Massachusetts Wildlife

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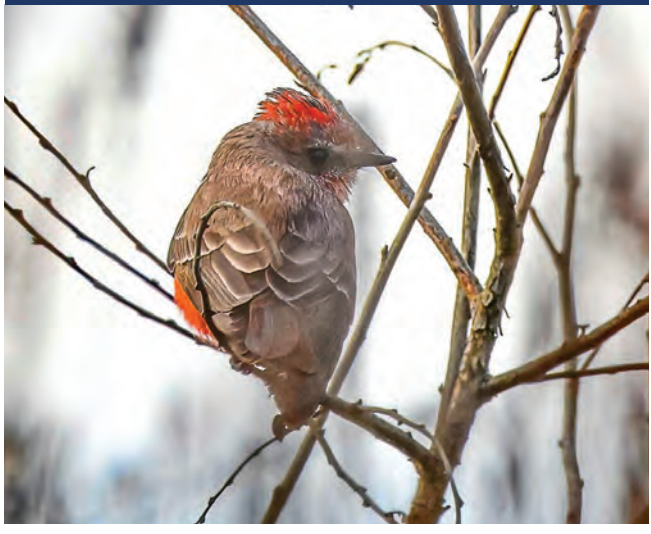
Eastern Coyote,
BioMap, Deer Hunting,
Fisheries Management

Rare bird documented in the Burrage Pond WMA on New Year's Day

Photo © Bill Marquardt



Bill Marquardt was visiting Burrage Pond Wildlife Management Area (WMA) on New Year's Day when something unexpected caught his eye. Bill observed and documented a young male vermilion flycatcher (*Pyrocephalus rubinus*) with a mottled red plumage. This striking red and gray flycatcher is a bird of open shrubby habitats of the southwestern United States and is seldom observed in the Northeast. In fact, there are only four other documented records of this species in Massachusetts with the last one being on Cape Cod in October 2022. While this bird bears some resembles to an adult female northern cardinal, the color and shape of their beaks are noticeably different.

Located in Halifax and Hanson, Burrage Pond WMA is a beautiful property where visitors can observe a variety of wildlife, including common mammals; numerous turtles and snakes; and many species of moths, butterflies, and native pollinators. Over 200 species of birds have been documented here, including ducks, geese, raptors, egrets, herons, bitterns, rails, shorebirds, and a variety of songbirds. Once a large cranberry-growing operation, this nearly 2,000-acre WMA contains extensive wetlands, ponds, and forested swamps. This area was once known as the Great Cedar Swamp and portions were logged for cedar and mined for bog iron in the 17th and 18th centuries. Since acquiring the land in 2002, MassWildlife has been restoring the cranberry bogs to natural emergent wetlands for improved wildlife habitat. This property has something for everyone, whether you fish or paddle in one of the many reservoirs, walk along the old cranberry bog dikes, hunt waterfowl in the wetlands, or explore the expansive red maple and Atlantic white cedar swamps. For maps of WMAs statewide, visit **mass.gov/wildlife-lands**.

MASSWILDLIFE

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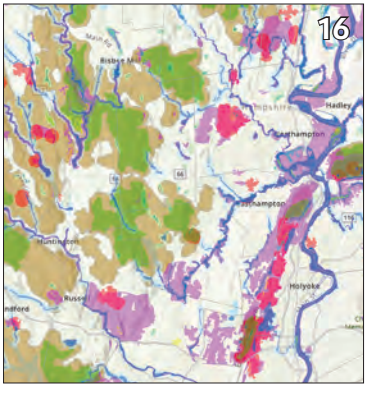

Map by MassWildlife/BioMap

Photo by Troy Gipps/MassWildlife

Photo © Sterling Worrell

MASSACHUSETTS WILDLIFE

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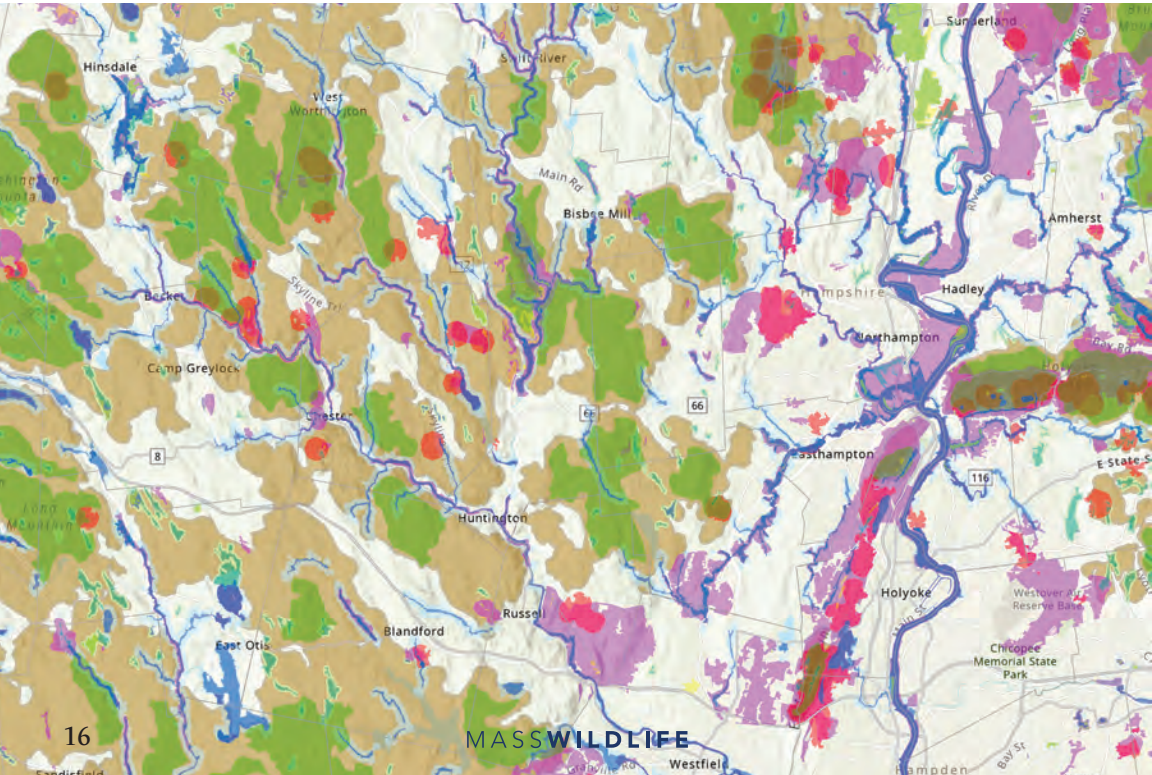
Features

On the Cover: An eastern coyote (*Canis latrans*) patrols a field at dawn. Moments like these appeal to wildlife enthusiasts of all stripes, but the line between beauty and nuisance behavior can quickly be blurred by the actions people take when they encounter these highly adaptable canids. Photo © Dean Cerrati

BIOMAP

Photo by Troy Gipps/MassWildlife

The Future of Conservation by Sarah Wasserman



Have you ever looked at a natural landscape while walking, driving to work, or even standing in your own backyard and wondered what plants and animals were present? Or how the landscape provides the habitat necessary for their survival? Our individual wildlife sightings and observations give some insight, but the larger, more complex story is hidden somewhere among the trees.

I have spent the last year working as MassWildlife's BioMap Outreach Specialist, immersing myself in conservation planning statewide. Learning from the many conservation leaders we have here in Massachusetts has changed how I understand the natural world. Now, when I stand at the second-floor window at MassWildlife's Field Headquarters in Westborough and look out over the Wayne F. MacCallum Wildlife Management Area (WMA), I see habitat data layered over the fields, forests, and wetlands. I can rise above the landscape in my mind and see a patchwork of colors below me that identify intact woodlands, biodiverse waterways, and important natural communities. I'm certainly not the only person who has learned to see the landscape in this way: it's a viewpoint that was first made available in Massachusetts over 20 years ago when BioMap **(mass.gov/biomap)** first launched. It was originally a paper map and only available digitally for those with access to early computer mapping programs. It graduated to an online platform for the second update in 2010. One year ago, MassWildlife and its partner, the Massachusetts Chapter of The Nature Conservancy, brought the mapping tool leaps and bounds forward with updated data, including new local and regional data layers, climate resilience data, and an innovative online platform that serves as a hub for conservation and habitat management resources. It was no small feat: BioMap data cover over 2.4 million acres of our 5.2-million-acre state. It's a critical tool for state agencies, conservation organizations, municipalities, regional planning agencies, and other conservation-minded groups. By identifying the most biodiverse and climate resilient habitats, BioMap ensures the efforts of these groups, and their funding, can be targeted for maximum success. Furthermore, BioMap will serve as a foundational dataset in setting groundbreaking biodiversity conservation goals for the Commonwealth, pursuant to Executive Order No. 618, which was signed by Massachusetts Governor Maura Healey on September 21, 2023.

BioMap is comprised of two main elements: **Core Habitat** and **Critical Natural Landscape**. Core Habitat identifies habitat necessary for the long-term persistence of rare species and a wide range of intact, resilient ecosystems. Critical Natural Landscape identifies large landscapes minimally impacted by development, as well as habitat buffers (Figure 1, see page 18). Within Core Habitat and Critical Natural Landscape are components that describe the different types of habitats (Figure 2, see page 18). These components identify habitats critical for supporting biodiversity across the state and have been part of the structure of BioMap since its launch in 2001.

The new data added to the BioMap released in November of 2022 encourage a wider range of conservation actions by a larger audience and at multiple scales. One of these additions is **Local Components**, which identify important habitats within each Massachusetts city and town. Local Components use the same data sources as Core Habitat and Critical Natural Landscape but analyze the data one town at a time. By changing the scale of the analysis, additional natural areas are identified, complementing the statewide data and giving each town a greater understanding of important habitats within its municipal boundaries. BioMap has also expanded beyond the borders of Massachusetts to include **Regional Components**. These data encompass connectivity pathways for plant and animal species whose ranges are expected to shift with climate change. These components also identify habitats for species that are vulnerable at regional and even global scales. And, finally, the

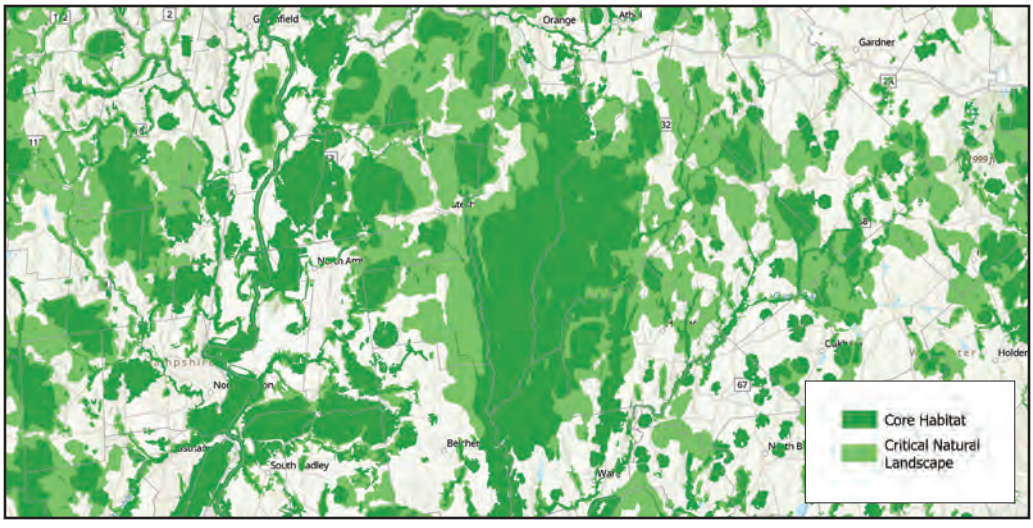
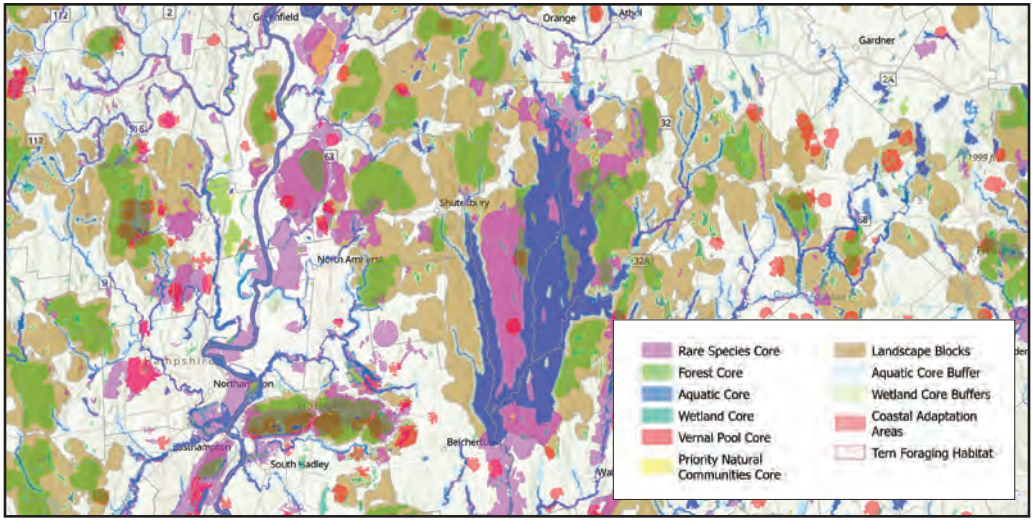


*Figure 1 (above): Core Habitat and Critical Natural Landscape **Elements** in Central Massachusetts, and (below) Figure 2: Core Habitat and Critical Natural Landscape **Components** in Central Massachusetts*



new BioMap deliberately incorporates **climate resilience data** to identify habitats where plants and animals can continue to thrive in the context of a changing climate.

Also new with BioMap is an information **"Hub"** where users can access data through an online interactive map, learn more about the Commonwealth's habitats and species through story maps and fact sheets, and explore BioMap town reports for each town in the Commonwealth.

In my role, I connect communities and organizations to the new BioMap and its resources. At the one-year anniversary of the new release, I decided to hit the road to hear directly from practitioners about how they're putting the enhanced data into action. The following three stories exemplify the hard work happening throughout Massachusetts to advance biodiversity conservation and climate resilience and illustrate the critical role BioMap plays in supporting these important endeavors.

Wendell Builds on Past Success

On October 20, 1914, members of the State Forest Commission visited the small town of Wendell. They drove across Massachusetts in a relatively new invention that people were calling the automobile. They were on a mission that day to examine a "burned over tract of several thousand acres." Despite this, the Commission saw the land's potential. It was acquired and later became known as Wendell State Forest.

One hundred and nine years later, I found myself driving along Route 2 in the company of thousands of other automobiles. I shared a destination with those commissioners of generations past: Wendell. The cloudy sky seemed ominous, but the threat of rain was not going to stop Dan Leahy and me from meeting. Dan is the chair of the Wendell Open Space Committee, which is tasked with updating the town's Open Space and Recreation Plan (OSRP) and setting a vision for the future of Wendell. Wendell is a town with one of the highest percentages of conserved land in the state at 63%. As we drove through town, Dan, who has lived here for 28 years, pointed out the patchwork of protected land; some state forest here, some wildlife sanctuary there, all interconnected to create a landscape that is almost completely covered by Core Habitat and Critical Natural Landscape. Wendell's town center looked like quintessential Massachusetts in late October, with leaves scattered across the town green, a white clapboard library, and historic meeting houses lining the roads. With only 924 residents, Wendell is a place where people look out for each other and for the land around them.

Photo © Julia Rabin

Photo ©Dan Leahy

Photo ©Dan Leahy

One of the most important ways a town can focus time and funding on conservation is through an OSRP. In places like Wendell, where there's a strong community belief in preserving the town's rural character, volunteers like Dan work tirelessly to bring the town's values to fruition. The open space planning process fosters discussions about land conservation and brings people together to forge a shared vision for the future. In creating the new plan, Dan and the Open Space Committee enlisted the help of Allison Gage, Senior Land Use and Natural Resources Planner for the Franklin Regional Council of Gov-

ernments (FRCOG), the regional planning agency for Franklin County, serving 26 towns. At FRCOG, BioMap is used in more than just open space plans. It's a key tool leveraged for the development of hazard mitigation, watershed and climate resiliency plans, and even a regional pollinator habitat plan that is currently in the works.

Allison, Dan, and the Wendell Open Space Committee have crafted an OSRP for Wendell that is thorough and ambitious, striking a balance between complex data and practical goal-setting. The comprehensive plan outlines Wendell's remaining conservation potential and incorporates community input. As they describe it, I am struck by the level of detail—it is several hundred pages in length. No parcel is ignored, and no potential conservation opportunity is left behind. The enhanced BioMap data have played a role in expanding the reach of their work. For example, in 2010, 502.5 acres of unprotected yet important forest land were identified in the Wendell OSRP as a priority for conservation. In the upcoming plan, which uses the new BioMap data, the number has increased to 2,645 acres. This is critical habitat for 15 rare species, including pale green orchid, wood turtle, and Jefferson salamander.

At several points on our drive, Dan pulled over to the side of the road and opened a map made by FRCOG during the planning process. The map places BioMap layers over other natural resource data in Wendell. Dan used it to point out places that aren't yet conserved but hold potential to protect waterways or increase habitat connectivity. It was a testament to the persistence of a conservation-minded community that strives to see the full picture of its vision emerge after decades or even a century or more of dedicated effort. Over 100 years ago, forest commissioners saw an opportunity to restore and protect an important area for the future. Today, Wendell is a conservation leader using BioMap to preserve their precious habitats for future generations.

Conservation on the Cape

On the other side of the state, across the Cape Cod Canal, land-use decision-making comes with a sense of urgency. The Cape is known for its extensive beaches, salt marshes, and vernal pools, among other resources. Add to this a human population that balloons each summer and development pressure that pushes up against conservation initiatives. In the 1980s, unprecedented development rates put conservation on the Cape in crisis, prompting the formation of the Cape Cod Commission, the regional land-use planning, economic development, and regulatory agency serving Barnstable County's 15 towns and adding to a growing network of local and regional land trusts, including the Harwich Conservation Trust.

On a call with Jessica Rempel, Natural Resource Analyst at the Commission, we discussed the importance of tools like BioMap for informing planning decisions. BioMap supports the approach of focusing on biodiverse and resilient land and gets to the heart of what planners need to know when balancing development and conservation. The Commission uses BioMap in its planning and regulatory work to identify important habitat and work with partners to protect land. Open space is precious on the Cape and BioMap's Core Habitat and Critical Natural Landscape layers are critical metrics that the Cape Cod Commission uses to guide its work with all the towns in Barnstable County.

On Jessica's recommendation, I traveled to the Town of Harwich on a brilliant, cloud-free October morning. I drove by picturesque boathouses and roadside lobster shacks before arriving at a Harwich Conservation Trust (HCT) property, where I met HCT Executive Director Michael Lach. Mike grew up on the Cape and has dedicated over two decades of his life to the HCT, so I knew I was sitting down with someone who had a deep knowledge of the landscape and its people.

Now entering its thirty-fifth year, the HCT works with landowners, the Town of

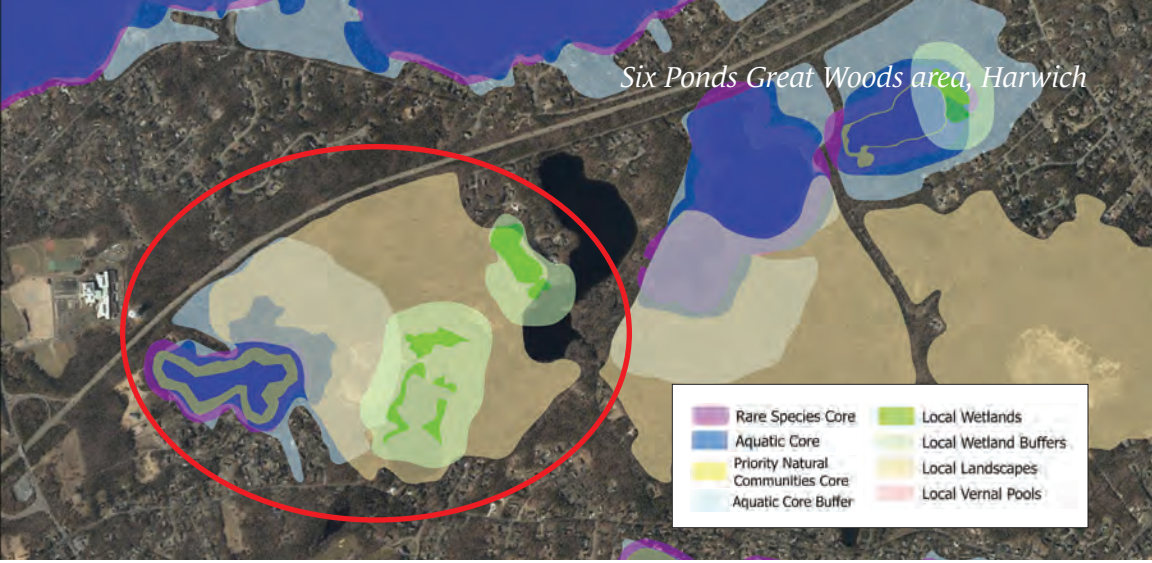


Figure 3: Circled in red above, the 85-acre Six Ponds Great Woods area, located south of Route 6 in Harwich. The Harwich Conservation Trust leveraged new BioMap data and worked with a variety of partners to conserve this ecologically important land.

Harwich, state agencies, and the U.S. Fish and Wildlife Service on land protection and stewardship, including ecological restoration. You don't have to own land or have a science degree to work with them, though. The HCT is also a community staple in Harwich that conducts citizen science and outdoor education through a robust network of volunteers.

Mike described two major projects in which BioMap is helping to guide the protection of critical habitats. The first is the Six Ponds Great Woods area (Figure 3, see above), where Mike combined his local knowledge with the BioMap data to enhance a connectivity corridor in the Six Ponds Special District. It's sandwiched between Aunt Edie's Pond, Cornelius Pond, and Walkers Pond, ponds covered by Core Habitat and Critical Natural Landscape, as well as Local Components. Looking more closely at the components reveals habitat critical for the persistence of rare species and aquatic biodiversity, as well as a coastal plain pondshore habitat, which supports a wide array of species, including dragonflies, damselflies, and multiple species of turtles. Adding in the new local BioMap data, the area is also identified as a Local Landscape and Local Wetland Habitat with a Local Wetland Habitat Buffer. These local layers add a new ecological perspective that allows the HCT to create a comprehensive picture of the landscape's conservation importance. This 85-acre, Six Ponds Great Woods area is the largest forested tract left on the Lower Cape and it is now preserved and under the HCT's care.

Aunt Edie's Pond, Six Ponds Great Woods area, Harwich

The second project Mike described is an ongoing endeavor for the HCT, the Red River Valley. As we strolled through acres of tall pines and oaks, Mike explained how HCT was in competition with subdivision developers for this land. Due in part to BioMap, the HCT knew how valuable the land was as a habitat for rare species, a watershed that feeds native fish biodiversity downstream, and an inland salt marsh that has room to expand as sea levels rise. The picture painted by the new BioMap allowed HCT to make a compelling case to their community and partners to come together and work towards this important conservation goal.

The land HCT is working to protect is a habitat type the Cape is well known for: a pitch pine and scrub oak forest, carpeted with soft mosses and lichens. It is due to the hard work of people like Mike and Jessica, using tools like BioMap, that the Cape continues to boast iconic landscapes and provide the sense of peace that so many residents and visitors have come to enjoy and rely upon.

A Greener Region Through Partnerships

As a tree grows, its roots dig into the soil, allowing it to access nutrients and create a solid foundation from which it can weather storms and reach towards the sky. It's a process that takes time, but the result is both beautiful and lasting, and is analogous to the growth, persistence, and reach of Greenbelt, Essex County's regional land trust. With roots 60 years deep and branches extending to 34 cities and towns, Greenbelt has conserved over 19,000 acres in Essex County and has securely tucked countless community projects under its belt.

As the last vestige of summer warmth gave way to crisp early-November air, I drove down the gravel path to Greenbelt's office, where I met Abby Hardy-Moss, Director of the Conservation Technology and Planning Division. On my approach, it was impossible not to notice the vastness of Great Marsh, whose surface area is a staggering 25,000 acres. It extended nearly as far as the eye could see and then blended imperceptibly with the cold, gray-blue Atlantic. Such beauty can make it easy to forget how significant the impact of coastal flooding is on North Shore communities like Essex. It was a sobering reminder of the critical nature of Greenbelt's work.

After greeting her rescue dog, Teddy, I sat in Abby's warm and sunny office to talk with her about this work. Having worked at Greenbelt since 2011, Abby could attest to the fact that BioMap is widely used throughout the organization, from parcel prioritization to project fundraising to habitat management plans. It also served as a major data source for Greenbelt's 2019 Land Conservation Prioritization Project, an effort that included the input of numerous local and regional partners and is an invaluable resource for the towns of Essex County. As part of the report's natural resilience, habitat, and flood mitigation analyses, BioMap data guides Greenbelt and the towns it serves towards climate-resilient decision-making. The new BioMap data are already being incorporated into the plan's update, which will continue to identify critical areas where conservation time and dollars should be focused.

I walked with Abby and Teddy at Castle Neck River Reservation, a Greenbelt property that connects to MassWildlife's Castle Neck Wildlife Management Area (I felt very at home wearing my navy blue MassWildlife staff vest). As we plodded through a plowed hayfield, Abby described how Greenbelt partnered with landowners, MassWildlife, and the Town of Ipswich to bring the project to fruition. Using BioMap data, which is integrated into Greenbelt's land selection process, Greenbelt acquired 32 acres in 2018 and 2019, MassWildlife purchased 54 acres in 2017, and the Town of Ipswich purchased 28 acres of connecting land to be used for soccer fields. The resulting 100 connected acres have a multitude of benefits. Greenbelt's land provides both active farmland and salt marsh, which contributes to the community by providing wildlife habitat

and mitigating the impacts of coastal flooding. The area also provides the community with outdoor recreational opportunities on the Wildlife Management Area, hiking, and sports. It's a perfect example of how BioMap data can inform and support collaborative partnerships and achieve conservation successes that ensure a climate-resilient future for the North Shore.

BioMap and the Future

It's been over two decades since the first BioMap was published, and, all these years later, I feel glad that I get the chance to see the future it is helping to create. Across Massachusetts, communities and conservation organizations with dedicated volunteers and staff like Abby, Mike, Jessica, Dan, and Allison are coming together with BioMap to bring this future to fruition. As our state strives to realize a bold biodiversity vision, BioMap will deepen our understanding of the landscape and inform decisions that will maximize our collective conservation efforts and protect the nature upon which we all depend.

About the Author

Sarah Wasserman served as MassWildlife's BioMap Outreach Specialist for the past year. During that time, she provided over 70 presentations to conservation groups, regional planning agencies, and municipalities to describe how the new BioMap data can enhance conservation work statewide. She recently transitioned to a new position as the Town of Carlisle's Land Use and Sustainability Coordinator. To learn more about BioMap, visit ***mass.gov/biomap****, or contact MassWildlife's Natural Heritage and Endangered Species Program at* ***natural.heritage@mass.gov****.*