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UMass Amherst Campus. Photo: University of Massachusetts Amherst

### At a glance:

- Research, education outreach, and active engagement in land protection in collaboration with state agencies, land trusts, and landowners
- Integrated research and extension faculty
- Faculty partnerships across Massachusetts and New England
- Management of over 2,000 acres through five forest properties

*“Faculty work beyond the institution’s walls and with professional entities and other universities to study the New England landscape while providing their students with critical exposure and learning opportunities.”*



**M**assachusetts has a proud history of land protection at both public and private institutions. As the flagship campus within the University of Massachusetts system, UMass Amherst began as the Massachusetts Agricultural College in 1863, a few decades before the first land trust in the state and the United States was created. The public institution was founded from the Land-Grant Colleges Act and has grown to a major research university enrolling over 30,000 students each year. Research and educational outreach to farmers and forest landowners have been a part of UMass’s history since the early 1900s. Today, **UMass Extension** centers around one goal: “to educate and inform individuals, communities, and businesses on topics of high public priority, utilizing the academic resources of UMass Amherst.”

Creating a productive, effective nexus between academic and extension programs at large research-oriented universities is not an easy task. There are disparate audiences, complex administrative hierarchies, and budget constraints to contend with. And in rapidly evolving policy-oriented and scientific fields, there are myriad competing objectives that might be achieved. Accordingly, programs that cross over between research and extension in fields such as forestry and environmental conservation often yield results that are short-lived and only modestly impactful. This background helps to explain why the research, teaching, and extension programs in forestry and land conservation at the University of Massachusetts Amherst have been, and continue to be, so remarkable.

Over the past several decades, UMass Amherst’s environmental conservation and extension forestry programs generated impressive results with long-term impact. Consider, for example, the Keystone



Students participating in Research Day on campus. Photo: University of Massachusetts Amherst

program created by the late Dr. David Kittredge, which has trained decades of responsible forest management advocates among the private woodlot owners of the Bay State. Likewise, the university's graduate programs in the field have produced generations of conservation managers for some of New England's largest conservation organizations, such as Gary Clayton and Jane Difley, who each recently concluded their careers as the leaders of two of New England's most prominent conservation organizations—Mass Audubon and the Society for the Protection of New Hampshire Forests, respectively.

A new generation of leaders is now stepping into the forefront, conducting research and developing formal educational and extension programs that are advancing sustainable forest management practices from the Connecticut Valley to Finland. What follows below is an overview of those programs in 2021, as we move into the era of profound climate change challenges. UMass students, staff, faculty, and administrators are striving to rise to these challenges, and to work with the women and men who will steward resilient fields, farms, and forests that will be here for the people of the twenty-second century to enjoy.

*In recognition of its outstanding work in both academic and extension contexts, UMass Amherst received in 2019 the Charles H.W. Foster Award for Academic Leadership in Land Conservation. In particular, the award highlighted the impact of Professor David Kittredge's career.*

## Family Forest Research Center

The **Family Forest Research Center** (FFRC) was established in the early 2000s as a partnership of the USDA Forest Service and UMass Amherst to research family forest owners across the country. Family forest owners collectively own one-third of the forests in the United States. Understanding the nature of this key land ownership group and the factors that shape their decisions is critical in keeping forests intact into the future. The FFRC aims to understand the behaviors and

attitudes of family forest owners across the country to better meet the needs of those individuals and society through effective forest policy.

Perhaps most notably, the FFRC conducts the **National Woodland Owner Survey**. This is a census of forest owners in the United States, and it provides quantitative data to understand the context of land ownership and decision-making. The National Woodland Owner Survey has enabled further research into sub-groups of family forest owners, including women and BIPOC landowners. These findings also drive outreach and educational resources to landowners on conservation-based estate planning.

## Keystone Project

Since 1988, **Massachusetts Keystone Project** has trained over 300 community leaders in forestry and conservation topics who collectively influence more than 175,000 acres of land in the Commonwealth. The program was developed to provide woodland owners in the state with land conservation information. Keystone (formerly called Coverts) derives its name from the ecological concept of a keystone species that has more impact on the surrounding environment than another individual species. The model for the program centers around investing time and resources into key community leaders and landowners to disseminate the relevant information in their networks and regions across the state.

Each Spring, a cohort of individuals are selected to attend a three-day training at the Harvard Forest in Petersham, Massachusetts. They participate in lectures, field walks, and discussions and further build their networks to become keystone cooperators. The expectation is that these individuals go back into their communities and serve as advocates for forest conservation by volunteering at least 30 hours of their time.

Cooperators have organized woods forums, hosted and facilitated events for local schools, written articles for the local papers, and served as trusted touchpoints for neighbors and community members seeking advice for their woodlands. As the number of Keystone Cooperators across the state grows, thousands of additional landowners are reached each year through their work. The community is encouraged to stay active and engaged through Keystone reunions and a listserv. The transfer of knowledge from professionals to Keystone cooperators to their communities effectively uses peer-to-peer learning.

## Women's Network

While reaching landowners and individuals interested in forest conservation through Keystone or other outreach programs is effective, UMass has joined the national effort to connect female landowners into a network. Through research stemming from the National Woodland Owner Survey, the need for women-specific programming has become apparent due to several factors. For example,



Keystone participants from 2018. Photo: Paul Catanzaro

women-specific programming can be designed to address research findings that: women landowners often feel that the historically male-dominated field of forestry and forest management can feel unwelcoming to women; women tend to think of their land more altruistically than men do by focusing on community and ecosystem services; and women often choose a different set of management objectives for forest land than men do.

UMass Extension has worked for several years to put on women's programming with events ranging from property site walks to forest bathing workshops. A formalized network called **Women on the Land** was developed in 2020 to encourage a more consistent community of educational opportunities and connections. A separate listserv allows women to share resources and upcoming events and to ask questions and discuss issues. The momentum for the network derived from the 2020 outreach publication also titled **Women on the Land: A Landowners Guide to Stewarding Her Woodlands**, a joint project between UMass and Michigan State University. The publication received national attention and praise and is used by landowners and natural resource professionals alike.

## Innovative Coursework from Integrated Faculty

Training the next generation of land protection and natural resource professionals is essential for UMass as an academic institution. The **Department of Environmental Conservation** is the central hub for environmental and conservation work on campus. Undergraduates can choose between building and construction technology, natural resource conservation, and environmental science majors.

Within the natural resource conservation major, students are encouraged to select a concentration in environmental conservation, fisheries ecology and conservation, forest ecology and conservation, urban forestry and arboriculture, water resources, or wildlife ecology and conservation. The forest ecology and conservation concentration is a Society of American

Foresters accredited program. Students can receive a Master's or Ph.D. in Environmental Conservation at the graduate level while pursuing the following concentrations: forest resources and arboriculture; human dimensions and environmental policy; water, wetlands, and watersheds; wildlife; fish; conservation biology; and sustainable building systems. Other graduate programs include a one-year Master's in Sustainability Science and a Master's in Geographic Information Science and Technology.

The courses available to undergraduate and graduate students focus on core sciences, quantitative science, and human dimensions. A combination of lecture classes and field classes provides students with the necessary skills and training to enter the conservation field. For example, Paul Catanzaro teaches Land Protection Tools and Techniques at the combined undergrad/grad level. The course includes speakers from across the state and region, giving students perspectives from landowners, land trusts, municipal planning, and research focused on land protection. Students are then allowed to reflect on these examples and integrate them into their learnings about landowner decisions, organizations that protect land, and various tools to protect, steward, and monitor land. Over the course of the semester, students complete an independent project related to land conservation and are often paired with local land trusts or conservation organizations to get hands-on experience.

The **Landscape Architecture and Regional Planning Department** prepares students for careers that work across disciplines and cultures to find sustainable solutions to complex problems. Their six areas of teaching and research are community engagement, technological innovation and regional economy, culture, heritage and society, design exploration, regenerative urbanism, and regional and greenway planning. The building in which the program is housed, the John W. Olver Design Building, showcases advanced cross laminated timber technology and is the largest mass timber academic building in the United States. Through inspiration found in the building, students can



John W. Olver Design Building. Photo: University of Massachusetts Amherst



Students in Mt. Toby Forest, Sunderland, MA. Photo: Harvard Forest

take coursework in sustainable planning and design, sustainable cities, city planning, planning for climate change, and cultural landscapes. Research by Elizabeth Hamlin Infield focuses on planning for climate change adaptation and large-scale landscape planning.

## Research for a Sustainable Future

Faculty in the Environmental Conservation department are well connected to research and projects across Massachusetts, New England, and worldwide. On-campus initiatives include the [Family Forest](#)

[Resource Center](#), the [Northeast Climate Adaptation Science Center](#), [Urban Natural Resources Institute](#), the [Center for Agriculture, Food, and the Environment](#), and [USGS Cooperative Fish and Wildlife Research Units](#).

Faculty also conduct research and maintain partnerships with the Harvard Forest (a research and education unit of Harvard University), the Woods Hole Institute, and the Silvio O. Conte National Wildlife Refuge. Beyond fieldwork,

many faculty work across disciplines and departments to study environmental policy, natural resource economics, and other social science disciplines. The integration and exposure of state and federal agencies into students' curriculum and research open doors for relevant work opportunities.

Assistant Professor Juniper Katz in the School of Public Policy focuses her research on environmental policy, policy process, and nonprofit management, with a particular interest in how policy and implementation jointly constitute public values among citizens and nonprofits interacting with governments.

Meghan Graham MacLean's experience as a research associate at Harvard Forest has fueled her recent work in the [Quantitative Ecology and Environmental Literacy Lab](#). Some of her recent work includes quantifying carbon consequences of future land use. This project modeled five future land use scenarios and their effects on above-ground forest carbon. The work was used in the [New England Landscape Futures Project](#), which helps New England explore possible future community patterns.

As an Extension Professor, Scott Jackson focuses on wetland and wildlife conservation. Working with Kevin McGarigal and Brad Compton, Scott developed the [Conservation Assessment and Prioritization System](#) (CAPS) and the [Critical Linkages project](#) and serves as project leader for the North Atlantic Aquatic Connectivity Collaborative (NAACC). These two projects involve bringing mapping and ecological concepts into software programs to identify important conservation areas for Massachusetts.



Gunn Brook Falls, Mt. Toby Forest, Sunderland, MA. Photo: Tom Walsh

## Land to Steward and Learn From

The Department of Environmental Conservation is responsible for managing and overseeing **five forest properties** totaling over 2,000 acres. The properties are the Mt. Toby Forest in Sunderland, MA (755 acres), which has some sections of old-growth; the Cadwell Memorial Forest in Pelham, MA (1,200 acres); the Savage Hill Forest near Princeton, MA (234 acres); the Knight-Sabin Forest in Pelham/Belchertown, MA (50 acres); and the Adams Brook Forest in Amherst, MA (50 acres).

Members of the community gifted these properties to serve as resources for university research and teaching. Malcolm Itter, an assistant professor in the Environmental Conservation Department, recently became the primary contact for the management of these properties. He hopes that they become active demonstration forests for students to observe and study active forest management. In the past, students worked with Emeritus Professor Bill Wilson to document decades' worth of forest structure and composition changes in the Mt. Toby and Cadwell forests. This long-term data set is currently being curated by the Forest Ecosystem Monitoring Cooperative.

The ability to study changes in forest dynamics, carbon, wildlife habitat, and restoration broadens the university's conservation portfolio. The forests represent different New England ecosystems and are living laboratories and classrooms for UMass students, faculty, and alumni to practice responsible stewardship. The properties are also loved by the greater community and are used for hiking, cross country skiing, and other forms of recreation, plus they serve as an important connection between the university and surrounding towns.

## Lessons Learned

As a state-supported institution, UMass Amherst hosts research and teaching in the many components of conservation and land protection. Broadly, this is

accomplished in a few important ways, and these can serve as take-aways for other institutions looking to design similar programs.

- Faculty from the Environmental Conservation Department, the Landscape Architecture and Regional Planning Department, the School of Public Policy, and the Stockbridge School of Agriculture work across areas of focus to promote conservation at all scales.
- Faculty work beyond the institution's walls and with professional entities and other universities to study the New England landscape while providing their students with critical exposure and learning opportunities.

The Extension program at UMass further supports and complements this work:

- Targeted outreach and providing educational programs to the surrounding communities mean that farmers and private landowners alike can receive information about current ecosystem health concerns and participate in workshops to improve stewardship.
- This work is made possible by specific Extension positions and monetary support from the state and the University.

Overall, the combination of expertise and resources in various conservation disciplines allows the members of the university to continue to push for land protection within Massachusetts and New England.

## More Information

Land Conservation Tools (Center for Agriculture, Food, and the Environment) <https://ag.umass.edu/resources/land-conservation-tools>

Mass Woods <https://masswoods.org/>

BioMap2 <https://ag.umass.edu/resources/land-conservation-tools/biomap2>



**ALPINE | Academics for Land Protection in New England** is a collaborative project of the Wildlands & Woodlands Initiative ([www.wildlandsandwoodlands.org](http://www.wildlandsandwoodlands.org)) based at the **Highstead Foundation** in Redding, Connecticut, USA ([www.highstead.org](http://www.highstead.org)).

**Wildlands & Woodlands** calls for conservation of 70 percent of New England as forests — while we still have this spectacular chance.

The **Lincoln Institute of Land Policy** based in Cambridge, Massachusetts, USA, seeks to improve the quality of life through the effective use, taxation and stewardship of land ([www.lincolninst.edu](http://www.lincolninst.edu)).

More information about the ***Role of Colleges and Universities in Land Conservation*** series can be found at [www.wildlandsandwoodlands.org/ALPINE](http://www.wildlandsandwoodlands.org/ALPINE)