

## PRESIDENT'S MESSAGE

NatureServe is making great strides in our mission to deliver science for effective conservation action. Our staff and Network are honored to receive the MacArthur Award this year. Known for our innovation and impact in tackling the world's most pressing environmental problems, this award is the institutional equivalent of their "genius grant." We are thrilled to receive this award from the MacArthur Foundation as it reinforces our Network's dedication to creatively connecting people with information on the species and natural places they care about.

Along with the new award came the launch of NatureServe.org, a user-friendly site that provides our visitors an easier way to learn about NatureServe and the importance of our mission.

The impact of our work is always widening. It has indeed been a banner year and one that speaks volumes about the brightness of NatureServe's future. Thank you for your continued support in making possible these science-driven triumphs for biodiversity.

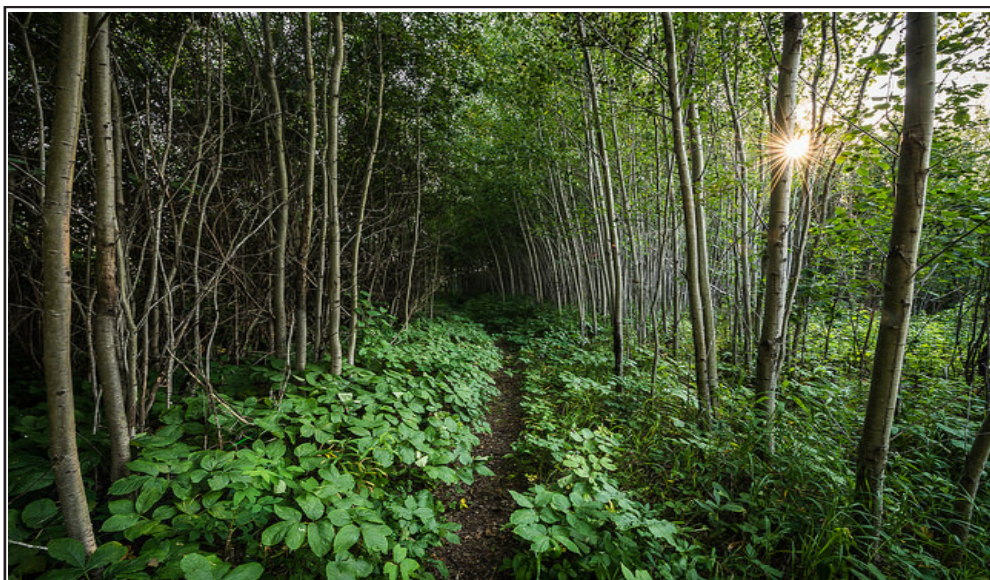


Mary L. Klein  
President & CEO



## RECONNECTING SCIENCE AND CONSERVATION

With a reach that is extending further around the world, NatureServe's mission—to put the best scientific information into the right hands—has generated exciting results. In this report you will read about a year highlighted by our receipt of the MacArthur Award, new ventures in citizen science, discovering the most important places to conserve in the Andes-Amazon, mapping changes in the U.S. Southwest and more.



Tunnel Trail, Alberta Canada | Photo by Jeff Wallace

## NatureServe Wins 2014 MacArthur Award for Creative and Effective Institutions

NatureServe has received one of the nonprofit world's most prestigious awards for organizational excellence from the John D. and Catherine T. MacArthur Foundation.

The Foundation bestows its annual MacArthur Award for Creative and Effective Institutions (MACEI) on exceptional nonprofits that demonstrate innovation and impact in tackling the world's most pressing problems.

The MacArthur Award will further NatureServe's mission most critically on two fronts: increasing the organization's voice in the dialogue over global change and expanding our role as an enabler of citizen science.

In choosing to make the Award to NatureServe, the MacArthur Foundation highlighted our role in helping governments and private companies act as more effective environmental stewards.

"NatureServe's work helps civil society, governments, and private companies establish benchmarks and make effective decisions about environmental stewardship," the foundation said. "By responding to more than six million data queries each year, the NatureServe network informs land use and natural resource management decisions that guide conservation to the most important places and diminish harmful impacts on biodiversity."

## MISSION

To provide the scientific basis  
for effective conservation action

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Frosted flatwoods salamander (*Ambystoma cingulatum*, G2) | Photo by Michael Graziano

## Finding at-risk plants and animals on forest lands

Foresters, wood-workers, and landowners were having trouble incorporating at-risk plants and animals into their land management activities because of a lack of data on where these creatures are located.

With funding from the Weyerhaeuser Company, National Council for Air and Stream Improvement, Inc. (NCASI), and the Sustainable Forestry Initiative, NatureServe developed an approach to help the forestry industry manage for biodiversity on their lands. We created a list of the at-risk plants and animals that are most likely to occupy forest lands, then used these species' habitats to predict where they might be found.

## How Climate Change Tools Inform Adaptation Planning

As temperatures continue to increase, so do the number of tools and approaches that are becoming available for wildlife conservation managers to inform and support efforts to adapt to climate change—but few studies document how practitioners have applied these tools and how they perceive their usefulness.

This report is the first to examine application of NatureServe's Climate Change Vulnerability Index (CCVI), one of the preeminent tools for measuring how sensitive species are to their changing environment. The analysis, carried out with Defenders of Wildlife and the Wildlife Conservation Society, and funded by Duke Energy characterizes:

- 1) How the CCVI tool has been used
- 2) The objectives addressed by projects using the vulnerability index
- 3) Novel approaches that might be useful to other users
- 4) How the results contributed to climate change adaptation planning
- 5) Improvements suggested by CCVI users

The CCVI is an online tool that integrates information about projected temperature and moisture changes, landscape context, natural history traits related to climate sensitivity and adaptive capacity, and documented and modeled responses to climate change. The tool supports assessments of any aquatic or terrestrial plant or animal within a specified geographic area.





BWB 2014 brought together more than 200 scientists, natural resource managers, and corporate and public decision-makers to discuss issues such as climate change and biodiversity science.

## BWB 2014: New Orleans

New Orleans, La. played host to Biodiversity Without Boundaries 2014, held April 6-10 at the historic Hotel Monteleone in the heart of the French Quarter.

The event brought together more than 200 scientists, natural resource managers, and corporate and public decision-makers to discuss issues including climate change, land conservation, coastal and marine protection, biodiversity science, and more. The more than 80 interactive workshops, panels, and plenaries, included:

**Citizen Science** – spanning three days, the presentations and discussions addressed opportunities, challenges, and best practices for designing, implementing, and effectively using citizen science projects for conservation and biodiversity science.

**Invasive Species** – this afternoon symposium featured practitioners on the front lines of invasive species science from across the western hemisphere.

**Ecosystem Services** – a two-day discussion on how to use ecosystem services valuation for restoration efforts.

## Citizen Science and the Appalachian Trail

Years of data on the rare plants and invasive species that line one of the country's most iconic long-distance footpaths will form the basis of a study that marks the onset of NatureServe's strategy for putting citizen science to rigorous scientific use.

Through a partnership with the National Park Service (NPS) and the Appalachian Trail Conservancy (ATC), NatureServe analyzed a vast storehouse of data detailing plant life all along the Northeastern region of the 2,000-mile Appalachian Trail, information (next page)



Protecting the Appalachian Trail will require data collection from scientists and volunteers alike.

## IN BRIEF

### Inside Puerto Rico

NatureServe and Para la Naturaleza (PLN) conducted assessments of the threats to, and priorities for, conserving biodiversity.

In 2013 and 2014, we assessed the draft National Land Use Plan to identify how well the plan would conserve biodiversity and where key conflicts might remain. PLN developed in-house capability to use Vista, NatureServe's advanced spatial planning tool, to review areas of conflict, determine their importance to biodiversity conservation goals, and make recommendations to the Planning Board for strategic changes to boost biodiversity conservation.

### Kevin Doyle Named First Larry Morse Fellow

NatureServe is pleased to announce that Kevin Doyle, the natural heritage botanist at the Wisconsin Department of Natural Resources, is the inaugural recipient of the Larry E. Morse Visiting Botanist Fellowship.

Doyle comes to the Fellow position with many years of experience in plant conservation and academic research, and a deep knowledge of Wisconsin's flora. In addition to the statewide scope of his fieldwork, he has mapped more than 500 locations of at-risk plants and developed information that is used by a broad cross-section of the state's agencies, landowners, and businesses to help conserve the state's most imperiled plants.

### Planning for Sensitive Species in Emergency Response

NatureServe provided crucial data when a storage tank in Bristolville, Ohio released crude oil into the ground. The U.S. Environmental Protection Agency (EPA) used NatureServe Network data to determine the potential presence of the rare Eastern Massasauga Rattlesnake near the site. Oil cleanup actions commenced once field verification ensured that the species was not present.

## LANDSCOPE AMERICA



© Wendy Shattil / Bob Rozinski

American Bison (*Bison bison*) | Photo Wendy Shattil / Bob Rozinski

Built with the purpose of increasing the pace and effectiveness of conservation action, LandScope America provides a dynamic platform for guiding collaboration and investment toward the places that need it most.

This free, publicly accessible web application enables practitioners, policymakers, and citizens alike to work together toward shared land protection priorities and goals.

### USING LANDSCOPE YOU CAN:

Reveal how and where other groups' priorities and values align with yours

Find partners who can join you in protecting and expanding public access to important places

Assemble maps, images, and stories of the places that matter to you most and the values they support

- Working lands and waters
- Recreational priorities
- Historic and cultural areas
- Scenic vistas
- Wildlife habitat
- Clean water
- Protected lands

### CONSERVATION PRIORITIES AT YOUR FINGERTIPS

LandScope is unique in providing users with a single resource for visualizing high-priority lands and waters across a range of ecological and cultural values, helping to direct attention and investment toward the places that need it most.

gathered over the years in part by citizen scientists. Analysis of that data—which includes long-term monitoring of rare plant occurrences and an inventory of invasive species detections and their rate of spread—will help conservationists and resource managers devise clearly defined initiatives for maintaining the health of the plant communities of the Appalachian Trail.

Recent decades have seen the emergence both of increasingly dire threats and of increasingly savvy volunteers eager to fan out across the trail's expanse. To harness that conservation muscle, ATC and NPS have put protocols in place that ensure volunteer efforts meet a high scientific standard. Over the last quarter-century, ATC has trained more than 200 citizen scientists to track the trail's rarest and most threatened plants. The resulting data have informed managers' response strategies, such as targeted removal of invasive species outbreaks, fencing in rare plants to guard against deer, and shifting stretches of the trail to protect struggling plant communities from being trampled by hikers.

"There's the potential, at least, to analyze the data, reach out to our natural heritage programs for additional contextual data, then run species distribution models, or spatial climate analyses, and come up with some hypotheses," said Healy Hamilton, NatureServe's chief scientist.

## Citizen Science in the Lone Star State

In partnership with Texas Parks and Wildlife and iNaturalist, NatureServe built a smartphone app that will help volunteers gather scientific data on species of concern in Texas, and share these data for wider use in protecting biodiversity.

The iNaturalist app for Android or iPhone allows Texas Nature Trackers (volunteers of all ages, working in partnership with the Texas Parks and Wildlife Department and the Texas Master Naturalist Program) to record observations in the field.

Thanks to this app, it is now easy for Texas data managers to set up new citizen science surveys and import the results to the greater NatureServe observation system.

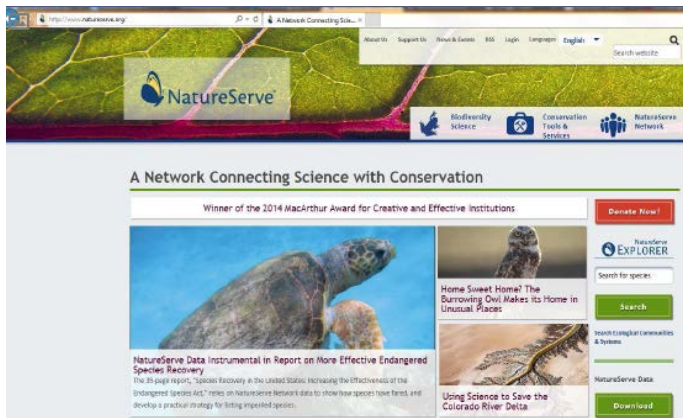
Citizen science is an area of special emphasis for NatureServe. Our network possesses a unique combination of data, expertise, computer applications, and a network of partnerships that complement and support the passion and enthusiasm of citizen scientists.



Photo by Chase A. Fountain | Texas Parks and Wildlife Department

Continued on last page





NatureServe.org, a fully responsive, user-friendly website with a fresh new look

## NatureServe.org gets a makeover!

NatureServe proudly announced the launch of a brand new website! After months of hard work and with helpful the input from many of our Network programs, we officially rolled out the new NatureServe website.

Our primary goal with this new website is to educate our visitors about NatureServe's mission and to share the success stories of the people who comprise our vast Network. When you visit our new site, you'll learn about how your support has made an impact on biodiversity. You'll also get a sense of the passion and dedication of the Network programs we work with.



In partnership with NYSDEC and a large number of experts and volunteers across the state, the NY Natural Heritage Program is compiling a statewide atlas of dragonflies and damselflies. Russet-tipped clubtail (*Stylurus plagiatus*) NatureServe Global Status: G5 Secure) | Photo by Jesse W. Jaycox.

## AMERICAN SOUTHWEST IS CHANGING



Desert sky, Joshua Tree National Park | Photo by Don Graham

It has been called America's most iconic landscape. Desert cacti, deep and winding canyon trails, red rock spires and surreal sandstone landscapes define the stunning southwestern U.S. The Mojave Desert and Great Basin in particular are characterized by expanses of sage brush, deserts, playas, and a series of long ranges interspersed with valleys harboring rare and endemic species.



Joshua Tree National Park | Photo by Don Graham

To the casual observer, the landscape seems stable. But dig deeper, and the data show that this iconic landscape is undergoing profound changes.

NatureServe recently mapped the expected changes within two large Southwest ecoregions that encompass parts of California, Nevada, Arizona, and Utah. Conducted for the U.S. Bureau of Land Management (BLM), these "rapid ecoregional assessments" analyzed the impacts of four stressors:

- Climate change
- Wildfires
- Invasive species
- Development, including urban sprawl and renewable energy

This assessment not only sheds light on the challenging future faced by the U.S. Southwest, but also provides critical insights to the BLM to inform their decisions on how to manage this region.

## WITH GRATITUDE

We wish to extend our sincere appreciation to the patrons and clients whose support helped NatureServe advance our shared mission between July 1, 2013, and June 30, 2014.

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Gail and Kenneth Albert  
Robert Alvo  
Michael Andrews  
Marcia Angle  
Calvert and Ted Armbrecht  
Rachel Ascher  
John A. and Joyce Bacone  
Madge Baker  
Wendy Baker and Jonathan Wilfong  
Doug Barker  
Reinier and Nancy Beeuwkes  
Nancy, Carolyn, and Amy Breden  
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## OUR THANKS

Georgia Welles  
Cathy Williams  
Irvine Wilson  
Dottie & Kenneth Woodcock  
Henry Woolsey  
Bruce Young  
Jean Young  
Karen Young

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Argonne National Laboratory  
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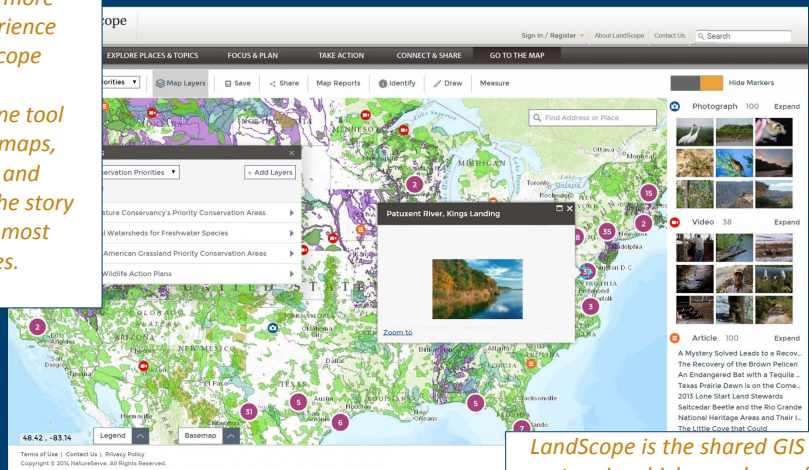
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South Atlantic Landscape  
Conservation Cooperative  
University of California, Berkeley

### LandScope America (continued)

LandScope's easy-to-use map viewer saves practitioners and policy-makers time and effort during research and planning phases, placing local and regional initiatives into broader contexts with a consistent set of baseline data in any browser and without the need for any desktop GIS tools or expertise.

The LandScope map viewer also features a growing collection of place-based stories, photos, and videos “pinned” to the map.

*Sleeker, faster, more modern—experience the new LandScope America, our innovative online tool that combines maps, articles, videos and photos to tell the story of our nation's most cherished places.*



*LandScope is the shared GIS system in which members of the partnership compile data and share updates on priorities and conservation efforts throughout the Chesapeake Bay watershed.*



# The Most Important Places to Conserve in the Andes-Amazon

The Eastern Andes and the Western Amazon Basin are recognized as one of the world's most important areas for biodiversity richness and uniqueness. However, the region's countries are under pressure to increase access to land and develop natural resources to support economic growth. These impacts increase the urgency of knowing which of the region's many elements of biodiversity are irreplaceable, and which places in the region are most important to conserve.



With funding from the John D. and Catherine T. MacArthur Foundation, NatureServe identified the most effective places to invest conservation resources in the region.

NatureServe scientists used biodiversity data to determine the irreplaceability of unprotected and threatened plants, animals, and places. We then estimated a range of predicted impacts over the next 20 years from infrastructure development (such as planned roads and mines), loss of freshwater connectivity caused by planned dam construction, and projected deforestation. Taken together, these analyses identified the most threatened places. Crucially, we looked at the costs of conserving these places, as well as the potential benefits from water and carbon resources.



(Top left) Ecuadorian Amazon rain forest looking towards Andes | Photo by Dallas Krentzel; (Middle) Collared Inca (*Coeligena torquata*). Male. Cabanas San Isidro, Cosanga, eastern Andes, Ecuador | Photo by David Cook; (Right) Chambira Palm (*Astrocaryum chambira*) of the western Amazon Basin | Photo by Dick Culbert

The final results reveal places in the Andes-Amazon that harbor the most vulnerable elements of biodiversity, the greatest potential for ecosystem service benefits, and the least cost for implementing conservation actions.



White-capped tanager (*Sericossypha albocristata*) spotted in Colombia | Photo by Dave Curtis



Ruby Poison Dart Frog, endemic to Peru and threatened by habitat loss (*Ameerega parvula*) | Photo by Drriss & Marrionn

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