**Use of a vulnerability index to assess species most likely to be impacted by climate change:**

**A proposal to the North Atlantic**

**Landscape Conservation Cooperative**

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**Project Description**

Numerous studies show that ongoing climate change will have major effects on the distribution and conservation status of much of our biodiversity. Resource managers urgently need a means to identify which species and habitats are most vulnerable to decline in order to direct resources where they will be most effective. To address this need, NatureServe and Heritage Program collaborators have developed a Climate Change Vulnerability Index (CCVI) to provide a rapid, scientifically defensible assessment of species’ vulnerability to climate change. The CCVI integrates information about exposure to altered climates and species-specific sensitivity factors known to be associated with vulnerability to climate change. This project will apply the CCVI to 60 species to be selected in collaboration with state wildlife experts, the Science Technical Review committee of the North Atlantic Coast, and with Manomet. Species selected for assessment will represent a) Federal Trust species of high responsibility by the NALCC, b) foundation species for habitats currently being assessed for climate change vulnerability by the Manomet Center for Conservation Sciences, and c) Species of Greatest Conservation Need (SGCN) as identified by the Regional Conservation Needs program.

**Goals and Objectives**

The goal of this project is to assess a set of animal and plant species that range along the north Atlantic coast for their climate change vulnerability using the Climate Change Vulnerability Index (CCVI) developed by NatureServe and its partners. The CCVI uses a scoring system that integrates a species’ predicted exposure to climate change within an assessment area and three sets of factors associated with climate change sensitivity, each supported by published studies: 1) indirect exposure to climate change, 2) species-specific factors (including dispersal ability, temperature and precipitation sensitivity, physical habitat specificity, interspecific interactions, and genetic factors), and 3) documented response to climate change.

We propose to work with a team of collaborators to select a set of 60 species important to the north Atlantic coast for determination of their potential vulnerability to climate change. Our team will be comprised of staff from NatureServe, Manomet, and the North Atlantic LCC, including the Science Technical Review team of the NALCC, as well as biologists from the state wildlife programs of the north Atlantic coastal region. We will accomplish these goals through the following objectives:

1. Convene a team of collaborators to select 60 species to be assessed using the CCVI. The set of species will include a mix of Federal Trust species of high responsibility by the NALCC, foundation species selected from habitats currently being assessed for climate change vulnerability by Manomet, and species of greatest conservation need as identified by the Northeast Association of Fish and Wildlife Agencies.
2. Using the NatureServe network’s extensive literature and spatial databases and other pertinent sources, assemble natural history and distribution information on the species and habitats selected for assessment.
3. Identify and assemble the downscaled climate predictions and other GIS data, including range maps of the selected species.
4. Apply the CCVI and document in detail the assumptions used in the assessment.
5. Using CCVI results, document the justification for each species assessed, and produce a final report that translates the results into language accessible to the educated lay public. The report may include, as appropriate, potential geographic areas of relatively lower vulnerability to guide conservation decisions, and possible adaptation strategies and monitoring recommendations for individual species or guilds of species.
6. Post the CCVI assessment results on the climate change section of NatureServe’s web site (<http://www.natureserve.org/prodServices/climatechange/ccvi.jsp>).

# Methodology and Approach

**Select species for assessment:** Identify members of the team to identify the 60 species to be assessed. Assemble a single comprehensive list of SGCN species of northeastern coastal distribution, Federal trust species, and potential foundation species of habitats currently being assessed. Include an inventory of the species already assessed using the CCVI in completed state-level projects. Propose a straw-man list for discussion by the team at a meeting, and finalize the list through followup conference calls as needed.

**Assemble natural history and distribution information:** NatureServe and the network of heritage programs have developed extensive information about the distribution, natural history, and conservation status of rare species and habitats. Following review of the existing information, information gaps will be identified and missing information will be amassed as needed through literature search and consultation with experts.

**Apply the CCVI:** Determine the availability of mid-century downscaled climate predictions for the north Atlantic region. If other data sets are not available in a suitable geographic coverage, download data from Climate Wizard (http://www.climatewizard.org). Using the climate data together with distributional and natural history information for each species to be assessed, complete CCVI assessments for each species. Outputs will be reviewed by the team of collaborators, and recommended changes adopted.

**Document results:** NatureServe will document and summarize the assumptions and data used to evaluate vulnerability for each species and post the CCVI results and supporting documentation for download on the climate change section of the NatureServe website. The materials posted will include detailed documentation of how species were evaluated against the component factors.

**Present and publish final report:** Results of the research will be written targeting the educated public, and presented as a poster or presentation at a public forum, and the final paper will submitted to a peer-reviewed journal for publication.