

Integrating Climate Change into Northeast and Midwest State Wildlife Action Plans

DOI Northeast Climate Science Center

Michelle D. Staudinger, Toni Lyn Morelli, and Alexander M. Bryan

May 2015



Michelle D. Staudinger, Toni Lyn Morelli, and Alexander M. Bryan (Editors)

DOI Northeast Climate Science Center
Morrill Science Center
611 North Pleasant Street
University of Massachusetts
Amherst, MA 01003-9297

Suggested Citation:

Staudinger, M. D., T. L. Morelli, and A. M. Bryan. 2015. Integrating Climate Change into Northeast and Midwest State Wildlife Action Plans. DOI Northeast Climate Science Center Report, Amherst, Massachusetts.
Available at: <http://necsc.umass.edu/>

Acknowledgements

We thank the U.S. Geological Survey (USGS) and DOI Northeast Climate Science Center for providing resources to support the development of this report. We thank Elizabeth Crisfield (Terwilliger Consulting Inc.), Karen Terwilliger (Terwilliger Consulting Inc.), Olivia LeDee (Minnesota Department of Natural Resources), Doug Pearsall (The Nature Conservancy), and John Paskus (Michigan Department of Natural Resources) for facilitating discussions with regional State Coordinators and other State personnel, and helping shape the overall direction of this report.

This DOI Northeast Climate Science Center Report underwent a formal USGS peer review process following the Fundamental Science Practices requirements and has received Bureau approval. We appreciate the constructive comments and input from A. Terando, D. Rosendahl, A. D'Amato, L. Thompson, B. Irwin, F. Thompson, N. DeCrappeo, and T. Jones-Farrand who provided reviews on individual chapters during the preparation of this report.

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Cover photos are courtesy of M. D. Staudinger, and USGS's Photo Collection in the USGS Multimedia Gallery.



AUTHOR TEAMS BY CHAPTER

Executive Summary:

Authors: Michelle D. Staudinger (USGS, NE CSC (Northeast Climate Science Center (NE CSC)), Toni Lyn Morelli (USGS, NE CSC), Alex Bryan (USGS, NE CSC)

Chapter 1: Climate Change in the Northeast and Midwest United States

Authors: Alexander Bryan (USGS, NE CSC), Ambarish Karmalkar (University of Massachusetts Amherst, NE CSC), Ethan Coffel (Columbia University, NE CSC), Liang Ning (Nanjing Normal University, NE CSC), Radley Horton (Columbia University, NE CSC), Eleonora Demaria (University of Massachusetts Amherst, NE CSC), Fanxing Fan (Chinese Academy of Sciences), Raymond S. Bradley (University of Massachusetts Amherst, NE CSC), Richard Palmer (University of Massachusetts Amherst, NE CSC)

Chapter 2: Northeast and Midwest regional species and habitats at greatest risk and most vulnerable to climate impacts

Authors: Michelle Staudinger (USGS, NE CSC), Laura Hilberg (University of Massachusetts Amherst), Maria Janowiak (Northern Institute of Applied Climate Science, U.S. Forest Service), Chris Swanston (Northern Institute of Applied Climate Science, U.S. Forest Service)

Chapter 3: Biological responses to climate impacts with a focus on Northeast and Midwest Regional Species of Greatest Conservation Need (RSGCN)

Authors: Toni Lyn Morelli (USGS, NE CSC), William V. DeLuca (University of Massachusetts Amherst, NE CSC), Colton B. Ellison (University of Massachusetts Amherst, NE CSC), Stephen F. Jane (University of Massachusetts Amherst), Stephen N. Matthews (Ohio State University)

Chapter 4: Scale-appropriate adaptation strategies and actions in the Northeast and Midwest United States

Authors: Michelle Staudinger (USGS, NE CSC), Laura Hilberg (University of Massachusetts Amherst), Maria Janowiak (Northern Institute of Applied Climate Science, U.S. Forest Service), Chris Caldwell (College of Menominee Nation, NE CSC), Anthony W. D'Amato (University of Vermont, University of Minnesota, NE CSC), Evan Grant (USGS), Radley Horton (Columbia University, NE CSC), Rachel Katz (USGS), Christopher Neill (Marine Biological Laboratory, NE CSC), Keith Nislow (US Forest Service, University of Massachusetts Amherst, NE CSC), Ken Potter (University of Wisconsin Madison, NE CSC), Erika Rowland (Wildlife Conservation Society), Chris Swanston (Northern Institute of Applied Climate Science, U.S. Forest Service), Frank R. Thompson III (University of Missouri Columbia, U.S. Forest Service, NE CSC), Kristopher Winiarski (University of Massachusetts Amherst, NE CSC)

EXECUTIVE SUMMARY

The Department of Interior Northeast Climate Science Center (NE CSC) conducts research that responds to the regional natural resource management community's needs to anticipate, monitor, and adapt to climate change. The NE CSC is supported by a consortium of partners that includes the University of Massachusetts Amherst, College of Menominee Nation, Columbia University, Marine Biological Laboratory, University of Minnesota, University of Missouri Columbia, and University of Wisconsin. The NE CSC also engages and collaborates with a diversity of other federal, state, academic, tribal, and non-governmental organizations (NGOs) to conduct collaborative, stakeholder-driven, and climate-focused work.

The State Wildlife Action Plans (SWAPs) are revised every 10 years; states are currently working towards a target deadline of October 2015. SWAP coordinators have been challenged to incorporate climate change impacts and species responses into their current revisions. This synthesis is intended to inform the science going into Northeast and Midwest SWAPs across the 22 NE CSC states ranging from Maine to Virginia, and Minnesota and Missouri in the eastern United States. It is anticipated that this synthesis will help guide SWAP authors in writing specific sections, help revise and finalize existing sections, or be incorporated as an appendix or addendum.

The purpose of this NE CSC-led cooperative report is to provide a synthesis of what is known and what is uncertain about climate change and its impacts across the NE CSC region, with a particular focus on the responses and vulnerabilities of Regional Species of Greatest Conservation Need (RSGCN) and the habitats they depend on. Another goal is to describe a range of climate change adaptation approaches, processes, tools, and potential partnerships that are available to State natural resource managers across the Northeast and Midwest regions of the United States. Through illustrative case studies submitted by the NE CSC and partners, we demonstrate climate change adaptation efforts being explored and implemented across local and large-landscape scales.

This document is divided into four sections and addresses the following climate and management relevant questions:

1. Climate Change in the Northeast and Midwest United States: How is the climate changing and projected to change across the Northeast and Midwest regions of the United States?
2. Northeast and Midwest regional species and habitats at greatest risk and most vulnerable to climate impacts: What are the relative vulnerabilities of fish and wildlife species and their habitats to climate change in the Northeast and Midwest?
3. Biological responses to climate impacts with a focus on Northeast and Midwest Regional Species of Greatest Conservation Need (RSGCN): How are threatened fish and wildlife likely to respond or adapt to climate change in the Northeast and Midwest?
4. Scale-appropriate adaptation strategies and actions in the Northeast and Midwest United States: What approaches, strategies, and actions could be taken to sustain fish, wildlife and their habitats in the short and long term across the Northeast and Midwest?

The outline and content for this document were developed with input from State Coordinators, members of the Northeast Association of Fish and Wildlife Agencies and Midwest Association of Fish and Wildlife Agencies, DOI Northeast Climate Science Center affiliated researchers, and other partners including the Landscape Conservation Cooperatives, the Northern Institute of Applied Climate Science, the Wildlife Conservation Society, and The Nature Conservancy. Terwilliger Consulting, Inc., was especially instrumental in helping connect and coordinate the authors of this report with State representatives through conference calls and email surveys to develop the most needed and effective information for current SWAP revisions.

On a final note, the SWAPs are living documents that can be added to and evolve on timescales beyond the 10-year revision cycle. The development of this report was timed such that SWAP coordinators and writers would have sufficient time to implement this input before their October 2015 deadline. However, this document is also meant to serve as a starting point for coordinated and collaborative climate science and adaptation across the region; the NE CSC

endeavors to continue to provide actionable science during the coming years in collaboration with its diverse federal, state, NGO, and academic partners.