

# Bates-Morse Mountain Conservation Area



Photo credit: Caitlin Cleaver

## Annual Report, 2019-2020

Prepared by Caitlin Cleaver, Director

May 2020

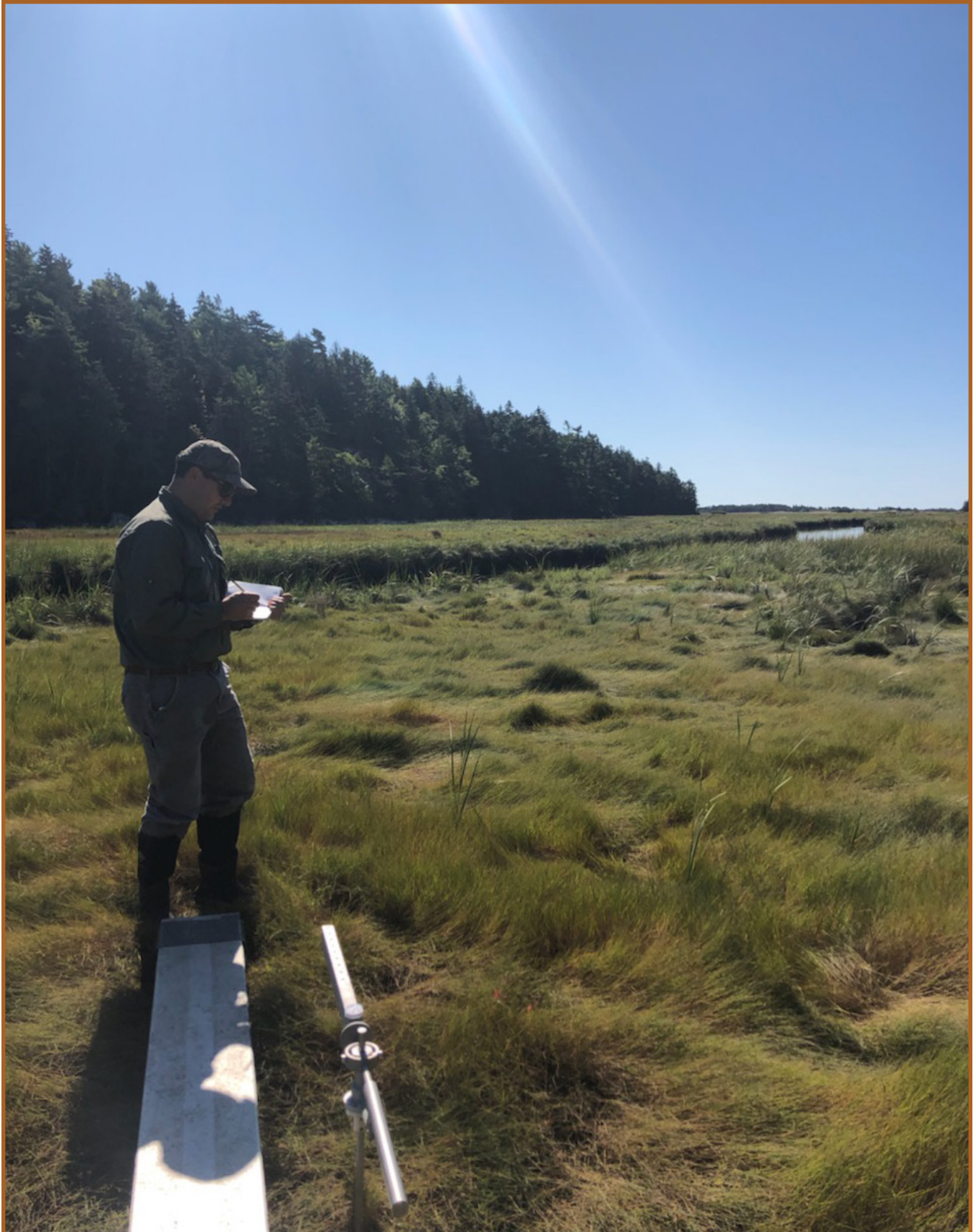


Photo credit: Caitlin Cleaver





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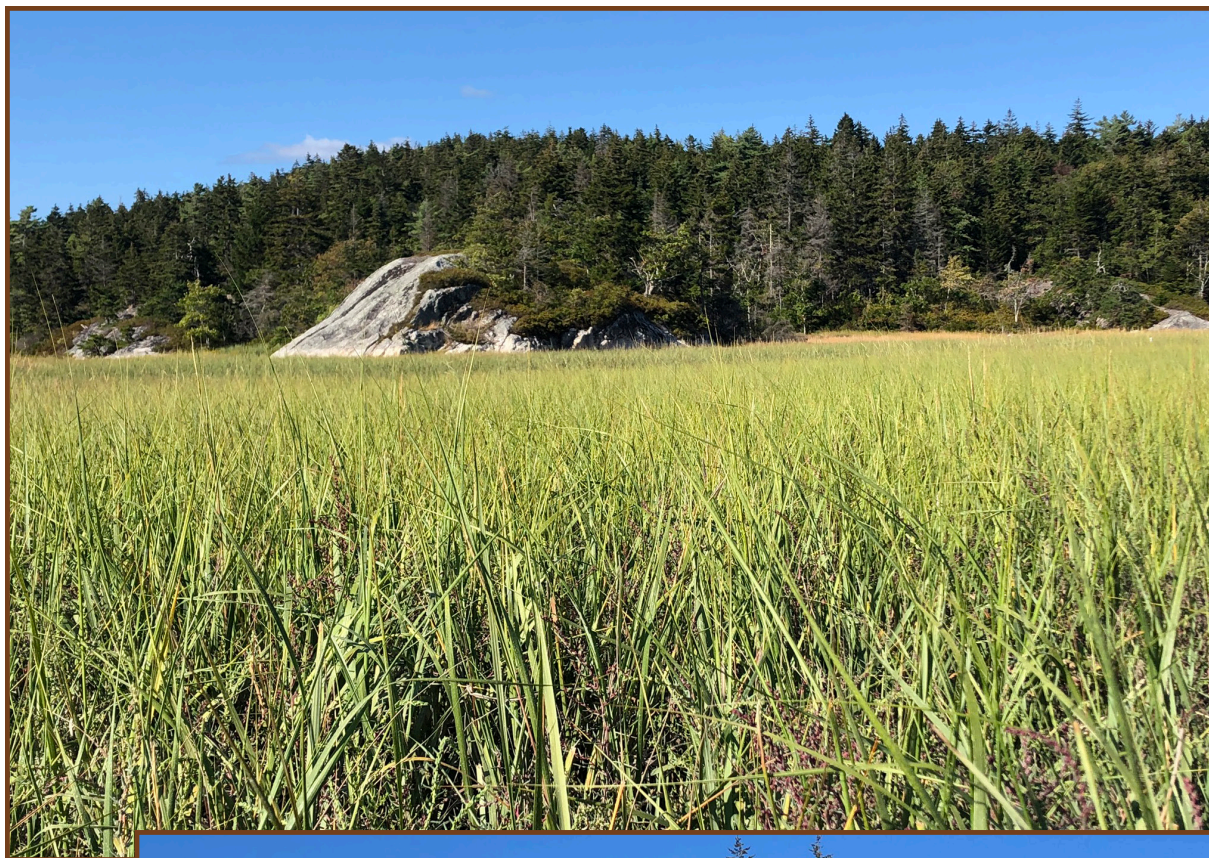


Photo credit: Caitlin Cleaver



# Letter from the Director

I am so grateful for the opportunity to manage the Bates-Morse Mountain Conservation Area. Since starting the director position in August of 2019, I have spent time learning more about BMMCA and the committed community that supports it. It's clear that BMMCA is an incredible asset and the need to balance conservation, education and research, and public access will continue.

This first year has proven to be unique although late summer and fall ran as anticipated with visitors arriving daily to hike the trail to the beach, classes from Bates and other schools taking students into the area to teach about different natural systems or participate in team building and leadership development and student groups from Bates visiting the Coastal Center at Shortridge on weekends. A busy winter semester and plans for teaching a May Term course based at Shortridge were disrupted and rapidly changed in March in order to respond to the Covid-19 outbreak. We closed Shortridge, canceling planned student club gatherings and students left campus in mid-March. The Shortridge closure will continue through the summer meaning we will not offer housing to researchers during the upcoming field season. In addition, we closed BMMCA to the public on March 29th which was an incredibly difficult decision to make, but one I believe was in the best interest of our staff and the public.

I certainly hope we can return to a summer routine of housing researchers next year as I had been looking forward to getting to know our summer research community. I truly enjoy bringing people together with different expertise to share experiences and knowledge about the natural world. Providing students with the opportunity to do field work in areas like BMMCA and to live at places like Shortridge can be truly transformative.

I am grateful for the obvious signs of spring. At the mountain, the ferns are beginning to emerge and the warblers and the piping plovers have returned for another nesting season. I am hopeful that we will soon reopen BMMCA to the public and annual monitoring, while not conducted by students, will happen. I am confident that some patterns of our pre-Covid life will return while others will likely change indefinitely.

I can't end this letter without sharing my gratitude for Laura Sewall, the former director, who eased my transition into this position and answered countless questions to help me understand the nuances of the job. Similarly, I have a deep appreciation for our staff, Jim Joseph, Don Bruce and Frank Wezner all of whom provided insights into the inner workings of BMMCA and Shortridge and patiently helped me navigate this first year. The Bates community was incredibly welcoming and supportive.

Looking forward to crossing paths at BMMCA!

Sincerely,

Caitlin



# Education

## Education

BMMCA continues to be an accessible destination for elementary schools through college and university groups for a wide variety of activity from team building and leadership development to studying field research methods. Few schools notify the director in advance of a field trip and, as a result, the numbers reported here likely underestimate the full extent of educational use of BMMCA.

### Elementary, Middle and High Schools: 12

Visits: 18

Students: 512

Phippsburg Elementary School: 120 students visited in September.

Additional visiting schools: Maine Coast Waldorf School, Mt. Ararat High School, Windham High School, Great Salt Bay School, Maine Coastal Academy, SAD 51 Gray – New Gloucester, Chewonki/ Morse High School, Hyde School, Chewonki, Kimberton Waldorf School (Kimberton, PA), Breakwater School, Real School, Hebron Academy

### Colleges: 5

#### Visits: 12

- Bowdoin: 5 visits, 79 students and faculty for an ecology course, Outing Club, Nordic Ski Team
- Colby: 1 visit, 12 students and faculty for a plant taxonomy course
- Harvard Business Club
- Kiel University in Germany: 1 visit, 14 students and faculty for geology

#### ■ Bates: 4 courses, student and alumni groups recorded at BMMCA

AY Shortridge retreats from September 6th to March 1st: 10 out of 19 scheduled; 9 were canceled for various reasons including inclement weather and disruptions from Covid-19

Number of students, faculty and staff served, AY 2019-2020: 134



Photo credit: Caitlin Cleaver

#### ■ Bates College Courses:

ES/GE0 240: Environmental Geochemistry (19 students)

FYS 476: Coastal Hazards (15 students)

FYS 445: Spirituality of Nature (14 students)



# Research and Monitoring

■ **Sediment Elevation Tables (SETs):** Annual monitoring completed in August by Geology professor, Bev Johnson and lab technician, Phil Dostie. Data held by Bev Johnson.

■ **Seawall Beach profiles:** Completed in June, July and August by Meg O'Brien '22 and Dewi Henry '22, under the supervision of geology professor, Mike Retelle. The data have been compiled and discussions are underway for developing a permanent archive for the extensive beach profile dataset from Seawall Beach and the pocket beaches on Cape Small.

■ **Salt marsh intertidal surveys:** Annual plant community surveys were conducted on the Sprague Marsh by Laura Sewall and Caitlin Cleaver in late August 2019. Surveys were started in 2015. (Data are stored on Google Drive in the BMMCA Research/Salt Marsh file.)



Photo credit: L.Sewall

■ **Pitch Pine research & student theses:** Brett Huggett, Assistant Professor of Biology at Bates has been doing research related to fungal endophytes in Pitch Pines at BMMCA since June 2019. In addition, he advised three students who conducted field work related to their thesis projects at BMMCA this past year, including:

■ Danielle Ward '20, Lichen Abundance and Distribution at Bates Morse Mountain Conservation Area

■ Ronni Mak '20, Diversity, Distribution, and Functionality of Fungal Endophytes Associated with Pitch Pine (*Pinus rigida*)

■ Nathaniel Reed '20, Long-term Analysis of Pitch Pine (*Pinus rigida*) Growth on the Southern Coast of Maine

■ **NeCSA (*Northeastern Coastal Stations Alliance*) update:**

*Nearshore Temperature Record:* Temperature loggers were collected and redeployed at two sites in late August 2019, in coordination with other NeCSA stations. Data were archived on Google Drive in the NeCSA file.

*Rocky Intertidal Community Monitoring:* Protocols for characterizing all intertidal survey sites were completed by Katie Dobkowski, visiting assistant professor of marine biology. Dobkowski established 2 rocky intertidal survey sites in close vicinity to BMMCA on Hermit Island and in Harpswell in May 2019. The sites were monitored for changes to the intertidal biotic community in the fall of 2019 by Dobkowski's Bio 195 field course and Olivia LaMarche '20. Olivia's thesis, *Characterizing the Gulf of Maine Rocky Intertidal: NeCSA Protocol to Monitor Environmental Change*, focused on summarizing patterns in NeCSA intertidal data collected to date from Shoals Marine Lab on Appledore Island and Schoodic Institute in Winter Harbor. She also provided recommendations to NeCSA.

*Network Activities:* In partnership with Schoodic Institute and with support from the Davis Conservation Foundation, Cleaver developed governance documents outlining how NeCSA will function as a network. Governance documents were finalized at a May 2020 meeting and will be adopted by network members later this summer.



■ **Southern Pine Beetle monitoring:** In partnership with The Nature Conservancy and the Maine Forest Service, BMMCA staff (Don Bruce and Caitlin Cleaver) continued monitoring for the Southern Pine Beetle in May 2020. The Southern Pine Beetle is a pest for pines throughout the southern US and is expected to expand its range northward with warming temperatures. To date, it has not yet been found in Midcoast Maine.

■ **Hemlock Management:** In 2016, students working with Brett Huggett, a biology professor, documented an infestation of Hemlock Woolly Adelgid (HWA) at BMMCA. In 2017, Conservation Biology students (BIES 246) developed a draft Hemlock Management Plan. In 2018, in response to their findings, and based on recommendations from the Maine Natural Areas Program, one hemlock was taken down. A sign was posted in 2019 to educate the public about the effects of climate change on the range of HWA and its impacts on Hemlock. From the first identification of HWA to today, the stand of hemlocks has been greatly reduced with additional infected trees being removed.



■ **BMMCA Research on-line:** The interactive map of BMMCA research is now live on the BMMCA website: <https://www.bates.edu/bates-morse-mountain-shortridge/research/>. Created in 2018 by Isobel Curtis '17, the map includes point locations of different projects and provides project titles, dates, discipline and abstracts representing approximately 50% of the projects completed at BMMCA to date.





# 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. The federally threatened and state endangered Piping Plover is Seawall's most notable rare bird. The endangered Least Tern has not nested at Seawall since 2005. Historically, tens of thousands of birds have used the beach during each fall migration (mid-July through early September); however, shorebird populations are in decline due to anthropogenic effects such as habitat loss and human disturbance. These threats are magnified by climate change. Despite grim trends, population numbers of the Piping Plovers in Maine show improvements providing evidence that conservation efforts by Maine Audubon and their partners could be paying off.

### ■ Piping Plovers:

**Statewide:** In 2019, 175 piping plover chicks fledged from 20 Maine beaches topping a 2018 record number of fledglings since monitoring began in 1981. The number of nesting pairs increased 31% from 2018, from 68 to 89 pairs (Audubon 2019 report). These numbers indicate that the plover population appears to be stabilizing with conservation efforts.

**Seawall Beach:** Seven pairs of plovers nested on Seawall Beach in 2019, producing 18 fledged chicks, which is an increase from 12 in 2018. The Morse River end hosted two nesting pairs while five were on the Sprague River end. Predator tracks were prevalent around nests, but only one nest was lost to predation and the pair quickly re-nested. The last brood fledged on August 17th. This was the latest nesting pair at monitored beaches.

**Popham Beach:** In 2019, Popham had 10 nesting pairs and 26 plover chicks fledged. Only three nesting attempts were unsuccessful with two predated and the third abandoned.



Photo credit: Unknown, received from Laura Sewall

### ■ Least Terns:

**Seawall:** In 2019, there were no nesting attempts. One nest attempt was found in 2016, but Least Terns have not attempted to nest on Seawall since 2005 when there was a 17-nest colony which succumbed to fox and coyote predation. No predator management has been implemented at Seawall.

**Popham:** In 2019, there were no nesting attempts. In 2016, 22 nests were active; however, all hatchlings succumbed to predation. In 2015, 40 nesting attempts resulted in 4 fledglings. In 2013, three nesting attempts occurred, but no fledglings and in 2012, two nesting pairs produced 3 fledglings. Prior to 2012, no terns had attempted to nest on Popham since 1997 when 15-pair colony resulted in no fledglings. No predator management has been implemented.

# The Gate Keeper's Log

March 30 through November 30, 2019



Photo credit: Caitlin Cleaver

■ **Visitors: 21,321 (20,657 in 2018)**

- Gate-keeping days: 173
- Average per day of gatekeeping: 124 per day, same as 2018
- Number of first-timers: 3,332 (84% are repeat visitors)
- Lot full: 65 days (compared to 48 days in 2018)
- Worth noting: 101 visitors on March 30th; lot full on April 6th & November 3rd

■ **Camps: 11; Visits: 18; Recorded Campers: 234**

Including Fernwood, Overland, Apage Adventures, Nashoba, Wishoba, NL Top Summer Camp, KELT Summer Camp, Small Point Summer School, Roots Cellar Day Program, Thru-hikers Nature Camp, LLBean Outdoor Discovery School

■ **Clubs and Groups: 8; Visits: 7; Visitors: 124**

Including the Auburn Recreation Center, American Foreign Exchange Students, LLBean Facilities Field Day, The Highlands Retirement Center, USM Senior Walking Club, Lewiston-Auburn Senior College, Fleet Feet Running Club, Bowdoin Parents' Weekend

■ **Conservation organizations:**

Visits included Maine Audubon, Merrymeeting Audubon, Sierra Club of Maine, The Nature Conservancy, and the Maine Department of Inland Fisheries and Wildlife.



# Looking Forward

## Bates-Morse Mountain Conservation Area

BMMCA continues to contribute to our understanding of coastal change in the Gulf of Maine. The long-term datasets covering multiple natural systems is invaluable as we navigate how to respond to these changes. Although we will miss student participation in our field efforts, monitoring will continue through the summer months including collecting beach profile, salt marsh vegetation, Sediment Elevation Table, and rocky intertidal community data. We will also continue monitoring nearshore water temperature as part of NeCSA's coastwide effort. We have joined a new collaboration and are working in partnership with the Phippsburg Conservation Commission and the Maine Oyster Company to support the community shellfish restoration and aquaculture work in the Basin. Francis Eanes, an economics professor in the Environmental Studies Department at Bates and two of his students will provide research support over the summer for Phippsburg's revision of its comprehensive plan with a specific focus on affordable housing and climate adaptation strategies.



Photo credit: Caitlin Cleaver

# Appendices

## Appendix A: Visitor data

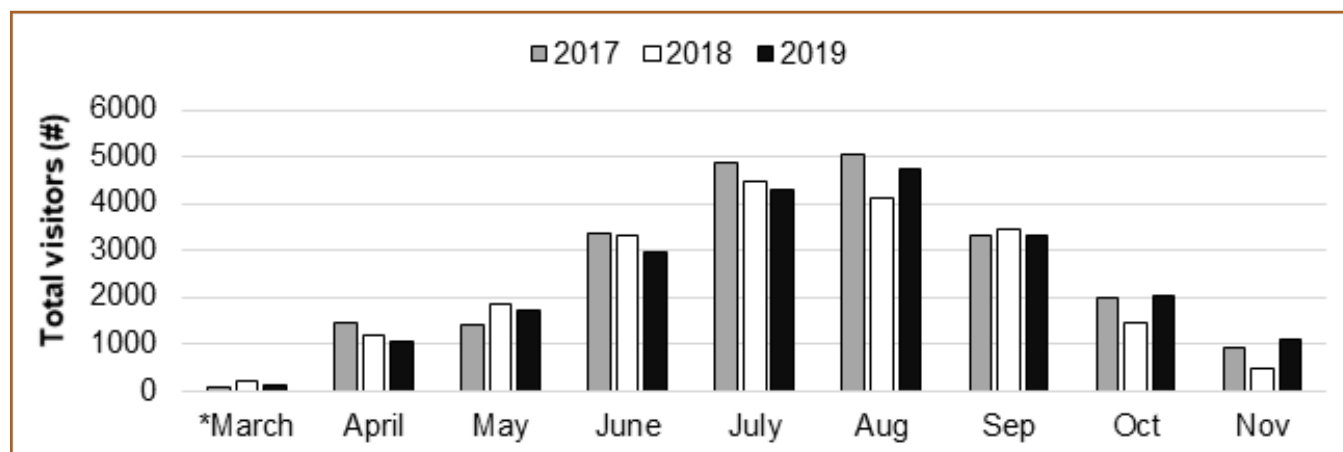


Figure 1. Total number of visitors by month during the season from 2017 – 2019.

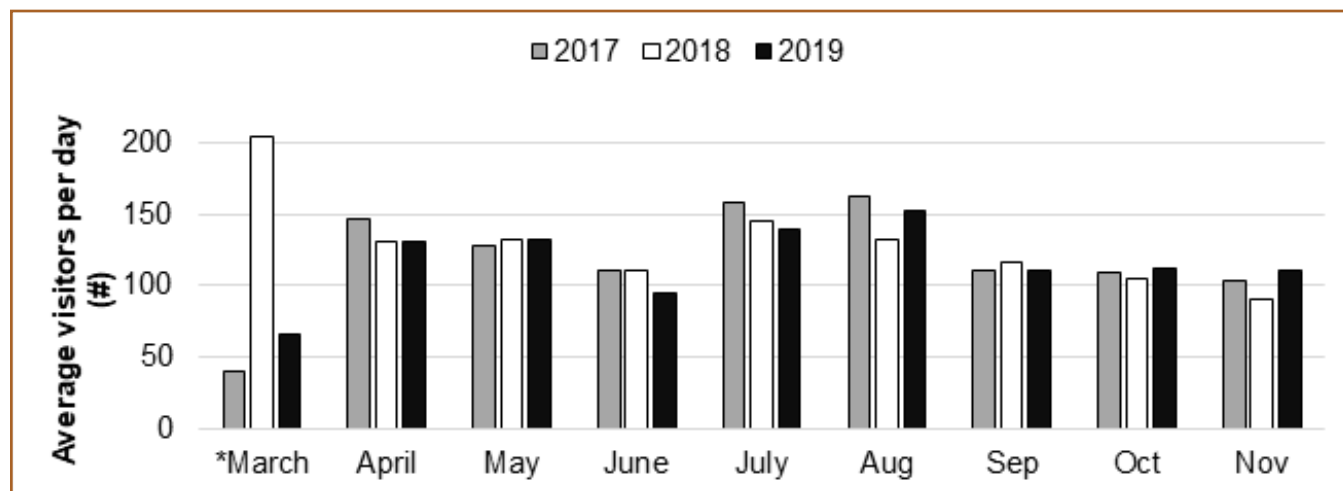


Figure 2. Average number of visitors per day during the season from 2017 – 2019.

TABLE 1. ANNUAL TOTALS

Year	Visits	Days	Per Day Average	Year	Visits	Days	Per Day Average
2009	13,589	206	66	2015	21,390	182	118
2010	16,182	168	96	2016	22,691	187	122
2011	16,361	174	94	2017	22,507	173	130
2012	17,286	190	91	2018	20,657	166	124
2013	18,802	181	104	2019	21,321	173	123
2014	19,147	171	112				



Appendix B: Report to the Town of Phippsburg

# Report to the Town of Phippsburg



Fall day on the Sprague Marsh; Right: Professor Huggett studying the pitch pines with thesis students

## Introduction to the Director

In August 2019, I started as the Director of Bates-Morse Mountain Conservation Area and Coastal Center at Shortridge and experienced a smooth transition thanks to Laura Sewall's generosity in sharing her experience and expertise. Since then, I have begun to understand the incredible natural treasure that the Bates-Morse Mountain Conservation Area and Seawall Beach are. I have spoken with visitors, residents, faculty, students, and others who value access to the area for recreation, education and research. Previously, I had served as the Director of Research at the Hurricane Island Center for Science and Leadership where I led applied

research projects to answer community-driven questions, partnering with commercial fishermen and aquaculturists and integrating the research into the education programs we ran on Hurricane Island in Penobscot Bay. I believe experiential environmental education and place-based research are transformative. Places like BMMCA where long-term monitoring is happening are critical in helping to inform our understanding of system responses to unprecedented, rapid change and to educate all audiences about the implications of those changes. I am honored to continue the tradition of protecting this place while balancing access for public use and research and educational activities in the area. Hope to see you some time this summer!

## Summary of Visitation and Education & Research Activities

The total number of visitors in 2019 was slightly up from 2018, but still below the total number of visitors in 2017 (Table 1.).

<b>Annual Totals:</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<i>Total visitors</i>	22,507	20,657	21,321
<i>Total gatekeeping days</i>	173	166	173
<i>Avg. visitors per day</i>	130	124	123

**Table 1.** Visitor totals for 2017, 2018, and 2019.

A number of different groups continue to access the area for educational and recreational activities. In 2019, these included:

- 10 college courses, teams, or clubs, including three Bates courses, a Colby plant taxonomy course, and a Bowdoin ecology course
- 18 K-12 school groups, including the Phippsburg Elementary School for their annual visit
- 20 summer camps or clubs
- 10 adult groups including trips made by Bates Alumni and during Bowdoin Parents' Weekend

Last summer, the Maine Department of Inland Fish & Wildlife continued to conduct plover surveys. This past fall, three Bates students utilized the area to collect data for theses or final projects. One of the projects was carried out by a senior Environmental Studies and English double major. She replicated the methods from a 1980s Bates study on the distribution and abundance of lichens in BMMCA and also collected specimens to donate to the Coastal Maine Botanical Gardens' herbarium. She plans to write a short field guide to lichen species found in BMMCA and make it available to the public.

## Other Updates

In late fall, a number of trees were cleared on either side of the Morse Mountain Rd. between the Bates parking lot and the top of the mountain. This work also removed a number of the hemlock trees infected with the Hemlock Woolly Adelgid (HWA). Care was taken to keep infected trees on site rather than transport them elsewhere and potentially spread HWA. The project was undertaken to reduce the number of trees falling across the road and growing into the power lines.

With the mild winter we had in 2019 - 2020, we experienced some days with high use. To manage this use, we staffed the gatehouse on weekend days that were forecasted to be sunny and on the warmer side. I suspect with the way the weather has been, we will have an early start to our 2020 season!

We would like to thank the Phippsburg Police, Fire Department and Emergency Response for their continued support and timely assistance with any emergency or enforcement issues that arise. We appreciate knowing that people who come to enjoy the area are in good hands.

## Looking Ahead

- The annual beach cleanup typically held in early spring has been postponed until later this summer or fall. Stay tuned!
- We are hoping to host a team of researchers from the University of New Hampshire who study shorebirds as well as two Bates Geology students this summer who will do research in the area for their senior theses.





Photo credit: Caitlin Cleaver



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# Bates-Morse Mountain Conservation Area

7 Andrews Lane  
Lewiston, Maine 04240



Photo credit: Jonathan Milne/ LightHawk