NatureServe
A Network Connecting Science With Conservation

Press Release

1101 Wilson Boulevard, 15th Floor
Arlington, VA 22209
tel 703-908-1800
www.natureserve.org

Contact: Rob Riordan, NatureServe / 703-908-1831
e-mail: rob_riordan@natureserve.org

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For Immediate Release

New Tool Developed to Assess Vulnerability of Species to Climate Change

Using NatureServe Index, Scientists Can Prioritize Which Species are at Greatest Risk

Arlington, Virginia — From declines in the Arctic ice pack to earlier spring migration dates for birds and earlier blooming periods for flowers, the effects of climate change on the natural world are becoming readily observable. The conservation group NatureServe today announced it has developed a new scientific tool designed to assess the vulnerability to climate change of a given species of plant or animal.

The NatureServe Climate Change Vulnerability Index allows scientists, natural resource managers, planners, and conservation practitioners to perform a rapid assessment of the relative vulnerability of species to the effects of predicted climate change in a defined geographic area.

"This tool brings together in one place all that scientists have learned about the characteristics of plants and animals that render them vulnerable to climate change," said Bruce E. Young, Ph.D., Director of Species Science for NatureServe, who led the team that developed the Vulnerability Index. "For the first time, we can compare the relative vulnerability of organisms as different as orchids and orcas," said Young, a zoologist based in Costa Rica.

Useful applications of the NatureServe Climate Change Vulnerability Index include:

- assessing the relative risk of any species or set of species to climate change, such as species targeted in State Wildlife Action Plans or other conservation planning efforts;
- identifying the common factors that are most responsible for causing a group of species, such as amphibians, to be at risk from climate change;
- identifying geographic areas with high concentrations of climate-vulnerable species;
- setting priorities for conservation action in a given region, state, or country.

How the Climate Change Vulnerability Index Works

The methodology for the Vulnerability Index was developed by a team of scientists from NatureServe in collaboration with colleagues from state natural heritage programs and other experts. The Excel-based tool uses a scoring system that considers two main components of vulnerability: a species' *predicted exposure to climate change* within a defined geographic area, and its *sensitivity to climate change*, each supported by published studies.

Each species is scored on a detailed set of factors, such as dispersal ability, natural and man-made barriers to dispersal, sensitivity to changes in temperature and precipitation, physical habitat requirements, and genetic variation. Scores on these factors are combined to yield an overall prediction of whether the species will likely suffer a contraction in range, reduction in population, or both during coming decades (the standard time scale used is through 2050). The overall rating is

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given according to the following scale: Extremely Vulnerable / Highly Vulnerable / Moderately Vulnerable / Not Vulnerable—Presumed Stable / Not Vulnerable—Increase Likely / Insufficient Evidence.

The Vulnerability Index is currently applicable to geographic areas of North America north of Mexico, with a new version under development to assess tropical species. Examples of how the Vulnerability Index is already in use across North America include:

- As a component of updating Nevada's State Wildlife Action Plan to incorporate the effects of climate change, Nevada Natural Heritage Program (NHP) scientists have assessed about 250 priority plants and animals. Their preliminary results will be reviewed at an experts workshop scheduled for mid-December. The Lahontan cutthroat trout, American pika, and mountain beaver are examples of animals assessed as vulnerable to climate change, while the great-tailed grackle could see its range increase. "We plan to use the Vulnerability Index to eventually assess all the species in the state, including the common ones, some of which could actually be the most susceptible to climate change," said biologist Jennifer Newmark, administrator of the Nevada NHP.

- Scientists with the Pennsylvania Natural Heritage Program of the Western Pennsylvania Conservancy are using the index to screen about 50 high-priority animal and plant species. The results will be provided to state agencies for potential use in future conservation planning.

- Updates to State Wildlife Action Plans that are underway by state agencies in Montana, North Dakota, Colorado, Michigan, and New Jersey will use the index to assess priority plant species in each state.

The ability of the index to assess individual species is intended to complement, not substitute for, assessments of the vulnerability of habitat types, which are also critical to conservation planning. By integrating these two types of assessments, scientists can get a more complete picture of the potential effects of climate change.

The NatureServe Climate Change Vulnerability Index, in the form of an Excel workbook file, can be freely downloaded from the NatureServe website. Also available is detailed guidance on how to use the index, and a case study of its use in Nevada.

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