

★ FWBC FY25 Annual Report

Project: Fish, Wildlife & Biodiversity Conservation

University of Massachusetts

NIFA REVIEW as of 12/30/2025

Project Director

Scott Jackson

Primary Critical Issue

Ecosystem Integrity and
Environmental Conservation

Fiscal Year

2025

Project Start & End Date

10/01/2020

Organization

University of Massachusetts

Organization Project Number

Accession Number

7002178

Funding Source

Extension Capacity Fund (Smith-
Lever 3(b) and 3(c))

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

In addition to traditional resources such as water, fisheries, wildlife, and forest products, natural ecosystems are valued for biodiversity, open space, aesthetics, and recreational opportunities. Because we know so little about the myriad ecological connections that organize ecosystems into self-sustaining entities, maintaining and restoring the ecological integrity of ecosystems is an essential component of natural resource conservation. The window of opportunity for effective land conservation in southern New England may be only 10-20 years. After this time, the unprotected landscape is likely to be too fragmented to be of much value for supporting wildlife or sustaining forest-based businesses. Land development and other human activity, their impacts on natural resources, and the role of natural ecosystems in buffering the impact of development on human communities has emerged as one of the most significant and challenging issues of our time. Despite an incomplete understanding of how human impacts will manifest at local and regional scales, land and resource managers will make decisions with the potential to either promote or compromise the long term integrity of natural ecosystems.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The Fish, Wildlife, and Biodiversity Conservation program represents the coordinated efforts of Extension faculty, professional staff, and external partners to identify and conserve critical natural resources of Massachusetts and the Northeastern U.S. The program focuses on important resources and services that ecosystems provide and pursues ecosystem and resource management strategies promoting the sustainable use of natural resources and maintenance of ecological integrity. We focus on research-based outreach strategies and key target audiences that can amplify our efforts and achieve our goals.

Target Audiences

- Landowners
- Land managers
- Community leaders
- Natural resource professionals
- Municipal officials
- Conservation organizations
- Regional Planning Agencies
- Agency personnel

Objectives

- Use landscape-scale modeling and decision support tools to facilitate strategic land conservation and spatially explicit habitat management
- Identification and assessment of landscape fragmentation and development of strategies to conserve and restore aquatic and terrestrial connectivity
- Promote land use practices that minimize the impact of development on natural resources and ecosystems

Approaches and Activities

- Use of the Conservation Assessment & Prioritization System (CAPS), Designing Sustainable Landscapes (DSL), and Critical
- Linkages to provide landscape-scale information to inform conservation decision-making
- Provide training and technical support to organization and agencies on the use of road-stream crossing assessments to identify opportunities to restore aquatic and terrestrial connectivity
- Work with conservation partners to use ecological assessments and conservation designs to guide land conservation and forest stewardship
- Conduct presentations and workshops on biodiversity conservation, landscape connectivity, strategic land conservation, and data sources and tools for conservation

Briefly describe how your target audience benefited from your project's activities.

The Fish, Wildlife and Biodiversity Conservation program provided the following benefits to target audiences.

- Updated ecological assessment data were generated and made available for the 13-state northeastern U.S.
- Landscape models were used to assess regional connectivity for various terrestrial and wetland ecosystems
- Road-stream crossing assessments were conducted and those data used in landscape-based connectivity modeling.
- Conservation organizations and agencies were provided with access to datasets based on sophisticated landscape modeling and assistance in using those data to prioritize conservation action
- Municipal officials, landowners, land managers, and natural resource professionals used spatially explicit information to guide land management and forest stewardship decisions
- Integration of CAPS, DSL, and Critical Linkages data into BioMap (Massachusetts) and Nature's Network (USFWS) conservation designs, as well as other conservation plans in the Northeastern U.S.
- CAPS, DSL, and Conservation Tools websites provide information about, and links to, data sources and tools to guide land conservation and forest stewardship
- Provided information and methodologies for assessing wetland condition and vulnerability to environmental change over time

Briefly describe how the broader public benefited from your project's activities.

The Fish, Wildlife and Biodiversity Conservation program uses state-of-the-art landscape models to better understand how human development is impacting natural ecosystems that provide clean air and water, forest products and other natural resources, fish and wildlife, and biodiversity that represents raw material for improving human welfare. Online resources such as websites and decision support tools, training programs, networking opportunities, and public education builds capacity at the local, state, and regional levels to protect and restore the ecological integrity of natural ecosystems so that they can continue to provide ecosystems services to future generations of Massachusetts residents.

Comments (optional)

Designing Sustainable Landscapes (DSL) and the Conservation Assessment and Prioritization System (CAPS)

- Continued development of CAPS software, DSL models, and related tools for a 13-state region in the northeastern U.S. This past year we released a simple-to-use web-based tool to increase accessibility of our CAPS and DSL data products and facilitate their use in land conservation by organizations that range from large governmental entities to small and diverse land

conservation organizations. We finalized and released to the public a parcel scoring tool (EcoAssess) for CAPS IEI and regional connectivity. EcoAssess was created utilizing Index of Ecological Integrity (IEI) scores and new regional connectivity metrics (ecoConnect) that are ecosystem-based and core independent.

- The MA Division of Ecological Restoration's Culvert Replacement Municipal Assistance Grant Program RFR directed applicants to use the results of CAPS and Critical Linkages analyses to determine their proposed culvert's priority for replacement.
- CAPS IEI is included in the Massachusetts Executive Office of Energy and Environmental Affairs Draft Guidance on Site Suitability Assessments for Clean Energy Infrastructure. The MA Department of Energy Resources is exploring the potential for using CAPS IEI, ecoConnect (regional connectivity), and the EcoAssess parcel scoring tool for cumulative impact assessments of energy facilities in MA.
- The CAPS (www.umasscaps.org) and DSL (www.umassdsl.org) web sites which provide information about CAPS, DSL, Critical Linkages and their various applications. Data and assessments are available for download as GIS layers or as PDF maps. This past year, 5,030 users accessed the sites (23,953 views). There were 2,382 downloads of reports/documentation, GIS data, and maps.
- In FY25, four workshops and presentations on DSL/CAPS and related applications reached 165 participants. Information about CAPS IEI, ecoConnect, and the EcoAssess parcel scoring tool were presented to the Rensselaer Plateau Alliance, the MA Association of Conservation Commissions, and at the International Conference on Ecology and Transportation. A 75-minute hands-on workshop on DSL data and the new EcoAssess tool was conducted at the Regional Conservation Partnership annual networking event.

River and Stream Continuity Project

- Coordinate and lead the North Atlantic Aquatic Connectivity Collaborative (NAACC); manage and continue to improve and expand the NAACC Crossings Database for assessment of road-stream crossings - 976 participants. The value of the NAACC is best illustrated by other organizations that are using it as a model for road-stream crossing assessments in their geographies. The Southeast Aquatic Resources Partnership (SARP) has been using the NAACC's non-tidal assessment protocol and scoring system to assess road-stream crossings in 14 states in the southeastern U.S. and is introducing this assessment protocol into the mid-west and intermountain-west regions of the country. In Canada, the Canadian Wildlife Federation is developing a nationwide collaborative to assess the barrier effects of road-stream crossings modeled on the NAACC and using NAACC protocols as a basis for their own crossing assessments. This past year, we began the process of merging the NAACC and SARP crossing assessment programs. The combined program will become the National Aquatic Connectivity Collaborative (NACC).
- Over the past year, 5,633 aquatic crossing assessments were conducted and data entered into the NAACC database. The NAACC's non-tidal aquatic connectivity module now includes 163 local and regional coordinators and 855 certified lead observers. The database received 416 new records collected using our terrestrial wildlife assessment module. There are 26 coordinators and 60 certified lead observers who are actively involved in assessing the

passability of crossings for terrestrial wildlife. This past year, 1,269 new culvert condition assessment records were entered into the NAACC database. There are 31 coordinators and 61 certified lead observers who are actively involved in culvert condition assessments. Since the start of the NAACC, the database has received and currently houses over 86,000 crossing assessments from 13 states.

- Work continued on a guidance document on how to implement the MA River and Stream Crossing Standards during wetland permitting. In Massachusetts, the requirement for new or replacement stream crossings is that they meet Stream Crossing Standards "to the maximum extent practicable." The guidance document will help interpret that phrase for applicants and the local conservation commissions that are responsible for issuing permits under the MA Wetlands Protection Act.
- In fiscal year 2025, 12 workshops, presentations, and training programs on the topic of river and stream continuity reaching 433 participants. Six training workshops were conducted on NAACC protocols, including:
 - Old Colony Planning Council: Tidal Aquatic Passability Assessment (20 participants)
 - Fuss & O'Neill: Tidal Aquatic Passability Assessment (7 participants)
 - Nashua River Watershed Association: Terrestrial Passability Assessment (9 participants)
 - NY Department of Environmental Conservation: Culvert Condition Assessment (23 participants)
 - Pioneer Valley Planning Commission: Culvert Condition Assessment (78 participants)
 - MA Division of Ecological Restoration: Culvert Condition Assessment (28 participants)

Wetlands Assessment, Protection, and Education

- Work continued on an EPA-funded project to use Unoccupied Aerial Systems (UAS) to assess wetland condition in salt marshes. This past year, the Massachusetts Department of Environmental Protection (MassDEP) asked us to develop and implement a long-term salt marsh monitoring program for Massachusetts. Faculty in the Department of Earth, Geographic, and Climate Sciences, the Department of Environmental Conservation, and the UMassAir program collaborated to develop and launch the MassMarsh program. FY25 was the first year of this effort with MassDEP providing \$1.4 million for the first three years of the project.
- We received a \$100,000 contract from the MA Division of Fisheries and Wildlife to explore whether drones and sensors could be used to monitor salt marsh sparrow populations. The project was successful in developing a mechanism for using drones to deploy and retrieve autonomous recording units that can be used to detect calling sparrows in hard-to-reach areas of salt marsh.
- Work continued in collaboration with the U.S. Geological Survey (USGS) and MassDEP, on a StreamStats based tool to provide information and suggested designs for replacement stream crossings to meet DEP's maximum extent practicable regulatory standards.
- Over the past year, 30 workshops, presentations, and training programs were conducted on wetlands topics reaching 347 participants. This included a 21-unit training program for two new municipal conservation agents and three conservation commissioners from small, western MA communities.

Fish & Wildlife Conservation

- For the period October 1, 2024, through September 30, 2025, the Massachusetts Snakes web site (<http://www.masnakes.org>) was visited by 12,000 users for a total of 47,000 page views.
- For the period October 1, 2024, through September 30, 2025, the Massachusetts Herp Atlas web site (<http://www.massherpatlas.org>) was visited by 1,900 users for a total of 7,000 page views.
- Over the course of the past year, seven workshops and presentations were conducted on the topic of fish, wildlife, and biodiversity conservation, reaching 179 participants. The majority of those workshops and presentations were on the subject of road and highway impacts on fish and wildlife.
- There were 209 downloads from eScholarship and Bepress-SelectedWorks of articles related to wildlife conservation and the effects of roads and highways on wildlife.