

APPALACHIAN

LANDSCAPE CONSERVATION COOPERATIVE

Assessing Vulnerability of Species and Habitats to Large-scale Impacts

New vulnerability assessments for 41 species and 3 habitats in the Appalachians now available

Year after year, regions across the U.S. and around the world continue to report record temperatures, extreme weather events, and dramatic shifts in precipitation resulting in droughts in some areas and flooding in others. Based on the best available science and recorded observations, this continuing trend is expected to accelerate as the century moves forward. Along with current environmental, economic, and social changes that are influencing the landscape, climate change will augment these developments, affecting habitats and species in different ways. Understanding the potential risk and vulnerability of species and habitats to climate change within the Appalachians – a region rich in unique biodiversity found nowhere else on the planet with nearly 200 federally listed threatened or endangered species- is of critical importance and thus a major research priority for the Appalachian LCC.



Shenandoah National Park. Credit: David McSpadden

In response, the LCC pursued a multi-year climate change vulnerability study conducted by NatureServe, which has produced a wealth of new information to support the work of the natural resources and conservation community in protecting species and habitats. The project generated new assessments on 41 species and 3

habitats in the Appalachians.

Of the 41-new species assessed – from amphibians like the southern pygmy salamander to plants such as the smooth purple cone flower - 30 were determined to be negatively impacted from future climate change, with 11 ranked as extremely vulnerable.



Credit: Nicholas A. Tonelli



Large-leaf grass-of-Parnassus
Credit: Nicholas A. Tonelli



Marbled salamander.
Credit: David Huth



Diana fritillary.
Credit: Greg Gilbert



To learn more about this project, visit <http://applcc.org/research/vulnerability-assessments>



NatureServe also looked into the potential vulnerability of three new, never before assessed, habitats: south-central interior small stream and riparian habitat, central interior highlands calcareous glade and barrens, and southern interior low plateau dry mesic oak forest. Researchers also compiled the results of 700 species and several habitats assessments previously completed by other researchers. Users can now view and search all of these assessments by relative ranking or vulnerability scores, conservation status ranks, state and subregion of assessment, and higher taxonomy.



Expert Panel discussing a decision tree to aid in selecting vulnerability assessment methods. Panel members (from left to right): Kim Hall, The Nature Conservancy, Great Lakes; Robert Cooper, University of Georgia; Bruce Young, NatureServe; Jean Brennan, Appalachian LCC; Kyle Barrett, Clemson University; Healy Hamilton, Marine Conservation Institute (now of NatureServe); *Credit: NatureServe*

Acquiring vulnerability information to large-scale impacts is vital for informing adaptation and mitigation efforts trying to sustain key Appalachian species and habitats.



Division of the Appalachian LCC into ecologically consistent subregions used for vulnerability assessments.

Based on the results from this study, researchers at NatureServe recommended:

- ➔ Capitalizing further on existing species assessments by examining results by major habitat categories.
- ➔ Focusing management on habitat benefits large numbers of associated species, but in order to be most effective there must be a greater understanding of species – habitat relationships;
- ➔ Combine climate vulnerability information with conservation status ranks to inform conservation planning;
- ➔ Conduct more in-depth assessment of species and habitats found to be highly or extremely vulnerable; and
- ➔ Focus on “no regrets” climate smart conservation actions such as increasing the size and genetic diversity of small populations, protecting large core areas and increasing connectivity, restoring natural ecosystem drivers, improve habitat condition, and employ targeted monitoring and adaptive management.

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To learn more about the Appalachian LCC, visit <http://applcc.org>



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