoo saved the day, pledging a substantial financial sponsorship, enough to rent a big tent, tables, chairs, and porta-potties and turn that parking lot into Science Central. The Zoo has been a lead sponsor of Rhode Island BioBlitz every year since, giving us the means to deploy BioBlitz to some of the most remote sites in the state, including the bird banding station on Corn Neck on Block Island in 2010, the top of a windswept hill in Providence Water's Joslin Farm in 2011, Dundery Brook in Little Compton in 2015, and Hopkinton's Kenyon Crossroads Preserve in 2016.



What do we look for in a BioBlitz site? With years of practice, we are now confident we could make Rhode Island BioBlitz work just about anywhere as long as there is an enthusiastic local host. Logistically, we need a place to set up a 40 x 60 or 40 x 80 tent and porta-potties, and to park 100 plus cars. Running a generator for the whole event is noisy and spoils the ambiance so a plug-in source of electrical power is a big plus. (If any reader has an electric car with vehicle-to-load capability, and is charitably minded, we could run BioBlitz silently off your car or truck . . . hint, hint.) Biologically, we need at least some open field habitat and some fresh water, and after that any combination of shrubland, forest, wetlands, beach, or marsh can be made to work. We try to alternate between inland and coastal sites.

BioBlitz yields a species inventory that has a number of valuable uses, but strictly as an inventory it has limits: it only covers one 24-hour period and it is highly dependent both on which volunteers can make it that year and on the weather. What does BioBlitz do besides create a species list? The most important outcomes are changes to public perceptions of the local environment, land conservation, and the importance of community participation in environmental science. You cannot participate in BioBlitz and fail to be impressed with the biodiversity that's all around us, even in places you might have thought were too degraded to bother with. At Roger Williams Park, a highly modified urban landscape in the heart of Providence, we found 665 species in 2000 and, with a larger crew and more experience, double that number in 2019. You don't have to go to the Amazon to see biodiversity and no place is an ecological throw-away.



BioBlitz also provides benefits by bringing a festival atmosphere (some might say "circus") centered on conservation land. In every town in Rhode Island, passionate people are working to conserve open space and protect the local ecosystems for all the benefits they provide, in terms of natural resources, clean water and air, and psychological support and healing. But this work often goes unseen or unappreciated . . . until 200+ people descend on the town from all over the Northeast for BioBlitz out of appreciation for the biodiversity and ecological processes there. A lot of the benefit of BioBlitz comes from its social and networking aspects. At BioBlitz generally, and within each taxonomic team, there is an important opportunity to mix people of different ages, skills, and experience. If you know you're interested in Nature but never knew how to turn that interest into an activity, or you're a young person who has become obsessed with a particular taxon, at BioBlitz you can work side by side with seasoned experts—be they amateurs or professionals from agencies or academe. They can show you what field guide is best, what kind of microscope or net you should get, or how to search a locale for that particular taxon, or you can just talk shop with people who get you. And the road goes both ways, seasoned veterans may need to see that youthful enthusiasm to reignite their passion!

BioBlitz embodies many aspects of the Natural History Survey's mission: its scientific orientation to real-world problems in ecology and conservation and its preference for collaborative, multi-disciplinary projects. Survey projects strive for meaningful community involvement—diverse people and diverse sources of knowledge that will blend to give us insight to the problems of conservation. Whether BioBlitz is at a fancy nature center or out in the middle of the woods, at the end of the day, all of us are naturalists because of our love for Nature and our appreciation for the positive effects of being in the natural environment. We want conservationists to succeed and we want to pass our values on to the next generation. How better to model our values across generations than at a BioBlitz!

BioBlitz 2023: "In the Heart of the Narragansett People"



By COLLEEN CRONIN

Every year the Rhode Island Natural History Survey chooses a location to unleash a gaggle of expert and amateur naturalists for a 24-hour BioBlitz. The Survey chooses a different location each year—although it has been held at Roger Williams Park twice—and has covered almost every corner of the state, including once on Block Island.

While the Survey has staged the event in places of importance to Indigenous people and sites on which they lived before the violence and displacement of colonization, a Bio-Blitz had never been held on tribal land until this year. For the 24th Rhode Island BioBlitz, held from 2 PM on Friday, June 9, to 2 PM on Saturday the 10th, the Narragansett Indian Tribe hosted the event on its reservation in "auke ut Nahiganseck," which translates to "we dwell here." The English name for the area is Charlestown.

While uncovering species was the task of the event, the Tribe and its history were on display for the full 24 hours of biodiversity bonanza. Dinalyn Spears, the Tribe's community planner and natural resource director, organized the blitz with Survey staff after she was approached about it last year. Spears had often heard of the events, but usually could not attend because of conflicts with the Tribal Powwow schedule. After talking about it with Survey director David Gregg and program manager Kira Stillwell, Spears felt as though this year would be a perfect opportunity.



Dinalyn Spears (third from the left) and the other Tribal members helping her to oversee BioBlitz 2023, along with the Survey's David Gregg (second from the left) and Kira Stillwell (fourth from the right). Photo by the author.

Spears said she hoped the Survey would give the Narragansett Indian Tribe's Natural Resource Department a "baseline inventory" of the species on the reservation so she and her team could start implementing any needed management or protection procedures. From a symbolic perspective, Spears said she also loved getting to see a lot of "people of like minds" gathering together to appreciate the beauty of the land.

More than 350 people attended the BioBlitz, setting a record for participation that Spears hoped was in part due to the historic location that isn't always open to the public.

The event started with an opening ceremony that included a traditional prayer and words from Tribal Council members. "We give thanks to the beauty of creation and biodiversity that surrounds us today," Spears's mother, Janice, said in an opening prayer honoring Mother Earth and nature.

The T-shirts for this year's event (the purple ones in the photo above), designed by artist and tribal member Angel Beth Smith, also nodded to the Narragansetts' creation story and how Turtle Island (North America) came to be.

With the end of the opening statements, Gregg blew his air horn and BioBlitz 2023 began. Participants were allowed to travel through about 1,200 acres of mostly wooded reservation land. Some areas of cultural importance were marked off-limits, including the tribe's Medicine Circle, which can only be entered from the east, according to Dinalyn Spears. Participants were asked to avoid those areas and to avoid taking home specimens for identification. Temporary removal of any samples had to be approved by the Tribe.

First Councilman Cassius Spears Jr. spoke about the importance of the reservation to the Narragansett Indian Tribe and about the tribe's connection to the natural world. "I must first acknowledge that without a place there are no people," he said to the crowd, "so this place is very sacred to us." He spoke about how the Narragansetts' land once reached far beyond the 2,000 acres or so where the reservation sits, and where they host their ceremonies today. "This little piece that we have today, this place that we steward today is even more important because of what we once had," he added, telling the participants that they were "in the heart of the Narragansett people." He added that in some ways BioBlitz and the process of identifying the natural world aligns with the Narragansett story of creation and the process their people undertook to introduce themselves to the natural beings they encountered and consider family. "When you're out there, and you're walking, in many ways . . . you're greeting them, you're forming that relationship," he said.

Notable finds included a northern black widow spider, which thrives during dry weather patterns like the one Rhode Island has seen recently, and a freshwater sponge collected from Schoolhouse Pond.

After several hours of early searching, many of the participants sat down for a dinner, also organized by Dinalyn Spears. The meal, which included succotash (a traditional Narragansett dish), was eaten around a fire pit while tribal member Thawn Harris told traditional Narragansett stories woven through with the modern history of his people—with many jokes mixed in.

At the end of dinner, Harris led a group of about 100 people in a Standing Quiver Dance, which he explained was typically performed by the men of the tribe on their return from a successful hunt. The group of naturalists, led by Harris, snaked their way to a mound, contained by stone and built by his grandfather and uncles decades ago. When they reached the top of the man-made hill, Harris' call-and-repeat got faster, and the sky started to thunder and then it rained down on the dancers. When it was over, many participants walked away smiling and laughing to grab dessert or continue their identifications.



Thawn Harris captivating the audience with his story-telling. Photo by Peter Lacouture.

On Saturday, after a night of exploring and camping on the reservation, Dinalyn Spears organized another event for participants, a medicinal plant walk, and an environmental awareness event for members of the Tribe. The medicinal walk drew a crowd of about 25 interested naturalists of all ages, who learned things like the difference between false and true Solomon's seal and hazelnut's overall health benefits. Dinalyn Spears, a master gardener, answered questions and offered ideas for teas. The environmental awareness event for Narragansett members offered the chance to learn about the programs the Tribe runs with Environmental Protection Agency grants for clean water and climate change mitigation.

The blitz ended with another horn blow from Gregg. The preliminary count was 1,038 species. "Above average and not a record," he said, explaining that a final count will be tallied at a later date. "But we know that this was an awe-some BioBlitz."

Through the course of the 24 hours, many participants told ecoRI News they felt privileged and lucky to spend time on Tribal lands. Gregg echoed the sentiment, saying everyone told him "it was the best location ever." Gregg said he hopes the count will be a resource for the tribe as it is finalized and that the BioBlitz will be the start of an ongoing relationship between the Survey and the Narragansett Indian Tribe.

Before wrapping up the event, Dinalyn Spears thanked the Survey and offered gifts to Gregg and Stillwell. Spears told ecoRI News she hopes there will be more events like the BioBlitz on the reservation in the future. "For me it's all about building new relationships . . . even rekindling old ones," she said. For those who want to collaborate, she told them to reach out. "This was great, at first I was worried," Spears joked during her thank-you, closing speech. "Now I can go to sleep."

Colleen Cronin is a staff reporter for ecoRI News. This story is adapted from one that originally appeared in ecoRI News (https://ecori.org/in-the-heart-of-thenarragansett-people-bioblitz-held-on-tribal-land-for-firsttime/) on June 12, 2023, by permission of the publisher.

P.S. from the editors: The species count from the BioBlitz has grown by another 200 from species recorded in our iNaturalist project but not listed on any of the forms turned in at the time. And check out this other terrific article by first-time BioBlitzer Abbie Lahmers in *SO Rhode Island*: https://sorhodeisland.com/stories/bioblitz-sees-record-number-of-nature-enthusiasts-flock-to-charlestown,101683.

Honoring Howie Ginsberg

At this year's RINHS Annual Meeting on March 30th in Swan Hall's Doody Auditorium on the URI Kingston campus, a high point was a short ceremony honoring Dr. Howard Ginsberg for his many years of service on the Survey Board of Directors. Howie was one the last three remaining original members of the Board from the Survey's founding in 1994. Keith Killingbeck did a PowerPoint presentation with his usual flair—reviewing Howie's many contributions to the Survey. Howie was presented with a recognition certificate bearing a resolution that was approved unanimously by the board at their February meeting.

A Resolution

- WHEREAS, Howie was an Original Member of the Team that Sprung the Rhode Island Natural History Survey into Existence in 1994; and
- WHEREAS, Howie has Survived Navigating a \$30,000 RINHS Budget Shortfall Every Year for 30 Years; and
- WHEREAS, Howie was Steadfast in his Support for the Survey and its Mission; and
- WHEREAS, Howie Brought his Vast Knowledge of Entomology and Vector-borne Diseases to the Survey; and
- WHEREAS, Howie has Taught Us All to Love and Appreciate Small Creatures that Sting, Bite, and Can Make You Ill; and

- WHEREAS, Howie, as Evidenced by his Bumber Sticker "Honk If You Love Paradichlorobenzene," has Led the Scientific Collections Initiative for the Survey for Many Years.
- **THEREFORE,** on this **14TH DAY OF FEBRUARY 2023**, be it **RESOLVED** that the Board of Directors and Staff of the Rhode Island Natural History Survey Gratefully Thank Howie Ginsberg for his Dedication and Commitment to the Study and Conservation of the Biota of the State of Rhode Island.



Howie Ginsberg, David Gregg, and Keith Killingbeck (L–R) at the recognition ceremony at the Annual Meeting in March.

The following are some excerpts from a letter from Roger LeBrun nominating Howie for the RINHS Distinguished Naturalist Award in 2018. "Dr. Ginsberg has significantly advanced scientific knowledge of Rhode Island's organisms and ecosystems as evidenced by his hundreds of publications and presentations. His seminal work on mosquito, tick, and pollinator ecology in the state, the region, and the nation has put Rhode Island on the map as an international resource in vector-borne disease and pollinator ecology. Dr. Ginsberg is recognized as an outstanding teacher and educator to graduate and undergraduate students and the general public on the ecological significance of Rhode Island's insects and natural systems. He has contributed his expertise in vector ecology to both protect the environment and public healtha very fine line to walk yet he Ginsberg does it with brilliant insight and considerable knowledge gleaned from decades of experience as a contributor to both local and national public health issues."

Meet Our New Board Members

By HUGH MARKEY

Nelle Couret—Vampire Hunter

URI Associate Professor and disease ecologist Jannelle "Nelle" Couret spends much of her time engaging with the kind of nasty bugs most would rather not think about: ticks and mosquitoes. She studies mosquito-borne diseases and their management from the perspective of public health. But she didn't spend her childhood in the wide-open spaces. "I grew up in the suburbs, so it's a kind of environment, but it's a very manicured one. I've always loved nature, but I wasn't the bug-hunting person."

In fact, it wasn't until she was in graduate school that her interest focused on such creatures. A professor at Emory University was researching mosquito borne diseases, and that was Couret's entry point into entomology. "I was learning how to kill insects, ironically, but I definitely enjoyed learning about them. The more I started learning about the biology of mosquitoes and working with them, the more interested I became.

"I just really fell in love with looking at these alien creatures. They're fascinating, and it feels like you're entering another world. I love that about them. The pace of experiments is so much faster when the generation times are quick. That was helpful for testing out ecological questions."

When she came to URI, Couret found that there was a robust program studying ticks. She began to collaborate with RINHS co-founder and former board member Howie Ginsberg, and that was the beginning of her tick work. She asked Ginsberg if she could work with him on a project about ticks. He had already been working to study the role of climate and host composition on Lyme disease. "So it's a really fun kind of organic process of growing into the field," Couret says. "I've really enjoyed every minute of it, and I'm continuing with mosquitoes. We're currently doing a great project with the state of Rhode Island where we're testing a novel targeted treatment for a vector of Eastern Equine Encephalitis."

"Basically, we're just kind of firing on all fronts. The lab is growing, and it's been really fun to get to know this area and grow the research locally and then have the students participate in that."



The memories from her urban childhood help Couret relate to her students as well. "A lot of them come from Providence, and don't have experience in the woods or hunting insects. I can say yes, I used to be afraid to handle these insects, and look at me now. I'm not afraid. I get to watch my students go through the same process. They're very tentative at first, and then they grow in confidence and start to appreciate the creatures. I get to help them on that journey as well. I tell them that if these were the size of cats and dogs, we'd have them as pets. It's just that they're so small that they feel so foreign to us.

"We consider ourselves to be vampire hunters, to be honest, because we're hunting blood suckers!"

Ben Gagliardi: Changing Hearts and Minds One Song at a Time

"I'm just a simple earwig Why do you all fear me? I lead a simple earwig life Look close and you will see . . ."

-From I'm Just a Little Earwig

We all have our hobbies, but how many can claim that they write songs for creepy little creatures? Ben Gagliardi, collections manager and staff biologist for The Nature Lab at the Rhode Island School of Design, is one such person. And in a way, the unique outlook the new RINHS board member promotes through his music relates to his day job as well. A visit to the lab will reveal all manner of preserved animals, fish, insects and more.

"We have an artist's reference collection," Gagliardi said. "It looks like an old-fashioned Victorian cabinet-ofcuriosity natural history museum. But we break a lot of rules: we let people open the cabinets, take stuff out. Students from any discipline can come in and learn from interacting with the specimen." He's had the job for six and a half years. "As collection manager, I make sure that things here are accessible and repaired when they need to be."

The road to both his job and his entomological musical compositions was not quite the one he envisioned. In his college years, he grew to love biology, and especially insects, but it was a required tenure as a TA that sparked an interest in combining teaching with song writing.

"I had to teach an introductory biology course for nonmajors, and my friends said, 'Oh no! Not that!' But I really enjoyed it. I loved teaching the basics, and getting people to care about stuff that wasn't necessarily in their field. The experience made me kind of look into teaching, or at least not following the academic research route."



It was on his daily commute between Providence and UConn that he came up with the idea of setting taxonomy to music. "I wanted to make something where every verse had to do with another taxon and hierarchical system." Since Gagliardi published the song on YouTube, he's seen people singing his song from as far away as Australia. "It's hilarious and a little remarkable," he said.

One Species Are We

(melody = Awake, Arise Good Christians)

Of three domains of all life, eukaryotes are we Inside each cell within us, a nucleus there be Bacteria, Archaea, unfortunate are they They have no membrane bound around their strands of DNA Chorus: Linnaeus! Linnaeus! Here's to your hierarchy And let it not betray us! One species are we!

Joanne Riccitelli: The Pleasure of a Challenge

Joanne Riccitelli is . . . amazing. And we know this is true because that's what the New York Times Games say. Who are we to doubt the venerable Times? But more on that later. For now, it's enough to know that Riccitelli brings decades worth of experience from her career as Land Protection Director for the South Kingstown Land Trust (SKLT) to the Board.

"I was a little afraid going into the land trust work that everything would be the same," Riccitelli said. "However, I learned that it was very much project-based work, dealing with different people, different funding sources, different attributes of the land, and different experts on the land. It was a very gratifying, wonderful job."



Her work with SKLT included completing over 100 projects successfully, largely by knowing how to read people. "We had to accurately understand what the values and needs of the landowners were," she said. "There was everything from wealthy landowners who wanted to put conservation easements on their properties for tax deductions to land-rich, cash-poor farmers or old timers who had feelings about the land and what was appropriate for future use. Plus, it was always a bit challenging to get information from the landowner regarding how much say their children should have in the process."

The land trust was also an organizational member of RINHS, and Riccitelli attended several lectures along with BioBlitzes through the years. BioBlitz 2023 gave her an idea about what she would like at least one aspect of her tenure to include. "I'd like to really understand what Kira and David go through to make that thing happen. I mean, it's a huge undertaking. It's just amazing. And it was so well organized. I'm a pretty well-organized person. I thought maybe I could step in and help with some things, but everything was taken care of." Now that she has the time, Riccitelli has become a major fan of the New York Times Games, the group that started with the hugely successful Wordle and has since published other brain games. It may be a mark of her self-competitiveness that she's more than a bit dedicated to increasing her score. She has quickly advanced through the ranking to the "amazing" level, one stop short of "genius." That would be enough for most people, but not for her. "I have to try a little bit more. But I'm happy with amazing."

Farewell to Scott Buchanan

The good news is that Scott Buchanan has relocated to Washington, D.C., to join the US Fish & Wildlife Service's Office of International Affairs, where he will be working towards implementation of the CITES treaty (Convention on International Trade in Endangered Species of Wild Fauna and Flora). We wish him the best in this important work. The bad news is that the Survey has lost an energetic and effective Board member, and Rhode Island has lost the first full-time "state herpetologist" ever hired by the RIDEM Division of Fish & Wildlife.



Scott Buchanan in Switzerland in June for the meeting of the CITES Animals Committee.

In his email to the rest of us breaking the bad news, Scott says: "My work in Rhode Island has meant a lot to me over the past decade, and I'm torn to be moving on. I will miss very much my connection to the southern New England landscape and ecosystems, and I will miss all the wonderful relationships I have made, including all of you. The opportunity to serve in state government and to move the ball forward on amphibian and reptile conservation in the state and region has been a privilege and a pleasure, and likewise, the opportunity to work to forward the mission of RINHS has been among the positive experiences along the way. Thanks everyone for being such wonderful mentors, colleagues, and friends for so many years. Rhode Island will remain in my heart and RINHS is a big part of that."

In his reply to Scott's announcement, Survey Executive Director David Gregg commented: "Definitely one of those bittersweet pieces of news. You're a talented and committed advocate for biodiversity and natural resource management and Rhode Island and the Survey will be the poorer without you. I'm encouraged that USFWS can recognize a good catch when they find one and moved to snap you up. That bodes well for their important work, and it's good to know you'll be bringing your energy and thoughtfulness to it. And how could you pass up an opportunity to join the global turtle police!"

In Memoriam: Hugh Willoughby (1931–2023)

Hugh Willoughby, the 2003 RINHS Distinguished Naturalist, died April 10, 2023 at the age of 91. He remained a great friend for many years. Some excerpts from his Distinguished Naturalist profile are included below (for the entire profile see https://rinhs.org/events/awards/distinguishednaturalist-award/hugh-willoughby/).

Hugh was born in Worcester, Massachusetts, and moved with his family to Riverside, Rhode Island, when he was 5. He majored in geology at Brown University, graduating with honors in 1953. After spending two years in the U.S. Army during the Korean Conflict, he worked for a time as an insurance claims adjuster, until a one-year position as head of a middle-school science department sent him into a career in public education. He retired from East Providence High School in 1986 after two separate stints there as an English teacher and guidance counselor. In between, he earned a Master's in guidance and counseling from Rhode Island College, and worked for the State Department of Education as Coordinator of Vocational Guidance and then for the URI Counseling Center as a Counselor and eventually as the Director.



In 2016, Hugh Willoughby (left) donated a beautifully restored, 1854 edition of Gilbert White's classic *Natural History of Selborne* to the Survey, here accepted by director David Gregg.

A self-taught naturalist, Hugh served on the Boards of the Audubon Society of Rhode Island and the American Birding Association, and was a leader on Audubon's Block Island fall weekend for 37 years. In addition to the Survey's Distinguished Naturalist Award, he was also named Outstanding Naturalist by the Audubon Society of Rhode Island and received the Claudia Wilds Award from the American Birding Association for his long and distinguished service.

Hugh's humor was legendary; he was the master of the pun, the one-liner, the double entendre, and most other forms of humor. He thank-you address when he was named Distinguished Naturalist had the audience rolling in aisles. Veteran Willoughby Watchers might recognize some of his standbys, such as "Sanctuary much!", "I've told you a million times not to exaggerate!", "A dump of gulls", "The bird was in that tree five minutes before I got here!", "That bird showed up a minute after I left!" He even managed to get in the last word with the instructions in his obituary: "No wake, no service, no flowers, no kidding!"

Note from the editors: As this issue was being finalized, we learned of the death on September 12th of Francis Underwood, our 2017 Distinguished Naturalist. you can find his profile at https://rinhs.org/events/awards/distinguishednaturalist-award/fran-underwood/

BioBlitz 2023 photos: *auke ut Nahiganseck*































































Photos contributed by Martha Boksenbaum, Mary Daley, David Gregg, Peter Lacouture, Janet Malenfant, Doug McGrady, Kate McPherson, Sheila Parenteau, Ray Simpson, Kira Stillwell, and Elise Torello (also those on pages 13 & 14).

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There are as many ways to build our knowledge of Rhode Island's animals, plants, and natural systems as there are people willing to help.

ANNUAL MEMBERSHIP in the Rhode Island Natural History Survey funds public events, helps conservationists and managers, and gives you a stake in the success!

Yes! I Want to Join the Survey.

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Our Mission

The Rhode Island Natural History Survey is an independent, member-supported nonprofit, founded in 1994, that engages people knowledgeable about Rhode Island's animals, plants, and natural systems with each other and with those who can use that knowledge for research, education, and conservation.

For environmental conservation there are fewer resources than ever . . . but with zoonotic diseases, climate change, invasive species, and habitat loss all accelerating, the natural world isn't getting any less complicated. We need good science and we need everybody to work together to make the most of our combined knowledge and experience.

The Natural History Survey manages data documenting the state's species and natural communities, publishes books and articles, facilitates science projects that have diverse partners or complex funding, and hosts events bringing people together, including conferences and the annual Rhode Island BioBlitz. The Survey is not a state agency or university department: it is embodied in members and friends who make generous gifts of time, money, and expertise to do this important work.

Notices

Natural History Week: November 11th–19th. We have three events planned; watch our *News to Use* email newsletter for more details and registration. On Wednesday the 15th at 6:30 pm there will be a BioBlitz introduction at Norman Bird Sanctuary (see below). The Lisa Lofland Gould Native Plant Program, which happens every other year, will include a presentation and reception. It will be from 1:00 to 4:00 in the afternoon of Saturday the 18th in 170 Avedisian Hall (Pharmacy building) on the URI Kingston campus. That same day at 7:00 pm, and in the same location, there will be a program for the presentation of this year's Distinguished Naturalist, Founders', and Golden Eye Awards.

Save the Date—Annual Open House and Natural History Art Exhibit: Tuesday, January 23rd (weather date the 24th), 5:00– 7:00 pm, at our offices in Building 14 on URI's East Farm. Any artists who would like to participate should get in touch.

Save the Date—2024 Rhode Island Nature Video Festival: February, Rhode Island College, date and other details TBA. You can warm up in advance by watching the complete reels from the previous three years on our YouTube channel—rinaturalhistory.

BioBlitz 2024: We are really excited to announce that our 2024 BioBlitz will be at the Norman Bird Sanctuary in Middletown on Friday and Saturday, June 7th and 8th. This will be our 25th Bio-Blitz, and 2024 is the 30th anniversary of the Survey's founding. The Norman Sanctuary was the site of our 2nd BioBlitz in September 2001, when the combination of its timing just days after the 9/11 terrorist attacks and less-than-ideal weather kept the attendance and species totals on the low side. So this will be a sort of "mulligan" BioBlitz. Orientation and registration will happen in the spring; watch the *News to Use* email newsletter for updates and announcements.

To Contact Us. . .

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