

# Extinction!

## Can Our Native Species Be Saved?

Twenty-first Annual Ecosystem Symposium

Saturday, April 12, 9 – 2:30

University of Colorado,  
Ramaley Auditorium

The Symposium is free  
and open to the public.

Donations will be accepted for the  
Boulder County Nature Association's  
Research Grants program.

Don't forget to bring your reusable  
plate, cup, and utensils for the  
complimentary lunch.

Many thanks to the sponsors  
who make this symposium possible:  
Boulder County Nature Association, Colorado  
Native Plant Society, Boulder County Parks and  
Open Space, City of Boulder Open Space and  
Mountain Parks, Boulder County Audubon  
Society and the University of Colorado Boulder.

Northern Harrier by Claudia Van Wie



# 21st Annual Boulder County Ecosymposium

## “Extinction! Can Our Native Species Be Saved?”

**Saturday, April 12 in Ramaley Auditorium at the  
University of Colorado**

8:30- 9:00 **Registration**

9:00 – 9:05 **Welcome and Announcements** Jeff Mitton, University of Colorado Boulder

9:05 - 9:35 **The Brave New World of Restoration Ecology: Looking Forward While Looking Back** Katharine Suding, University of California Berkeley

9:35 - 10:05 **Can Citizen Science Monitoring Provide Reliable Data to Assess the Vulnerability of the American Pika to Climate Change in the Front Range of Colorado and Beyond?** Megan Mueller, Rocky Mountain Wild

10:05 - 10:35 **General Overview of the Updated Environmental Resource Element of the Boulder County Comprehensive Plan and its Application to Environmental Conservation** Mac Kobza, Boulder County Parks and Open Space

10:35 - 11:00 **Break**

11:00 - 11:30 **When Protection is Not Enough - Managing for Resilient Bristlecone and Limber Pine Populations in the Southern Rockies** Anna Schoettle, USDA Forest Service, Rocky Mountain Research Station

11:30 - 12:30 **Rights of Nature Panel Discussion** with Pricilla Stuckey, Boulder Rights of Nature; Tim Seasteadt, University of Colorado Boulder; Pete Fogg, BoulderCounty Land Use Department; Rick Casey, East Boulder County United. Moderated by Steve Jones, Boulder Rights of Nature

12:30 - 1:30 **Complimentary Lunch**

1:30 – 2:00 **State of the Birds in Boulder County: Threatened, Endangered, and Extirpated Breeding Species** Steve Jones, Boulder County Nature Association and Boulder County Audubon Society

2:00 - 2:30 **Potential Flood Effects to Rare and Endangered Plants and Animals**  
Lynne Sullivan, City of Boulder Open Space and Mountain Parks

2:30 **Closing Remarks** by Jeff Mitton

## **Presentation abstracts and speaker biographies**

**Symposium Moderator: Jeff Mitton, University of Colorado-Boulder**

*Jeff Mitton* received a BA in Zoology from the University of Connecticut in 1969 and a Ph D in Ecology and Evolution from Stony Brook University in 1973. He spent one year as a post doctoral fellow in the Department of Genetics at the University of California at Davis and started as an assistant professor in the Department of Ecology and Evolutionary Biology at CU in 1974, where he is now professor. Mitton's research interests focus on the genetics of natural populations of plants and animals. He has worked on marine and freshwater mussels, killifish, trout, pines, aspen, spruce and mountain pine beetles. His research usually begins with interests developed natural history observations and usually addresses the genetic basis of adaptation to specific environments. Mitton's teaching includes an introductory class in genetics and upper division courses in population genetics and molecular methods. Mitton writes a biweekly column entitled "Natural Selections" for the Boulder Camera. His columns describe the natural history and ecological interactions of plants and animals in Colorado.

**Katharine Suding, University of California Berkeley: The Brave New World of Restoration Ecology: Looking Forward While Looking Back**

While a key aim of environmental management should be avoiding degradation in the first place, it's an unfortunate truth that humans are impacting most ecosystems throughout the globe. As these impacts increasingly compromise biological diversity, it is a good time to think about restoration as a positive tool to combat these impacts. However, at the same time, these impacts make the possibility of restoring back to a past point in time -- to a time with little to no human footprint -- harder and harder to achieve. How do we restore nature if the world is changing and we can't go back in time? I will discuss this issue in the context of invasive species in wildland-urban landscapes, including my experiences, and will highlight the importance of considering future environmental change and the involvement of people in conservation.

*Katharine Suding* is an associate professor of restoration ecology at University of California Berkeley, soon to move to University of Colorado Boulder (this summer). She



and her students work at the interface of soil, plant, and biodiversity sciences with the goal of applying this work to challenges of restoration, invasion, and environmental change. She has published over 75 papers, and edited the book, New Models for Ecosystem Dynamics for Restoration, and a special issue on Global Biological Change in the *American Journal of Botany*.

### **Megan Mueller, Rocky Mountain Wild: Can citizen science monitoring provide reliable data to assess the vulnerability of the American pika to climate change in the Front Range of Colorado and beyond?**

The American pika (*Ochotona princeps*) is a small mammal found in mountainous regions of Western North America. Prompted by evidence linking recent population extirpations in the Great Basin to climactic trends, the U.S. Fish and Wildlife Service has given the species consideration for protection under the Endangered Species Act (ESA). However, it is unclear whether other portions of the species' range are experiencing the same climate related extirpations. In the Southern Rocky Mountains, ongoing research is leading to a better understanding of the determinants of the current distribution of pika, recent changes in distribution, and the degree to which populations are vulnerable to extirpation in response to climate change. The Front Range Pika Project aims to further this research by utilizing trained citizen scientists to conduct long-term monitoring of American pika at multiple sites across the Front Range. At each site, citizen scientists search for evidence of pika occupancy and gather data on several habitat variables. The survey is also designed to facilitate analysis of whether volunteers can collect reliable data. After four consecutive field seasons, preliminary analysis suggests that surveys conducted by citizen scientists do provide reliable data that will be useful in advancing understanding of the determinants and long-term trends of pika occupancy in the Front Range. In conjunction with similar professional and citizen science research across the region, the effort will help us to assess the species' vulnerability to climate change in the Southern Rocky Mountains.

*Megan Mueller* is a Conservation Biologist with Rocky Mountain Wild (RMW). She has a B.A. in biology from the University of Colorado and an M.S. in Environmental Studies at the University of Montana. She's worked for the USFS Rocky Mountain Research Station, drafted a feasibility study for river otter restoration for the New Mexico Department of Game and Fish, and worked for a number of conservation organizations. She is a Doris Duke Conservation Fellow. Megan currently leads Rocky Mountain Wild's wildlife conservation and citizen science programs. In this position, she has worked on research and conservation of a variety of species, including American pika, wolverine, boreal toad, and Gunnison sage-grouse.

### **Mac Kobza, Boulder County Parks and Open Space: General Overview of the Updated Environmental Resource Element of the Boulder County Comprehensive Plan and its Application to Environmental Conservation**

Staff at the Boulder County Parks and Open Space Department, in cooperation with the Land Use Department, recently completed an update of the Environmental Resource Element (ERE) of the Boulder County Comprehensive Plan. We will review the coarse-scale and fine-scale approach that guides the ERE ecosystem management concept and discuss the mapped environmental resources and listed species of special concern. We will also give a brief overview of the application of the ERE to county-wide conservation planning.

*Mac Kobza* is a staff Wildlife Biologist at the Boulder County Parks and Open Space Department. Mac has a Master's degree in Biology and served as a research ecologist for the United States Geological Survey and the South Florida Water Management District for over 14 years in the Florida Everglades before coming to Boulder. Mac has a broad background in planning, conducting and managing terrestrial and aquatic ecosystem research and restoration programs.

### **Anna Schoettle, USDA Forest Service, Rocky Mountain Research Station: When Protection is not enough - Managing for Resilient Bristlecone and Limber Pine Populations in the Southern Rockies**

The very elevational limits of tree survival, the alpine treeline, are defined by majestic Rocky Mountain bristlecone (*Pinus aristata*) and limber (*P. flexilis*) pine trees in the Southern Rocky Mountains. Their slow growth and long generation time have historically enabled these trees to persist on the landscape for centuries; however, these are the same traits that hinder the species' ability to adapt to novel stresses such as the non-native pathogen that causes white pine blister rust (WPBR). WPBR has begun to invade and impact the Southern Rockies and continues to spread. Increasing the frequency of naturally occurring resistance to WPBR and providing opportunities to accelerate adaptation in the pine populations is needed to sustain these iconic pine species in the presence of the pathogen in a changing climate. This presentation will discuss the foundation of the Proactive Strategy and recent advances to sustain bristlecone and limber pine populations and their ecosystems in the Southern Rocky Mountains.

*Dr. Anna Schoettle* has been conducting research on tree ecology in high mountain ecosystems since 1985 for the USDA Forest Service, Rocky Mountain Research Station in Fort Collins, CO. In recent years, her research has focused on Rocky Mountain bristlecone pine and limber pine forests of the Southern Rocky Mountains as they are challenged by a spreading non-native disease, the mountain pine beetle epidemic, and climate change. She has developed proactive methodologies to increase the resiliency and sustainability of these mountain-top forests. Anna earned her Bachelor's and Master's degrees from Cornell University (Ithaca, NY) and her Doctorate from University of Wyoming (Laramie, WY).

**Priscilla Stuckey, Boulder Rights of Nature; Tim Seastedt, University of Colorado-Boulder; Pete Fogg, Boulder County Land Use Department; Rick Casey, East Boulder County United; Moderated by Steve Jones, Boulder Rights of Nature: Panel Discussion of the Rights of Nature in Boulder County**

Despite concerted efforts by environmental groups and government agencies, native species continue to disappear from Boulder County. Few extirpated species have been recovered, and degradation of native ecosystems continues, especially on the plains. Do we need to establish legal standing (rights) for naturally occurring ecosystems and their native species populations to protect them from further destruction and degradation by human activities? How might this be accomplished?

*Priscilla Stuckey* is a founding member of Boulder Rights of Nature. *Kissed by a Fox*, her book which won the 2013 WILLA award for creative nonfiction, explores human connection and communication with other species.

*Tim Seastedt* is professor in the University of Colorado department of Ecology and Evolutionary Biology and a fellow at the Institute of Arctic and Alpine Research. His research interests include novel ecosystems and biological controls for invasive non-native plants.

*Peter Fogg* is Manager of the Boulder County Land Use Department's Long Range Policy Team. He has investigated the practical and legal ramifications of rights of nature ordinances and negotiated with environmental groups seeking adoption of rights of nature language in the Boulder County Comprehensive Plan.

*Rick Casey* has taught environmental economics at Front Range Community College and recently became involved in political activism. He helped the city of Boulder pass its Resolution 2H about corporate personhood and East Boulder County United pass the Lafayette Community Rights Act in 2013, and is now assisting with the start of the Colorado Community Rights Network.

**Steve Jones, Boulder County Nature Association and Boulder County Audubon Society: State of the Birds in Boulder County -- Threatened, Endangered, and Extirpated Species**

During the last two decades of the 19th century, four locally rare bird species ceased nesting in Boulder County: Barrow's Goldeneye, Sharp-tailed Grouse, Mountain Plover, and Long-billed Curlew. Throughout much of the 20th century, Boulder County's breeding avifauna remained relatively stable, and at least one species, Peregrine Falcon, was recovered after being locally extirpated during the 1950s. Now we face a second wave of extirpations as prairies in eastern Boulder County become degraded by urbanization, invasion of deciduous trees, and weed infestation. Northern Harriers,

Loggerhead Shrikes, and Lark Buntings--all once considered fairly common locally--haven't nested successfully for several years. Burrowing owl and ferruginous hawk populations are dwindling. No programs are currently in place to restore previously extirpated nesting species.

*Steve Jones* is author of [The Last Prairie: A Sandhills Journal](#), and co-author of [The Shortgrass Prairie](#), [The Peterson Field Guide to the North American Prairie](#), [Colorado Nature Almanac: A Month-By-Month Guide to Wildlife and Wild Places](#), [Wild Boulder County](#), and [Butterflies of the Colorado Front Range](#). Steve helped organize and carry out the Colorado Breeding Bird Atlas I and II projects, and he organized the first comprehensive small owl and wintering raptor surveys in Boulder County. His 25 years of consulting work includes more than two-dozen breeding bird and resource inventories for city, county, and state open space programs. He has led field trips and taught nature classes for 32 years, and he taught in the Boulder Valley Public Schools for 33 years.

**Lynne Sullivan, City of Boulder's Open Space and Mountain Parks Department:  
Forecasting Flood Effects on OSMP's More Rare Natural Resources**

Flood effects on local natural resources will be a fascinating course of study for years to come. This presentation will preview potential effects on the more rare species and systems found in the city of Boulder's Open Space and Mountain Parks Department. Informed by many post-flood field observations by OSMP resource staff we'll talk about the federally listed Ute Ladies' Tresses Orchids, Preble's Meadow Jumping Mice, cottonwood galleries, Northern Leopard Frogs and more.

*Lynne Sullivan* is an interpretive naturalist with the city of Boulder's Open Space and Mountain Parks Department. She is passionate about exploring the wonders of nature and natural processes and sharing her findings through interpretive hikes. Currently she is exploring Biomimicry, a problem solving tool based on the understanding that nature functions sustainably, is locally attuned and adapted to its environment, and therefore is an ideal mentor for the creation of ecologically sustainable solutions to our problems.

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***Many thanks to the sponsors who make this symposium possible: Boulder County Nature Association, Colorado Native Plant Society, Boulder County Parks and Open Space, City of Boulder Open Space and Mountain Parks, Boulder County Audubon Society and the University of Colorado at Boulder.***