

FORTY-FOURTH

natural
areas
conference

Working Beyond Boundaries:
**Collaboration as a Key to
Natural Areas Management**

Fort Collins, Colorado / October 10-12, 2017

Pawnee Primrose Plethora by Michael
Menefee. Photo taken at the Pawnee
National Grassland (USFS) in Colorado.



Presented by the Natural Areas Association



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Hello, and welcome to the 2017 Natural Areas Conference.

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The theme of this conference, collaboration, has never been timelier. There is a sense of urgency now, as we see the challenges to our work mounting. Climate change is accelerating. There are significant forces that stand in opposition to the science that forms the foundation of our work. And the need to preserve land is becoming more pressing with each day.

Finding ways to come together in the work we do, and the time to gather, is more critical now than ever. We need each other as we search for solutions and strategies that are effective in this new landscape.

Fortunately, you couldn't ask for a better group of people to be in this with than the members of the Natural Areas Association. We've weathered a lot, and we've met challenges before. Truly, we know from experience that together we are better.

To better support the natural areas professional community in these challenging times, we've made some major changes behind the scenes. We relocated the NAA's main office to Pennsylvania. Concurrently, we restructured our staff, bringing in a team brimming with fresh ideas and energy. We're streamlining processes so that we can focus on bringing more to our members. We've increased our webinar programming, and we plan to debut more on-the-ground training at regional workshops. We also will establish a members-only portal on our website to give you easy access to a wider range of resources.

Fort Collins is a fitting setting for this year's conference. Its location provides excellent natural areas to showcase. They are much loved, and much used, so there is also an abundance of expertise within the field of urban natural areas management.

While it's essential that this event helps us address the challenges of conservation and land management that we currently face, it is equally important that we take this time to celebrate our successes. We'll do just that at the closing plenary. We've assembled a panel of practitioner scientists, each of whom will talk about a project that began as just another big idea facing long odds. Through perseverance and hard work, however, they became unique collaborations that have protected significant natural areas. These stories will end the conference on a high note, and I hope they leave you with visions of what's possible in spite of many challenges, ideas for great projects of your own, and the inspiration to pursue them.

I'd like to thank my fellow members of the conference planning committee for their hard work on this event and our sponsors, whose support is critical to its success. And finally, thank you all for taking the time to attend this year's conference.

Sincerely,



Lisa L. Smith
Executive Director, Natural Areas Association

Welcome to Fort Collins!

We're pleased you could join us for the 44th-annual conference of the Natural Areas Association. This year's event takes place within sight of Colorado's Front Range, where the Rocky Mountains meet the Great Plains. We have planned an excellent event for you that will surely stimulate thought, discussion, and action as we address issues regarding the protection of our natural areas.

This year's theme, *Working Beyond Boundaries: Collaboration as a Key to Natural Areas Management*, fits well here. Colorado's Front Range is a hub of collaborative conservation that provides a model for other regions across the country. You can find numerous examples of this approach in action, from citizen-initiated tax dollars that conserve natural areas at the city and county levels to large-scale conservation efforts like the Mountains to Plains Project, a land protection effort that involves private groups, county and city government, and nonprofit organizations.

From the opening to the closing plenaries, we will delve into issues facing the conservation community, the challenges of managing natural areas, and creative approaches to addressing all of these collectively and successfully. Our field trip options offer conference participants an opportunity to experience some of the outstanding landscapes in the area.

Students are the next generation to care for our treasured natural resources. We have planned events specifically to support their professional development in natural areas conservation and management. These include a professional networking luncheon and "Keys to Conservation Careers," where natural areas professionals introduce themselves and their work. Training in USAJOBS and advice from human resources professionals will also be provided.

Outside the conference, the city of Fort Collins and the surrounding area have much to offer. Fort Collins consistently ranks high as a desirable place to live. It is the home of Colorado State University, which is well-known for academic programs in natural resource management and tourism and recreation, as well as its emphasis on campus sustainability. Fort Collins, home to federal, state, county, and city government resource management offices, engages in progressive city planning and utility programs. The city is home to fabulous recreational opportunities, diverse cultural attractions, a vibrant nightlife scene, and family fun. The community is also recognized as the craft beer capital of Colorado.

Make the most of your time here. Delve into the oral and poster sessions. Be awed by the collaborative work that is going on in the name of natural areas protection and management. Learn more about the amazing natural diversity that surrounds you and spend some time in Old Town Fort Collins. We hope you leave with new professional contacts and friends as well as the inspiration and newfound knowledge to support you in your work.

On behalf of the conference planning team, I'd like to give a special thank you to our sponsors for their commitment to this year's Natural Areas Conference.

Natural Areas Conference Planning Committee 2017

Welcome

Exhibitors

Preregistration area and Atrium at The Hilton

The NAA thanks this year's exhibitors. Be sure to stop by the exhibits area and meet them.

Aquatic and Wetland Nursery
Bayer USA
Buffalo Brand Seed
Bureau of Land Management (BLM)
Center for Collaborative Conservation (CCC)
City of Ft. Collins Natural Areas Program/Nature In The City
CSU—Warner College of Natural Resources
Diamond Mowers
Granite Seed and Erosion Control
National Natural Landmarks Program
Regis University
Rocky Mountain BioProducts
Sitka Technology Group
Truax
Western State Colorado University

Questions and Conference Updates

The staff at the conference registration desk will be happy to help answer any questions you might have. This is also where the lost and found is located. Check for last-minute updates to the conference schedule and other important information on the message board stationed near the registration desk.

Name Badges

Please wear your name badge to all conference events. It is your ticket to sessions, workshops, breaks, and socials. Look within the sleeve of your name-badge for tickets to the events you chose to attend during registration.

Cell Phones

Please silence cell phones during sessions as a courtesy to presenters and participants.

Stay Current

Please use #NACFtCollins on social media related to the conference. Also, search #NACFtCollins to stay up to date with conference events. Follow the NAA on Twitter @naturalareas.

Exhibitors

Areas for Exhibitors will be open from Tuesday morning at 7:30 am through Wednesday at 5:30 pm, as well as during Tuesday's Poster Session and Thursday's Field Workshops to provide participants time to meet exhibitors and browse their displays.

Field Workshops

If you preregistered for a field workshop, you will find a ticket indicating your field workshop choice behind your name badge. Should you have questions regarding a scheduled workshop, please visit the conference registration desk. We ask that you not change your field workshop selection, but if you feel you must, the deadline for doing so is Tuesday at 2 pm (on a space-available basis).

Student Competition

We thank those who entered the student awards presentation. A team of judges will evaluate student posters and oral presentations. The top student presenters will receive their monetary awards and certificates on Wednesday night at the awards dinner.

WiFi Access

Wireless Internet access will not be provided in the event meeting spaces. Guests of the hotel can obtain wireless access in their rooms and public spaces.

Schedule at a Glance

Monday, Oct. 9

5 - 7 pm Register/Check-in (in front of Salons II and III)

9 am - 6 pm WK-1 (Salon I)

9 am - noon WK-2 (Salon IV)

Tuesday, Oct. 10

7:30 am - 5 pm Registration (in front of Salons II and III)

8 - 10:15 am Conference Welcome and Opening Plenary (Salons I and II) [p. 6](#)

10:15 - 10:45 am Break (Atrium)

10:45 am - 12:15 pm State Natural Areas Roundtable (Vet Medicine Meeting Room)

10:45 am - 12:15 pm Concurrent Sessions and Symposia [p. 8](#)

12:15 - 1:45 pm Student-Mentor Networking: Passing the Drip Torch (Legends Room) [p. 8](#)

12:15 - 1:45 pm Lunch (On your own, hotel lunch buffet available)

1:45 - 3:15 pm Concurrent Sessions and Symposia

3:15 - 3:45 pm Break (Atrium)

3:45 - 5:15 pm Concurrent Sessions and Symposia

6 - 8 pm Poster Session and Reception (Salons II and III) [p. 12](#)

Wednesday, Oct. 11

7 - 8 am *Natural Areas Journal* Editors' Meeting (Legends Room)

7:30 am - 5:00 pm Registration (in front of Salons II and III)

8:00 - 10:00 am Concurrent Sessions and Symposia [p. 15](#)

10 - 10:30 am Break (Atrium)

10:30 am - noon Concurrent Sessions and Symposia

noon - 1:30 pm NAA Membership Meeting and Luncheon (Legends Room, preregistration required) [p. 20](#)

noon - 1:30 pm Lunch (On your own, hotel lunch buffet available)

1:30 - 3:00 pm Concurrent Sessions and Symposia

3 - 3:30 pm Break (Atrium)

3:30 - 5:15 pm Closing Plenary (Salons II and III) [p. 20](#)

6:15 - 9:15 pm NAA Awards Dinner (Salons II and III) [p. 22](#)

Thursday, Oct. 12

7 - 8:30 am Field Workshop Departures (Pick up box lunch in Rams Room and depart through doors adjacent to hotel pool) [p. 23](#)

9 am - noon WK-3 (Salon I) [p. 23](#)

6 - 7:30 pm NAA Happy Hour (Green and Gold Room)

Venue Map

Hilton Fort Collins

425 W Prospect Rd
Fort Collins, CO 80526

All sessions will take place at this location.

COLORADO STATE BALLROOM

KEY

- Meeting/Conference Rooms
- Food & Beverage
- Fitness Facilities
- Amenities
- Hotel Services
- Restrooms
- Elevators



Opening Plenary (8 – 10:15 am)

The Natural Areas Conference opens with an overview that orients natural areas practitioners to where they are — the Front Range of Colorado — and to the current state of the profession. This talk emphasizes how collaboration is a critical and powerful tool when it comes to strategies for advancing natural areas stewardship. Our keynote speaks to the challenges that managers face at Rocky Mountain National Park, a landscape that is being (over)loved.

We will explore this theme using the Mountains to Plains initiative as a case study, showing how a range of tools rooted in social science can help natural areas managers build consensus across diverse stakeholder groups. The plenary concludes with a presentation about Colorado's natural history and natural areas, providing participants with a sense of place.

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8 am Welcome, Terri Hogan, Invasive Plant Program Manager, National Park Service, and Lisa Smith, Executive Director, Natural Areas Association

KEYNOTE ADDRESS

8:15 am Keeping Natural Areas Natural: Juggling Resource Protection and Heavy Visitor Use

Darla Sidles, Superintendent, Rocky Mountain National Park

Protection of our natural areas is growing increasingly demanding as our population grows. Climate change, invasive species, fire, and wildlife management are just a few of these challenges. In addition, many parks, forests, and other public lands across the country have been experiencing unprecedented visitation over the last few years. While it is important for the longevity of our natural areas to have nature lovers rather than apathy or indifference, the crushing number of visitors in many of our most beloved areas has become unmanageable. Both the visitor experience and natural resource conditions are suffering. Social trails, invasive species, wildlife encounters, pollutants, and loss of biodiversity are increasing. How can we address this issue more collaboratively to ensure that we are providing the very important experiences to the public that will encourage them to be future advocates and protectors of our natural and cultural resources, while simultaneously protecting the resources during this exponential visitation growth?

PLENARY ADDRESSES

8:45 am Deep Advocacy, Click-Bait Hazards, and Collaborative Conservation

John Stokes, Director, City of Fort Collins
Natural Area Department

With so many forces working against the conservation movement right now, it's easy to feel overwhelmed and unable to effect real change. Yet there are tools with the potential to move us forward, in particular the "deep advocacy" approach first developed in the poverty alleviation arena by Sam Daley-Harris. So-called deep advocacy is a deliberate, comprehensive approach to causing social and environmental change. The conservation movement is good at "click-bait" activism — think scary photos of polar bears — but less good at advocacy that leads to long-term change. This talk will describe why overreliance on click-bait activism poses risks, and how deep advocacy may provide a better pathway to collaborative conservation success. Successful forms of deep advocacy will be described, from the Fort Collins experience to the national level.

9:30 am The Natural History of Colorado

Dave Anderson, Director of the Colorado Natural Heritage Program (CNHP), Warner College of Natural Resources, Colorado State University

Colorado embodies the spirit of adventure and discovery that defines our nation. The bounty, history, and romantic allure of our dramatic landscapes have inspired generations of people worldwide to come to the Mountain West. Included in this long list of people have been hunter-gatherers, prospectors, explorers, vacationers in their RVs, and conference attendees! In this presentation, we go on a wild ride through an overview of Colorado's natural history. In that process, we will explore our landscapes through many different lenses. We'll look at how geological processes, evolution, and human enterprise have wrought the face of the Colorado that you are visiting now. We can't talk about natural history without talking about my heroes, the key people in our storyline of discovery. We'll also focus on some of our most fascinating natural history treasures and their stories. I hope this will set the stage for your adventure with us in Colorado this week.

Tuesday, Oct. 10

ABOUT THE SPEAKERS



Dave Anderson is the director of the Colorado Natural Heritage Program (CNHP) in the Warner College of Natural Resources at Colorado State University. In this role, he works with the full spectrum of Colorado's conservation community to support decision-making with information and science to help CNHP's partners conserve the state's natural heritage. Anderson's background includes experience in biological surveys, monitoring, modeling, mapping natural resources, GIS, data analysis, writing, outreach, education, program development, teaching, training, and fundraising in the service of biodiversity conservation. He has worked at CNHP since 1999.

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Darla Sidles has served as the superintendent of Rocky Mountain National Park since August 2016 — the first female to fill the role in the park's 101 years. Since 2001, she has had superintendent roles at Saguaro National Park and Grand Canyon-Parashant National Monument in Arizona, and Independence National Historical Park in Philadelphia, PA. Sidles began her career as a Student Conservation Association volunteer in 1986 with the U.S. Forest Service in the North Cascades. Seasonal positions with the USFS and NPS led to a permanent job at Zion National Park in 1994, where she held several posts, including vegetation, wilderness management, and head of planning for the park's General Management Plan.



John Stokes is director of the city of Fort Collins' Natural Area Department, which manages 43,000 conserved acres. The department engages in significant ecological restoration projects and provides education, recreation, and ranger services. In addition to his director's role, Stokes is engaged in efforts to sustain and protect the Poudre River. He began his conservation career with the Appalachian Trail Conservancy and then worked for 10 years with The Nature Conservancy before starting his directorship in Fort Collins in 2003.

Symposia/Organized Sessions (10:45 am – 5:15 pm)

(1) Organized Session: Collaborative Forest Management

Room: Salon II

Talks in this session highlight how collaborative forest restoration efforts (including but not limited to the national CFLR program) are identifying changes in diverse elements and processes: spatial patterns, potential future fire severity, wildlife populations and habitat use, understory plant community development, and collaboration among partners.

(2) Organized Session: Post-Fire Ecosystem Dynamics

Room: Salon III

This session presents current research findings related to post-fire ecosystem dynamics in ponderosa pine and dry mixed conifer forests to help land managers better understand if, where, and what type of restoration is needed and to identify any existing research gaps.

(3) Organized Session: Groundwater-Dependent Wetlands Organized Session

Room: Aggie (Room 232)

This session presents recent advances in the inventory and characterization of groundwater-dependent wetlands (including fens), review the role of fens as critical habitat in supporting rare plants, and highlight the importance of collaboration and information sharing in efforts to identify, conserve, manage, and restore these natural areas.

(4) Symposium: Invasive Species Management – Analysis to Inform Invasive Species Management Across the Invasion Process

Room: Salon I

This symposium provides an overview of different analyses that inform management decisions across the stages of invasion from initial introduction to efficient use of resources for control efforts.

(5) Symposium: Pollinator Habitat Restoration and Implementation of Pollinator Friendly Best Management Practices

Room: Salon IV

This symposium discusses pollinator habitat management, restoration, and the implementation of pollinator best management practices.

(6) Symposium: Invasive Species Management – EDRR: Examples of National EDRR Programs to Inform Development and Implementation of EDRR Efforts for Natural Areas Managers

Room: Salon VI

This symposium presents early detection rapid response (EDRR) efforts at various scales and present tips and tools to help improve EDRR Program implementation.

(7) Symposium: Value of Healthy Land in Water Resources Management – The Cache la Poudre River: Efforts to Build and Sustain a Healthy Working River

Room: Green and Gold

This symposium features five individuals building path-breaking collaborative initiatives related to the Cache la Poudre River that include: ecological restoration, sociological efforts to build community, watershed management, instream flow protection, and park development.

(8) Symposium: Examining National Park Climate Adaptation through the Policy Lens

Room: Research (Room 202)

Climate change adaptation in national parks raises challenging (“gnarly”) questions, because policy is often silent or ambiguous regarding climate change response. This symposium showcases an NPS effort that analyzes policy, identifies where further guidance is needed, and provides a foundation for policy evolution.

Student-Mentor Networking: Passing the Drip Torch

12:15 – 1:45 pm Legends Room

Students and recent grads, take advantage of this unique opportunity to talk with those working in a range of careers, and meet potential employers! Students will be seated with professionals working in their field, and lunch will be provided to participants. Must be preregistered to participate.

Room	Salon I	Salon II	Salon III	Salon IV
Topic	GENERAL SESSION Conservation Across Boundaries: Stakeholder Engagement	ORGANIZED SESSION Collaborative Forest Management (1)	ORGANIZED SESSION Post-Fire Ecosystem Dynamics (2)	GENERAL SESSION Role of Natural Areas in Pollinator Conservation
Moderator	Rebecca Johnson	Jenny Briggs	Julie Korb	Lori Makarick
10:45 am	Deah Lieurance: Enhancing Collaboration Between University, Non-Governmental Organizations, and Government Agencies to Address the Invasion Risk of Non-Native Biomass Planting in Florida	Susan Harrelson: The Southwest Jemez Mountains Collaborative Landscape Restoration Project: Fostering Resilience, Partnerships, and a Robust Monitoring Program	Jens T. Stevens: Understory Thermophilization Following the 2002 Hayman Fire	Mike Leahy: Natural Areas as Repositories of Invertebrate Diversity
11:15 am	Ashley Rodman: Taking the Proactive Approach to Natural Areas Protection Through Outreach — A Case Study at Buffalo National River, Arkansas	Cory Davis: Roaming Across Boundaries: Collaborative Meso-Carnivore Monitoring in the Northern Rockies	Marin E. Chambers: Post-Fire Conifer Regeneration in Ponderosa Pine Forests of the Southern Rocky Mountains	Ashley Rohde: Effects of Shrubland Techniques on Insect Pollinators and Communities
11:45 am	Adam D. McCurdy: Collaborating for Success: Lessons Learned from Collaborative Forest Management and Planning	Jeffery B. Cannon: Comparing Changes in Spatial Patterns Between Restoration Treatments and Wildfires in the Colorado Front Range	Kyle C. Rodman: Modeling the Influence of Climate and Local Site Factors on Post-Fire Regeneration in the Southern Rocky Mountains Ecoregion	
12:15 pm	LUNCH	LUNCH	LUNCH	LUNCH
Topic	SYMPOSIUM Invasive Species Management — Analysis to Inform Invasive Species Management Across the Invasion Process (4)	<i>Organized session (1) continues</i>	<i>Organized session (2) continues</i>	SYMPOSIUM Pollinator Habitat Restoration and Implementation of Pollinator-Friendly Best Management Practices (5)
Moderator	Nick Young		Julie Korb	William Carromero
1:45 pm	Gericke Cook: Human-Assisted Pathways for Invasive Species Introduction and Spread	Jens T. Stevens: Evaluating Potential Trade-Offs Among Fuel Treatment Strategies in Mixed-Conifer Forests of the Sierra Nevada	Camille S. Stevens-Rumann: Wildfires and Climate Facilitate Ecosystem Transitions	Scott Hoffman Black: Best Management Practices for Pollinators: Creating Practices That are Meaningful and Implementable for Rangelands Across the West
2:15 pm	Amanda M. West: Employing Multi-Date Remote Sensing for Monitoring Invasive Species Distribution in Natural Areas	Kathleen McIntyre: Collaborative Governance and Public Lands: Outcomes, Successes, and Challenges Under the CFLRP	Justin P. Ziegler: Tree Regeneration Patterns Following Atypical Stand-Replacement Fire: Influence of Topography and Neighbors	Mary M. Rowland: Native Bees and Large Mammals: Vertebrate-Invertebrate Interactions in Riparian Natural Areas
2:45 pm	Dana Blumenthal: Global Changes Often Favor Invasive Species in a Semi-Arid Grassland — Ten Years of Experiments With Elevated CO ₂ , Warming, Altered Precipitation and N Deposition	Wenchi Jin: Landscape-Scale Restoration of Shortleaf Pine-Oak Woodland in the Missouri Ozarks: An Ecological-Economic Trade-Off Analysis	Judith D. Springer: Do Hazardous Fuels Treatments Ameliorate Effects of High-Intensity Wildfire on Warm-Dry Mixed-Conifer Forest Plant Communities?	Thomas N. Kaye: Restoration and Management of Prairie Habitats to Support Pollinating Insects
3:15 pm	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK
Topic	<i>Symposium (4) continues</i>	GENERAL SESSION Wildland Fire as a Management Tool	GENERAL SESSION Fire and Forest Management	<i>Symposium (5) continues</i>
Moderator		Peter Garner	Paula Fornwalt	
3:45 pm	Ian Pearse: How Do Plant Invasions Impact Insect Food Webs	Jan Ng: Within-Stand Tree Spatial Patterns in Sierra Nevada Mixed-Conifer Forests: Management by Topography in Frequent-Fire Systems	Jonathan Coop: Fire, Succession, Type Conversion, and Alternate Stable States in Southwestern Forests	Thomas Seth Davis: Biological and Functional Diversity of Pollinators in Rangeland Habitats of Colorado
4:15 pm	Catherine Jarnevich: Evaluating Alternative Management Scenarios to Inform Invasive Species Management Actions	Mike A. Battaglia: Forest Structure Outcomes after Mixed-Severity Wildfire: Do They Meet Restoration Goals?	Ryan B. Walker: Restored Fire Regimes Reduce Subsequent Wildfire-Mediated Conversion from Forest to Non-Forest Vegetation Types	Victoria Wojcik: Competition and Interactions between Managed Honey Bees and Native Bees in North America
4:45 pm	Symposium Panel Discussion	Thomas R. Rosburg: Effects of Spring Surface Fire on Microclimates and Plant Community Composition in Central Iowa Oak Forest	Kristen Shive: Scaling Stand-Scale Measurements to Landscape-Scale Predictions of Forest Regeneration After Disturbance: The Importance of Spatial Pattern	Symposium Panel Discussion
5:15 pm	ADJOURN	ADJOURN	ADJOURN	ADJOURN

Room	Salon V	Salon VI	Green and Gold	Rams
Topic	GENERAL SESSION Rare Species Management — Monitoring	GENERAL SESSION Invasive Species Management	GENERAL SESSION Value of Healthy Land in Water Resources Management	GENERAL SESSION Urban Conservation — The Role of Collaboration
Moderator	Jess Sweeney	Tyler Smith	Will Davis	Esther Stroh
10:45 am	Carol A. Dawson: The Power of Demographic Data in the Recovery of Threatened and Endangered Plant Species	Lea' R. Bonewell: Investigation of an Introduced Population of Southern Watersnakes, <i>Nerodia fasciata</i> , in the Lower Colorado River, Arizona	Allison E. Rhea: Tracing Elevated Stream Nutrient Export Back to Wildfire	Zarah Wyly & Tim Vendlinski: Arcade Creek: Sacramento's Greatest Opportunity
11:15 am	Bonnie Heidel: Alternate Views of Reality: 30 Years of Threatened Species Monitoring in Drought, Flood and Pestilence	Jennifer Dean: Setting Invasive Species Management Priorities With State Partners	Derek M. Schook: Declining Channel Migration Rates on a Free-Flowing River Suggest Future Riparian Habitat Loss	Bob Meadows: Restoration and Preservation of Natural Dark Skies Across Land Management Agencies and Communities
11:45 am	Holly Bernardo: Using Long-Term Citizen Science Monitoring Data to Decrease Extinction Risk of Rare Plants in the Chicago Region		Jana McKenzie: Envisioning a River's New Future: A Story of Collaboration After Adversity	Amy Yarger: The Urban Prairies Project: Partnerships for Open Space Restoration
12:15 pm	LUNCH	LUNCH	LUNCH	LUNCH
Topic	GENERAL SESSION Rare Species and Plant Communities — Management	SYMPOSIUM Invasive Species Management — EDRR: Examples of National EDRR Programs to Inform Development and Implementation of EDRR Efforts for Natural Areas Managers (6)	SYMPOSIUM Value of Healthy Land in Water Resources Management — The Cache la Poudre River: Efforts to Build and Sustain a Healthy Working River (7)	GENERAL SESSION Urban Conservation — Managing Recreation
Moderator	Garrett LaCivita	Terri Hogan	John Stokes	Jeff Grasser
1:45 pm	Brian Bowen: Rare Species Management and Restoration in the Middle Tennessee Glades and Barrens	Jeff Morissette: Geospatial Tools to Coordinate the Management of Invasive Mussels in the West	Zach Smith: Riparian Restoration, Paths and Fishing Access — But Where's the Water?	Eric Krause: An Updated Framework for Rock Climbing Management in Front Range Parklands
2:15 pm	Christine Hartman: Monitoring and Adaptive Management of Protected Raptors within Multi-Use Open Space Parks	Joe Devivo: Using Natural Resource Inventories to Inform Exotic Species Management	Marylou Smith: The Poudre Runs Through It: Five Years of Sociological Bridge Building	Betsy Miller: Recreational Pressures on Urban Open Space Preserves
2:45 pm	James H. Locklear: Endemic Plants of the Central Grassland of North America: Distribution, Ecology, and Conservation Status	Amy A. Yackel Adams: Improving Early Detection and Rapid Response for Cryptic Species: Current Analytical Tools and Future Directions	Rick Bachand: Restoration of the Cache La Poudre River Through Downtown Fort Collins	Steven Murdock: Gone to the Dogs: Closure and Restoration of the 107 AC, Elk Meadow Park Off-Leash Dog Area
3:15 pm	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK
Topic	GENERAL SESSION Rare Species Management — Preparing for a Changing Climate	<i>Symposium (6) continues</i>	<i>Symposium (7) continues</i>	GENERAL SESSION Urban Conservation
Moderator	Catie Boehmer			Rachel Green
3:45 pm	Patricia Gordon-Reedy: A Multiscalar Approach to Rare Plant Management: A Case Study of Dehesa Nolina (<i>Nolina interrata</i>)	Lindy Garner: Crucial Conservation Conversations: Optimize EDRR and Prioritize Strategic Invasive Species Management on National Wildlife Refuges	Jill Dropeza: Protecting Water Quality Through Collaborative Restoration In The Upper Poudre River Watershed	
4:15 pm	Jessica P. Smith: Assisted Migration of the Critically Imperiled Rocky Mountain Monkeyflower, <i>Mimulus gemmiparus</i> : A Cooperative Conservation Project	Mark Frey: An EDRR Pilot Project in Washington, D.C.	Matt Day: Building A Downtown River Park: The Heuristics of Public Process and Planning	Rebecca D. B. Everette: Nature in the City: Enhancing Habitat and Community Access in the Urban Realm
4:45 pm	Jacob Zeldin: Thinking Outside the Box When Producing Materials to Restore Locally Rare Plant Species: Micropropagation of <i>Cirsium hillii</i> in the Chicago Region	Symposium Panel Discussion	Symposium Panel Discussion	Sarah R. Eysenbach: Regeneration of Plant Communities in Cleveland Metroparks
5:15 pm	ADJOURN	ADJOURN	ADJOURN	ADJOURN

Tuesday, Oct. 10

Aggie (Room 232)	Research (Room 202)
ORGANIZED SESSION Groundwater-Dependent Wetlands (3)	GENERAL SESSION Technology for Land Management Success — Mapping Tools
Kathleen Dwire	Molly McCormick
Kathleen A. Dwire: Occurrence and Characteristics of Groundwater-Dependent Wetlands on National Forests: Findings from Recent Inventories	Nathan Shampine: Land Management: Data-Driven Decision-Making
Joanna Lemly: Mapping Fen Wetlands on National Forest Land Through Aerial Photo Interpretation	Chuck Casper: An Interactive Web-Based Platform for Communicating Restoration Planning and Progress
Dave Weixelman: Plant Species Composition and Abundance in Relation to Soil Chemistry, Thickness of Peat, and Livestock Use in Fens in the Sierra Nevada, CA, U.S.A.	
LUNCH	LUNCH
<i>Organized session (3) continues</i>	SYMPOSIUM Examining National Park Climate Adaptation Through the Policy Lens (8)
	Cat Hawkins Hoffman
Bonnie Heidel: Unique Contributions of the Wyoming Fen Flora	Cat Hawkins Hoffman: Nobody Knew (Conservation) Could Be So Complicated — The Conundrum for Long-Standing Conservation Tenets of the National Park Service
E. William Schweiger: Using Structural Equation Modeling to Link Human Activities to Wetland Ecological Integrity in the Protected Landscape of Rocky Mountain National Park	Gregory Eckert: Adaptation Policy Analysis: Fuel Treatments and Post-Fire Response in Stand-Replacing Fire Regimes
Claiborne Woodall: Restoring Southern Blue Ridge Mafic Fens and Woodlands in Virginia: Two Decades of Active Management at Big Spring Bog and Grayson Glades State Natural Area Preserves	Amanda Hardy: Adapting to Wildlife Range and Distribution Shifts in Response to Climate Change: A Case Study of a Low-Mobility Listed Species, the Desert Tortoise
MID-AFTERNOON BREAK	MID-AFTERNOON BREAK
GENERAL SESSION Conservation Across Boundaries — Species Protection	Symposium (8) continues
Meredith Grady	
Jill Gannon: Collaborating Across Boundaries to Improve Management of Native Prairies: Adaptive Management within the U.S. Fish and Wildlife Service across Refuge System Lands of the Prairie Pothole Region	Danielle Buttke: Infectious Disease Management in Wildlife in the Context of Environmental Change
Kent Fricke: Managing for Recovery of a Prairie Icon: The Future of Lesser Prairie-Chicken Management	Gregor Schuurman: Adaptation Across the Nation: Shifting the Paradigm of National Park Management
Kelly Kindscher: Sustainable Harvest of Osha, <i>Ligusticum porteri</i> , an Important Medicinal Plant of the Southwest U.S.	Symposium Panel Discussion
ADJOURN	ADJOURN

Tuesday, Oct. 10

Poster Session and Reception (6 – 8 pm)

Salons II and III

A complimentary selection of snacks, light refreshments and Odell's beer varieties, plus a cash bar, are available during this event. Poster presenters will be available for questions about their work while attendees socialize.

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BILL CLOUGH

- Pakapakauāua Adopt-A-Forest Program, Growing Forests and the Future Conservationists to Manage Them. **David G. Anderson** (david.g.anderson@hawaii.gov)
- Restoring Carbon Sequestration Processes in a Degraded Wet Meadow. **Lydia Baldwin** (Lydia.baldwin@colostate.edu)
- The Influence of Warm-Dry Mixed Conifer Forest Restoration Treatments on Herbaceous Food Biomass for Ungulates in Southwestern Colorado. **Danielle Benally** (dbenally@fortlewis.edu)
- Using Count Based Population Viability Analyses to Assess the Effects of Multiple, Interacting Threats Acting at Different Spatial Scales on the Extinction Risk of a Rare Plant. **Holly L. Bernado** (bernardo@wustl.edu)
- The Coastal Plain Sand Communities of Southeast Missouri. **Andrew P. Braun** (Andrew.Braun@mdc.mo.gov)
- Restoration Inside the Fence: Engaging Incarcerated Populations to Help Improve Greater-Sage-Grouse Habitat Through Native Plant Propagation and Ecological Education. **Jessie Brothers** (jessie@appliedeco.org)
- Health Benefits of Natural Sounds and Dark Night Skies in U.S. National Parks. **Emma Brown** (emma_brown@nps.gov)
- Introduction to the U.S. National Vegetation Classification, Vegbank and the Proceedings. **Marianne K. Burke** (mburke@fs.fed.us)

Tuesday, Oct. 10

2017 NATURAL AREAS CONFERENCE

- Evaluating Revegetation Outcomes at Reclaimed Well Sites in the Powder River Basin. **Sara D. Burns** (sburns12@uwyo.edu)
- Ground Dwelling Insect Species Richness and Abundance in Different Forest Restoration Treatments in Warm, Dry Mixed Conifer in Southwest Colorado. **Ruby Connelly** (raconnelly@fortlewis.edu)
- Piping Plover Habitat Loss at The Nature Conservancy's John E. Williams Preserve, Central North Dakota: An Interdisciplinary Study of Alkaline Prairie Pothole Glacial Lakes, Hydrogeology and Vegetation Encroachment. **Matthew Cox** (mtcox@stthomas.edu)
- Complexity as a Framework for Transboundary Conservation. **Charles G. Curtin** (ccurtin@earthlink.net)
- Prairie Quest Farm: Working Land Conservation and Restoration. **Mary C. Damm** (marydamm@gmail.com)
- The Effects of Fire Restoration Treatments on Large Mammals in Southwestern Colorado, USA. **Rachel Dees** (rhdees@fortlewis.edu)
- Physiochemical Drivers of Variation if Grass-Invasion Impacts on Soil Carbon Cycling. **Delaney Demro** (demro2@illinois.edu)
- Testing Devices to Reduce Raptor Electrocutation on Vertical Subtransmission Power Poles. **James F. Dwyer** (jdwyer@edmlink.com)
- Is a Coot a Duck? An Analogy for Understanding the Relationship Between National Natural Landmarks and the National Park System and the Cross Boundary Conservation Opportunities Available. **Heather Eggleston** (heather_eggleson@nps.gov)
- Determining Efficacy of Pinyon-Juniper Thinning Treatments in Sage-Grouse Habitat. **Cody Ernst-Brock** (cody_ernst_brock@nevada.unr.edu)
- Socio-ecological Effects of Recurrent and Prolonged Drought in the Southern Great Plains. **T.D. Fagin** (tfagin@ou.edu)
- Distributions and Conservation Priorities for Crop Wild Relatives of the United States. **Stephanie L. Greene** (Stephanie.Greene@ars.usda.gov)
- The Monitoring of a Small Snow Trillium (*Trillium nivale*) Population in Southwestern Pennsylvania. **Kristin M. Grohol** (whyte@calu.edu)
- Decadal Trends of an Endangered Sand Dune Species. **Bonnie Heidel** (bheidel@uwyo.edu)
- An Analysis of Threats to Water Resources in the National Wildlife Refuge System. **Michael Higgins** (mike_j_higgins@fws.gov)
- A Comparison of Landcover Datasets for Efficacy in the Analysis of Rare Species Distribution. **B.W. Hoagland** (bhoagland@ou.edu)
- Ecological Stewardship: Restoration at Denver Botanic Gardens Chatfield Farms. **Rebecca Hufft** (rebecca.hufft@botanicgardens.org)
- A Multi-Agency Collaboration to Develop Seed Transfer Guidelines for Seven Native Forbs in the Western United States. **Francis F. Kilkenny** (ffkilkenny@fs.fed.us)
- Checklist of Bees (Apoidea) From a Private Conservation Property in Western Montana. **Marirose Kuhlman** (mkuhlman@mpgranch.com)
- Using the Assessment, Inventory and Monitoring Strategy to Measure Treatment Effectiveness in the Taos Field Office. **Alexander C. Laurence-Traynor** (acelt91@gmail.com)
- Effects of Soil and Water Conservation on Vegetation Cover: A Remote Sensing Based Study in the Middle Silluh Valley, Northern Ethiopia. **James Lyimo** (lyimojames@yahoo.com)
- Management of *Psidium cattleianum* on Oahu, Hawaii: A Collaborative Biocontrol Release. **Jenna Masters** (Jenna.m.masters@hawaii.gov)
- Using Interactive Models to Increase Hydrology Literacy. **Gina McCrackin** (gmccra@rams.colostate.edu)

Posters continue on page 14

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- **Conserving Genetic Resources: USDA-ARS National Laboratory for Genetic Resources Preservation.**
Annette Miller (annette.miller@ars.usda.gov)
- **The North American Bat Monitoring Program: Collaborating Across a Continent to Monitor and Conserve Bats.** **Lee O'Brien** (lee_obrien@fws.gov)
- **Genecology and Seed Zone Mapping for Bottlebrush Squirreltail.** **Jeffrey E. Ott** (jeott@fs.fed.us)
- **Meeting Multiple Management Priorities with Limited Resources When Making Post-Fire Management Decisions in the Intermountain West.** **Mary E. Patterson** (marypatterson2017@u.northwestern.edu)
- **Increasing the Use of Restorative Prescribed Fire Through Collaboration: Burning Through Barriers.**
Lauren Pile (lpile@fs.fed.us)
- **Understanding Aspen Population Dynamics as a Result of Compound Disturbance in Colorado.** **Arianna Porter** (aaporter@colostate.edu)
- **Control of an Invasive Grass Under Projected Climate Change Conditions for the State Of Florida.**
Candice M. Prince (cprince14@ufl.edu)
- **Sudden Aspen Decline Impacts Across Varying Forest Restoration Treatment Types in Warm, Dry Mixed Conifer, Southwest Colorado.** **Matthew D. Richardson** (mdrichardson@fortlewis.edu)
- **Predation on Early Recruitment in Mediterranean Forests After Prescribed Fires.** **Javier Sagra** (Javier.Sagra@uclm.es)
- **Burning Down Barriers to Urban Natural Area Management.** **Karen Scopel** (karen.scopel@greeleygov.com)
- **Large-Scale Control of Invasive Weeds and Response of Native Species to Indaziflam Tank Mixes.**
Jim Sebastian (jsebastian@bouldercounty.org)
- **Alterations in Fire Behavior and Fire Effects as a Result of Pre-Fire Mastication.** **Camille S. Stevens-Rumann** (C.Stevens-Rumann@colostate.edu)
- **It Takes a Village: Augmenting an Endangered Butterfly Metapopulation in San Diego, California.** **Spring Strahm** (spring.strahm@consbio.org)
- **Affirmation of the Shale Barren Endemic *Packera mancosana* (Asteraceae: Senecioneae) of Southwest Colorado as a Distinct Species Using Molecular Phylogenetic and Phylogeographic Methods.**
Stacey Tabb (sstabb@fortlewis.edu)
- **On the Brink: Rare Plant Population Dynamics in Kīpahulu Valley, Haleakalā National Park, Maui.**
Stacey K. Torigoe (torigoes@hawaii.edu)
- **A New Emerging Invasive Threat to Northeastern Rich Mesic Forests: Managing the Hardy Kiwi Vine (*Actinidia arguta*).** **Jessica Toro** (nativehabitatrestoration@gmail.com)
- **Integrating Recreation and Restoration in a Post-Industrial Landscape on Chicago's South Side.**
Lauren Umek (lauren.umek@chicagoparkdistrict.com)
- **Understanding the Socioeconomic Impacts of Forest and On-Farm Tree Conservation and Management.**
Kealie Vogel (kdvogel2@illinois.edu)
- **Forest Disturbance Trends from 1985 to 2014 in the Cascade Mountain Range, Washington.** **Jessica Walker** (jjwalker@usgs.gov)
- **Functional Diversity Buffers Negative Effects of Drought in Xeric Tallgrass Prairie: Implications for Resource Management.** **Caitlin White** (caitlin.t.white@colorado.edu)
- **Effects of Climate Change on Mast-Seeding in a Semi-Arid Conifer: Pinyon Pine (*Pinus edulis*).** **Andreas Wion** (andreas.wion@colostate.edu)

Tuesday, Oct. 10

Symposia/Organized Sessions (8 am – 3 pm)

(9) Symposium: Conservation Across Boundaries – Laramie Foothills: A Conservation Success Story

Room: Salon I

This symposium showcases the Laramie Foothills Mountains to Plains Project, a landscape-scale conservation effort to conserve a wildlife corridor from the Roosevelt National Forest to the Pawnee National Grasslands.

(10) Organized Session: Managing for an Uncertain Future: Climate Adaptation for Parks and Natural Areas

Room: Salon II

Talks in this session provide a practical and coherent summary of the climate adaptation process, including key steps and their context, with presentations that discuss guidance and examples of climate adaptation used by the National Park Service Climate Change Response Program and partner agencies.

(11) Organized Session: Implementing the National Seed Strategy

Room: Salon III

This session will highlight projects that are part of the implementation of the National Seed Strategy. The National Seed Strategy was signed in August 2017, calling for an unprecedented level of collaboration within and among public and private organizations nationwide.

(12) Organized Session: Moving Targets: Modeling and Managing Biodiversity Redistribution in Response to Environmental Change

Room: Salon IV

This session brings together experts who model how environmental change is influencing the biodiversity of natural areas, uncertainties related to that modeling, and the implications for management of natural areas within and across boundaries and borders.

(13) Symposium: Burners without Borders: Cross-Boundary Planning and Implementation of Controlled Burning to Restore Forests Symposium

Room: Salon V

Forward-looking solutions to growing wildfire challenges require society to embrace wildland fire as a management tool and to co-manage risks through “all hands, all lands” approaches. In pursuit of that end, this symposium summarizes ongoing progress toward cross-

boundary planning and implementation of controlled burning on the Front Range of Colorado.

(14) Symposium: U.S. National Vegetation Classification: Crossing Boundaries with Classification

Room: Salon VI

This symposium focuses on current applications of the U.S. National Vegetation Classification in support of an all-lands approach to conservation, including examples from a wide range of agencies (state, federal, and NGO).

(15) Symposium: Developing a Collaborative Strategy to Manage Invasive Winter Annual Grasses Throughout the West Symposium

Room: Rams

This symposium presents real-world results from multiple field sites where winter annual grass control has resulted in increases in native grass and forb biomass and increased species diversity.

(16) Symposium: Overstory and Understory Relationships: Exploring Effects of a Shifting Overstory on an Herbaceous Understory

Room: Aggie (Room 232)

This symposium synthesizes information to deliver a broad overview of overstory-understory dynamics across several North American ecosystems.

(17) Symposium: History and Use of Research Natural Areas

Room: Research (Room 202)

This symposium discusses the history of designating Research Natural Areas and their value for research and baseline for natural resource management.

(18) Symposium: Pile Burning: Ecological Consequences, Restoration Strategies and Management Alternatives

Room: Natural Resources (Room 230)

This symposium describes current pile burning practices and pile burning alternatives, and presents the latest advances in pile burning research regarding soil heating, soil microbial dynamics, and vegetation reestablishment

Room	Salon I	Salon II	Salon III	Salon IV
Topic	SYMPOSIUM Laramie Foothills — Mountains to Plains: A Conservation Success Story (9)	GENERAL SESSION Conservation Across Boundaries — Tools	GENERAL SESSION Natural Areas Management in Light of a Changing Climate	GENERAL SESSION Invasive Species Management
Moderator	Mark Sears	Maria Musgrave	Tori Hymel	Tim Merlino
8:00 am	John Stokes: Laramie Foothills Land Conservation Planning and Conservation	Molly McCormick: Restoration Assessment and Monitoring Program for the Southwest (Ramps)	Gregor Schuurman: "Resilience" — It's Everywhere, but What Does it Mean in a Climate Change Adaptation Context?	
8:30 am	Jason Labelle: 12,000 Years in the Laramie Foothills: The Importance of Cultural Resource Identification and Protection	Raquel Wertsbaugh: Colorado Natural Areas Program: A Conservation Model Using Voluntary Agreements	Esther D. Stroh: Mapping Future Fire-Climate Suitability Thresholds for Three South Central U.S. Woody Ecosystems	Thomas R. Rosburg: Tree Cutting and Goat Browsing in a Savanna Restoration: Effects on Microclimates and Vegetation
9:00 am	Crystal Strouse: Rare Plants and Plant Communities at Soapstone Prairie	Melanie Peters: Scenic Views Need More Than Appreciation: A National Park Service Approach	Miranda D. Redmond: Climate and Landscape Physiography Interact to Control Tree Growth in Semi-Arid and Sub-Alpine Ecosystems of the Rocky Mountains	Jonathan M. Sullivan: Exploring Edge Effect and the Impact of Invasive Vegetation on Snowy Plover Nesting Success
9:30 am	Daylan Figgs: Laramie Foothills — Energy by Design: A Collaborative Science-Based Plan for Energy Development	Kurt Dreisilker: Implementing Ecological Restoration Beyond Our Boundary: Strengthening Collaborations with Online Learning for Volunteer Stewards	Peter J. Weisberg: Seasonal Water Balance Drives the Distribution of Plant Functional Groups in a Semi-Arid Region	
10:00 am	MID-MORNING BREAK	MID-MORNING BREAK	MID-MORNING BREAK	MID-MORNING BREAK
Topic	<i>Symposium (9) continues</i>	ORGANIZED SESSION Managing for an Uncertain Future: Climate Adaptation for Parks and Natural Areas (10)	ORGANIZED SESSION Implementing the National Seed Strategy (11)	ORGANIZED SESSION Moving Targets: Modeling and Managing Biodiversity Redistribution in Response to Environmental Change (12)
Moderator		John Gross	Carol Dawson	Jeffrey Morisette
10:30 am	Jennifer P. Barfield: Assisted Reproduction as a Tool to Mitigate Disease, Preserve Genetics and Facilitate Movement of Genetics across Landscapes for Bison: The Laramie Foothills Bison Conservation Herd	John Gross: Climate Change Adaptation for Natural Areas: Embracing the Unknown	Carol Dawson: Implementing the National Seed Strategy	Helen R. Sofaer: Modeling Ecological Responses to Climate: What Are the Challenges and Opportunities?
11:00 am	Meegan Flenniken: Restoration of Greenback Cutthroat Trout to Red Mountain Open Space, Larimer County, CO	Cat Hawkins Hoffman: Lost Your Compass? We Can Relate. Scenario Planning for Climate Change Adaptation in the National Park Service	Judy Perkins: Mojave Desert Native Plant Program: Implementing the National Seed Strategy in the Mojave Desert Ecoregion	Healy Hamilton: Applications of Species Distribution Modeling to Biodiversity Management and Conservation in an Era of Rapid Global Change
11:30 am	Daniel W. Tripp: Plague Mitigation Prevents Plague-Associated Prairie Dog Colony Collapse	Don Wojcik: Integrating Climate Change into Planning for Natural Areas: An NPS Planner's Perspective and Experience	Anne Halford: Cross-Pollination — Funding, Tools and Partnerships to Meet Our National Seed Strategy Goals	Joanna Wu: Projected Effects of Climate Change on Avian Communities in U.S. National Parks
Noon	LUNCH	LUNCH	LUNCH	LUNCH
Topic	<i>Symposium (9) continues</i>	<i>Organized session (10) continues</i>	<i>Organized session (11) continues</i>	ORGANIZED SESSION Natural Areas Management in Light of a Changing Climate
Moderator				Jeffrey Morisette
1:30 pm	John Hughes: An Overview of Black-Footed Ferret Recovery Efforts in the Great Plains and Intermountain West	Brian W. Miller: Embracing Complexity and Uncertainty: Merging Simulation Modeling and Scenario Planning to Inform Natural Areas Management Under Climate Change	Michael Remke: Native Soil Materials: What Can Soil Biota Do for Our Restoration Efforts?	David J. Lawrence: Aquatic Invasive Species Range Expansions in Response to a Changing Climate
2:00 pm	Erin Youngberg: Monitoring the Effect of Sylvatic Plague in Black-Tailed Prairie Dogs on Density and Trends of Grassland Birds in the Mountains to Plains Area of Northern Colorado	Shelley D. Crausbay: Developing Proactive Strategies for Ecological Drought in the 21st Century	Christopher B. Woolridge: Predictive Provenancing: Can Southern-Sourced Seeds Be Used in Midwest Restoration Efforts?	Danielle Buttke: The Chicken or the Egg? The Interplay of Disease and Climate Change on Wildlife Populations
2:30 pm	Symposium Panel Discussion	Thomas J. Timberlake: Examining the U.S. Forest Service's Climate Change Vulnerability Assessments: Themes and Opportunities	Trip to USDA Seed Lab (2:30 – 3:30 pm)	Michelle Deprenger-Levin: Conservation Planning for Colorado's Alpine Plant Communities Based on Herbarium Records: Predicting Community Response to a Changing Climate
3:00 pm	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK

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Salon V	Salon VI	Green and Gold	Rams
GENERAL SESSION Communicating about Natural Areas Conservation	GENERAL SESSION Restoration in the Anthropocene	GENERAL SESSION Restoration in the Anthropocene	GENERAL SESSION Restoration in the Anthropocene
Betsy Miller	Hannah La Luzerne	Emily Neidhardt	Courtney Gutman
Tracy Boutelle Fidler: How The Definition of Natural Areas Has Shifted Over Time and How It Affects Our Ability to Communicate the Value of Such Places	Kathryn M. Barlow: Patterns of Plant Community Assembly after Reclamation with Native Plants	Stephen E. Fick: Distribution Modeling of Pre-Columbian California Grasslands with Soil Phytoliths: New Insights for Restoration and Prehistoric Grassland Ecology	Jenise M. Bauman: Plant Community Recovery and Soil Development within Four Estuary Restoration Projects in Western Washington
Adam D. McCurdy: The Forest Health Index: An Interactive Platform to Communicate and Visualize Changes Impacting Natural Areas	Daniel L. Mummey: Pre-Established Plant Influences on Antelope Bitterbrush (<i>Purshia tridentata</i> pursh) Seedling Recruitment and Growth: Analysis of Species and Positional Effects	Larry Schmidt: Using Botanical Collections to Inform Conservation and Restoration of Threatened Plant Communities	Jody Nelson: Ecological Restoration of a Superfund Site (Rocky Flats Site, Colorado)
Kristy Burnett: Using Social Media to Build Awareness for Natural Resource Issues	Andrew P. Rayburn: Twenty Years of Collaborative Riparian Restoration: Long-Term Recovery of Cache Creek after Curtailment of In-Channel Gravel Mining	James F. Rosson: Using Tree Species Dominance as an Indicator of Degraded Shifts in Population Structure and Diversity	Jillian R. Pastick: Adaptive Management Experiments for Restoration of Oak Ecosystems: Effects of Canopy Thinning on Seedling Regeneration and Ground Layer Plant Communities
Sara Melena: Sometimes the Best Relationship is a Long-Distance Relationship: A Communication Campaign to Influence Human Behavior Around Wildlife	Erika Valek: Challenges of Utilizing Municipal Compost as an Amendment in Boreal Forest Reclamation on Nutrient Poor Sites	Sasha L. Victor: Differential Effects of Invasive Species on Sandberg's Bluegrass Competitive Ability and Tolerance	David J. Robertson: Two Decades of Intensive Forest Stewardship Improve Stand Integrity but Not Resiliency
MID-MORNING BREAK	MID-MORNING BREAK	MID-MORNING BREAK	MID-MORNING BREAK
SYMPOSIUM Burners without Borders: Cross-Boundary Planning and Implementation of Controlled Burning to Restore Forests (13)	SYMPOSIUM U.S. National Vegetation Classification: Crossing Boundaries with Classification (14)	Keys to Conservation Careers	SYMPOSIUM Developing a Collaborative Strategy to Manage Invasive Winter Annual Grasses Throughout the West (15)
Matthew Thompson	Carol Spurrier	Terri Hogan	Scott Nissen
Robert N. Addington: Identifying Opportunities for Collaborative Controlled Burns on Colorado's Front Range	Scott B. Franklin: Introduction to the U.S. National Vegetation Classification	Various sessions (see page 19)	Cynthia S. Brown: A Systems Approach That Targets Ecological Processes is Key to Winter Annual Grass Management
Michael D. Caggiano: Using Cooperative Agreements and Local Resources to Increase the Scale of Controlled Burning in Northern Colorado	Patrick Comer: Tools for Linking Classification to Management		Derek Sebastian: Evaluating a Long-Term Control Strategy for Managing Invasive Winter Annual Grasses — the Time to Act is Now
Bryan Karchut: Burning without Borders: The Northern Colorado Fireshed Cooperative	Karl Brown: Synergies in Mapping and Classification: NPS Experience and Future Directions		Shannon Clark: Comparing Natural Areas Herbicide Management Options for Downy Brome (<i>Bromus tectorum</i> L.) Control and Native Species Tolerance
LUNCH	LUNCH	LUNCH	LUNCH
<i>Symposium (13) continues</i>	<i>Symposium (14) continues</i>	<i>Keys to Conservation Careers continues</i>	<i>Symposium (15) continues</i>
Matthew P. Thompson: Fires Don't Know Ownership Boundaries, Neither Do Control Opportunities; Let's Plan with That in Mind	Todd Keeler-Wolf: The Value of a Standard Vegetation Classification for Mapping and Conservation: A State's Perspective	Various workshops (see page 19)	Paul Mieman & Steve Sauer: More Forage and Improved Management Flexibility Are Expected Outcomes Resulting from a New Herbicide for Invasive Winter Annual Grass Control on Rangeland
Yu Wei: Prioritizing Controlled Burns for Headwater Protection	Joanna Lemly: Application of the U.S. NVC to Wetland Restoration: Using Classification to Establish Appropriate Threshold for Wetland Condition Assessment		Dan Tekiela & Harry Quicke: Responding to New Invasive Annual Grass Threats with an Interagency Working Group
Symposium Panel Discussion	Symposium Panel Discussion		Symposium Panel Discussion
MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK

Room	Aggie (Room 232)	Research (Room 202)	Natural Resources (Room 230)
Topic	GENERAL SESSION Value of Ecosystem Services	GENERAL SESSION Technology for Land Management Success	
Moderator	Reina Heinz	Eddie Lagucki	
8:00 am	Peter A. Dratch: Monitoring the Natural Quality of Designated Wilderness	Brian Knowles: Getting to the Root of Land Management Success: Data Management is Key	
8:30 am	Michael D. Bell: Why Care About Air? Linking Impacts of Air Quality in Natural Systems to Ecosystem Services	Carla Rebernak: Soil Data Availability for Management of Natural Areas	
9:00 am	Drew Bennett: Estimating Colorado's Return on Investments in Conservation Easements	Kathryn Nuessly: New Directions in Modeling and Communicating Noise Impacts in National Parks	
9:30 am	Jane Rice: Market-Based Conservation: Lessons Learned in Program Design	Noel Bacheller: Application of Machine Learning Methods to Predict Future Vegetation Composition in a Diked Coastal Estuary Based on Hydrological Parameters Modeled under Different Scenarios	
10:00 am	MID-MORNING BREAK	MID-MORNING BREAK	MID-MORNING BREAK
Topic	SYMPOSIUM Overstory and Understory Relationships: Exploring Effects of a Shifting Overstory on an Herbaceous Understory (16)	SYMPOSIUM History and Use of Research Natural Areas (17)	SYMPOSIUM Pile Burning: Ecological Consequences, Restoration Strategies and Management Alternatives (18)
Moderator	Brice Hanberry	William Carrmero	Chuck Rhoades
10:30 am	Tyler Bassett: Effects of Prescribed Fire and Thinning During Midwestern Oak Savanna Restoration	J. Stephen Shelly: Research Natural Areas in the U.S. Forest Service: 90 Years of Progress, and a Look Toward the Future	Chuck Rhoades and Eric Schroder: Tallying the Implications of Pile Burning for Multiple Resource Management in Fuel Reduction and Forest Health Projects in the Rocky Mountain Region
11:00 am	Carter S. Kinkead: Woodland Ground Flora Changes in Relation to Overstory Structure in the Ozark Highlands	Esteban Muldavin: A Proposed Natural Areas Climate-Change Monitoring Network for the Southwest United States Based on a Climate Change Vulnerability Index	Ian Sexton: Increased Seeded Native Species Establishment in Restored Slash Pile Burn Scars at Lily Lake, Rocky Mountain National Park
11:30 am	Ryan F. Limb: Great Plains Plant Community Changes Associated with Juniper Encroachment	Hugh Safford: Fire and Research Natural Areas in California: Restoring a Key Ecological Process to Reference Landscapes	W.J. Massman: Modeling Soil Temperatures During Fires Requires Modeling Unresolved Aspects of Soil Moisture and Water Vapor Dynamics
Noon	LUNCH	LUNCH	LUNCH
1:30 pm	Craig A. Carr: Understory Vegetation Dynamics and Ecosystem Resilience in an Eastern Oregon Ponderosa Pine Forest	Andy Scott: The Research Natural Areas of Alabama: History, Need, Uses, and Future Opportunities	Deborah S. Page-Dumroese: Slash Pile Impacts on Surface and Belowground Standard Substrate Decomposition Rates
2:00 pm	Jonathan D. Bakker: Scale Dependence of Overstory-Understory Relationships in Dry, Mixed-Conifer Forests	Laurie Huckaby: Research Natural Areas in U.S. Forest Service Rocky Mountain Region	Jane E. Stewart: Long-Term Changes in Soil Microbial Diversity after Slash Pile Burning
2:30 pm	Symposium Panel Discussion	Symposium Panel Discussion	Symposium Panel Discussion
3:00 pm	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK	MID-AFTERNOON BREAK

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Keys to Conservation Careers

10:30 am - 3 pm Green and Gold Room

This session is designed for students interested in pursuing careers in conservation and natural areas management. Each presenter will talk for 15 minutes. We'll then open the floor for a 20-minute panel discussion. (Moderator: Terri Hogan)

SESSION SCHEDULE

10:30 - 10:35 am	Welcome
10:35 - 10:45 am	City: Justin W. Scharton, Senior Environmental Planner, Land & Water Management, City of Fort Collins Natural Areas Department
10:45 - 10:55 am	County: Therese Glowacki, Resource Management Division, Boulder County Parks and Open Space
10:55 - 11:05 am	County: Casey Cisneros, Land Stewardship Manager, Larimer County Natural Resources
11:05 - 11:15 am	Academia: Brett Wolk, Assistant Director, Colorado Forest Restoration Institute, Colorado State University
11:15 - 11:25 am	State: Eric Odell, Species Conservation Program Manager, Terrestrial Section, Colorado Parks and Wildlife
11:25 - 11:35 am	Federal: Greg Eckert, Restoration Ecologist, National Park Service
11:35 am - noon	Panel Discussion and Q&A
noon	Lunch

CAREER WORKSHOPS

1:30 - 2 pm	USAJOBS Training: Lynea Jaramillo, NPS
2 - 2:20 pm	Human Resources Panel: Pathways for Student Entry Into Conservation Jobs, Job Outlook: Diana Doan, NPS
2:20 - 2:40 pm	Human Resources Panel: Pathways for Student Entry Into Conservation Jobs, Job Outlook: Tracy Gripp, Colorado Parks and Wildlife
2:40 - 3 pm	Panel Discussion and Q&A
3 pm	Mid-afternoon Break



Student attendees at the 2016 Natural Areas Conference in Davis, CA. Pictured far right is Student Involvement Chair Jodi Vandermeye. Photo by Bill Clough.



NAA Annual Membership Meeting & Luncheon

Noon - 1:30 pm Legends Room

All current NAA members are invited and encouraged to attend. Connect with colleagues and learn about all the important initiatives coming soon from NAA. The meeting will also include the election of NAA board members. Those who preregistered for the luncheon will have tickets in the sleeve of their name badge.

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Managing Smaller Natural Areas:

Case Studies on the Role They Play in Protection

The closing plenary is intended to inspire conference attendees as you depart for home and return to your jobs of conserving natural areas. We selected its focus based on feedback from a panel session at the 2016 Natural Areas Conference that focused on managing natural areas in the Anthropocene. Managers of smaller natural areas raised questions about the role that they play in the bigger picture of managing ecological resources. How do smaller natural areas remain relevant and justified in their management?

In this interactive session, we will present a series of case studies related to this topic, as well as our theme, *Working Beyond Boundaries*. These are examples of success stories that, three decades ago, were viewed as unpopular and, in some cases, rejected. All involve the conservation of relatively small natural areas that provided a crucial foundation for the conservation of much larger landscapes, and ultimately the protection of several species.

We've asked three speakers to present these case studies, which today are viewed as cutting-edge conservation projects. We want to use this session to end on a high, hopeful note by highlighting the work of committed, passionate natural areas professionals who never lost sight of the endgame. In all cases, they saw these projects through to fruition, and the benefits exceeded all expectations.

3:30 pm Introduction, Greg Aplet, Senior Science Director, The Wilderness Society

CASE STUDIES

3:45 pm Case Study 1: Successful Partnership Conserves the Imperiled Mardon Skipper

Scott Black, Executive Director, Xerces Society

In 2000, the mardon skipper, *Polites mardon*, was listed as a candidate species under the Endangered Species Act (ESA). In an effort to conserve this butterfly, federal, state and nonprofit partners developed a strategy that led to the development and implementation of comprehensive studies of host plant preference and impacts of management activities, the implementation of management plans for specific mardon sites, and the development of a rangewide monitoring protocol. This ongoing process has led to the discovery of new populations of the butterfly; mardon skipper-specific management at many sites across its range; and, as a result, an improved outlook for the butterfly. This work was cited as one reason the U.S. Fish and Wildlife Service did not ultimately list the species under the ESA. The project serves as a model that could be replicated for the conservation of additional U.S. butterfly species, and potentially applied to additional animal groups.

4:05 PM Case Study 2: If You Want to Go Fast, Go Alone. If You Want to Go Far, Go Together

Heather Knight, Associate Director, Center for Collaborative Conservation

This is the story of how the creation of a single Nature Conservancy preserve led to the conservation of a watershed 25 years later. It began at a time of controversy and tension. Conservation was largely feared. Annually, Colorado was losing private working

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lands and open spaces to commercial and exurban development at a rate equaling the size of Rocky Mountain National Park. Despite the situation, rural and urban community members came together, recognizing that they shared a common goal, and that together they could achieve more for people, agriculture and nature. The result was a 22-mile-wide conservation corridor, literally stretching from the mountains to the plains. The effort connected the high-elevation forested public lands, the rugged foothills shrublands, and the lower elevation, mostly private grasslands. The Laramie Foothills offers lessons in landscape-scale collaborative conservation.

4:25 pm Case Study 3: Conservation of Small and Large Natural and Semi-Natural Areas in Florida

Reed Noss, Florida Institute for Conservation Science

One common approach to biodiversity conservation is the protection of small (and often isolated) natural areas for the rare species and natural communities they contain. Another is the conservation of large, connected landscapes composed of both natural and semi-natural lands. These should be seen as complementary, not competing, approaches. Florida is, biologically, the hottest spot within a global biodiversity hotspot, and was for many years a leader in land conservation. Acquisitions included natural areas as well as semi-natural landscapes such as cattle ranches. Maintaining and restoring habitat connectivity for wide-ranging animals, for example with the Florida Ecological Greenways Network and the Florida Wildlife Corridor, was emphasized. Unfortunately, small and isolated natural areas have not received as much attention lately. Now, reduced political support for conservation in Florida and increased human population growth and habitat destruction have increased the risk for both natural and semi-natural landscapes. It is more urgent than ever that conservationists emphasize the complementary strategy of protecting small natural areas and large, connected semi-natural landscapes.

4:45 pm Panel Discussion: Moderated by Greg Aplet

5:15 pm Plenary Adjourns

ABOUT THE SPEAKERS



Scott Black is the executive director of the Xerces Society and chair of the IUCN Butterfly Specialist Group. He has received many awards, including the 2011 Colorado State University College of Agricultural Sciences Honor Alumnus Award and the U.S. Forest Service Wings Across the Americas 2012 Butterfly Conservation Award.



Heather Knight hails from Australia, where she received her education in ecology and natural resources management and secondary teaching, followed by graduate research on human disturbance of wildlife on the Great Barrier Reef. Knight immigrated to the U.S. in 1991 and for almost 25 years led a community-based conservation effort for The Nature Conservancy in northern Colorado. In 2016, Heather joined the Center for Collaborative Conservation at Colorado State University as the associate director of practice. Heather and her husband, Rick, live and steward a place in Livermore, Colorado.



Reed Noss is a freelance writer, photographer, lecturer and consultant in ecology and conservation. He retired in spring 2017 as Provost's Distinguished Research Professor of Biology at the University of Central Florida and is currently a visiting scholar at the Nicholas School of the Environment, Duke University. He received a B.S. degree in education from the University of Dayton, an M.S. degree in ecology from the University of Tennessee, and a Ph.D. in wildlife ecology from the University of Florida. He has served as editor-in-chief of *Conservation Biology* and president of the Society for Conservation Biology. He is an elected fellow of the American Association for the Advancement of Science. His recent research includes studies of the vulnerability of species and ecosystems in Florida to sea-level rise; climate adaptation strategies; disturbance ecology; road ecology; and ecosystem conservation and restoration. He has more than 300 publications, including eight books. His most recently published book is *Forgotten Grasslands of the South: Natural History and Conservation* (Island Press, 2013). His current book, *Fire Ecology of Florida and the Southeastern Coastal Plain*, is in press with University Press of Florida, with publication expected in early 2018.

Natural Areas Association Awards Dinner

Awards Dinner Cocktails will begin at 6:15 pm, as attendees mingle with friends and colleagues. Those who registered for the full conference and pre-registered for the Awards Dinner will have dinner tickets in the sleeve of their name badge. The NAA will honor recipients of the Carl N. Becker Stewardship Award and George Fell Award, and give out Student Presentation Awards. Please join us in acknowledging these deserving individuals.

THE GEORGE B. FELL AWARD

The George B. Fell Award, the NAA's highest award, recognizes exceptional achievements in the natural areas profession.



CLINTON DELAFIELD

Larry Smith has devoted his career to natural areas conservation and management. He started out in 1977 as a community ecologist and conservation planner with the Tennessee Natural Heritage Program. In 1986, he took a position at the Ohio Field Office of The Nature Conservancy as director of science and stewardship, managing the Conservancy's statewide system of private nature preserves. From 1990 to his retirement in 2015, Smith worked as natural protection manager for the Virginia Natural Heritage Program. He managed the Natural Areas Protection section, which oversees the state's natural areas protection and planning and cave and karst protection programs. Smith continues to work on behalf of natural areas as a land conservation specialist in the Office of Land Conservation for the Virginia Department of Conservation and Recreation.

THE CARL N. BECKER STEWARDSHIP AWARD

The Carl N. Becker Stewardship Award recognizes individuals or groups for excellence and achievement in managing the natural resources of reserves, parks, wilderness, and other protected areas.



BILL KLEIMAN

For 24 years, **Bill Kleiman** has been the project director for The Nature Conservancy's Nachusa Grasslands in north-central Illinois. In that capacity, he has directed various aspects of land management, habitat restoration, and the volunteer stewardship program for the 3,600-acre preserve. Nachusa Grasslands recently introduced bison and has a growing science program with over two dozen scientists involved. Kleiman co-leads the Grassland Restoration Network and works closely with the Middle Rock Conservation Partners. He has been burn boss for over 350 fires. Kleiman is active with the Illinois Prescribed Fire Council, and is co-author of the Illinois Fire Needs Assessment.

Conference Field Workshops

Your field workshop selection is indicated on a ticket in the sleeve of your name badge. If you have questions regarding your scheduled trip or if you'd like to change your trip, visit the registration table before Wednesday at 2 pm (changes can only be made on a space available basis). No changes can be made after Wednesday at 2 pm.

Field workshops will depart from the side doors of the Hilton, the entrance next to the pool. **Please arrive 20 minutes before your scheduled departure time to pick up your lunch in the Rams room and assemble with your group.** Bring appropriate outdoor gear, sunscreen and your water bottle. Transportation will depart promptly at the scheduled departure time.

FW-1 Rocky Mountain National Park (7:30 am - 5 pm)

FW-2 Conserving Biological Diversity in the Boulder Area Prairie-Foothills Ecotone: Tallgrass Prairie in the Semi-arid West (7:15 am - 6 pm)

FW-3 Chalk Bluffs State Natural Area (8:30 am - 3 pm)

FW-4 Soapstone Prairie Natural Area and Red Mountain Open Space (7:15 am - 5 pm)

FW-5 Urban River Restoration Bike Ride: Successes and Challenges (8:45 am - 2:30 pm)

FW-6 Forests, Fires, and Water: Poudre Canyon, Cache la Poudre River, active forest restoration sites, and Historic Mishawaka Amphitheatre and Restaurant (8 am - 5 pm)

FW-7 Recreation Management in the Urban Interface (7:30 am - 3 pm)



Poudre Canyon Passage by Michael Menefee.

Conference Workshop

9 am - noon Salon I

Instructor: Christine Taliga, USDA
NRCS Revegetation Technical
Advisor to the National Park Service

Participants have preregistered for
this workshop.

NAA Happy Hour

6 - 7:30 pm Green and Gold Room

Following your field workshop, join
us for your choice of complimentary
Odell Brewing Company beers and
pub snacks, and relax with other
conference and field workshop
attendees. The perfect way to end
your 2017 Natural Areas Conference
experience on a happy and high
note.

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Conference Planning Team

Lead Organizers

Kate Angell, Conference Manager, Natural Areas Association
Terri Hogan*, Conference Chair, National Park Service
Lisa Smith, Executive Director, Natural Areas Association
Renee Boronka, Cleveland Museum of Natural History

Program

Paula Fornwalt*, U.S. Forest Service
Rocky Mountain Research Station
Susan Spackman Panjabi*, Colorado Natural Heritage Program,
Colorado State University
Lisa Smith*, Natural Areas Association
David Anderson, Colorado Natural Heritage Program,
Colorado State University
Terri Hogan, National Park Service
Renee Boronka, Cleveland Museum of Natural History
Carol Dawson, Bureau of Land Management
Phil Krening, Bureau of Land Management
Daylan Figgs, City of Fort Collins Natural Areas Department
Crystal Strouse, City of Fort Collins Natural Areas Department
Sue Kenney, City of Fort Collins Natural Areas Department
Karen Mancini, City of Fort Collins Natural Areas Department
Miranda Redmond, Colorado State University
Camille Stevens-Rumann, Colorado State University
Steve Olson, U.S. Forest Service
Kate Angell, Natural Areas Association

Sponsorships

Lisa Smith*, Natural Areas Association

Exhibits

Carol Dawson*, Bureau of Land Management
Phil Krening, Bureau of Land Management

Field Workshops

Greg Eckert*, National Park Service
Camille Stevens-Rumann*, Colorado State University
Steve Olson, U.S. Forest Service
Terri Hogan, National Park Service
Paula Fornwalt, U.S. Forest Service
Rocky Mountain Research Station
Kate Angell, Natural Areas Association

Volunteers

Jodi Vandermyde*, Illinois Environmental Protection Agency
Miranda Redmond*, Colorado State University
Terri Hogan, National Park Service

Student Scholarships

Jodi Vandermyde*, Illinois Environmental Protection Agency
Jody Shimp, Shawnee Resource, Conservation, and
Development Area
Kim Smith, University of Arkansas
Steve Olson, U.S. Forest Service
Fran Harty, The Nature Conservancy, Illinois
Ruark Cleary, Florida Fish and Wildlife Conservation Commission
Kevin Fitch, Motlow Community College, Tennessee
Alice Long Heikens, Franklin College, Indiana
Terri Hogan, National Park Service
Todd Bittner, Cornell Plantations, New York
Randy Nyboer, Illinois Natural History Survey
John Taylor, Ball State University, Indiana
Joanna Woodruff, Central Indiana Land Trust

Natural Areas Association Annual Awards

Rick K. Myers*, Virginia Division of Natural Areas
Mike Leahy, Missouri Natural Heritage Program
Roger McCoy, Tennessee Division of Natural Areas
Terri Hogan, National Park Service

* Chair or co-Chair

Colophon

Editorial Services: Sarah K. Riehl **Graphic Design:** Juliano Boronka
Icons: Mortar Board by Catia Marsh Mallow from the Noun Project;
Ticket Star by Viktor Vorobyev from the Noun Project

NATIONAL SEED STRATEGY FOR REHABILITATION AND RESTORATION

Restoring Natural Areas with “The Right Seed in the Right Place at the Right Time”

RESTORING NATURAL AREAS

The National Seed Strategy provides a coordinated approach to ensure that genetically appropriate seed reserves are available when and where they are needed to restore healthy plant communities.

Organizations and individuals at all levels are contributing to common goals, pooling resources, sharing information, and achieving results for advancing plant conservation on a broad scale.

Implementation will help guide ecological restoration across large landscapes, especially lands damaged by rangeland fires, invasive species, severe storms, and drought.

WORKING TOGETHER TO:

- (1) Identify seed needs.
- (2) Undertake research and improve technologies.
- (3) Develop tools for land managers.
- (4) Ensure good communications.

WHO?

A coalition of 12 federal agencies and other members of the Plant Conservation Alliance (PCA) developed the strategy to address widespread shortages of native seed. The PCA is a network of more than 300 public and private partners dedicated to native plant conservation.

LEARN MORE AND JOIN US!



The Bureau of Land Management and the Plant Conservation Alliance invite all Natural Areas Association members to join us in implementing the National Seed Strategy (www.blm.gov/seedstrategy). To get involved, send an email to seedstrategy@blm.gov.

45TH NATURAL AREAS CONFERENCE

October 23-25, 2018
Indiana Memorial Union
University of Indiana, Bloomington

natural
areas
association

Plan now to join us for the 2018 Natural Areas Conference, at the Indiana Memorial Union on the University of Indiana, Bloomington, campus. This will be our 45th annual conference, and a celebration of the Natural Areas Association's history – and future – as an organization. Our theme:

Building Resilience: The Future of Natural Areas

The event will include sessions on:

- Collaborative Approach to Conservation: Public/Private Partnerships
- Corridors, Migration, Assisted Migration
- Fire Ecology
- Genetic Diversity and Biodiversity/Rare Species Management
- Human/Wildlife Conflicts
- Pollinators
- Natural Areas Management in Light of a Changing Climate
- Communicating About Natural Areas Conservation
- Urban Natural Areas
- Native Seed and Natural Areas Conservation
- Karst Conservation
- Invasive Species Management
- Technology for Land Management Success
- Working Landscapes and Conservation
- Restoration Ecology



Watch for more at naturalareasconference.org.
Registration opens summer 2018. And stay tuned for more info about the 2019 Natural Areas Conference, October, in **Pittsburgh, PA!**