

2023

INTERNATIONAL CONFERENCE ON  
ECOLOGY AND TRANSPORTATION

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## CONFERENCE TIMES & TIME ZONES

Thanks for joining ICOET from you time zone. Because the conference includes an in-person component, all times in the program are expressed relative to local time in Vermont (Eastern Standard Time, EST). If you are participating virtually, you can find your time relative to EST based on your location, using this website:

<https://greenwichmeantime.com/time-gadgets/time-zone-converter/>. We have also put major time zones at the beginning of the program.

**For example, Vermont is -4:00 hours relative to GMT, so 9 am EST in the program = 6 AM in California and 3 pm in Johannesburg, South Africa.**





# MESSAGE FROM THE CHAIR

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Chris Slesar, ICOET Conference Chair

*Vermont Agency of Transportation*

On behalf of the ICOET Steering Committee, it is my pleasure to welcome you to the thirteenth biennial International Conference on Ecology and Transportation in Burlington, Vermont. This will be our first hybrid ICOET and we are thrilled to be back in person and to expand our reach far beyond the walls of the conference rooms via virtual participation.

We have an exciting program with over 235 presentations — including Podium, Lightning and Multimedia/Poster — from 18 countries and 34 US states. ICOET 2023 is a joint conference with the AASHTO Committee on Environment and Sustainability Annual meeting and Transportation Research Board Standing Committee on Environmental Analysis and Ecology (TRB AEP 70) which creates a unique opportunity to enhance our already-robust program. We are honored to have evolutionary ecologist Madhusudan (Madhu) Katti, Ph.D. from North Carolina State University as our keynote speaker.

The conference theme for 2023 is Synergy at Scale: Partnering for a Healthy Landscape. Partnerships at multiple scales — whether they be global or local — lead to aggregated results greater than the sum of the individual parts. These partnerships overlap and interact in dynamic ways. There are the partnerships that are exclusive to the work we are doing in our own jurisdictions, and there are partnerships that transcend geopolitical boundaries and capture broader landscapes. These multi-scale partnerships contribute to creating and maintaining a healthy planet.

This is an exciting time for practitioners and academics working in linear infrastructure and road ecology. In many ways it is an unprecedented time with extraordinary global opportunities and extraordinary global challenges. It is within this backdrop that we will undertake a four-day dialog that will inform and inspire participants to return to their respective jurisdictions and continue to bring our work to the next level. Over these four days we will be steeped in the most current research and practices as represented by the foremost minds — both newcomers and veterans — in transportation ecology research, academics and practice. We will explore relevant topics at multiple scales from global to local and everything in between.

Our collective work as practitioners, ecologists, planners, managers, advocates, engineers, researchers and academics in the ecology of linear infrastructure requires the synergy of diverse perspectives and dynamic partnerships. Similarly, this interdisciplinary conference flourishes on the relationships among participants. The conference will be highly engaging, interactive, and will delve into a diversity of relevant topic areas that ensure transportation decision-making is grounded in science and sound policy. We warmly welcome newcomers to ICOET and look forward to embracing them in the camaraderie of the ICOET community. Please take every opportunity to network with old and new colleagues, collaborators and friends.

Welcome and enjoy the conference!

Chris Slesar  
Vermont Agency of Transportation  
ICOET 2023 Steering Committee Chair

# MESSAGE FROM THE ORGANIZER

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Fraser Shilling, PhD

*Road Ecology Center Director and ICOET Lead Organizer*

Transportation and other linear infrastructure impact all natural systems, directly through mortality and other road effects (e.g., noise, light, and chemical pollution), and/or indirectly by facilitating land development, fueling extraction, and contributing to climate change. At the same time, scientists and practitioners try to understand and reduce, or eliminate these impacts to protect and conserve natural processes and attributes. ICOET is still the #1 international conference to learn about both how transportation and other infrastructure impact and interact with the environment and how people and partnerships are improving these interactions. By participating in the conference you are in a unique space, crossing the lines among single-discipline conferences. By participating and presenting, you are helping to grow one of the fastest-changing areas of transportation and ecology. Thanks to our sponsors, to the universities supporting the next generation of transportation ecologists, to the state and federal agencies encouraging their staff's participation, and to the private organizations and individuals providing their expertise.

This year's conference has a number of firsts and victories to celebrate: 1) We are meeting jointly with the American Association of State Highway & Transportation Officials' Committee on Environment and Sustainability and the Transportation Research Board's Committee on Environmental Analysis and Ecology. This means agency decision-makers will be able to hear about the current best practices in ecological studies, new engineering technologies, and potential solutions to environmental impacts; 2) ICOET will be held in hybrid format (in-person and virtual), allowing greater participation by international and state partners and also limiting greenhouse gas production from travel; and 3) ICOET has helped spawn state and federal legislation and appropriations that benefit wildlife and aquatic connectivity, land restoration, and partnerships with critical tribal and other partners.

ICOET benefits from: a) a very active Steering Committee, which advises on overall strategies in conference content and evolution, selects awardees, and connects the conference to other organizations; b) a Program Committee that functions as a deep bench of scientific and practice experts, and c) an Abstract Review Committee, which includes many of you, providing your expert reviews of all contributed presentations. To these Committees -- I appreciate all of your efforts, individually and collectively.

The Road Ecology Center is joined in organizing ICOET 2023 by the UC Davis Institute of Transportation Studies (<https://its.ucdavis.edu/>) and the National Center for Sustainable Transportation (<https://ncst.ucdavis.edu/>). The three organizations are each pioneers and among the largest in their fields and, in combination cover most issues in evolving sustainable transportation. We are excited to bring you ICOET 2023 and to make sure that ICOET is continuously and expertly managed into the future. We look forward to meeting many of you virtually and to helping you have a great ICOET experience. Look us up online, or during the conference.

Fraser Shilling, PhD  
ICOET Lead Organizer

Director, Road Ecology Center  
<https://roadecology.ucdavis.edu>

# KEYNOTE SPEAKERS

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**Julie Moore**  
Natural Resources Secretary  
State of Vermont

The Vermont Agency of Natural Resources (ANR) has primary responsibility for protecting and sustaining Vermont's environment, natural resources, wildlife and forests, and for maintaining Vermont's beloved state parks. Moore was named to that position by Governor Phil Scott in January 2017. As ANR Secretary, Moore shapes Vermont's environmental agenda, focusing on water quality, the forest economy, and the importance of conservation. She currently serves on the boards of the Vermont Housing and Conservation Board, Vermont Council on Rural Development, as well as ECHO Lake Aquarium and Science Center.



**Joe Flynn**  
Transportation Secretary  
State of Vermont

Joe Flynn has served in Vermont State Government since October 2009 in capacities from AOT Rail Director (AOT), a brief stint (2 months) in the Irene Recovery Office (AOA), Director of Vermont Emergency Management (DPS), Director of Emergency Management and Homeland Security (DPS), Deputy Commissioner of Public Safety (DPS), and his current role as Secretary of Transportation (AOT). During those years, along with many others, he has had roles in Vermont's Irene response and recovery, and the FEMA Public Assistance Program going from AOT to Vermont Emergency Management.



**Madhu Katti**  
Professor  
North Carolina State University

Dr. Madhusudan Katti is Director of Science, Technology, and Society and Associate Professor in the Chancellor's Faculty Excellence Program for Leadership in Public Science and in the Department of Forestry and Environmental Resources at North Carolina State University. His work centers Reconciliation Ecology—the application of evolutionary ecology to find real-world solutions for reconciling biodiversity conservation with human wellbeing. An ecologist by training, he now engages local communities and the broader public in studying how human activities and histories of colonization and segregation shape the distribution of nature and biodiversity in urban areas. He is actively engaged in rethinking and redesigning his own research and the teaching of ecology and conservation biology within a broader framework of decolonizing science.



# Land and Indigenous Rights Acknowledgement

We wish to acknowledge that ICOET 2023 is taking place on the unceded territories of the traditional custodians of the N'dakinna (en-DAH-kee-NAH), the Western Abenaki (A-ben-A-kee), and, in the southwest corner, the Mahican (mə'hi-kən) peoples. We wish to recognize the generations of traditional custodians who have lived in and derived their physical and spiritual needs from the forests, grasslands, seas, rivers, lakes and streams of Vermont for time immemorial. We pay respect to their elders past and present. We are grateful for the opportunity to share in the bounty of this place and to protect it at all costs. While we cannot undo what has been done before, we can acknowledge what has happened and strive to lead in a different way to inspire, reward and celebrate reconciliation across our organization and the community. As we respect and acknowledge the past we can enthusiastically embrace what the future can bring by walking together, working together, celebrating together and leading our organization and the community to an inspired future for all.

# SPONSORS & ORGANIZERS

THANK YOU to our generous private Sponsors for continuing to help us reduce registration fees, to our outstanding co-host agencies in Arizona, Idaho, Nevada, New York, North Dakota, Texas, and Washington, and to the members of the Steering, Program, Abstract Review, and Awards Committees. ICOET 2023 is made possible through the financial and volunteer support of the many organizations listed in this program. Please take time during your participation during the conference to visit the Sponsor virtual booths and exhibits, learn about their products and services, and to express your appreciation for their support of the conference.

## ORGANIZERS, LEAD SPONSORS, AND HOSTS



Agency of Natural Resources  
Vermont Fish & Wildlife Department



## STATE AND FEDERAL SPONSORS



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## EXHIBITORS



## CONTRIBUTORS



# Welcome to ICOET 2023!



Wallis Annenberg Wildlife Crossing  
Groundbreaking, Earth Day, April 22, 2022

“P-22 never fully got to be a mountain lion. His whole life, he suffered the consequences of trying to survive in unconnected space, right to the end when being hit by a car led to his tragic end. The Wallis Annenberg Wildlife Crossing would not have been possible without P-22, but the most fitting memorial to P-22 will be how we carry his story forward in the work ahead. One crossing is not enough – we must build more, and we must continue to invest in proactive efforts to protect and conserve wildlife and the habitats they depend on—even in urban areas.” **BETH PRATT, A EULOGY FOR P-22**



Photo: Steve Winter

**PROJECT PARTNERS:** CALTRANS, NATIONAL PARK SERVICE, SANTA MONICA MOUNTAINS CONSERVANCY/MRCA, RESOURCE CONSERVATION DISTRICT OF THE SANTA MONICA MOUNTAINS, NATIONAL WILDLIFE FEDERATION, LIVING HABITATS LLC.

[savelacougars.org](http://savelacougars.org) • [101wildlifecrossing.org](http://101wildlifecrossing.org)





# EVENT PROGRAM

9 AM EST = 6AM Pacific, 1 PM GMT, 3PM South Africa,  
6:30PM India, 11 PM Sydney

▲ Lake Champlain  
Salon

■ Vermont A/B

● Adirondack  
Ballroom

★ Green  
Mountain A

◆ Green  
Mountain B

✚ Green  
Mountain C

● Montpelier

## MONDAY, JUNE 5

8:30 AM (EST)

- **Day 1 Welcome Plenary Session**  
Remarks from Conference Chair, Steering Committee, and Organizer

9:20 AM (EST)

- **International and VT Welcomes**  
**Keynote Addresses by VT Transportation and Natural Resources Secretaries**

9:50 AM (EST)

- **Plenary Keynote: Dr. Madhu Katti, North Carolina State University**

10:30 AM (EST)

**Break (10 minutes)**

10:40 AM (EST)

- **Plenary Session on Equity, Transportation and the Environment (ICOET/AASHTO)**

12:10 PM (EST)

- **Buffet Lunch at the Hilton: Networking, Awards**

1:10 PM (EST)

**Technical Session 1, 2, 3, 4, and Panel 1**

- Session 1: Phish Food for Thought — AOP Funding and Collaboration (44,62,140,234)
- Session 2: Twenty Plus Years of Evolution & Global Expansion of Road Ecology (14,105,172,240)
- ◆ Session 3: Climate Resiliency — Weathering the storm (79,136,178,225)
- ★ Session 4: Reap What you Sow — Verges and Pollinators (66,130,156,164)
- ✚ Panel 1: Approaches to Bats within Transportation Structures
- ▲ AASHTO CES CR Meeting
- AEP70/ICOET Session: Alternative Impact and Benefit Analysis, Beyond NEPA (41,102,213,241)

2:40 PM (EST)

**Break (20 minutes)**

3:00 PM (EST)

**Technical Session 5, 6, 7, 8, 9 and 20**

- ▲ Session 5: Vermont's Terrestrial Passage Screening Tool (35,90,94,220)
- Session 6: Engineering Solutions for transportation impacts on ecology (68,212,TBD, 235)
- ◆ Session 7: Writing the next chapter for crossings and climate change (30,118,197,202)
- ✚ Session 8: Pollinating Opportunities in rights-of-way (217,157,5,211)
- Session 9: Bats & Bugs — Roosting & Dispersal (93,200,201,238)
- ★ Session 20: All Creatures and Crossings Great and Small (47, 58, 148, 221)

- AASHTO: Updates from FHWA

4:30 PM (EST)

- AEP70 Business Meeting

6:00 PM (EST)

Welcome Dinner Reception (Ticketed Event)

**End of Day 1**



# EVENT PROGRAM

9 AM EST = 6AM Pacific, 1 PM GMT, 3PM South Africa,  
6:30PM India, 11 PM Sydney

- ▲ Lake Champlain Salon
- Vermont A/B
- Adirondack Ballroom
- ★ Green Mountain A
- ◆ Green Mountain B
- + Green Mountain C
- ◆ Montpelier

## TUESDAY, JUNE 6

**Fun t-shirt day (wear your most fun t-shirt)**

### 9:00 AM (EST) ● Day 2 Welcome Plenary Session Orientation

### 9:15 AM (EST) ★ Technical Session 10, 11, 13, 14, 17, and Lightning Session 1

- ★ Session 10: Staying Current with Aquatic Habitats (57, 71, 82, 109)
- ◆ Session 11: Wildlife Connectivity — Models and Movements (42, 64, 151, 168)
- ✚ Session 13: Linear Infrastructure Impacts on Biodiversity in Africa (7, 27, 171, 239)
- ◆ Session 14: I Saw the Sign (100, 101, 150, 223)
- Session 17: Making Wildlife Crossings Make Cents (46, 126, 187, 219)
- ▲ Lightning Session 1: Aquatic Ecology and Sustainability (11, 31, 85, 146, 177, 182, 186, 214, 218, 226)

■ AASHTO: "What's Hot" KS/Panel

### 10:45 AM (EST) Break (15 minutes)

### 11:00 AM (EST) ★ Technical Session 12, 15, 16, 17, 18, 19 and Lightning Session 2

- ★ Session 12: Where do we go? Traffic, Fencing and Wildlife (19, 222, 233, 236)
- ◆ Session 15: Don't Squish the Squamata: Road Ecology and Herps (4, 37, 133, 165)
- Session 16: Automated and AI Processing for Safety & Ecology (53, 104, 129, 180)
- ✚ Session 18: Addressing Connectivity & Linear Infrastructure (43, 48, 97, 154)
- ◆ Session 19: Planning & Partnerships at Scales Big and Small (23, 123, 125, 208)
- ▲ Lightning Session 2: Terrestrial Ecology & Tools (15, 33, 45, 77, 88, 92, 185, 199, 207)

■ AASHTO CES Environmental Process Meeting



# EVENT PROGRAM

9 AM EST = 6AM Pacific, 1 PM GMT, 3PM South Africa, 6:30PM India, 11 PM Sydney

▲ Lake Champlain Salon

■ Vermont A/B

● Adirondack Ballroom

★ Green Mountain A

◆ Green Mountain B

✚ Green Mountain C

● Montpelier

## TUESDAY, JUNE 6

12:30 PM (EST)

**Lunch on your own**

2:00 PM (EST)

**Technical Session 21, 22, Panels 2 & 3 and Workshop 1**

- Panel 2: Building a Crossing, Building a Movement: The Wallis Annenberg Wildlife Crossing and Beyond)
- ★ Session 21: Policy and Partnerships - Break down Silos (3, 40, 52, 205)
- ◆ Session 22: Tools from a Policy and Program Toolbox (32, 91, 107, 147)
- ✚ Panel 3: Asia's Linear Infrastructure safeGuarding Nature (ALIGN) Project
- Workshop 1: Wildlife Crossing Safety Workshop
- *Poster Setup*

▲ AASHTO CES AQCCE Meeting (GHG & NEPA)

3:30 PM (EST)

**Break (15 minutes)**

3:45 PM (EST)

**Sponsor Meet-up (60 minutes)**

- Meeting Justice40 Goals: A Workshop
- Zoom CDFW Training Meeting: "Wildlife Connectivity Mitigation Guidelines Deep Dive"
- ★ USFWS Meeting

4:45 PM (EST)

**Poster Reception (120 minutes)**

6:45 PM (EST)

**END OF DAY 2**





# EVENT PROGRAM

9 AM EST = 6AM Pacific, 1 PM GMT, 3PM South Africa,  
6:30PM India, 11 PM Sydney

- ▲ Lake Champlain Salon
- Vermont A/B
- Adirondack Ballroom
- ★ Green Mountain A
- ◆ Green Mountain B
- + Green Mountain C
- ⬡ Montpelier

## WEDNESDAY, JUNE 7

<b>8:00 AM (EST)</b>	<b>Field Trip Day Orientation</b>
<b>8:30 AM (EST)</b>	<b>Field Trip 1:</b> Lake Champlain <b>Field Trip 2:</b> Reptiles and Amphibians <b>Field Trip 3:</b> Moose and their Habitat <b>Field Trip 4:</b> Road Crossings in the Northeast <b>Field Trip 5:</b> Bike Trip Along the Lake <b>PM Field Trip 6:</b> Land Use and Transportation Planning
<b>9:00 AM (EST)</b>	<span style="color: blue;">▲</span> <b>AASHTO CES Research TF</b>
<b>10:00 AM (EST)</b>	<b>BREAK</b>
<b>10:15 AM (EST)</b>	<span style="color: blue;">▲</span> <b>AASHTO: State Showcase – VA, NE</b>
<b>12:00 PM (EST)</b>	<b>LUNCH</b>
<b>1:30 PM (EST)</b>	<span style="color: blue;">▲</span> <b>AASHTO: Discussion Tables</b> <span style="color: orange;">●</span> <b>AASHTO: States and Implementing IJA/BIL</b>
<b>3:00 PM (EST)</b>	<span style="color: blue;">▲</span> <b>AASHTO: Regional Breakouts</b>
<b>5:00 PM (EST)</b>	<b>END OF DAY 3</b>



# EVENT PROGRAM

9 AM EST = 6AM Pacific, 1 PM GMT, 3PM South Africa, 6:30PM India, 11 PM Sydney

- ▲ Lake Champlain Salon
- Vermont A/B
- Adirondack Ballroom
- ★ Green Mountain A
- ◆ Green Mountain B
- + Green Mountain C
- ◆ Montpelier

## THURSDAY, JUNE 8

**Fun sunglasses day (wear your most fun sunglasses)**

**9:00 AM (EST)**

### Technical Session 23, 24, 25, 26 & Panel 4

- Panel 4: Making Connections — Transportation and Aquatic Conservation
  - ★ Session 23: Wildlife Corridors and Transportation Planning (22, 38, 111, 232)
  - ◆ Session 24: A Road Less Traveled — Wildlife Movement and Crossings (1, 56, 144, 188)
  - + Session 25: Reducing WVC in the Space-Time Continuum (167, 190, 193, 198)
  - ◆ Session 26: "Structure"d Partnerships for Wildlife (99, 124, 131, 237)
- 
- AASHTO CES Natural Resources

**10:30 AM (EST)**

### Break (15 minutes)

**10:45 AM (EST)**

### Technical Session 27, 28, 29 and Panel 5

- ★ Session 27: Diving in to the First Pooled Fund Study for Transportation Ecology (78, 116, 191, 229)
  - ◆ Session 28: So, Was There an Impact? Post-Construction Assessment (87, 117, 160, 175)
  - + Session 29: Non-Traditional Partnerships for Connectivity Conservation (89, 189, 215, 228)
  - Panel 5: Navigating Wildlife Infrastructure Opportunities in the Infrastructure Investment and Jobs Act
- 
- AAHSTO: Success stories and opportunities with Tribal consultation

**12:15 PM (EST)**

### Plenary Wrap-Up and Introduction to ICOET 2025

**1:00 PM (EST)**

### END OF CONFERENCE



Video courtesy Winston Vickers, UC Davis

# ABOUT THE SESSIONS

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## MONDAY, JUNE 5 | 1:10 PM – 2:40 PM (EST)

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### Session 1: Phish Food for Thought — AOP Funding and Collaboration (44,62,140,234)

- 44** Assessing the Unknown: Understanding the Impacts of Culverts on Aquatic Habitat Fragmentation and Aquatic Organism Passage in the Southeastern United States — Kathleen Hoenke, Southeast Aquatic Resources Partnership
  - 62** Aquatic Organism Passage at Transportation Crossings: Part 1 — Project Design, Technical Guidance, and Examples for Success— Daniel Buford, FHWA Office of Project Development and Environmental Review
  - 140** Fish Passage Design and Transportation Infrastructure — Nancy Munn, NOAA Fisheries
  - 234** FHWA Aquatic Organism Passage Implementation Guide — Joseph Krolak
- 

### Session 2: Twenty Plus Years of Evolution and Global Expansion of Road Ecology

- Intro** On the Beginning of Road Ecology in the USA -- Richard Forman, Harvard University
  - 240** Our Road Ecology Roots and the History of ICOET -- Sandra Jacobson, ICF
  - 172** Global Evolution and Diversification of Linear Infrastructure and Ecology -- Wendy Collinson, EWT & Carme Rosell, IENE
  - 105** The Revival of Foundational Tenets of Transportation Ecology and Expansion into New Realms -- Kimberly Andrews, UGA & Kris Gade, ADOT
  - 163** Wicked Challenges and Fleeting Opportunities for the Next 20 Years of Transportation Ecology -- Fraser Shilling, Road Ecology Center, UC Davis
- 

### Session 3: Climate Resiliency — Weathering the storm (79,136,178,225)

- 79** Stream Smart Takes a Trip: Better Culverts Beyond Maine (and just in time!) — Sarah Haggerty, Maine Audubon
  - 136** Pennsylvania Road Stream Crossing Design for Aquatic Organism Passage and Storm Resiliency — Eric Chase - Center for Dirt and Gravel Road Studies, Penn State University
  - 178** Infrastructure Climate Resilience for the National Forests of California — Gordon Keller, Genesee Geotechnical
  - 225** Multi-layered Transit Network Resilience to Flooding: An Analysis of 19 U.S. Cities — Huiying ("Fizzy") Fan, Georgia Institute of Technology
- 

### Session 4: Reap What you Sow — Verges and Pollinators (66,130,156,160)

- 66** Roadside revegetation with native plants: establishment of plants and support of pollinators — Emilie Snell-Rood, University of Minnesota
  - 130** Milkweeds and Machine Learning: Using Drones and AI to Monitor Roadside Monarch Breeding Habitat — Jaret C. Daniels and Justin Ridge, Florida Museum of Natural History, University of Florida
  - 156** Using Wildflowers and Compost Amendment to Manage Our Disturbed Roadside Soils — Christina N Kranz, North Carolina State University
  - 160** Modified mowing for pollinators in New York State Right of Ways; does it work? — Kaitlin Stack Whitney, Rochester Institute of Technology
- 

### Panel 1: Approaches to Bats within Transportation Structures

This panel will address bat roost identification within transportation structures and how to navigate the regulations through avoidance, minimization, and mitigation measures. Project examples from the Northeast, Southeast, and Florida will be discussed. Audience participation is encouraged by providing opportunities to ask questions and share experiences.

# ABOUT THE SESSIONS

## AEP70/ICOET Joint Session: Alternative Impact and Benefit Analysis (Beyond NEPA) (41,102,213,241)

- 213** Opportunities for Air Pollution and Climate Mitigation using Roadside Green Infrastructure — Richard Baldauf, US Environmental Protection Agency
- 41** Environmental Impact of PHEV to BEV Transition: A Life Cycle Assessment Study— Scarlett Alexander, San Diego State University
- 102** The Future is Now – Creative Sustainable Bridge Solutions— Linda Figg - FIGG Group Inc.
- 241** Alternative Impact and Benefits Analysis (Beyond NEPA) – The UK Perspective (Social Value — Emily King, Social Value & Equity Advisory, Jacobs

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## MONDAY, JUNE 5 | 3:00 PM – 4:30 PM (EST)

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### Session 5: Vermont's Terrestrial Passage Screening Tool (35,90,94,220)

- 35** Integrating the Terrestrial Passage Screening Tool into Vermont Conservation Design — Jens Hawkins-Hilke, VT Department of Fish and Wildlife
- 90** Using The Terrestrial Passage Screening Tool In Project Review And System-Wide Prioritization — Glenn Gingras, Vermont Agency of Transportation
- 94** Mapping omnidirectional movement of terrestrial mammals in Vermont around roadways and transportation structures — Caitlin Drasher, University of Vermont
- 220** Integrating genetic data into assessments of wildlife connectivity across the road network of Vermont — James Murdoch, University of Vermont

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### Session 6: Engineering Solutions for transportation impacts on ecology (68,212,231,235)

- 68** Development of Safety Funding Models for Use of Highway Safety Improvement Program (HSIP) Funding for Wildlife-Vehicle Collision Countermeasures on State Roads in Arizona — Kerry Wilcoxon, Arizona Department of Transportation
- 212** Approval Processes for Wildlife Crossings on State Highway Systems – Navigating the Caltrans System to Implement Novel Solutions — Sasha Dansky, PE, Mark Thomas & Company
- 231** TBD — TBD
- 235** Innovative Bridges for Healthy Landscapes Benefiting Air, Water, and Wildlife — Linda Figg, FIGG Group



# ABOUT THE SESSIONS

**MONDAY, JUNE 5 | 3:00 PM – 4:30 PM (EST)**

## Session 7: Writing the next chapter for crossings and climate change (30,118,197,202)

- 118** What we know about climate change and wildlife crossings: A literature review and case study — Caitlin Littlefield, Lead Scientist, Conservation Science Partners
- 202** Don't stop now: Using existing knowledge and tools to adapt wildlife-friendly infrastructure to a changing climate — Meade Krosby, Climate Impacts Group, University of Washington
- 30** Advancing climate-informed wildlife crossings: Wildlife Crossings and Climate Consensus Group joint statement and recommendations — Julia Kintsch, ECO-resolutions
- 197** Policy opportunities to ensure transportation infrastructure maintains landscape connectivity and enhances climate resilience — Anna Wearn, Center for Large Landscape Conservation

## Session 8: Pollinating Opportunities in rights-of-way (5,157,211,217)

- 5** The Buzz About a New Bumble Bee Conservation Agreement — Dan Salas, Stantec
- 157** Lessons from the First Nationwide Conservation Agreement for Monarch Butterflies on Energy and Transportation Lands — Caroline Hernandez, University of Illinois Chicago
- 211** Reimagining Roadside Landscapes: pollinator-friendly roadside solar and other opportunities — Matthew Quirey, The Ray
- 217** Imperiled Pollinator Habitat Conservation along Roadways — Jennifer Hopwood, Xerces Society for Invertebrate Conservation



## Wildlife Detection and Warning Systems



OPEN ROAD SYSTEM



CROSSWALK SYSTEM



SLOW DOWN SIGNS



MOBILE SYSTEM



CONSULT | DESIGN | BUILD | MAINTAIN

[timh@crosstekco.com](mailto:timh@crosstekco.com)



# ABOUT THE SESSIONS

## MONDAY, JUNE 5 | 3:00 PM – 4:30 PM (EST)

### Session 9: Bats — Practices, Roosting & Dispersal (93,200,201,238)

- 93** Bats in swallow nests: implications for bat conservation — Jill Carpenter, LSA Associates
- 200** Converting Abandoned Railroad Tunnels into Bat Hibernacula: Benefiting Bats and Transportation Organizations — Janette Perez-Jimenez, University of Cincinnati, USA
- 201** Use of Innovative Technology to Deter Bat Bridge Use Prior to and During Construction — Basak Bektas, Dept. of Mechanical and Civil Engineering, Minnesota State University, Mankato
- 238** A Streamlined and State-specific Approach to Bat Consultation on Routine Transportation Projects in Georgia — Morgan Niccoli, Arcadis, Inc.

### Session 20: All Creatures and Crossings Great and Small (47, 148, 188, 221)

- 47** Capturing Herpetofauna and Small Mammals with Camera Traps and Infrared Trip Wire Systems — Madison Nadler, University of Texas Rio Grande Valley
- 148** Wood Turtles to Moose: A Corridor Approach to Connectivity along a State Highway in Central VT — Laura Stone P.E., Vermont Agency of Transportation
- 58** Temporal clustering of prey in wildlife passages provides no evidence of a prey-trap — April Martinig, University of New South Wales
- 221** Big crossings for small animals: evaluating timelines for discovery, use, and occupancy of wildlife crossing structures by various small mammal species — Lindsay Millward, Oregon State University

## TUESDAY, JUNE 6 | 9:15 AM – 10:45 AM (EST)

### Session 10: Staying Current with Aquatic Habitats (57, 71, 82, 109)

- 57** Stream & Wetland Mitigation Forecasting: Developing a Predictive Model for Faster Project Delivery and Cost-Savings — Elizabeth Myers Toman, The Ohio State University
- 71** Environmental DNA Applications for the Detection of Freshwater Mussels and Use for Facilitating ESA Section 7 Consultation — Nathaniel T. Marshall, Stantec Consulting Ltd., Columbus, Ohio
- 82** Fish Passage and Macroinvertebrate Colonization in Constructed Stream Channels as an Indicator of Aquatic Connectivity Following Culvert Removal — Paul W. James, Central Washington University
- 109** Remote Biologists – Integrating UAS and Spatial Data in Wetland Detection & Modeling — Blake Walter, Felsburg Holt & Ullevig

## DUDEK

*Passion yields excellence.  
Passion drives progress.  
Put our passion to work for you.*

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### SERVICES

#### Transportation Ecology

- Advance Planning for Transportation Projects
- Wildlife Camera Studies
- Wildlife Crossing Planning and Design



#### AI Wildlife Image Processing

- Image Processing through Pattern Recognition
- Customized Image Management
- Automated Actionable Data Outputs



# ABOUT THE SESSIONS

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**TUESDAY, JUNE 6 | 9:15 AM – 10:45 AM (EST)**

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## Session 11: Wildlife Connectivity — Models and Movements (42, 64, 151, 168)

- 42** More than Models and Field Data: Site-specific Design of Wildlife Crossings in Alaska — Simon Wigren, HDR
- 64** A Scientific Approach to Developing Habitat Connectivity Mitigation — Piper Wallingford, The Nature Conservancy
- 151** Landscape linkage models do not consistently predict wildlife movement — Autumn Iverson, Road Ecology Center, University of California, Davis
- 168** Incorporating elk movement behavior from GPS monitoring to identify high priority areas for road mitigation along I-40 near Great Smoky Mountains National Park — Liz Hillard-Wildlands Network

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## Session 13: Linear Infrastructure Impacts on Biodiversity in Africa (7, 27, 171, 239)

- 7** Activity patterns and mortalities of wildlife along the Phalaborwa – Hoedspruit railway line in Balule Nature Reserve, South Africa — Siboniso Thela
- 27** Linear infrastructure and primates: impact and mitigation examples from South Africa, Africa and beyond — Birthe Linden, University of Venda & Lajuma Research Centre
- 171** Roadkill in Ethiopia: a case study examining vertebrate road mortality on selected highways passing through four spatially isolated protected areas of eastern Ethiopia — Getachew Mulualem Ethiopian Biodiversity Institute
- 239** The effect of Linear infrastructure on vertebrates in Hluhluwe-iMfolozi Park and Isamangalis Wetland Parks in KwaZulu-Natal, South Africa — Cameron Cormac, Centre for Functional Biodiversity, University of KwaZulu-Natal

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## Session 14: I Saw the Sign (100, 101, 150, 223)

- 100** Effect of wildlife crossings signs on driver's speed: an experiment on BR-262, Mato Grosso do Sul, Brazil. — Beatriz Cecato Dumalakas - Luiz de Queiroz" College of Agriculture (ESALQ) - University of São Paulo (USP)
- 101** New prototype of road sign based on temporal models that warns drivers in real time about the risk of animal-vehicle collision: implementation at regional scale and first results — Victor J Colino Rabanal. Department of Animal Biology. University of Salamanca (Spain)
- 150** Animal and driver behavior near the moment of collision: implications for design of collision reduction measures — Victor J Colino Rabanal. Department of Animal Biology. University of Salamanca (Spain)
- 223** Towards safer roads: the LIFE SAFE-CROSSING project in Greece — Yorgos Iliopoulos, CALLISTO: Wildlife and Nature Conservation Society, Greece

---

## Session 17: Making Wildlife Crossings Make Cents (46, 126, 187, 219)

- 46** Economic Decision Support for Wildlife-Vehicle Conflict Reduction — Graham Porter, Road Ecology Center, University of California, Davis
- 126** Collaborating to Catalyze Action – A Funder's Perspective on Connectivity Conservation in California — Neal Sharma, Wildlife Conservation Network

# ABOUT THE SESSIONS

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**187** West-Wide Assessment of Cost-Effective Opportunities for Mitigating Wildlife Vehicle Collisions and Ecological Connectivity — Kylie Paul, Center for Large Landscape Conservation

**219** Taking the long road: A 10-year approach for valuing and evaluating wildlife crossings for compensatory mitigation on Florida's roadways — Ben Shepherd, Inwood Consulting Engineers, Inc.

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## TUESDAY, JUNE 6 | 9:15 AM – 10:45 AM (EST)

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### Lightning Session 1: Aquatic Ecology and Sustainability (11, 31, 85, 146, 177, 182, 186, 214, 218, 226)

**11** A Decision Support Tool for the Sustainability Rating Index for the Maintenance of Rural Roads in India — Raji Reddy Myakala, National Institute of Technology Warangal

**31** Data Analytics Tools for Ecology Program Management — Jason Morrell, Arcadis U.S., Inc.

**85** Tri-State Perspective of Seed Based Restoration — Cathy Ford, Idaho Transportation Dept.

**146** Stream Crossings in Transition: Design of Culverts and Bridges on the Frontline of Coastal Wetlands Migration — Carrie Banks, Massachusetts Division of Ecological Restoration

**177** Environmental DNA: A new tool for Transportation Projects — Jake Riley, Stantec Consulting

**182** Full-delivery DOT P3s for TMDL Reductions — Micah Shapiro, Resource Environmental Solutions

**186** Healing Springs Natural Area: Rare Fish Species and Stream Mitigation Needs Drive Acquisition of a Natural Area in a Rapidly Urbanizing Landscape — Kayti Ewing, Arkansas Department of Transportation

**214** Effects of the life history stages and water quality parameters on the toxicokinetics of 6PPD-quinone, an acutely toxic tire rubber byproduct, in coho salmon — Garrett Foster, Washington State University

**218** Transportation supports Recovery of Threatened Crayfish — Katasha Cornwell, Florida Department of Transportation

**226** Incorporating NAACC scoring methodology into project objectives and anticipating post construction scores on a Large Culvert program in New York State. — NYS Department of Transportation

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## TUESDAY, JUNE 6 | 11:00 AM – 12:30 PM (EST)

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### Session 12: Where do we go? Traffic, Fencing and Wildlife (19, 222, 233, 236)

**19** Influence of traffic volume on the variation in the mammal community composition within the road effect zone — Thomas Yamashita, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville

**222** Effects of Traffic Volume on the Success of Right-of-Way Fence Modifications for Pronghorn Permeability — Jeff Gagnon Arizona Game and Fish Department

**233** Evaluating the Effectiveness of Redesigned Wildlife Exits Along a South Texas Highway — Jamie Langbein, University of Texas Rio Grande Valley

**236** Estimating road age and traffic volume using machine learning to understand how vehicular traffic is affecting Greater sage-grouse in Wyoming — Richard Inman, U.S. Geological Survey

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# ABOUT THE SESSIONS

**TUESDAY, JUNE 6 | 11:00 AM – 12:30 PM (EST)**

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## Session 15: Don't Squish the Squamata: Road Ecology and Herps (4, 37, 133, 165)

- 4** Why did the Albany Adder Cross the Road? Or did it? Methods to detect and mitigate extinction threats to an elusive dwarf adder — Shona MacAffer, Edinburgh University
- 37** Do Wildlife Underpasses Reduce Mortality Among Amphibians in Vermont? — Matthew R. Gorton, Rubenstein School of Environment and Natural Resources, University of Vermont
- 133** Predicting zones of high-turtle-presence on roads: A tool to identify locations in need of mitigation — Steffy Velosa, Concordia University, Department of Geography, Planning and Environment, Canada
- 165** Amphibian Road Crossing Hotspot Modeling — Jed Merrow, McFarland Johnson

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## Session 16: Automated and AI Processing for Safety and Ecology (53, 104, 129, 180)

- 53** AI/ML Solutions for Wildlife Vehicle Collision Hotspot & Road Surface Analysis — Roland Dijkhuizen, Arcadis Nederland B.V.
- 104** AI Assisted Wildlife Camera Trap Image Processing and Management — David Waetjen, Road Ecology Center, UC Davis and Dudek
- 129** Rapid Animal Detection and Identification System - RADIS — Vedant Srinivas, Eastlake High School, Sammamish, Washington
- 180** AI applications in advanced roadside sensing systems — Hao Xu, Associate Professor, University of Nevada, Reno

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## Session 18: Addressing Connectivity & Linear Infrastructure (43, 48, 97, 154)

- 43** Planning and Designing California High-Speed Rail for Wildlife Movement: Stakeholder Engagement, Impact Assessment, and Mitigation on the San José to Merced Project Section — Serge Stanich, California High-Speed Rail Authority
- 48** IUCN Protected Area Technical Report: Addressing ecological connectivity in the development of roads, railways and canals. Ament R, Clevenger AP, van der Ree R, editors. — Melissa Butynski, Center for Large Landscape Conservation
- 97** Investigating and mitigating potential wildlife-connectivity effects of a very large aqueduct in California — Brock Ortega, Dudek
- 154** Research Results and Mitigation Strategies to Improve Wildlife Connectivity and Human Safety along I-40 in the Pigeon River Gorge near the Great Smoky Mountains National Park — Steve Goodman, National Parks Conservation Association

# ABOUT THE SESSIONS

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**TUESDAY, JUNE 6 | 11:00 AM – 12:30 PM (EST)**

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## Session 19: Planning & Partnerships at Scales Big and Small (23, 123, 125, 208)

- 23** Regional Greenspace Planning Partnerships in the Greater Cincinnati Area — Margaret Minzner, OKI Regional Council of Governments
  - 123** Corridor K of the Appalachian Development Highway System: Fresh Perspectives on Environmental Stewardship and Project Delivery — Wanda Payne, NC Department of Transportation
  - 125** Partnerships Pave the Way: Highway 17 Wildlife Crossing Completed for Mountain Lions in Santa Cruz County, California — Morgan Robertson, California Department of Transportation
  - 208** Robert Moses Parkway Transformation, Niagara Falls, NY — Peter Pasnik, New York State Department of Transportation
- 

## Lightning Session 2: Terrestrial Ecology & Tools (15, 33, 45, 60, 77, 88, 92, 185, 199, 207)

- 15** Virginia's First Wildlife Corridor Action Plan — James Hatcher, Virginia Department of Transportation
- 33** Influence of Traffic and Noise on Bobcat and Coyote Behavior and Use of Wildlife Crossing Structures in Southern Texas — Anna Rose Mehner, University of Texas Rio Grande Valley – Brownsville
- 45** Development of public policies to promote mitigation of animal-vehicle collisions on roads using participatory and transdisciplinary approaches — Larissa Oliveira Gonçalves - Laboratório de Ecologia, Universidade Federal do Rio Grande do Sul, Brasil
- 77** What makes a road verge species rich? — Svenja B. Kroeger - The Norwegian Institute for Bioeconomy Research (NIBIO; Trondheim, Norway)
- 88** To What Extent Have the Mandates of Transportation Agencies been Improved Regarding the Consideration of Biodiversity? An International Comparison. — Sabrina Mruczek, Concordia University
- 92** A Non-Profit Community-based Organization and a For-Profit Technology Company Collaborate on a Citizen Science Project to Increase Awareness Amongst Drivers in an Exurban Community — Amanda Keil, Wild Aware
- 185** Optimal Locations for EV Charging Stations with focus on Sustainability, Advancing Innovative Technologies and Carbon Footprint Reduction — Syeda (Zeema) Haque, PE and Catie Seaton, Modern Geosciences
- 199** Organizing and Sharing Wildlife Crossing Photos -FDOT's Wildlife Bridge Crossing GIS Site — Brent Setchell, Florida Department of Transportation District 1
- 207** Over, Under, A Road Runs Through: A Collaborative Secondary Educational Module on Wildlife Crossings and Habitat Connectivity — Amanda Keil, ARC Solutions



# ABOUT THE SESSIONS

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**TUESDAY, JUNE 6 | 2:00 PM – 3:30 PM (EST)**

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## Session 21: Policy and Partnerships - Break down Silos (3, 40, 52, 205)

- 3** Advancing innovative transportation solutions as part of an integrated, collaborative approach to regional connectivity and climate resilience — Mikael Cejtin, Staying Connected Initiative
  - 40** Highway Departments as Watershed Stewards – Trans-jurisdictional Challenges and Opportunities for Reducing Flooding — Sara Reynolds, Cornell University
  - 52** An Analysis of State and Local Connectivity Policies Impacting Transportation Ecology — Travis Brammer, Ruckelshaus Institute of Environment and Natural Resources, University of Wyoming
  - 205** Breaking Down State Agency Silos Between Wildlife and Transportation — Matt Howard, Utah Department of Transportation
- 

## Session 22: Tools from a Policy and Program Toolbox (32, 91, 107, 147)

- 32** Vermont's Highways & Habitats Trainings and a Culture of Connectivity and the Vermont Agency of Transportation — Chris Slesar, Vermont Agency of Transportation
  - 91** Digital Tools for Engaging Audiences — Melissa Rottenberg (Arcadis)
  - 107** Leveraging Section 10 of the Endangered Species Act to Cover DOT Projects (Even When there is a Section 7 Nexus) — David Zippin
  - 147** Open tools for collaborative wildlife management and conservation — Sarah C Davidson, the Ohio State University and Max Planck Institute of Animal Behavior
- 

## Panel 2: Building a Crossing, Building a Movement: The Wallis Annenberg Wildlife Crossing and Beyond)

This panel will discuss the Wallis Annenberg Wildlife Crossing, a project for the next century, providing a lasting benefit to wildlife for generations to come. More than two decades of study by the National Park Service in the Los Angeles area has shown roads and development are not only proving deadly for animals trying to cross, but have also created islands of habitat that can genetically isolate all wildlife—from bobcats to birds to lizards. Beth Pratt (NWF) will moderate discussion with panelists, including California Secretary of Natural Resources, Wade Crowfoot.

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## Panel 3: Asia's Linear Infrastructure safeGuarding Nature (ALIGN) Project

This panel will give a series of presentations on the challenges of linear infrastructure expansion in Asia and how the ALIGN project is addressing some of these issues at local and regional scales through partnerships and collaboration, in the three focal countries: Mongolia, India and Nepal. USAID will also discuss its efforts to support smarter, greener, community-sensitive development of LI in Asia.

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## Workshop 1: Wildlife Crossing Safety Workshop

This workshop will focus specifically on the requirement in BIL for FHWA to conduct a study of the state of the practice of methods to reduce collisions between motorists and wildlife, and to produce an associated Report to Congress. The study will assess the causes and impacts of wildlife-vehicle collisions on motorists and wildlife and include solutions and best practices for reducing wildlife-vehicle collisions, and improving habitat connectivity for terrestrial and aquatic species.

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# ABOUT THE SESSIONS

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**THURSDAY, JUNE 8 | 9:00 AM – 10:30 AM (EST)**

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## Panel 4: Making Connections — Transportation and Aquatic Conservation

This panel explores different approaches to support transportation infrastructure improvements that benefit communities and aquatic ecosystems. Panelists will highlight specific projects, best practices, and recent science, as well as collaborative actions and the regulatory role NOAA Fisheries undertakes to benefit ecosystems and transportation.

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## Session 23: Wildlife Corridors and Transportation Planning (22, 38, 111, 232)

- 22** How Wildlife Concerns Are Incorporated Into Transportation Planning — Patricia Cramer, Wildlife Connectivity Institute
  - 38** Wildlife Connectivity and Transportation Mitigation in Oregon: Partnerships in the Development of the Oregon Wildlife Corridor Action Plan — Rachel Wheat, Oregon Dept of Fish and Wildlife
  - 111** Trade-offs when setting statewide priorities for wildlife road crossings: a nonprofit-led case study for North Carolina — Ron Sutherland, Wildlands Network
  - 232** Development and Implementation of New Mexico's Wildlife Corridors Action Plan — James Hirsch, New Mexico Department of Transportation
- 

## Session 24: A Road Less Traveled — Wildlife Movement and Crossings (1, 56, 58, 144)

- 188** Mojave Desert Tortoise Transportation Ecology Task Force: An interdisciplinary approach to help save a threatened species — Elizabeth Fairbank, Center for Large Landscape Conservation
  - 1** Spatio-temporal responses to road-related disturbance by a mammal community in a tiger landscape — Akanksha Saxena, Wildlife Institute of India
  - 56** Wild boars extend their home ranges along road barriers — Marcus Elfström, EnviroPlanning AB
  - 144** Desert Bighorn Sheep Prefer Overpasses . . . Or Do They? — Chad Loberger, Arizona Game and Fish Department
- 

## Session 25: Reducing WVC in the Space-Time Continuum (167, 190, 193, 198)

- 167** A spatiotemporal analysis of ungulate-vehicle collision hotspots in response to road construction and realignment — Sandra MacDougall, Red Deer Polytechnica
  - 190** Prioritizing Wildlife Crossings in North Carolina — Alex Vanko, Wildlands Network
  - 193** Spatially Explicit Decision Support to Resolve Wildlife-Vehicle Conflict — Fraser Shilling, Road Ecology Center, University of California, Davis
  - 198** Spatiotemporal assessment of wildlife-vehicular collisions in New Hampshire — Amy Villamagna, Plymouth State University
- 

## Session 26: "Structure"d Partnerships for Wildlife (99, 124, 131, 237)

- 99** Building Bridges: How Colorado is Reimagining Collaboration to Address Wildlife Connectivity — Michelle Cowardin (Colorado Parks & Wildlife)
- 124** Bridging the Gap: Cultivating Successful Partnerships and Conservation Outcomes with Diversity, Equity, and Inclusion — Shannon Crossen, ICF Jones and Stokes
- 131** Land trusts and wildlife crossing structures: How to involve private land partners in projects to reduce wildlife-vehicle conflict and reconnect landscapes — Kylie Paul, Center for Large Landscape Conservation
- 237** Partnerships and Planning to Reduce Wildlife and Transportation Conflicts in the Greater Yellowstone Ecosystem — Elizabeth Fairbank, Center for Large Landscape Conservation



# ABOUT THE SESSIONS

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## THURSDAY, JUNE 8 | 10:45 AM – 12:15 PM (EST)

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### Session 27: Diving in to the First Pooled Fund Study for Transportation Ecology (78, 116, 191, 229)

- 116** Benefits of initiating a pooled fund study — Nova Simpson, Nevada Department of Transportation
  - 191** Cost-benefit analyses of mitigation measures along highways for large animal species: An update and an expansion of the 2009 model — Marcel Huijser, Western Transportation Institute, Montana State University
  - 78** Innovative Fiber-Reinforced Polymers for Wildlife Crossing Infrastructure — Matthew Bell, Western Transportation Institute
  - 229** Efficacy and Design of Elevated Road Segments for Small Animal Passage — Cheryl Brehme, US Geological Survey
- 

### Session 28: So, Was There an Impact? Post-Construction Assessment (87, 117, 160, 175)

- 87** Multiyear post-construction monitoring of two ocelot road mortality mitigation projects in southern Texas — Kevin W. Ryer, School of Earth, Environmental, and Marine Sciences, University of Texas Rio Grande Valley - Brownsville
  - 117** Justifying mitigation via highway impacts on wildlife distributions, behaviors, gene flow, and mortality. — Scott LaPoint, Black Rock Forest
  - 160** Post-assessment of the eco-environmental impact of highway construction--a case study of Changbai Mountain Ring Road — Xiaochun Qin, School of Civil Engineering, Beijing Jiaotong University
  - 175** A bridge for the tiger: the story of mitigation measures on India's oldest highway — Bilal Habib, Wildlife Institute of India
- 

### Session 29: Non-Traditional Partnerships for Connectivity Conservation (89, 189, 215, 228)

- 89** Advancing Wildlife Crossings on I-70 East Vail Pass through Community-led Partnerships — Julia Kintsch, ECO-resolutions
  - 215** Local solutions to planning and funding of wildlife crossings: A case study from Teton County Wyoming — Chris Colligan, Teton County
  - 189** The role of land trusts in enhancing wildlife connectivity: A case study from Coyote Valley, CA. — Marian Vernon, Peninsula Open Space Trust
  - 228** NGO-led road ecology research: a catalyst for diverse partners and local support for mitigation on I-40 near Great Smoky Mountains National Park — Liz Hillard-Wildlands Network
- 

### Panel 5: Navigating Wildlife Infrastructure Opportunities in the Infrastructure Investment and Jobs Act

This panel will share lessons learned by state agency and NGO representatives on how best to navigate the various Federal wildlife crossing funding opportunities, with a focus on evaluating discretionary grant requirements. The panel will also focus on strategies for prioritizing how best to match-up wildlife infrastructure projects with the various federal funding pots. Presenters will highlight case studies from successful and ongoing fundraising efforts and will discuss such topics as how to develop competitive applications, leverage partnerships, and stay up-to-date on available funding opportunities. Panelists: Renee Callahan - ARC Solutions, Brent Setchell (v) - Florida DOT Tony Cady (v) - Colorado DOT, Mikael Cejtin - Staying Connected Initiative, Scott Jackson - North Atlantic Aquatic Connectivity Collaborative, Wayne Emington (v) - National Park Service



# POSTER SESSION

TUESDAY, JUNE 6 | 4:30pm (EST)

Abstract # in ( )

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**Comparing two standardized data-collection protocols for road mortality surveys: Bike or car? (2)**

Jochen A.G. Jaeger, Concordia University Montreal, Canada

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**A Hotspot Analysis of WVCs in Virginia Using GIS Applications (6)**

Stephen Bell, Virginia Tech Transportation Institute

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**FHWA New York Division's Endangered Species Act Compliance Procedures (8)**

Melissa Toni, Federal Highway Administration

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**Increasing Light Pollution, Its Effect on Nighttime Ecology and a Scalable Solution to Reversing the Trend (9)**

Tim Brothers, Massachusetts Institute of Technology and International Dark-sky Association

---

**Roadkill Observation and Data System (ROaDS) Deployment for Federal Lands (10)**

Matthew Bell, Western Transportation Institute

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**Victoria St. road widening project: a successful transportation – ecology partnership. (12)**

Jackie Scott, Central Lake Ontario Conservation Authority

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**Protecting Transportation Infrastructure while Maintaining Wetland Functions – Strategies for Resolving Human-Beaver Conflicts (16)**

Tyler Brown, Vermont Fish and Wildlife Department

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**Analysis of news related to vehicular collisions with wildlife: does the media reflect the reality of the highways in Mato Grosso do Sul? (206)**

Rafael Batista de Moraes, "Luiz de Queiroz" College of Agriculture (ESALQ) - University of São Paulo (USP)

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**The Effects of Drive – Through Mobile Emissions on Air Quality (18)**

Tryston Calder

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**Going to Bat – A Cooperative Approach to the Conservation of Summer Roosting Bats in New Jersey Bridges (20)**

Ami Gulden, CWB, PWS, Dewberry

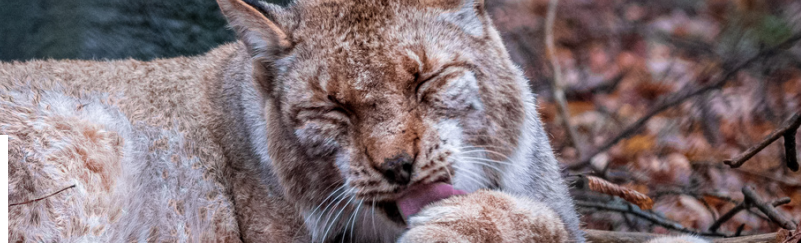
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**The Effect of Road Mitigation Structures on the Texas Tortoise (*Gopherus berlandieri*) (21)**

Elizabeth A. Saldo, University of Texas Rio Grande Valley

# POSTER SESSION

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**Designing Experimental Studies for Determining the Effectiveness of Roadkill Mitigation Measures: A Bayesian Approach Applied to Odor Repellents (24)**

Michal Bíl, CDV, Transport Research Centre

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**Use of I-90 wildlife crossing structures in Washington's Cascade Mountains assessed by camera trap data on medium to large mammals (25)**

Alison Scoville, Central Washington University

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**Evaluating a watershed approach to stormwater mitigation with the Stochastic Empirical Loading and Dilution Model (SELDM) (26)**

Gregory E. Granato, U.S. Geological Survey

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**Bringing New Technologies to an Old Science (28)**

Chelsea Harris, AECOM

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**Central Florida I-4 Wildlife Crossing Need, Design, & Construction update (34)**

Nicole Monies, FDOT

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**Regaining Ground: In-house Partnerships to Convert Underutilized Outdoor Spaces into Pollinator Resources at Transportation Agency Facilities (203)**

Alissa Salmore, Idaho Transportation Department

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**Environmental Impact of PHEV to BEV Transition: A Life Cycle Assessment Study (41)**

Scarlett Alexander, San Diego State University

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**A Literature Analysis to Determine Optimal Wildlife Crossing Structure Size (49)**

Pat Basting, Jacobs; John Kronholm, presenter CDOT

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**A Multi-faceted Approach to Improve Conditions for Pollinators along Washington State Highways (50)**

Katina Kapantais, Washington State Department of Transportation

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**Road Ecology in North-Eastern Sierras: Research and Collaboration to Enhance Restoration of Wildlife Connectivity and Public Safety on Hwy 395 (51)**

Mari Galloway, Wildlands Network

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**Designing Wildlife Crossings to Meet Focal Species Needs: An Example from Interstate 15 Connectivity Planning efforts in Southern California (55)**

Trish Smith, The Nature Conservancy

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# POSTER SESSION

TUESDAY, JUNE 6 | 4:30pm (EST)

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## **Natural History Resource Centre in Kenya: A Feasibility Study (59)**

Elisha Akech Ochungo, Multimedia University, Kenya

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## **Reconnecting Northern California Habitats: A Presentation of Caltrans North Region Wildlife Connectivity Projects (63)**

Hannah Clark, Caltrans

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## **Integration of Natural Capital and Nature-based Solutions (NbS) to move the needle toward carbon footprint reduction (65)**

Virginia (Ginny) King, Stantec

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## **Integrating Stakeholders and Connectivity Data in Wildlife Crossing Infrastructure Planning for Highway 58 in the Tehachapi Linkage in Central California (67)**

Katie Rodriguez, CA Dept. of Transportation (Caltrans)

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## **Partnering for the Commonwealth: Incorporating Natural Resource Priorities into Transportation Planning for a Resilient Landscape (69)**

David Paulson, MA Department of Transportation Highway Division

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## **Modified jump-outs for white-tailed deer and mule deer (204)**

Marcel P. Huijser, Western Transportation Institute - Montana State University

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## **Engaging in cooperative research and development partnerships to advance the science of ecosystem monitoring across the Nation (72)**

Joseph Bell, US Geological Survey

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## **Partnership & Coordination to Support Transportation, Ecology & Park-like Character within Adirondack Travel Corridors (209)**

Alexandra von Bieberstein, New York State Department of Transportation

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## **Bat activity differences between highway sites with and without wildlife crossing structures depends on echolocation frequency guild (75)**

Jenna L. Chapman

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## **Mammal use of underpasses to cross Route 606 in Guacimal, Costa Rica (76)**

Eleanor Turner, University of California San Diego

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## **Amphibian and reptile use of mitigated habitats and crossing structures in the Snoqualmie Pass area of Interstate-90 in Washington State, USA (80)**

Jason T. Irwin, Central Washington University

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# POSTER SESSION

TUESDAY, JUNE 6 | 4:30pm (EST)



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## **Linear infrastructures and Biodiversity in Africa (81)**

Wendy Collinson, Jonker The Endangered Wildlife Trust

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## **Advancing the consideration of ecological connectivity in environmental assessment: Synthesis of current challenges and steps ahead (83)**

Jochen A.G. Jaeger, Concordia University Montreal, Canada

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## **Assessing major linear infrastructure threats to great apes and gibbons across three pilot landscapes (84)**

Melissa Butynski, Center for Large Landscape Conservation

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## **Securing Connectivity Across Highways for Jaguars in Strategic Regions of Sonora and Sinaloa, Mexico (86)**

Cecilia Aguilar Morales, Wildlands Network

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## **Opportunities for Air Pollution and Climate Mitigation using Roadside Green Infrastructure (213)**

Richard Baldauf, US Environmental Protection Agency

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## **Ecosystem-based, Core-independent Regional Connectivity to Inform Conservation Networks at Multiple Scales (96)**

Scott D. Jackson, University of Massachusetts Amherst

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## **Considerations for Determining Advance Mitigation Credits for Wildlife Connectivity Actions (106)**

Laurel Low, CA Department of Fish and Wildlife

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## **Implementing Unmanned Aerial Systems and Aerial Pesticide applications for Compensatory Mitigation and Wetland Restorations (108)**

Wes Cartner, North Carolina Department of Transportation

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## **South Jersey Transportation Authority (SJTA) Roadway Environmental Advancement Initiative (READI) (110)**

Nicholas Marchese, South Jersey Transportation Authority

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## **I-91 Brattleboro Bridge - A Bridge to Nature - Enhancing Infrastructure to Preserve and Celebrate the Landscape (112)**

Linda Figg, FIGG Group Inc.

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## **How Do You Determine Achievable Ecological Uplift in Stream Restoration? Biological Monitoring Pre- and Post-Stream Restoration (113)**

Bree Stephens, RES

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# POSTER SESSION

TUESDAY, JUNE 6 | 4:30pm (EST)

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**Wildlife Use Culverts to Cross the Pan-American Highway in Guanacaste Conservation Area, Costa Rica (119)**

Tom Langen, Clarkson University

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**A multi tools approach for assessing the impact of two different linear transport infrastructures on landscape connectivity for four terrestrial mammals species. (120)**

Lucie DISPAN de FLORAN, University of Reims Champagne-Ardenne, France

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**Pikas Rock! Use of linear infrastructure rock embankment and wildlife crossing structures by the American Pika (*Ochotona princeps*), a rocky habitat specialist (121)**

Kristina Ernest, Department of Biological Sciences, Central Washington University

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**A multi-partner effort to plan for connectivity and safe passage on highways between three California mountain ranges (224)**

Marian Vernon, Peninsula Open Space Trust

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**Wildlife Connectivity Efforts in Caltrans District 7 (Los Angeles and Ventura Counties) (134)**

Celina Oliveri, Caltrans

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**Social equity implications of future mobility (135)**

Marc Brenman, IDARE LLC

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**The combined effects of anthropogenic disturbance, local-scale environment, and structural characteristics on wildlife crossing use in South Texas (137)**

Thomas J. Yamashita, Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville

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**Safe Passages for Wildlife on Interstate-10 East of Tucson, Arizona: Applying science to achieve on the ground mitigation (138)**

Jessica A. Moreno, Coalition for Sonoran Desert Protection

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**National Seed Strategy - Restoring Resilience (139)**

Brian Smith, FHWA

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**Avoiding Dead-End Wildlife Crossings – Achieving Connectivity Across and Beyond Highway Rights of Way Through Multi-Organization Collaboration, Planning, Design, Mitigation, and Land Securement (141)**

David MacKinnon, Nova Scotia Environment & Climate Change

# POSTER SESSION

TUESDAY, JUNE 6 | 4:30pm (EST)



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**Prioritizing Wildlife Passage Infrastructure Improvements via Optimized Hot Spot Analysis and Modeling Deer-Vehicle Collision Count-Data (142)**

Chris Standley, NYS Dept. of Transportation

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**NY Routes 400/16 Roundabout Center Island Stormwater Infiltration, Aurora, NY.(143)**

Andrew Schrauth, New York State Department of Transportation

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**Connecting Habitat, Wildlife, and Community in the Gaviota Coast: A Case Study (145)**

Shannon Crossen, ICF Jones and Stokes

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**Federal Highway Administration Implementation of BIL Section 11123: Wildlife Crossing Safety (149)**

Colleen Fletcher, Federal Highway Administration

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**Animal and driver behavior near the moment of collision: implications for design of collision reduction measures (150)**

Victor Colino Rabanal, University of Salamanca

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**Latin America and Caribbean Transport Working Group (153)**

Mirna Manteca, Wildlands Network/Latin America and Caribbean Transport Working Group

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**Monitoring of herptofauna-specific road crossing structures in Southern Appalachia reveals use by timber rattlesnakes (*Crotalus horridus*) and a diversity of other wildlife species. (155)**

Liz Hillard, Wildlands Network

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**Ecology of Play: Restoring Streets as Both Spaces for Play and Urban Watersheds (158)**

Ethan Pepin, Rutland Regional Planning Commission/Tufts University

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**The Management of Private Road Crossings in the Lake Champlain Basin (159)**

Luke Briccetti, Graduate Student, SUNY Plattsburgh

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**Teaming with stakeholders for success in aquatic habitat restoration (161)**

Garrett Jackson, Washington State Department of Transportation

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**Identifying and Prioritizing Core Linkages for American Marten alongside Transportation Infrastructure in the Adirondack Mountains, New York, USA. (166)**

Chris Standley, NYS Dept. of Transportation



# POSTER SESSION

TUESDAY, JUNE 6 | 4:30pm (EST)

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## **California Department of Fish & Wildlife's Terrestrial Barrier Dataset (169)**

Michael Hardy, Biogeographic Data Branch, California Department of Fish & Wildlife

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## **Resilience governance of social-ecological systems (170)**

Ahjond Garmestani, U.S. Environmental Protection Agency

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## **VDOT's Enrollment in the Monarch Candidate Conservation Agreement with Assurances (CCAA) (227)**

Susan Alexander, Virginia Dept. of Transportation

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## **Increasing safety and improving connectivity through multi-stakeholder leadership. (176)**

Victor Grivegnée-Dumoulin, Corridor Appalachien

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## **Integration of Weed-Suppressive Bacteria With Herbicides to Reduce Exotic Annual Grasses (179)**

Matt Germino, USGS

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## **Ecological Connectivity Plan, Highway 10, Quebec, Canada : Increasing safety, Improving connectivity and stakeholders leadership (181)**

Victor Grivegnée-Dumoulin, Corridor Appalachien

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## **Evaluation of Roadside Pollinator Habitat & Management Practices (184)**

Diane Debinski & Rob Ament

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## **Mountain yellow-legged frog, mitigation, captive breeding, translocation, multi-agency (192)**

Francois Appiah, Caltrans

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## **Federal Funding Opportunities to Reduce Wildlife-Vehicle Collisions and Improve Fish Passage & Habitat Connectivity (194)**

Renee Callahan, ARC Solutions

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### Non-Government Organizations

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Endangered Wildlife Trust  
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