Bates-Morse Mountain Conservation Area



Annual Report, 2021-2022 Prepared by Caitlin Cleaver, Director May 2022

2021–2022 BMMCA Annual Report



Photo credit: Nathaniel St. John. Fall gathering to thank Frank Wezner, retiring BMMCA steward, for his service.

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Letter from the Director

I am grateful for the glimpses of normalcy that we experienced over this last year.

The summer of 2021 proved to be more similar to pre-pandemic times than 2020 in terms of patterns of visitation and in having Bates students supporting our staff in the parking lot and working on their thesis research in the area. Additionally, we were able to reopen the Shortridge Coastal Center during lulls in Covid waves and allow students, staff and faculty to



Photo credit: Dot Kelly

gather together for faculty retreats, to enhance learning, and just be. 2021 did bring a number of transitions with the retirements of people important to the work we do at Morse Mountain. We thank those individuals for their contributions and commitment to conservation, education and research.

As always, I want to extend our gratitude to the Phippsburg Fire Department and emergency response teams for their commitment to ensuring public safety and for participating in our wildfire risk assessment process at Morse in August of 2021. I also want to thank various landowners who have allowed us to access research sites on or near their property as well as the Small Point community for supporting two student positions for the summer. Thank you!

I am looking forward to this summer when we will welcome two new Stewards to support management efforts at Morse Mountain, four Bates students who will be working on various research activities, and a returning team of Saltmarsh Habitat & Avian Research Program scientists who will be based at Shortridge and doing work throughout the Phippsburg peninsula. We have a number of exciting initiatives underway and are planning to continue important long-term monitoring efforts. We hope to see you at Morse Mountain this season!

Sincerely,

Caitlin

Acknowledgements

Over this past year, a number of individuals important to the work that we do at BMMCA took the opportunity to retire or cycled off of our board. These individuals are clearly committed to conservation, research and education and we are deeply appreciative of their service to BMMCA over the years.

- Don Hudson served on the BMMCA Corporation board and brought an incredible depth of knowledge about conservation practice to the position. His contributions helped guide conservation action within the area over a number of years and we truly appreciate his efforts. Thank you for your service, Don!
- Mike Retelle taught and mentored students at Bates College for over 30 years. Throughout his time at Bates, he continually brought his class and thesis students to BMMCA to study the dynamic barrier beach and dune system. He has been an excellent advocate for continuing to protect this undeveloped system. Over the years, his research took him to the Arctic in Svalbard, Norway, the Shetland Islands, and elsewhere. Mike will be greatly missed as a consistent sight at BMMCA, but we suspect to see him on Seawall Beach now and then helping to continue the extensive, long-term dataset that he established. Thank you, Mike!
- Nancy Sferra served as the Director of Land Management at The Nature Conservancy and is retiring this spring after a 30-year career in various roles at TNC. She oversaw land management and legal compliance monitoring, including conducting the easement monitoring at BMMCA. Nancy was also extensively involved in habitat restoration and using fire as a land management technique. Nancy was an invaluable resource in managing BMMCA and she will be missed!

Frank Wezner is stepping down after 6 1/2 years of stewardship at BMMCA. His enthusiasm, positive attitude, and cheerfulness made it a pleasure for those who were lucky enough to be around and work with him. Despite the heat, cold, rain, or mosquitoes, Frank's dependability and professionalism during daily operations always helped keep things running smoothly, safer, cleaner, and friendlier. His ability to educate, connect, and enhance the visitor experience were without exception. His efforts to do so have no doubt resulted in many more people caring for Morse Mountain and helping to ensure that it remains undisturbed in its natural state for years to come. Thank you, Frank for all your great work, you will be missed! (Written by Don Bruce, BMMCA Lead Steward)

Research and Monitoring

Salt marshes: In the summer of 2021, three Bates students worked with Bev Johnson, professor in the Earth and Climate Sciences Department on their theses related to aspects of marsh restoration and response to climate change. In August, monitoring of the Sediment Elevation Tables and the salt marsh vegetation surveys in the Sprague continued. Time series data for the salt marsh vegetation transects are archived on Google Drive. Johnson holds the time series data from the SETs. Additionally, researchers from UMass Amerst conducted a study on seasonal sedimentation rates on the Sprague and a Bowdoin student did an independent project assessing the impact of green crabs on the marsh during the fall semester.

2021 – 2022 BMMCA STUDENT RESEARCH

- Parker Caswell, '22 Bates College, Carbon Fluxes (Methane Emissions and Carbon Dioxide Sequestration) and Groundwater Hydrology Along the Freshwater Margin of the Sprague River Salt Marsh
- Elene Chamberlin, '22 Bates College, Examining Gulf of Maine Intertidal Community Structure
- Jean Clemente, Bowdoin College, European green crabs (*Carcinus maenas*) mitigate shading effects on cordgrass (*Spartina alterniflora*) growth in a Maine salt marsh
- Henry Hardy, '22 Bates College, Examining Gulf of Maine Rocky Intertidal Community Structure via NeCSA Protocol
- Henry King, '22 Bates College, Assessing the Impacts of a Ditch Plug on Sedimentation, Groundwater Hydrology, and Carbon Dynamics in a Salt Marsh, Phippsburg ME
- Meg O'Brien, '22 Bates College, Spatial Elevation Dynamics and Carbon Sequestration



Photo credit: Caitlin Cleaver. Students in the short-term class based at BMMCA learn how to collect beach profile data from Mike Retelle, Bates professor in Earth and Climate Sciences.



Photo credit: Dot Kelly. Cleaver and Jessie Batchelder from Manomet prepare for a dive on the oyster reef site in the Basin.

Beaches: Students in the Sedimentary Processes and Environments course, taught by Mike Retelle, collected beach profile data on Seawall Beach in April 2022. The data have been compiled with the goal of developing a permanent archive for the extensive beach profile dataset from Seawall Beach and the pocket beaches on Cape Small. Bates students will collect additional beach profile data this summer and fall. Coastal Forests: Brett Huggett, a professor in the Bates Biology Department continued his research related to fungal endophytes in Pitch Pines at BMMCA, which he started in June 2019. Students in The Ecology of Place: Field Methods for Coastal Research at Bates-Morse Mountain short-term course taught by Cleaver and Isobel Curtis, '17 revisited the hemlock stand infested with the invasive Hemlock Wooly Adelgid to assess what has changed since Curtis completed her thesis research on the stand in 2017. The students will make recommendations regarding future management of the stand.

NeCSA (Northeastern Coastal Stations Alliance)

- Network Activities: NeCSA partners have collected data through standardized protocols for 5 years. We are working with Laurie Baker, a visiting professor of Digital and Computational Studies and students enrolled in her short-term course, Community-Engaged Data Science, to collate and clean data from NeCSA partners. We will also host an Environmental Data Initiative (EDI) fellow this summer to do initial analysis to summarize our findings to date. Stay tuned!
- *Nearshore Temperature Record:* Temperature loggers will be re-deployed in June of 2022. This monitoring is in coordination with other NeCSA stations. Data will be archived on Google Drive in the NeCSA file and shared with the 2022 EDI fellow.
- Rocky Intertidal Community Monitoring: Katie Dobkowski, a visiting assistant professor of Biology, her BIO195A and theses students, and Maggie O'Neill, a Bates post-baccalaureate researcher collected NeCSA data to characterize the intertidal communities at two sites on Hermit Island in Phippsburg and at two sites in Harpswell in October 2021. Both Elene Chamberlin, '22 and Henry Hardy, '22 worked with NeCSA data for their senior theses; Chamberlin presented her thesis research at the Benthic Ecology Meeting held in Portsmouth, NH in March 2022. Data from 2021 and past years are currently being cleaned and will be collated into a single file to be kept on Google Drive in Bates' NeCSA data folder as well as shared with the 2022 EDI fellow.

- Basin Oyster Project (BOP): BMMCA Director and Bates students will continue working in partnership with the Phippsburg Conservation and Shellfish Commissions, the Maine Oyster Company, Manomet, and local landowners to determine if an oyster reef can be built and sustained in the Basin in Phippsburg. The team was awarded a grant through the TNC SOAR (Supporting Oyster Aquaculture and Restoration) program in the fall of 2021 which will support field efforts in the summer of 2022. The team is currently securing permitting through the Maine Department of Marine Resources and the Department of Environmental Protection to establish the reef this summer. Pete Dunbar, '23 did an independent study this spring developing educational curriculum related to the project and joined the 4th grade class at Phippsburg Elementary for an in-class lesson and a field trip. Dunbar will also conduct research on sedimentation rates in the Basin as part of his senior thesis in Geology.
- BMMCA Research on-line at https://www.bates. edu/bates-morse-mountain-shortridge/research/. Isobel Curtis, '17, created the map, which includes point locations of different research projects and provides project titles, dates, discipline and abstracts representing approximately 50% of the projects completed at BMMCA to date. This map will be updated by Bates students in summer 2022 with projects that took place from 2019 through 2021.



Photo credit: https://www.bates.edu/bates-morse-mountain-shortridge/research/

Conservation and Wildlife

Migratory Shorebirds on Seawall Beach

Seawall Beach provides critical habitat to migratory shorebirds, many of which are protected under federal and state legislation. 2021 proved to be an incredible year for Piping Plovers in Maine. Seawall Beach was highlighted as providing particularly good habitat during the 2021 season and hosted 15 breeding pairs of plovers, a Least Tern colony, Willets, and Spotted Sandpipers. A suite of factors facilitated such a successful season, including that the Morse River end of Seawall provided an estimated 9,750 square feet of intact sandy dune habitat with limited foot traffic. All data reported below has been compiled by Maine Audubon in the 2021 Maine Coastal Birds Project Report.

Least Terns:

- Statewide: During a June 10 census, 281 pairs were recorded in Maine with 116 nesting pairs and 40 fledglings at Crescent Surf Beach in Kennebunk, 71 nesting pairs and 17 fledglings at Higgins Beach in Scarborough, 18 nesting pairs and 41 fledglings at Laudholm Farm Beach in Wells, and 63 nesting pairs on Stratton Island, a site that ended up being abandoned. Seawall hosted 13 nesting pairs initially, but this number continued to increase throughout the season. State productivity for the 2021 season was considered fair and estimated at 0.48 fledglings per pair of Least Terns.
- Seawall: On June 8, there were 13 nesting pairs; additional pairs arrived throughout the month with a final estimate of 60 nesting pairs. At least 39 chicks fledged. Predators, such as fox, coyote and gulls frequent this site, but no notable predation events took place; however, dog tracks were visible throughout the colony area during two separate occasions in late July.

Piping Plovers:

- Statewide: In 2021, 125 pairs of Piping Plovers nested on 24 Maine beaches and 213 chicks fledged topping a 2020 record number of fledglings since monitoring began in 1981. On average, plover pairs produced 1.7 chicks/ pair with a 58% chick survivorship rate. The number of nesting pairs in 2021 represent a 27.6% increase from 2020. For the last eight years, at least 60 nesting pairs have been identified in Maine, demonstrating that the population has stabilized and is growing with conservation efforts.
- Seawall Beach: Thirty-three Piping Plover chicks fledged from Seawall representing the largest number of chicks fledged from any one beach. The last brood fledged as late as August 23, 2021; the latest recorded date for a brood to have successfully fledged in Maine. Seawall hosted 15 breeding pairs that made 21 nesting attempts with only 8 being unsuccessful.



Photo credit: From L. Sewall's files. Piping plover on beach.

Management Activities

- Southern Pine Beetle monitoring: In partnership with The Nature Conservancy and the Maine Forest Service, BMMCA staff (Don Bruce) started 2021 monitoring for the Southern Pine Beetle (SPB) in early May. Results from 2021 data showed no signs of SPB at BMMCA; however, the first SPB was found in southern Maine last fall. SPB is a pest for pines throughout the southern US and is expected to expand its range north as temperatures warm.
- Wildfire risk assessment: In August 2021, we had a site visit with a fire ranger specialist from the Maine Forest Service to determine the risk of wildfire to the standing structures within BMMCA. A community risk assessment and potential mitigation measures will be presented in early summer and we hope to continue this work to develop a plan for how to protect the Conservation Area in case of a wildfire.
- Beach cleanup: We did a fall 2021 and a spring 2022 beach cleanup to remove lobster traps from Seawall Beach. On October 13, BMMCA staff and volunteers from the St. John family, the Small Point Community, the BMMCA Corp. board, regular visitors, and a group of students from Morse High School all joined in to clear over 80 traps from the beach. On April 25, a small group including BMMCA staff and board member removed approximately 50 traps from Seawall taking care not to disturb the newly arrived Piping Plovers.

Bates Alum Service Day: In April 2022, approximately 10 Bates alum joined us at BMMCA to tackle various projects including securing dune fencing along the White Rocks on Seawall Beach to minimize foot traffic and protect the fragile vegetation there. Volunteers put up other fencing to protect sensitive areas, picked up trash, cleaned signs among other tasks. The parking lot website was rolled out in 2020 to inform visitors about when the parking lot has filled for the day. We utilize the parking lot as a management tool and so when the lot fills, we turn away additional cars until parking spots open up. We update the website with the status of the parking lot to help visitors plan their trips (bmmparking.com).



Photo credit: Caitlin Cleaver. Students and Isobel Curtis do trail work behind the Shortridge Coastal Center in May 2022.

Education & Public Visitation

Educational Activities

BMMCA continues to be an accessible destination for elementary schools through college and university groups as well as for non-school groups. A wide variety of activities take place including team building, leadership development, studying field research methods or specific habitats, and scientific research. We do not know the full extent of group activities taking place, because group visits are only recorded when the parking lot is staffed by our stewards. From June 2021 through May 2022, forty-two visits by 29 different groups with approximately 757 participants were recorded.

2021 GROUP VISITS TO BMMCA

- College groups included the Bowdoin Outing Club, Bowdoin Orientation Trips, Bowdoin Ecology course, Bowdoin Nordic Ski Team, Bowdoin Environmental History course, University of Maine Farmington Field Botany class, UMass Amherst researchers
- Elementary, middle and high school groups included Brunswick High School Field Hockey, Freeport High School, Gloucester High School, Hartsbrook School, Hebron Academy, Hebron Station School, Hyde School Outing Club, Maine Central Institute, Maine Coast Waldorf School, Portland High School Outing Club, Wiscasset High School Outing Club
- Other groups included Apogee Adventures, Chewonki Foundation, Chill Yoga, Chop Point Summer Camp, Merrymeeting Audubon, Overland Summer Camp, Small Point Summer Camp, Small Point Road Race, Westbrook Recreation Department, Yarmouth Girl Scouts

Bates College groups included:

A virtual BMMCA event for the 2021 Bates College Reunion: Cleaver provided an update about educational and research activities, public visitation and developments at BMMCA and the Shortridge Coastal Center to approximately 30 Bates alum in June 2021.

Bates course visits to BMMCA included:

• The Ecology of Place: Field Methods for Coastal Research at Bates-Morse Mountain: Cleaver and Isobel Curtis who works for Midcoast Conservancy and graduated from Bates in 2017 taught a shortterm course in May 2022 based at the Shortridge Coastal Center and BMMCA. Students learned protocols for determining green crab abundance and distribution, identifying salt marsh vegetation, conducting beach profiles, monitoring Wooly Adelgid infestations in hemlock stands and surveying plots for forest health.

- Biological Skills: Field Ecology (BIO s39 Shortterm, taught by Katie Dobkowski, professor of Biology)
- Coastal Hazards (FYS 476, taught by Bev Johnson, professor of Earth and Climate Sciences)
- Managing the Gulf of Maine: Climate Change and the Impact on Coastal Communities (ENVR 124, FYS 534, taught by Cleaver)
- Sedimentary Process and Environments (EACS 210, taught by Mike Retelle, professor of Earth and Climate Sciences)

Public Visitation:

For 2021, visitor data was collected over 194 gatekeeping days from January 1 through November 28, 2021. Overall, 23,550 people visited Bates-Morse Mountain in 2021 with approximately 18.5% coming for the first time. The parking lot filled on 75 days out of 194 gatekeeping days or 39% of days the parking lot was staffed (compared to 68% in 2020 and 37% in 2019). The increase in the total number of visitors from 2020 to 2021 could be due to an increase in the number of days the parking lot was staffed. The pattern of visitation, in terms of the number of days when the parking lot filled, was more similar to years prior to the pandemic.

ANNUAL TOTALS						
Year	Visits	Gatekeeping Days	Per Day Average			
2017	22,507	173	130			
2018	20,657	166	124			
2019	21,321	174	123			
2020	22,898	179	128			
2021	23,550	194	121			



Photo credit: Caitlin Cleaver, Students in the short-term class based at BMMCA gather at the top of Morse Mountain.

Looking Forward Bates-Morse Mountain Conservation Area

Maine Audubon teams have already started monitoring this year's shorebirds and the season is shaping up to be an active one. This summer, we will reopen the Shortridge Coastal Center to host visiting researchers and Bates students. Four Bates students will support ongoing monitoring and research while also interacting with visitors in the parking lot. In the fall, we will do another beach cleanup and volunteer day. Looking ahead, we will be implementing a project to study scallop larval distribution along Maine's coast in partnership with the Maine Center for Coastal Fisheries and the Hurricane Island Center for Science and Leadership and with funding from the Atlantic States Marine Fisheries Commission. We are in the process of pursuing funding to determine the best practices for managing the Sprague and Morse Marshes in response to sea level rise. The feasibility study will be a collaboration among multiple departments at Bates and involve students and community partners.



Photo credit: Caitlin Cleaver. Students in the short-term based at BMMCA conduct beach profile monitoring.



Photo credit: Caitlin Cleaver. Students in the short-term based at BMMCA inspect the hemlock stand for Wooly Adelgid infestation.

Appendix A: Report to the Town of Phippsburg, 2021-2022

2021 Report to the Town of Phippsburg



Photo credit: Caitlin Cleaver

A Note from the Director

Operations at BMMCA returned to "normal" in 2021. We saw an increase in visitation, which coincided with an increase in the number of days that we staffed the parking lot. Morse Mountain continues to be a popular destination for members of the public, educational groups and researchers. During the summer, we had two Bates students help staff our parking lot. Henry King (Bates '22) and (Meg O'Brien, Bates '22) did an excellent job of educating the public about the type of research that takes place in the area and they were well supported by our long-time stewards, Don Bruce and Frank Wezner. We are grateful to the Small Point community for their generous support of the student positions. We had a bittersweet send-off for Frank Wezner who decided to retire from his position as Steward of BMMCA. Frank was an invaluable staff member and served the Conservation Area incredibly well. He will be missed, but I suspect we'll continue to see him at the Mountain. As always, we would like to thank the Phippsburg Police, Fire Department and Emergency Response personnel for their continued support and timely assistance with issues that arise any time, day or night. We are looking forward to a busy 2022 season!

- Caitlin Cleaver, Director, Bates-Morse Mountain

Visitation & Educational Activities:

Overall, we had a total of 23,500 visitors over 194 days worked by our stewards for an average of 121 visitors per day (Table 1).

Annual Totals:	2017	2018	2019	2020*	2021
Total visitors	22,507	20,657	21,321	22,331	23,550
Total gate- keeping days	173	166	173	179	194
Avg. visitors per day	130	124	123	128	121

Table 1. Visitor totals for March through November in 2017, 2018, and 2019; for January through December in 2020; and, January through November in 2021 (*the area was closed to the public in April and May 2020).

A number of different groups continue to access the area for educational and recreational activities. We do not know the full extent of group activities taking place since we only count those when the parking lot is staffed by our stewards. Groups included a total of 757 participants from 40 visits by 28 different groups ranging from high school and college outing clubs to summer camps to college courses.



Fall Beach Cleanup: On October 13, we had our second annual fall beach cleanup effort. Volunteers from the St. John family, the Small Point Community, the BMMCA Corp. board, regular visitors, and a group of students from Morse High School all joined in. We cleared over 80 traps from the beach and got to enjoy some beautiful weather! We will continue to do two beach cleanup efforts each year.

Photo: Nathaniel St. John

Research & Monitoring:

Maine Audubon conducted weekly plover surveys throughout the summer. Three Bates students and one Bowdoin student conducted research in the area in the summer and fall with projects ranging from understand hydrology on the marsh to green crab impacts on marsh vegetation. Bates students and the BMMCA director continue to work in partnership with the Phippsburg Conservation Commission, Manomet and the Maine Oyster Company on the Basin Oyster Project where we're testing the effect of oyster reef-building efforts on a small-scale.



Left: Henry and Meg help conduct salt marsh vegetation transects on the Sprague Marsh.

Right: Bev Johnson, Professor in Earth and Climate Sciences Dept. at Bates College and Henry conduct Sediment Elevation Table monitoring to understand how the Sprague Marsh is responding to sea level rise.

Photos: Caitlin Cleaver



Looking Ahead:

- The annual beach cleanup for the spring will take place in April 2022 and given the number of traps and gear that wash up each fall, we will schedule a fall cleanup date as well. We are also organizing a Bates volunteer day for the end of April.
- This summer, we are hoping to host a team of researchers from the University of New Hampshire who study shorebirds as well as an Environmental Data Initiative Fellow and two Bates students who will conduct monitoring and research projects in the area as well as help manage the parking lot.
- Please plan to check our website for the full annual report. It will likely be posted by mid-June 2021. (www.bates.edu/bates-morsemountain-shortridge/photos-annual-reports/)

Bates-Morse Mountain Conservation Area

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Photo credit: Caitlin Cleaver