

Initiative: Fish, Wildlife and Biodiversity Conservation

Project Leader: Scott Jackson

Initiative Overview

Massachusetts is the third most densely populated state in the nation. The rate of land consumption for residential development is steadily increasing far out of proportion to its population growth. Haphazard growth has impacted water resources, natural resource-based enterprises, open space, wildlife habitat, and community character. Climate Change is already impacting natural resources and the way that people interact with natural systems. Nearly half the state's communities lack professional planning staff, while volunteer boards struggle with increasing levels of responsibility, liability, time demands and public mistrust.

The Fish, Wildlife & Biodiversity Conservation Project addresses these concerns through related initiatives that focus on habitat loss and fragmentation, establishing priorities for ecological restoration, mitigating development impacts on wildlife and ecosystems and climate change adaptation. Major initiatives include:

The Conservation Assessment and Prioritization System (CAPS) is a computer software program and an approach to prioritizing land for conservation that provides an objective, dynamic, and flexible tool to support decision-making for land conservation, land management, project review and permitting to protect habitat and biodiversity.

The River & Stream Continuity Project - focuses on the impact of road-stream crossings (culverts, bridges, fords) on fish and other aquatic organism passage by providing technical guidance and standards, field surveys, and other tools and approaches for setting priorities for culvert upgrade or replacement.

Wildlife Conservation engages in applied research and provides information, educational materials and programs based on current research to promote wildlife conservation including efforts to better understand the impacts of roads and highways on wildlife and ecosystems and to develop and evaluate techniques for mitigating those impacts.

Wetlands Regulations and Protection - part of a broader effort to provide training and information to municipal officials, this initiative provides workshops and materials for conservation commissions in the implementation of the Massachusetts Wetlands Protection Act.

Climate Change Adaptation – conducting research, outreach education and facilitating a coordinated response to climate change that includes vulnerability assessments, climate adaptation planning, and coordinated action to protect natural resources/systems and strengthen their contributions to the resiliency of human communities in MA.

Activity Summary – 2015

- Create, coordinate and lead the Massachusetts Climate Adaptation Partnership (1)
- Create, expand and maintain the Massachusetts Wildlife Climate Action Tool (1)
- Continue development of CAPS software and related tool(1)
- Critical Linkages Analysis of Taunton River Watershed (1)
- Critical Linkages Analysis for Millbury, Auburn & Tewksbury MA (1)
- Critical Linkages analyses in DEP surveyed watersheds (1)
- Development and Distribution of CAPS Scenario Testing Software (1)
- Development of CAPS IBI Software
- Research on the Relationship between CAPS Metrics and Wetland Condition (1)
- Maintain and expand content for the "streamcontinuity.org" web site (1)
- CAPS Analysis and Critical Linkages Analysis for Route 11 Project in Connecticut(1)
- Continue development of CAPS software and related tools(1)
- Critical Linkage Analysis for Millbury and Auburn(1)
- Critical Linkages Research Project(1)
- Development and Distribution of CAPS Scenario Testing Software(1)
- Revise and Enhance MassCAPS Web Site
- Wetlands Assessment and Monitoring Methods: Research on Forested Wetlands(1)
- Workshops on the results and use of CAPS analyses(1)
- Manage and continue to improve and expand the NAACC Crossings Database for volunteer assessment of road-stream crossings (1)
- Continue development and refinement of crossing standards, assessment protocols and training materials, and scoring algorithm (1)
- Training programs on regulations, assessment, prioritization and technical issues related to road-stream crossings (19)
- Development of a Comprehensive State Monitoring and Assessment Program for Freshwater Wetlands in Massachusetts (1)
- Wetlands Assessment and Field Techniques course (1)
- Workshops, presentations and technical assistance on wetlands and wetlands protection regulation (Current Reporting Year: 2015) (5)
- Book Chapters: Wildlife Crossing Structures for Small Vertebrates (3)
- Coordination of the MA Calling Amphibian Survey as part of the North American Amphibian Monitoring Program (NAAMP) (1)
- Maintain the Massachusetts North American Amphibian Monitoring Program (NAAMP) web site (1)
- Maintain the Mill River Watershed Web Site (1)
- Update and maintain the MA Herp Atlas Web Site (1)
- Workshops, presentations and technical assistance on mitigating the impacts of transportation on fish, wildlife, and ecosystems (1)

Total educational contacts

	Adult Contacts
In Person	2658
Indirect Contacts (Print, Web, etc...)	112060

Narrative Summary

With a budget of \$184,500 (from the MA Division of Fisheries and Wildlife) the Massachusetts Wildlife Climate Action Tool was created over the course of six months. It was an enormous undertaking in so short a time period. I spent much of my time coordinating the work, working with the web site designer, and writing and editing content for the site (www.climateactiontool.org).

Formation of the MA Climate Adaptation Partnership followed, to create and maintain the Climate Action Tool and to conduct research, promote engagement, provide technical assistance, and implement projects across Massachusetts for climate change adaptation. The Partnership currently includes the MA Division of Fisheries and Wildlife, Northeast Climate Science Center, MA Cooperative Fish and Wildlife Research Unit, and the UMass Center for Agriculture, Food, and the Environment.

I serve as a general resource on fish, wildlife and biodiversity conservation with a particular emphasis on reptiles and amphibians, and the impact of roads and highways on wildlife and ecosystems. Over the past year activities included: Serving as Massachusetts coordinator for the North American Amphibian Monitoring Program (NAAMP), additionally, I conducted 14 workshops and presentations, including 3 conference presentations, on the topic of fish, wildlife and biodiversity conservation. At the request of MA State Senate President Stanley Rosenberg I (along with Bethany Bradley and Tom Cairns) conducted an assessment of natural resources with the proposed route of the Tennessee Gas Company's Northeast Direct pipeline. The report, titled "A Natural Resources Assessment of the Tennessee Gas Pipeline Company's Proposed Northeast Energy Direct Project's Pipeline Route Within Massachusetts".

I created the River and Stream Continuity Project in 2000 and have served as project leader ever since. This year the project expanded significantly and is now called the North Atlantic Aquatic Connectivity Collaborative (NAACC) and covers 13 states in the northeastern U.S. I served as PI on two grants (total \$724,375) to create the NAACC and continue to serve as project leader. In addition to expanding efforts to assess road-stream crossings geographically I've been working with Paula Rees (WRRC), Steve Mabee (Geosciences) Rick Palmer (Civil and Environmental Engineering), and Dan Sheldon and Schlomo Zilberstein (Computer Science) on a million dollar plus project to deepen the culvert-related work to include culvert condition assessments, structural, hydraulic and geomorphic risk of failure, and potential disruption of services due to storm-related culvert failures. These projects will allow us to make common cause between environmental agencies/organizations interested in protecting and enhancing aquatic connectivity and highway and emergency management agencies that seek to create more resilient transportation infrastructure.

I continue to play a leadership role in Massachusetts and the region for wetlands assessment and wetlands protection. I serve as a project leader working with the MA Department of Environmental Protection, MA Office of Coastal Zone Management and U.S. EPA to develop cost-effective tools and techniques for assessment and monitoring of wetland and aquatic ecosystems. A central focus of our work has been the development of field-based Indices of

Biological Integrity (IBIs) referenced to CAPS landscape-based models. Collection of vegetation data from forested wetlands and shrub swamps continued in 2015 in order to better understand the robustness of IBIs both geographically and across a wider range of wetland types. The close collaboration with MassDEP ensures the relevance of this work for policy and regulations related to wetlands assessment and protection. I continued my long-standing collaboration with the MA Association of Conservation Commissions (MACC) to provide training to conservation commissioners. This past year my wetland related work has included:

- Extensive data collection in forested wetlands and shrub swamps of the Westfield and Housatonic River watersheds for development of complex Indices of Biological Integrity (IBIs).
- Working with MassDEP on a report summarizing the results of a study of the success of wetland mitigation projects in Massachusetts. The results of the study were presented at the MACC Annual Environmental Conference and as a national webinar for the Association of State Wetland Managers (ASWM). I also participated in numerous meetings and telephone conversations with MassDEP staff to develop recommendations for regulatory and policy changes to improve wetland mitigation in MA.
- Custom software for implementing CAPS-based indices of biological integrity (IBIs) for streams, forested wetlands and salt marshes was developed and distributed to collaborating agencies. The software allows users to input field data and implement complex IBIs that were developed using the CAPS Index of Ecological Integrity (IEI) to define reference conditions consistent with EPA's concept of a "generalized stressor gradient."
- A technical report titled "Creation of CAPS-IBI Software and Lake Nutrient Modeling: Components of the Massachusetts Comprehensive Wetlands Assessment and Monitoring Program" was completed and submitted to U.S. EPA and the MA Department of Environmental Protection.

Collaborating Organizations:

- **Massachusetts Department of Agriculture**
- **Massachusetts Department of Environmental Protection**
- **Massachusetts Association of Conservation Commissions**
- **Massachusetts Office of Coastal Zone Management**
- **Environmental Protection Agency**
- **Massachusetts Division of Fisheries & Wildlife**
- **Northeast Climate Science Center**
- **Massachusetts Cooperative Fish & Wildlife Research Unit**

