



# ICOET 2015 Preliminary Program Agenda International Conference on Ecology and Transportation

September 20-24, 2015 | Raleigh Convention Center | Raleigh, North Carolina, USA

SUNDAY September 20	
1:00pm – 5:00pm	<b>Pre-Conference Workshop</b> <b>Innovative Approaches to Wildlife and Highways Interactions: The Basics</b> <i>(Room: TBA)</i>
2:00pm – 6:00pm	Registration Open   Exhibit Set-up for Sponsors Presenter Set-up for Poster Session 1   Sponsor Organization Meetings <i>(TBA)</i>
4:00pm – 5:00pm	<b>ICOET Steering Committee Meeting</b> <i>(Room: TBA)</i>
	Dinner on your own
7:00pm – 8:30pm	<b>Transportation Research Board (TRB) ADC30 Committee Meeting</b> <i>(Room: TBA)</i>

MONDAY September 21				
7:00am – 8:30am	Continental Breakfast			
7:00am – 3:00pm	Presenter Set-up for Poster Session 1 <i>(Room: TBA)</i>			
8:00am – 10:00am	<b>OPENING PLENARY SESSION</b> <b>Welcome Remarks and Invited Speakers</b> <i>(Room: TBA)</i>			
10:00am – 10:30am	Refreshment Break   Preview Posters   Sponsor Exhibits Open			
PARALLEL SESSIONS 10:30am – 12:00pm	<b>SESSION 101</b> Crossing Structures, Reducing Collisions, Increasing Connectivity – Part I <i>(Room: TBA)</i>	<b>SESSION 102</b> Sustainability and Resilience in Transportation Systems – Part I <i>(Room: TBA)</i>	<b>SESSION 103</b> Aquatic Wildlife, Ecosystems, and Wetland Interactions – Part I <i>(Room: TBA)</i>	<b>SESSION 104</b> Developing and Deploying Large- Scale Programmatic Approaches – Panel Discussion <i>(Room: TBA)</i>
12:00pm – 1:15pm	<b>Luncheon with Keynote Speaker Andrew Winston</b> <i>(Room: TBA)</i>			
PARALLEL SESSIONS 1:30pm – 3:00pm	<b>SESSION 105</b> Staying Connected in the Northern Appalachians – Panel Discussion <i>(Room: TBA)</i>	<b>SESSION 106</b> Planning for Transportation Ecology – Part I <i>(Room: TBA)</i>	<b>SESSION 107</b> Terrestrial Wildlife and Ecosystem Interactions – Part I <i>(Room: TBA)</i>	<b>SESSION 108</b> Mitigation for Transportation Projects <i>(Room: TBA)</i>
3:00pm – 3:30pm	Refreshment Break   Preview Posters   Sponsor Exhibits Open			
3:30pm – 5:30pm	<b>POSTER SESSION 1</b> <i>(Room: TBA)</i>			
6:00pm – 8:00pm	<b>Welcome Reception at Jimmy V's Osteria</b> <i>(Sheraton Raleigh Hotel)</i>			
6:30pm – 10:00pm	Presenter Set-up for Poster Session 2 <i>(Room: TBA)</i>			

Registration and Sponsor Exhibits Open

TBA: To Be Announced



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TUESDAY September 22					
7:00am – 8:30am	Registration and Sponsor Exhibits Open	Continental Breakfast			
7:00am – 8:30am		Sponsor Organization Meetings (TBA)			
7:00am – 3:00pm		Presenter Set-up for Poster Session 2 (Room: TBA)			
PARALLEL SESSIONS 8:30am – 10:00am		SESSION 201 Crossing Structures, Reducing Collisions, Increasing Connectivity – Part II (Room: TBA)	SESSION 202 Sustainable Urban Mobility Plans – Panel Discussion (Room: TBA)	SESSION 203 Best Management Practices for Construction, Operations, and Maintenance (Room: TBA)	SESSION 204 Transportation Ecology Policy and Regulatory Developments (Room: TBA)
10:00am – 10:30am		Refreshment Break   Preview Posters   Sponsor Exhibits Open			
PARALLEL SESSIONS 10:30am – 12:00pm		SESSION 205 Crossing Structures, Reducing Collisions, Increasing Connectivity – Part III (Room: TBA)	SESSION 206 Urban Transportation Ecology Issues (Room: TBA)	SESSION 207 New Frontiers in Regional Advanced Species Mitigation – Panel Discussion (Room: TBA)	SESSION 208 Vegetation Management within Transportation Corridors (Room: TBA)
12:00pm – 1:15pm		Luncheon with Keynote Speaker (Room: TBA)			
PARALLEL SESSIONS 1:30pm – 3:00pm		SESSION 209 Crossing Structures, Reducing Collisions, Increasing Connectivity – Part IV (Room: TBA)	SESSION 210 Multimodal Transportation Ecology Issues (Room: TBA)	SESSION 211 Stormwater and Water Quality Management for Transportation Projects (Room: TBA)	SESSION 212 Advancing the Eco-Logical Approach in 2015 – Panel Discussion (Room: TBA)
3:00pm – 3:30pm		Refreshment Break   Preview Posters   Sponsor Exhibits Open			
3:30pm – 5:30pm		POSTER SESSION 2 (Room: TBA)			
	Dinner on your own				
7:30pm – 9:00pm	SESSION 213 Wildlife Road Crossings for North Carolina: Research, Comprehensive Planning, and Implementation – Panel Discussion (Room: TBA)	SESSION 214 Tools and Approaches to Integrate Climate Risk and Increase Resilience in the Transportation System – Panel Discussion (Room: TBA)			
7:30pm – 9:00pm	Sponsor Organization Meetings (TBA)				



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WEDNESDAY September 23			
6:00am – 7:30am	Continental Breakfast		
6:30am – 8:00pm  <b>Please Note the specific Boarding, Departure, and Return Times for each Field Trip.</b>	<b>FIELD TRIPS hosted by North Carolina Department of Transportation</b> Lunch provided for Field Trips 2 and 3. Water and snacks provided for all trips. <b>Depart from Raleigh Convention Center front entrance.</b>		
	<b>FIELD TRIP 1</b> <b>Mingo Creek: Wetland and Stream Mitigation</b> <i>Boarding 8:30am</i> <i>Departure 9:00am</i> <i>Return by 1:00pm</i>  Lunch on your own	<b>FIELD TRIP 2</b> <b>Longleaf Pine Ecosystem: Endangered Species Mitigation</b> <i>Boarding 7:30am</i> <i>Departure 8:00 am</i> <i>Return by 6:00pm</i>	<b>FIELD TRIP 3</b> <b>The Outer Banks: Resiliency and Disaster Response</b> <i>Boarding 6:30am</i> <i>Departure 7:00am</i> <i>Return by 8:00pm</i>
Dinner on your own			
7:30pm – 9:00pm	Evening Presentation or Special Event (TBA)		

THURSDAY September 24					
Breakfast on your own					
7:30am – 12:00pm	Registration and Sponsor Exhibits Open				
<b>PARALLEL SESSIONS</b> 8:30am – 10:00am	Registration and Sponsor Exhibits Open	<b>SESSION 401</b> <b>Crossing Structures, Reducing Collisions, Increasing Connectivity – Part V</b> <i>(Room: TBA)</i>	<b>SESSION 402</b> <b>Sustainability and Resilience in Transportation Systems – Part II</b> <i>(Room: TBA)</i>	<b>SESSION 403</b> <b>Aquatic Wildlife, Ecosystems and Wetland Interactions – Part II</b> <i>(Room: TBA)</i>	<b>SESSION 404</b> <b>Programmatics and Partnerships for Improving Transportation Ecology</b> <i>(Room: TBA)</i>
10:00am – 10:30am	Refreshment Break   Sponsor Exhibits Open				
<b>PARALLEL SESSIONS</b> 10:30am – 12:00pm	Registration and Sponsor Exhibits Open	<b>SESSION 405</b> <b>Partnerships for Achieving Effective and Sustainable Outcomes in Eastern North Carolina – Panel Discussion</b> <i>(Room: TBA)</i>	<b>SESSION 406</b> <b>Planning for Transportation Ecology – Part II</b> <i>(Room: TBA)</i>	<b>SESSION 407</b> <b>Terrestrial Wildlife and Ecosystem Interactions – Part II</b> <i>(Room: TBA)</i>	<b>SESSION 408</b> <b>Emerging Issues and New Directions in Transportation Ecology</b> <i>(Room: TBA)</i>
12:00pm – 12:30pm	<b>CLOSING PLENARY SESSION</b> <b>Conference Wrap-Up</b> <i>(Room: TBA)</i>				
End of Conference – Lunch on your own					
1:00pm – 4:00pm	Sponsor Organization Meetings (TBA)				



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**MONDAY September 21 | Parallel Sessions | 10:30am – 12:00pm**

**Session 101: Crossing Structures, Reducing Collisions, Increasing Connectivity – Part I**

***Using Browning Bridge and Resource Selection Models to Evaluate Impact of Road and Environmental Factors on Road Crossing Locations by Elk and Moose in the Greater Yellowstone Ecosystem: Moving Forward from Research to Management***

Jon Beckmann, Wildlife Conservation Society, Bozeman, Montana, United States; Timothy Cramer and Shane Roberts, Idaho Transportation Department, Idaho Falls and Rigby, Idaho, United States

***Wildlife-Vehicle Collisions: Predicting Where to Mitigate with a Conceptual Modelling Framework***

Casey Visintin, University of Melbourne, Parkville, Victoria, Australia

***Using Circuit Theory to Address the SLOSS Question in Road Ecology***

Mårten Karlsson, KTH, Stockholm, Sweden; and Andreas Seiler, Swedish University of Agricultural Sciences, Riddarhyttan, Sweden

***Applying Circuit Theory to Road Mitigation Planning for Wildlife***

Kerry Nichol森, Alaska Department of Fish and Game, Fairbanks, Alaska, United States; Andreas Seiler, Swedish University of Agricultural Sciences, Riddarhyttan, Sweden; and Mattias Olsson, EnviroPlanning AB, Gothenburg, Sweden

**Session 102: Sustainability and Resilience in Transportation Systems – Part I**

***Scenario Planning for Sustainability and Resilience: Central New Mexico as a National Example***

Benjamin Rasmussen, U.S. DOT Volpe Center, Cambridge, Massachusetts, United States; and Tina Hodges, U.S. DOT Federal Highway Administration, Washington, D.C., United States

***Arizona Department of Transportation Extreme Weather Vulnerability Assessment: A Landscape Ecology Approach***

Kristin Gade, Arizona Department of Transportation, Phoenix, Arizona, United States; Joshua DeFlorio, Cambridge Systematics, Inc., New York, New York, United States; and Kristin Tremain, AECOM, San Francisco, California, United States

***Climate Vulnerability and Economic Assessment for At-Risk Transportation in the Lake Champlain Basin, New York***

Michelle Brown, The Nature Conservancy, Keene Valley, New York, United States; Debra Nelson, New York State Department of Transportation, Albany, New York, United States; and Jessica Levine, TNC Canada, affiliate of The Nature Conservancy, Montreal, Quebec, Canada

***A Case Study Approach for Engineering and Economic Analysis for Climate Change Adaptation: Denali National Park Road***

Amit Armstrong, U.S. DOT Federal Highway Administration, Vancouver, Washington, United States; and Paul Schooten, National Park Service, Anchorage, Alaska, United States

**Session 103: Aquatic Wildlife, Ecosystems, and Wetland Interactions – Part I**

***The North Atlantic Aquatic Connectivity Collaborative: Unifying Stream Crossing Assessment Protocols Across the Region***

Jessica Levine, TNC Canada, affiliate of The Nature Conservancy, Montreal, Quebec, Canada

***Stream Smart: Maine's Road-Stream Crossing Outreach and Education Program***

Barbara Charry, Maine Audubon, Falmouth, Maine, United States

***Using Functions-based Approaches in Planning Transportation and Mitigation of Impacts***

Dean Urban, Nicholas School of the Environment, Duke University, Durham, North Carolina, United States; and Christy Ihlo, Nicholas Institute for Environmental Policy Solutions, Durham, North Carolina, United States

***Restoring Aquatic Habitat Connectivity Where Highways Cross Streams***

Paul Wagner, Washington State Department of Transportation, Olympia, Washington, United States

**Session 104: Developing and Deploying Large-Scale Programmatic Approaches – Panel Discussion**

Organizers: Julianne Schwarzer, U.S. DOT Volpe Center, Cambridge, Massachusetts, United States; and Marlys Osterhues, U.S. DOT Federal Highway Administration, Washington, D.C., United States



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**MONDAY September 21 | Parallel Sessions | 1:30 – 3:00pm**

**Session 105: Staying Connected in the Northern Appalachians: From Structural to Functional Connectivity – Panel Discussion**

Organizer: Jens Hawkins-Hilke, Vermont Fish and Wildlife Department, Essex Junction, Vermont, United States

**Session 106: Planning for Transportation Ecology – Part I**

***Incorporating Wildlife and Ecosystem Values into Environmental Performance Measures for State Departments of Transportation***

Daniel Nally, David Zippin and Jeffrey Ang-Olson, ICF International, Englewood, Colorado, San Francisco, California, and Sacramento, California, United States

***How Washington State Developed Habitat Connectivity Investment Priorities using a Geographic Information System***

Kelly McAllister and Stacey Plumley, Washington State Department of Transportation, Olympia, Washington, United States

***Expediting Transportation Planning and Multi-Agency Environmental Review with Species Distribution Models in Virginia and throughout the Eastern United States***

Jason Bulluck, Virginia Department of Conservation and Recreation, Richmond, Virginia, United States

***A More Inclusive Transportation Framework: Integrating Wildlife into Transportation Decision-Making for Federal Lands***

Steven Suder, U.S. Fish and Wildlife Service, Falls Church, Virginia, United States

**Session 107: Terrestrial Wildlife and Ecosystem Interactions – Part I**

***Effectiveness of Bat Mitigation Measures on European Roads***

Morten Christensen, Grontmij A/S, Soroe, Denmark

***Best Management Practices for Bat Species Inhabiting Transportation Infrastructure***

Holly Smith and Justin Stevenson, RD Wildlife Management and Consulting, Los Lunas, New Mexico, United States

***Large Carnivore Interactions at Wildlife Crossing Structures***

Adam Ford, University of Guelph, Guelph, Ontario, Canada

***Using Wildlife Behavior to Better Design Mitigation on Highway Projects***

Sandra Jacobson, USDA Forest Service, Davis, California, United States

**Session 108: Mitigation for Transportation Projects**

***Mitigating for the Construction of a Highway through Croatan National Forest, North Carolina***

Mary Frazer and Rachelle Beaugard, North Carolina Department of Transportation, Raleigh, North Carolina, United States

***Decision Support For Regional Advance Mitigation Planning***

Patrick Crist, NatureServe, Boulder, Colorado, United States

***Permeability of a Four-lane Mitigated Highway and a Two-lane Unmitigated Highway for American Martens in the Boreal Forest***

Jorge Gaitan, Concordia University, Montreal, Quebec, Canada

***Tidal Wetland Creation along the Connecticut Coastline: Challenges, Solutions, and Lessons Learned***

Kevin Carifa and Christopher Samorajczyk, Connecticut Department of Transportation, Newington, Connecticut, United States; Jeffrey Simmons and Simon Hildt, Stantec Consulting Services, Inc., Scarborough, Maine, and Northampton, Massachusetts, United States



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## MONDAY September 21 | Poster Session 1 | 3:30 – 5:30pm

Poster presentations in the following general topic areas: Aquatic Wildlife, Ecosystems, and Wetland Interactions; Stormwater and Water Quality Management for Transportation Projects; Best Management Practices for Construction, Operations and Maintenance; Crossing Structures, Reducing Collisions, Increasing Connectivity; Multimodal Transportation Ecology Issues; Planning for Transportation Ecology; Transportation Ecology Policy and Regulatory Developments.

***Making a Change in the Life of Riverine Species: Removal of 300 Barriers in Northern Sweden***

Ida Schönfeldt, Swedish Transport Administration, Luleå, Sweden; and Sofia Perä, County Administrative Board of Norrbotten, Luleå, Sweden

***Impacts Assessment of Highway Construction on Hydrologic Connectivity***

Xinjun Wang, China Academy of Transportation Sciences, Beijing, China

***Efficacy of Roadway Stormwater and Other Drainage Facilities as Suitable Wood Stork Forage Habitat In Central Florida***

Kristin Caruso, Scheda Ecological Associates, Inc., Tampa, Florida, United States

***Aquatic Organism Passage Improvements to Increase Habitat Connectivity for Yazoo Darters (*Etheostoma raneyi*)***

Amy Carson, U.S. Fish and Wildlife Service, Jackson, Mississippi, United States

***Benefits of Stream Simulation Designed Road-Stream Crossings: Flood Resiliency, Aquatic Organism Passage and Economics***

Brian Austin and Dan McKinley, USDA Forest Service, Rutland, Vermont, United States

***Use of a Keystone Species to Enhance Habitat Restoration for Transportation Projects***

David Bailey, University of Washington, Woodinville, Washington, United States

***Negative Impacts of Roads on Amphibians across a Vast Geographic Region, as Indicated by Citizen Science Amphibian Monitoring Data***

Tom Langen, Clarkson University, Potsdam, New York, United States

***Effect of Tillage and Amendments on Vegetation Growth and Infiltration for Soils Disturbed Through Development***

Richard McLaughlin, Fatemeh Mohammadshirazi, and Joshua Heitman, North Carolina State University, Raleigh, North Carolina, United States; and Virginia Brown, TetraTech, Hillsboro, Texas, United States

***Urban Runoff Pollutants Spatial Distribution in the Southern California Association of Governments (SCAG) Region: An Application of GIS Using the U.S. Environmental Protection Agency's PLOAD model and SCAG Land Use Scenario Dataset***

Tom Vo, Frank Wen, Ping Wang, and Alison Linder, Southern California Association of Governments, Los Angeles, California, United States

***The Influence of the Expressway Construction on the Local Rivers Network and Water Quality in the Qinghai-Tibetan Plateau of China***

Lin Hu, CCCC First Highway Consultants Co., Ltd., Xi'an, China

***Characterization of Stormwater Runoff from Bridges in North Carolina and Determination of Effects of Bridge Runoff on Selected Receiving Waters***

Chad Wagner, U.S. Geological Survey, Raleigh, North Carolina, United States

***Determining the Best Stormwater Treatment Practice for Bridge Deck Runoff***

Ryan Winston and William Hunt III, North Carolina State University, Raleigh, North Carolina, United States

***South Carolina Department of Transportation (SCDOT) ACE Basin***

James Trumbull, HDR, North Charleston, South Carolina, United States

***Microbially Mediated Detection of Damaged Concrete***

Julia Maresca and Paul Moser, University of Delaware, Newark, Delaware, United States



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***Taking a Multispecies Approach to Evaluating the Effectiveness of Wildlife Passages for Small and Medium Sized Mammals in an Eastern Canadian Boreal Forest***

April Robin Martinig and Jochen Jaeger, Concordia University, Montreal, Quebec, Canada; and André Desrochers, Université Laval, Quebec City, Quebec, Canada

***Cost-Effective Retrofit to Reduce Collisions with Elk along Interstate-17 in Northern Arizona***

Jeffrey Gagnon, Chad Loberger, Scott Sprague, Sue Boe, and Ray Schweinsburg, Arizona Game and Fish Department, Phoenix, Arizona, United States

***WWW.SRAZENAZVER.CZ: Experiences from the First Year of the Animal-Vehicle Collision (AVC) Report Application***

Michal Bíl, Jan Kubecek, Peter Oríšek, Richard Andrášik, and Jirí Sedoník, CDV Transport Research Centre, Brno, Czech Republic

***Monitoring Deer and Black Bear Activity and Behavior Along Unfenced Underpasses***

Bridget Donaldson, Virginia Center for Transportation Innovation and Research, Charlottesville, Virginia, United States

***Methods to Monitor Structures with Trail Cameras while Minimizing the Risk of Theft and Vandalism***

Kelly McAllister, Washington State Department of Transportation, Olympia, Washington, United States; and Patricia Cramer, Cramer, Logan, Utah, United States

***The Passage Bench, a Review of their Construction as a Standard Bridge Design on River Crossings in Minnesota***

Peter Leete, Minnesota Department of Natural Resources, Saint Paul, Minnesota, United States

***Crossing Structure Design for Arboreal Mammals' Passage and its Efficiency on Connecting Two Atlantic Forest Remnants***

Camila Castilho, Universidade Estadual de Campinas - UNICAMP, Campinas, SP, Brazil

***Enhancing Wildlife Connectivity along California's Highways: The Case of State Route 241 Wildlife Protection Fence in Orange County***

Valarie McFall and Doug Feremenga, Transportation Corridor Agencies, Irvine, California, United States; Winston Vickers, Wildlife Health Center, University of California, Davis, Davis, California, United States; and Patrick Huber, Information Center for the Environment, University of California, Davis, Davis, California, United States

***Turtle Mortality and Hotspot Identification along a Rural Southern Ontario Highway***

Sarah Merriam, Ministry of Transportation, Ontario, Downsview, Ontario, Canada

***Addressing and Minimizing Vehicle and Wildlife Interactions in Maine***

Richard Bostwick, Maine Department of Transportation, Augusta, Maine, United States

***Combining Genetic and Non-Genetic Techniques to Evaluate the Ability of Wildlife Crossing Structures to Restore Population Connectivity for Arboreal Mammals***

Kylie Soanes and Rodney van der Ree, Australian Research Center for Urban Ecology, Parkville, Victoria, Australia

***ARC Solutions – The Next Phase: Facilitating New Thinking, New Methods, New Materials and New Solutions for Wildlife Crossing Structures***

Renee Callahan, Center for Large Landscape Conservation, Bozeman, Montana, United States; Rob Ament, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; and Sandra Jacobson, USDA Forest Service, Davis, California, United States

***Moose Collisions in the Fairbanks North Star Borough***

Job Noordeloos, University of Alaska Fairbanks, Fairbanks, Alaska, United States

***Will Electrified Pavement Prevent Mule Deer and Elk Intrusions through Fence Openings?***

Joseph Flower, Utah State University, Logan, Utah, United States



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***Improving Connectivity for Mountain Lions on Highway 17 Corridor in California through Collaboration with Multiple Partners***

Nancy Siepel, California Department of Transportation, San Luis Obispo, California, United States

***More than Ten Thousand Reptiles Road-Killed Per Year on a Recent Paved Road in Southern Brazil***

Júlia Diniz Beduschi Travassos Alves, Larissa Oliveira Gonçalves, Fernanda Zimmermann Teixeira, Igor Pfeifer Coelho, and Andreas Kindel, Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, Brazil

***Predicting the Effects of Road Paving on Vehicle-Animal Collisions: A Case Study in a Brazilian Protected Area Considering Carcass Removal and Detection***

Larissa Gonçalves, Júlia Diniz Beduschi Travassos Alves, Fernanda Zimmermann Teixeira, Igor Pfeifer Coelho, and Andreas Kindel, Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, Brazil; and Magnus Machado Severo, Instituto Chico Mendes de Conservação da Biodiversidade, Porto Alegre, Brazil

***Do Resource Agency Reviews of Transportation Projects Translate to Better Fish and Wildlife Crossings?***

Marla Chambers, North Carolina Wildlife Resources Commission, Oakboro, North Carolina, United States

***Where People and Wildlife Intersect: Prioritizing Mitigation of Road Impacts on Wildlife Connectivity***

Meredith McClure, Center for Large Landscape Conservation, Bozeman, Montana, United States; and Rob Ament, Western Transportation Institute, Montana State University, Bozeman, Montana, United States

***Using Multiple Research Methods to Understand Movement Patterns and Choices in Road Crossing Locations by Black Bears for Mitigation Planning***

Heather Chasez, E Sciences Inc., Orlando, Florida, United States

***Broad Utility of Volunteer-Collected Wildlife-Vehicle Collision Observations at Large Scales***

Kate Tiedeman and Fraser Shilling, Road Ecology Center, University of California, Davis, Davis, California, United States; Rosemary Garcia, California State University, Los Angeles, Los Angeles, California, United States; and Alan Muchlinski, California State University, Los Angeles, Los Angeles, California, United States

***Effectiveness of Wildlife Fences in Reducing Wildlife-Vehicle Collisions and the Wildlife Use of Underpasses along the SP-225 Motorway, São Paulo, Brazil***

Fernanda Delborgo Abra and Katia Ferraz, Universidade de São Paulo, Escola Superior de Agricultura Luiz de Queiroz, Piracicaba, SP, Brazil; Marcel Huijser, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; and Vânia Pivello, Universidade de São Paulo, Instituto de Biociências, São Paulo, Brazil

***Assessing Habitat Permeability at Wildlife Corridor-Road Intersections***

Martin Lafrenz, Catherine de Rivera, and Leslie Bliss-Ketchum, Portland State University, Portland, Oregon, United States; Lori Hennings, METRO, Portland, Oregon, United States; and Sandra Jacobson, USDA Forest Service, Davis, California, United States

***The Differential Use of Large Underpasses by Small Animals and Effects of adding Structure***

Cheryl Brehme, U.S. Geological Survey, Western Ecological Research Center, San Diego, California, United States

***Assessing the Relationships Between Emissions and Vehicle Activity for a Compressed Natural Gas (CNG) Transit Bus Fleet***

Phil Lewis, Chuanhai Zhu, and Yongwei Shan, Oklahoma State University, Stillwater, Oklahoma, United States

***Road Space Enclosure Scale and Sequence Characteristic based on Human Aesthetic Perception and Landscape Experience***

Xiaochun Qin and Qingchao Wei, Beijing Jiaotong University, Beijing, China

***Improving the Cost-Benefit in Detecting Spatial Patterns of Road-Kills: How Often and When to Survey?***

Aline Costa and Fernando Ascensão, Centro Brasileiro de Estudos em Ecologia de Estradas (CBEE), Lavras, Brazil; and Alex Bager, Brazilian Center for Road Ecology Research, Lavras, Brazil





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***Innovative and Sustainable Transportation Evaluation Process (INSTEP)***

Jan Burton and Treff Alexander, National Park Service–Denver Service Center, Denver, Colorado, United States

***Planning for Wildlife and Safety: A Case Study showing State Departments of Transportation Can Plan for Wildlife-Vehicle Collision Mitigation with Limited Resources***

Coleman Burnett, SWCA Environmental Consultants, Warrenville, Illinois, United States; Chris Cudia, Jim Hirsch, and Blake Roxlau, New Mexico Department of Transportation, Santa Fe, New Mexico, United States; and Mark Watson, New Mexico Department of Game and Fish, Santa Fe, New Mexico, United States

***GreenLinks: A Tool to Better Integrate Transportation and Landscape-Level Conservation Planning***

Mary Mittiga, U.S. Fish and Wildlife Service, Panama City, Florida, United States; and Joy Swanson, Florida Department of Transportation, Chipley, Florida, United States

***Roads and Ecological Infrastructure: Concepts and Applications for Small Animals***

Kimberly Andrews, University of Georgia, Aiken, South Carolina, United States

***Large Scale Defragmentation Plan for Ungulates along E20 in Southwestern Sweden***

Mattias Olsson, EnviroPlanning AB, Gothenburg, Sweden

***Effective Sustainable Transportation Design: Using the Envision™ Manual in the Decision Making Process***

John Lazzara and Janet Gonzalez, HDR, Chicago, Illinois, United States

***Ohio River Bridges: Downtown Crossing, Environmental Compliance and Conformance***

Nancy Allen and Kenneth Carper, Stantec Consulting Services, Inc., Louisville, Kentucky and Raleigh, North Carolina, United States

***When the Project Changes During Construction: Managing Environmental Commitments Through Redesign***

Gray Rand and Ron Bockelman, David Evans and Associates, Inc., Bellevue, Washington, United States; and Craig Broadhead, Washington State Department of Transportation, Union Gap, Washington, United States

***Commitment Tracking for Environmental Compliance***

Susan Ridenour, Lori Wesolek, Ben Morrow, and Russ Freistat, McCormick Taylor, Philadelphia, Pennsylvania, Baltimore, Maryland and Columbus, Ohio, United States



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**TUESDAY September 22 | Parallel Sessions | 8:30 – 10:00am**

## **Session 201: Crossing Structures, Reducing Collisions, Increasing Connectivity – Part II**

### ***The Wildlife Crossing Guilds Decision Framework: A Behavior-based Approach to Designing Effective Wildlife Crossing Structures***

Julia Kintsch, ECO-resolutions, Golden, Colorado, United States; Sandra Jacobson, USDA Forest Service, Davis, California, United States; and Patricia Cramer, Cramer, Logan, Utah, United States

### ***Small Animal Funneling Extractor (S.A.F.E.) For Gopher Tortoise and Other Small Animals in Florida***

David Bogardus, Florida Department of Transportation, District 4, Fort Lauderdale, Florida, United States; and Michael Melendez, Genesis Enterprises & Engineering Services, LLC, Pompano Beach, Florida, United States

### ***Wide-Ranging Mammals: How to Deal with Road-Kills?***

Fernando Ascensão, Centro Brasileiro de Estudos em Ecologia de Estradas (CBEE), Lavras, Brazil; Arnaud Desbiez and Patricia Medici, Lowland Tapir Conservation Initiative, IPÊ–Institute for Ecological Research, Campo Grande, Mato Grosso do Sul, Brazil; and Alex Bager, Brazilian Center for Road Ecology Research, Lavras, Brazil

### ***Road Connectivity for Amphibians and Reptiles: A Survey of Systems in California***

Tom Langton, Transport Ecology Services (HCI Ltd.), Halesworth, Great Britain; Anthony Clevenger and Tiffany D.H. Allen, Western Transportation Institute, Montana State University, Harvie Heights, Alberta, Canada and Bozeman, Montana, United States; Robert Fischer and Cheryl Brehme, U.S. Geological Survey, Western Ecological Research Center, San Diego, California, United States

## **Session 202: Sustainable Urban Mobility Plans: A Strategic Planning Concept from Europe – Panel Discussion**

Organizer: Frank Wefering, Rupprecht Consult, West Islip, New York, United States

## **Session 203: Best Management Practices for Construction, Operations, and Maintenance**

### ***Developing a New Pile to Reduce Impacts to Endangered Species Act Listed Species***

Marion Carey and Jim Laughlin, Washington State Department of Transportation, Olympia and Seattle, Washington, United States; Tim Dardis, Peter Dahl and Per Reinhall, University of Washington, Seattle, Washington, United States

### ***Enhancing Wildlife Conservation in Road Corridors by Applying Best Maintenance Practices***

Carme Rosell, MINUARTIA, Barcelona, Spain; Andreas Seiler, Swedish University of Agricultural Sciences, Riddarhyttan, Sweden; Jan Olof Helldin, Calluna AB, Lindesberg, Sweden; Heinrich Reck, Institute for Natural Resource Conservation, Kiel, Germany; and Edgar A. van der Grift, Alterra–Wageningen UR, Wageningen, The Netherlands

### ***Airport Grasslands Produce a Diverse Insect Fauna of Threatened Species***

Magnus Stenmark, Ecom AB, Gävle, Sweden; and Magnus Persson, Swedavia AB, Stockholm-Arlanda, Sweden

### ***Developing Highway Best Management Practices for Species At Risk in Ontario: Balancing Protection, Compliance and Operation***

Kristen Harrison, MMM Group Limited, Kitchener, Ontario, Canada

## **Session 204: Transportation Ecology Policy and Regulatory Developments**

### ***Synchronization of Reviews for Transportation and Infrastructure: The Effort to Update the 1988 “Red Book”***

Lauren Diaz, U.S. Army Corps of Engineers, Washington, D.C., United States; and Michael Ruth, U.S. DOT Federal Highway Administration, Washington, D.C., United States

### ***It is a Long Way from Bangkok to the Andaman Sea: An IENE Mission for Greening Development Plans and Promoting Environmentally Friendly Solutions on a Biodiversity Hotspot of Southeast Asia***

Miklos Puky, MTA Centre for Ecological Research, Danube Research Institute, Budapest, Hungary; Lazaros Georgiadis, IENE, Florina, Greece; and Elke Hahn, Bundesministerium für Verkehr und Innovation, Vienna, Wien, Austria

### ***The History of Restoring Wildlife Habitat Connectivity in New South Wales, Australia***

Josie Stokes, NSW Roads and Maritime Services, Randwick, New South Wales, Australia

### ***“Pay or Prevent”: Case Studies Involving the Legal Responsibility for Damages and Losses from Large Mammal-Vehicle Collisions on Highways in São Paulo, Brazil***

Fernanda Delborgo Abra, Prime Engenharia, São Paulo, Brazil; Beatriz Granziera, Environmental Department, São Paulo, São Paulo, Brazil; Marcel Huijser, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; Katia Maria Paschoaletto Micchi de Barros Ferraz, ESALQ–University of São Paulo, Piracicaba, SP, Brazil; and Camila Mansur Haddad de Oliveira Santos, Lazzarini Moretti e Moraes Advogados, São Paulo, Brazil



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**TUESDAY September 22 | Parallel Sessions | 10:30am – 12:00pm**

**Session 205: Crossing Structures, Reducing Collisions, Increasing Connectivity – Part III**

***Utilizing Wildlife Crossings in Nevada: A Multiagency Approach to Reduce Wildlife-Vehicle Collisions and Improve Habitat Connectivity at the Landscape Scale***

Nova Simpson, Nevada Department of Transportation, Carson City, Nevada, United States

***Distribution and Abundance of Roadkill on an Irish Motorway in Relation to Mammal Underpasses***

Eugene J. Finnerty, Pádraig M. Whelan and Fidelma Butler, University College Cork, Cork, Ireland; David Schuller, Eurolink Motorway Operations M3 Ltd, Co. Meath, Ireland; and Vincent O'Malley, National Roads Authority, Dublin, Ireland

***Estimating Crossing Rates at Wildlife Crossing Structures: Methods Matter!***

Edgar A. van der Grift, Alterra–Wageningen UR, Wageningen, The Netherlands; Marcel Huijser and Jeremiah P. Purdum, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; and Whisper Camel-Means, Confederated Salish & Kootenai Tribes, Pablo, Montana, United States

***Evaluation of a Roadside Buried Cable Animal Detection System***

Cristian Druta, Virginia Tech Transportation Institute, Blacksburg, Virginia, United States

**Session 206: Urban Transportation Ecology Issues**

***Estimating the Future Impacts of Exurban Growth and Traffic Demand on Wildlife Connectivity***

Patrick McGowen, Western Transportation Institute, Montana State University, Bozeman, Montana, United States

***Getting it Done: Two Large-Scale Wildlife Crossing Projects Speed to Completion on the Edge of the Highly Urbanized Tucson, Arizona Region and a Path Forward for More***

Kathleen Kennedy and Carolyn Campbell, Coalition for Sonoran Desert Protection, Tucson, Arizona, United States

***Landscape Linkage Models Fail to Predict Wildlife Movement Based on Wildlife-Vehicle Collision Carcass Data***

Fraser Shilling, Road Ecology Center, University of California, Davis, Davis, California, United States

***Sustainable Bridge Solutions for Resilience that Enhance the Environment Today while Planning for the Future***

Linda Figg, FIGG, Tallahassee, Florida, United States

**Session 207: New Frontiers in Regional Advanced Species Mitigation for Transportation Projects – Panel Discussion**

Organizer: David Zippin, ICF International, San Francisco, California, United States

**Session 208: Vegetation Management within Transportation Corridors**

***The Role of Roadside Habitats for the Conservation of Biodiversity***

Jan Olof Helldin, Calluna AB, Lindesberg, Sweden; and Andrew Bennett, La Trobe University, Bundoora, Australia

***The Crucial Role of Roadsides in Pollinator Health: Best Management Practices for Pollinator Habitat Health in Highway Rights of Way***

Jennifer Hopwood, Xerces Society for Invertebrate Conservation, Portland, Oregon, United States

***Evaluating the Impact of Roadside Vegetation on Native Insect Pollinators***

Jaret Daniels, McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, Gainesville, Florida, United States

***Integrating a Unmanned Air System in Mitigation Implementation***

Kyle Snyder, Institute for Transportation Research and Education, North Carolina State University, Raleigh, North Carolina, United States; LeiLani Paugh, North Carolina Department of Transportation, Raleigh, North Carolina, United States; and Mark Mickley, Mulkey Engineers & Consultants, Cary, North Carolina, United States



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**Session 209: Crossing Structures, Reducing Collisions, Increasing Connectivity – Part IV**

***The Effectiveness of Wildlife Underpasses in Combination with Short Sections of Wildlife Fencing in Providing Safe Crossing Opportunities for Wildlife and Reducing Wildlife-Vehicle Collisions for Large Mammals***

Marcel Huijser and Elizabeth Fairbank, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; Whisper Camel-Means and Dale Becker, Confederated Salish & Kootenai Tribes, Pablo, Montana, United States; Jonathan Graham and Vicki Watson and University of Montana, Missoula, Montana, United States; and Pat Basting, Independent Researcher, Arvada, Colorado, United States

***The Effectiveness of Wildlife Crossings and Fencing on Preventing Wildlife Mortalities: A Ten-Year Study along US-1 Highway in South Florida***

Greg Juszli, Scheda Ecological Associates, Inc., Delray Beach, Florida, United States; Barbara Culhane and Joy Castro, Florida Department of Transportation, District 6, Miami, Florida, United States; Claus Hansen, Gui de Almeida and Robert Mrykalo, Scheda Ecological Associates, Inc., Delray Beach and Tampa, Florida, United States

***Monitoring Effectiveness of Road Wildlife Mitigation for Large Animals in Ontario, Canada***

Kari Elizabeth Gunson, Eco-Kare International, Peterborough, Ontario, Canada; and Andrew Healy, Ministry of Transportation, Ontario, North Bay, Ontario, Canada

***Long-Term Response of Grizzly Bears to Wildlife Crossing Structures: Will They Get Used to Small Structures?***

Mirjam Barrueto, Western Transportation Institute, Montana State University, Canmore, Alberta, Canada

**Session 210: Multimodal Transportation Ecology Issues**

***Permitting and Conservation Issues with a Passenger Rail Project: Perspectives from a Public/Private Sector Partnership***

Mark Bakeman, Washington State Department of Transportation, Olympia, Washington, United States

***Evaluating Permeability of Existing Roads and Railroads for Ungulates***

Andreas Seiler, Swedish University of Agricultural Sciences, Riddarhyttan, Sweden; Mattias Olsson, EnviroPlanning AB, Gothenburg, Sweden; and Mats Lindqvist, Swedish Transport Administration, Gothenburg, Sweden

***California High-Speed Rail: Early Agency Coordination for Enhanced Mitigation***

Sarvy Mahdavi, U.S. Environmental Protection Agency, Region 9, Los Angeles, California, United States

***A Simple, Low-Cost Train Detection and Warning System to Prevent Wildlife-Train Collisions***

Jonathan A. J. Backs, John A. Nychka and Colleen Cassidy St. Clair, University of Alberta, Edmonton, Alberta, Canada

**Session 211: Stormwater and Water Quality Management for Transportation Projects**

***Estimating the Risks for Adverse Effects of Total Phosphorus in Receiving Streams with the FHWA Stochastic Empirical Loading and Dilution Model (SELDM)***

Gregory Granato, U.S. Geological Survey, Northborough, Massachusetts, United States; and Susan Jones, U.S. DOT Federal Highway Administration, Washington, D.C., United States

***Sustainable Approach to Groundwater Remediation at Asphalt Testing Sites***

Chris Niver, North Carolina Department of Transportation, Raleigh, North Carolina, United States

***Coupling Green Infrastructure Construction with Scheduled City Street Renovation: Research Findings, Lessons Learned, and Future Opportunities***

Andrew Anderson and William Hunt III, North Carolina State University, Raleigh, North Carolina, United States

***Total Maximum Daily Load (TMDL) Alternative – Category 4b Watershed Restoration Plans***

Andrew McDaniel and Craig Deal, North Carolina Department of Transportation, Raleigh, North Carolina, United States



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### Session 212: Advancing the Eco-Logical Approach in 2015: New Implementation Activities and Resources – Panel Discussion

Organizers and Presenters: Julianne Schwarzer, U.S. DOT Volpe Center, Cambridge, Massachusetts, United States; and Marlys Osterhues, U.S. DOT Federal Highway Administration, Washington, D.C., United States

#### ***Implementing an Eco-Logical Approach in the I-75 Corridor in Southeast Michigan***

Presenters: Jeff Grabarkiewicz, Michigan Department of Transportation, Lansing, Michigan, United States; and John Paskus, Michigan Natural Features Inventory, Lansing, Michigan, United States

#### ***Valuation and Crediting Approaches for Transportation and Metropolitan Planning Agencies***

Presenters: James Kagan, Institute for Natural Resources-Portland, Oregon State University, Portland, Oregon, United States; Lisa Gaines, Institute for Natural Resources, Oregon State University, Corvallis, Oregon, United States; and Fraser Shilling, Road Ecology Center, University of California, Davis, Davis, California, United States

## TUESDAY September 22 | Poster Session 2 | 3:30 – 5:30pm

Poster presentations in the following general topic areas: Emerging Issues and New Directions in Transportation Ecology; Mitigation for Transportation Projects; Programmatic and Partnerships for Improving Transportation Ecology; Sustainability and Resilience in Transportation Systems; Terrestrial Wildlife and Ecosystem Interactions; Urban Transportation Ecology Issues Vegetation Management within Transportation Corridors.

#### ***An Automated GIS Approach to Estimating Lateral Drainage Effect of Ditches for Regional Environmental Screenings***

David Johnson, North Carolina Department of Transportation, Raleigh, North Carolina, United States

#### ***Vulture System: A Social Network for Biodiversity Conservation in Brazil***

Alex Bager, Clara Grilo, Bianca Morais, Samuel Campos, and Thiago Nascimento, Brazilian Center for Road Ecology Research, Lavras, Brazil; and Fernando Ascensão, Centro Brasileiro de Estudos em Ecologia de Estradas (CBEE), Lavras, Brazil

#### ***Conservation Migratory Ungulates in Mongolia: Mitigation of Linear Transportation Infrastructure***

Dashzeveg Tserendeleg, Wildlife Conservation Society, Ulaanbaatar, Mongolia

#### ***Jake Brakes and Rare Snakes***

James Brady, Vermont Agency of Transportation, Montpelier, Vermont, United States

#### ***Infrastructures and Contexts: Mitigation of Tools and Devices for the Future of Ecological Highway***

Gaia Sgaramella, University of Trento, Trento, Italy

#### ***Watershed Resources Registry: Working Together to Improve Environmental Outcomes in Maryland***

Sandy Hertz and Heather Lowe, Maryland State Highway Administration, Baltimore, Maryland, United States

#### ***Funding Advanced Mitigation for the Environmental Impacts of Transportation Projects***

Jaimee Lederman, University of California, Los Angeles, Los Angeles, California, United States

#### ***Environmental Impact Assessment in Europe in Relation to Road Building and Species Conservation***

Miklos Puky, Szilvia Simigla, and Blanka Gal, MTA Centre for Ecological Research, Danube Research Institute, Budapest, Hungary; Eugene O'Brien, Sinead Gavin, Mairead Ni Choine, and Barry Corrigan, ROD Consulting Engineers, Dublin, Ireland; Dennis Wansink, Bureau Waardenburg (BUWA), Culemborg, The Netherlands; Lennart Folkesson, VTI-Swedish National Road and Transport Research Institute, Linköping, Sweden; and Lazaros Georgiadis, IENE, Florina, Greece

#### ***Mingo Creek: Paying It Forward from Mitigation to Education***

Deanna Riffey, North Carolina Department of Transportation, Garner, North Carolina, United States

#### ***Bear Creek Case Study: Reconciling Salmon Habitat Restoration and Cultural Resource Preservation***

Jon Gage, David Evans and Associates, Inc., Issaquah, Washington, United States



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***A Comparison of Three Methods to Determine the Location of Highway-Crossing Sites for Red Wolves and Black Bears: Implications for Successful Placement of Mitigating Structures***

Christine Proctor, Virginia Tech, Blacksburg, Virginia, United States

***The Environmental Mitigation for Construction of the North Section of the Ring Road, São Paulo, Brazil***

Marcelo Arreguy Barboza and Guilherme Augusto Domenichelli, Dersa - Desenvolvimento Rodoviário S.A, São Paulo, Brazil; Fernanda Delborgo Abra, Prime Engenharia, São Paulo, Brazil; and Plinio Bruno Aiub, Vet-Sistem, São Paulo, Brazil

***Spatial Patterns of Large Mammal Railway Mortality Before and After Highway Mitigation in Banff National Park***

Patrick Gilhooly and Colleen Cassady St. Clair, University of Alberta, Edmonton, Alberta, Canada

***Successful Design and Implementation of Federally Threatened Species Transplant and Habitat Restoration***

Samantha Clark, Jacobs Engineering Group, Denver, Colorado, United States; Tim Buntrock and Patrick Hickey, Colorado Department of Transportation, Broomfield and Greeley, Colorado, United States

***Igor I. Sikorsky Airport Runway Safety Area Improvements: Integrated Tidal Wetland and Listed Species Mitigation Planning and Design***

Daniel Hageman, Fitzgerald and Halliday, Inc., Hartford, Connecticut, United States

***Kirk Ave Bus Depot***

Glenn Robinson, Morgan State University, Baltimore, Maryland, United States; and George Hill, Maryland Transit Administration, Baltimore, Maryland, United States

***Oklahoma DOT Programmatic Biological Assessment for the American Burying Beetle***

Julianne Whitaker, Oklahoma Department of Transportation, Oklahoma City, Oklahoma, United States; and Rhonda Spinks, U.S. Fish and Wildlife Service, Tulsa Ecological Services, Tulsa, Oklahoma, United States

***Assessing the Potential of High-Speed Rail Lines to Reduce CO2 Emissions: Three Case Studies from Turkey***

Gulcin Dalkic, Osman Balaban, and Tumay Celikkol Kocak, Middle East Technical University, Ankara, Turkey

***Evolution of a Newly Formed Inlet in a Transportation Corridor on the Outer Banks of North Carolina: A Photographic Tale of Inlet Migration***

Mary Kathy Herring, North Carolina Department of Transportation, Raleigh, North Carolina, United States

***Research on Slope Erosion of Highway in the Qinghai-Tibetan Plateau***

Tianwei Wang, CCCC First Highway Consultants Co., Ltd., Xi'an, China

***Conceptual Nature-Based and Gray Infrastructure for Flood Resiliency at Oakwood Beach, Staten Island, New York***

Brian Sayre, Dewberry, Parsippany, New Jersey, United States

***Overview of the Center for Environmental Excellence by AASHTO Website: A Comprehensive Resource on Environmental Issues in Transportation***

Jenny O'Connell, AASHTO, Washington, D.C., United States; and Amy Phillips, Bloomberg BNA, Arlington, Virginia, United States

***Developing Transportation Policies and Systems to Preserve the Ecosystem In Jeju, South Korea***

Lee-Jung Kim, AKRF, Inc., New York, New York, United States

***Wildlife Friendly Roads Toolbox for Central America***

Daniela Araya Gamboa, Panthera, Moscow, Idaho, United States

***South Carolina Department of Transportation's Environmental Compliance Program***

Jason McMaster, HDR, North Charleston, South Carolina, United States

***Construction Sustainability Index (CSI): A Proposed Assessment Framework***

Mohamad Shoaib Samandar, North Carolina State University, Raleigh, North Carolina, United States



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### ***Colorado Department of Transportation (CDOT), 2013 Flood Event: Rebuilding Transportation Facilities for Roadway and Ecological Resiliency***

Kelly Maiorana, CH2M Hill, Englewood, Colorado, United States

### ***The Small, The Forgotten and the Dead: Highway Impact On Vertebrates and its Implications for Mitigation Strategies***

Alberto González Gallina, INECOL - Instituto de Ecología, A.C., Coatepec, Mexico

### ***Quantifying the Size and Severity of the Road Effect Zone for Insectivorous Bats in South-Eastern Australia***

Manisha Bhardwaj, Australian Research Center for Urban Ecology, Melbourne, Australia

### ***Update on Long Point Causeway Improvement Project 2008-2015***

Rick Levick, Long Point World Biosphere Reserve Foundation, Port Rowan, Ontario, Canada

### ***Eco-Road Construction of Mountainous Regions in the Eastern Part of Korea***

Sangdon Lee, Ewha Womans University, Seoul, Republic of Korea

### ***Evaluating Wildlife-Vehicle Collisions and Habitat Connectivity in the Madison Valley, Montana***

Tiffany D.H. Allen and Angela Kociolek, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; Brent Brock, Lance Craighead, and April Craighead, Craighead Institute, Bozeman, Montana, United States

### ***Modeling Occupancy of Barn Owls in Relation to Road Mortality in Southern Idaho, USA***

Tempe Regan and James Belthoff, Boise State University, Boise, Idaho, United States; Christopher McClure, The Peregrine Fund, Boise, Idaho, United States; Angela Kociolek, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; and Melinda Lowe, Idaho Transportation Department, Boise, Idaho, United States

### ***Indirect Effects of Roads on Endemic Island Herpetofauna***

Kristina Chyn, Texas A&M University, College Station, Texas, United States

### ***Creating Nesting Habitat for Barn Swallows (*Hirundo rustica*)***

Larry Sarris, Ministry of Transportation, Ontario, Downsview, Ontario, Canada

### ***Variation in Wildlife Vehicle Collisions based on Landscape Context and Road Classification: A Case Study in the Raleigh, North Carolina Metropolitan Area***

Brenda Donis Lemus, Prescott College, Franklinton, North Carolina, United States

### ***Honduran Emerald Conservation: Using the Species Ecology to Develop a Payment for Ecosystem Service Program in Response to Road Improvements Associated with an Agricultural Corridor Project***

Fabiola Rodriguez, Jeff Larkin, and Dorian Escoto, Indiana University of Pennsylvania, Indiana, Pennsylvania, United States; José Luis Ramos and Ivan Ochoa, ASIDE, Tegucigalpa, Honduras; Thelma Mejía, Lilian Ferrufino, Saby Cruz, Rosa Ramírez, and Denis Padilla, Universidad Nacional Autónoma de Honduras, Tegucigalpa, Honduras; Daniel Lebbin and John Tschirky, American Bird Conservancy, The Plains, Virginia, United States

### ***How Spatial, Geometric, and Biotic Features of Roads Affect Vehicular Collisions with Barn Owls (*Tyto alba*) Along Interstate 84 in Southern Idaho***

Erin Pikcingis and James Belthoff, Boise State University, Boise, Idaho, United States; Steven Hanser, U.S. Geological Survey, Snake River Field Station, Boise, Idaho, United States; Jeremy Thompson, Borah High School, Boise, Idaho, United States; Eric Yensen, Michigan State University, East Lansing, Michigan, United States; Angela Kociolek, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; and Melinda Lowe, Idaho Transportation Department, Boise, Idaho, United States

### ***Road Kills of Owls (*Asio otus*, *Tyto alba*)***

Janos Farkas, Eotvos Lorand University, Budapest, Hungary

### ***Improving Marginal Lands to Enhance Insect Pollinator Habitat and Provide Ecosystem Services***

Jennifer O'Brien, North Carolina State University, Raleigh, North Carolina, United States



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***The Effect of Artificial Light on Wildlife Use of Passage Structures***

Leslie Bliss-Ketchum, Catherine de Rivera, Brian Turner, and Dolores Weisbaum, Portland State University, Portland, Oregon, United States

***A Feasibility Growth Study of Native Mosses and Associated Self-Sustaining Flora on Vertical Infrastructure***

Mary Kaufman, Achievable Landscapes in Planning, Glen Ellyn, Illinois, United States

***Tracking and Managing Federally Protected Plant Species on North Carolina Department of Transportation (NCDOT) Roadsides***

Cheryl Gregory, North Carolina Department of Transportation, Raleigh, North Carolina, United States

***North Carolina's Colorful Transportation Ecosystem***

Derek Smith, North Carolina Department of Transportation, Raleigh, North Carolina, United States

***Experimental Study on Highway Slope Greening with Wild Flowers on Hainan Island***

Ti Wang, China Academy of Transportation Sciences, Beijing, China

***Evaluation on the Restorability of Revegetation in Qinghai-Tibet Highway Based on GIS analysis***

Yangang Yang, China Academy of Transportation Sciences, Beijing, China

***Adaptive Management for Balancing Safety and a Rare Plant at a Regional Airport***

Matt Arsenault, Stantec Consulting Services, Inc., Topsham, Maine, United States

***Challenge and Countermeasures to the Revegetation of the High Altitude and Cold Regions of Qinghai-Tibetan Highway***

Xueping Chen, Yangang Yang, Jiding Chen, and Yaping Kong, China Academy of Transportation Sciences, Beijing, China

***The Function of Infrastructures' Habitats as Landscape Features on Biodiversity***

Jörgen Wissman and Tommy Lennartsson, Swedish Biodiversity Centre, Swedish University of Agricultural Science and Uppsala University, Uppsala, Sweden

**TUESDAY September 22 | Evening Panel Sessions | 7:30 – 9:00pm**

**Session 213: Wildlife Road Crossings for North Carolina: Research, Comprehensive Planning, and Implementation – Panel Discussion**

Organizer: Ron Sutherland, Wildlands Network, Durham, North Carolina, United States

**Session 214: Tools and Approaches to Integrate Climate Risk and Increase Resilience in the Transportation System – Panel Discussion**

Organizer: Heather Holsinger, U.S. DOT Federal Highway Administration, Washington, D.C., United States





**WEDNESDAY September 23 | Field Trips**

**Field Trip 1: Mingo Creek – Wetland and Stream Mitigation**

*Boarding 8:30am, Departure 9:00am, Return by 1:00pm, Lunch on your own*

This **half-day** tour (4 hours round-trip) will visit the distinctive Mingo Creek mitigation site, a large piedmont North Carolina wetland complex, surrounding buffer, and uplands that have been preserved despite suburban development pressure. Located just east of Raleigh and the Neuse River, the mitigation site is bordered by major transportation corridors for U.S. Highway 64 and the Norfolk Southern Railway. Within this unique site participants will observe vegetation typical not only of piedmont North Carolina, but also representative species from the mountains and the coastal plain. Discussions will address the site's history from its inception to its future long-term stewardship. While viewing this wetland complex and several piedmont streams, participants will also learn about North Carolina's own wetland (NCWAM) and stream (NCSAM) assessment methods developed by an interagency team of state and federal staff from NCDOT, N.C. Department of Environment and Natural Resources, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service. Sturdy walking shoes or boots are recommended for this tour. Participants will return to downtown Raleigh in time for lunch on your own.

**Field Trip 2: Longleaf Pine Ecosystem – Endangered Species Mitigation**

*Boarding 7:30am, Departure 8:00am, Return by 6:00pm, Lunch included*

This **full-day** tour (8 hours round-trip) will highlight mitigation sites in the North Carolina's Sandhills region and coastal plain, home to the longleaf pine. Covering 92 million acres of the southeastern U.S., the longleaf pine ecosystem was, in its prime, one of the most extensive and biologically diverse ecosystems in North America. The decline of these once dominant forests now threatens such wildlife species as the red-cockaded woodpecker, rough-leaf loosestrife, and the Venus flytrap. The first tour stop will be at the Plantation Road site in New Hanover County, purchased by NCDOT for wetland and endangered species mitigation for the I-40 interstate highway connector. Discussions will address mitigation site management highlighting interagency cooperation. Participants may view rare carnivorous endemics such as Venus flytrap and pitcher plants. Next stops will include sites along the future widening of U.S. Highway 17 in Pender County, where NCDOT is creating habitat for a red-cockaded woodpecker population in the adjacent Holly Shelter Game Land. Participants will visit the game land to observe a red-cockaded woodpecker cavity tree—and hopefully a bird—as it is the only woodpecker known to excavate cavities in living trees. The tour will also look at a swing-span bridge, due for replacement, over the state's Intracoastal Waterway and discuss the challenges of replacing this infrastructure in a developed coastal environment.

**Field Trip 2: The Outer Banks – Resiliency and Disaster Response**

*Boarding 6:30am, Departure 7:00am, Return by 8:00pm, Lunch included*

This **extended-day** tour (12 hours round-trip) will take participants to the dynamic and fragile ecosystems of the Outer Banks of North Carolina—a chain of narrow barrier islands along the state's coast. Linked together by N.C. Highway 12 and the NCDOT Ferry System, the Outer Banks is a major economic region of the state and home to many endangered species. The tour will visit infrastructure sites that continually face significant impacts from routine storms, hurricanes, and other natural processes. Discussions will address the efforts of recovery and the challenge of implementing ecologically sensitive solutions to the transportation needs of Outer Banks residents and visitors. The tour will cross over the ever-changing Oregon Inlet on the 2.5 mile-long Bonner Bridge—opened in 1963 and due for replacement—and travel through Pea Island National Wildlife Refuge to the New Inlet that breached Highway 12 during Hurricane Irene in 2011. Tour stops will include the historic U.S. Coast Guard lifesaving station on Pea Island for a view of Bonner Bridge and the Oregon Inlet, a visit to the temporary bridge over New Inlet, and lunch at the Bodie Island lighthouse.



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**THURSDAY September 24 | Parallel Sessions | 8:30 – 10:00am**

**Session 401: Crossing Structures, Reducing Collisions, Increasing Connectivity – Part V**

***Design and Effectiveness of Fence Ends and Animal Jump-outs in Kootenay National Park***

Trevor Kinley, Parks Canada, Radium Hot Springs, British Columbia, Canada

***Maine Road Infrastructure Survey for Terrestrial Wildlife Passage Retrofit Potential***

Barbara Charry, Maine Audubon, Falmouth, Maine, United States; and Julia Kintsch, ECO-resolutions, Golden, Colorado, United States

***Cost Reduction Opportunities Associated with the Design and Construction of Wildlife Overpass Structures***

Terry McGuire, McGuire Consulting, Calgary, Alberta, Canada; Rob Ament, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; and Renee Callahan, Center for Large Landscape Conservation, Bozeman, Montana, United States

***Efficacy and Cost-Effectiveness of Mitigation Measures to Reduce Wildlife-Vehicle Collisions in the Bow River Valley, Alberta, Canada***

Anthony Clevenger, Western Transportation Institute, Montana State University, Harvie Heights, Alberta, Canada

**Session 402: Sustainability and Resilience in Transportation Systems – Part II**

***Addressing Biodiversity Conservation on Roads in South Africa***

Wendy Collinson, Harriet Davies-Mostert, and Shelley Lizzio, The Endangered Wildlife Trust, Johannesburg, South Africa

***Ecosystem Services and the Forest Service: Implications for Regional Transportation Planning***

Jonas Epstein, USDA Forest Service, Washington, D.C., United States

***Cultural Roads: Opportunities and Challenges Considering Ecological Impact along Parkways***

Aisling O'Carroll, Independent Researcher, Cambridge, Massachusetts, United States

***Road Salt Recycling and Water Quality Improvement through Phytoremediation and Bio-Fuel Production***

Andrew Alden and Cristian Druta, Virginia Tech Transportation Institute, Blacksburg, Virginia, United States

**Session 403: Aquatic Wildlife, Ecosystems and Wetland Interactions – Part II**

***Oregon Spotted Frog Habitat Model: An Application of Science to Facilitate Endangered Species Act Project Review***

Jeff Dreier and Marion Carey, Washington State Department of Transportation, Olympia, Washington, United States

***Fish, Waterways and Roads: The Challenges of Combining Hydrology and Dynamic Systems with Stationery and Static Infrastructure***

Fabrice Ottburg, Alterra–Wageningen UR, Wageningen, The Netherlands; Matt Blank, Western Transportation Institute, Montana State University, Bozeman, Montana, United States; and Paul Wagner, Washington State Department of Transportation, Olympia, Washington, United States

***Arroyo Toad Management Down the Path of Invasive/Exotic Species Removal***

Michael Robson, Bergmann Associates, Horseheads, New York, United States

***Minimizing Transportation Related Impacts to Native Freshwater Mussels: A Look at the Toxicity of Polyacrylamide and Turbidity***

Sean Buczek, North Carolina State University, Apex, North Carolina, United States



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**Session 404: Programmatic and Partnerships for Improving Transportation Ecology**

***The Oregon Department of Transportation's Route to a Statewide Migratory Bird Treaty Act Take Permit***

Chris Maguire, Oregon Department of Transportation, Salem, Oregon, United States; and Diane Winterboer, USDA/APHIS/WS National Wildlife Research Center, Portland, Oregon, United States

***Public/Private Partnerships, a Roadway to the Future: Alabama Department of Transportation and Westervelt Ecological Services***

John Wigginton, Westervelt Ecological Services, Auburn, Alabama, United States

***Bridging the Knowledge Gap between Engineers and Biologists***

Scott Aston, Contech Engineering Solutions, West Chester, Ohio, United States; and Sandra Jacobson, USDA Forest Service, Davis, California, United States

***Investing in Wildlife Research Partnerships to Measure Success on Connectivity Projects***

Josh Zylstra, Washington State Department of Transportation, Union Gap, Washington, United States

**THURSDAY September 24 | Parallel Sessions | 10:30 – 12:00pm**

**Session 405: Partnerships for Achieving Effective and Sustainable Outcomes in Eastern North Carolina – Panel Discussion**

Organizers: Anne Burroughs, Dewberry, Raleigh, North Carolina, United States; and Gary Jordan, U.S. Fish and Wildlife Service, Raleigh, North Carolina, United States

**Session 406: Planning for Transportation Ecology – Part II**

***Cognizant Environmental Planning for Virgin Transportation Corridors in Florida***

Hannah Hernandez and Casey Lyon, Florida Department of Transportation, Ocoee and Deland, Florida, United States

***European Strategies for Adaptation of Infrastructure to the Surrounding Landscape***

Lars Nilsson, Swedish Transport Administration, Borlänge, Sweden

***Prisoners' Dilemma: Using Game Theory to Create Collaboration and Resilience in Transportation Ecology***

Patricia Cramer, Cramer, Logan, Utah, United States

***Tools, Workshops and Technical Assistance for Local Governments to Integrate Wildlife and Biodiversity Conservation in Land Use and Transportation Planning in North Carolina: Outcomes from Five Years***

Kacy Cook and Brooke Massa, North Carolina Wildlife Resources Commission, Star and Raleigh, North Carolina, United States; and Allison Schwarz Weakley, North Carolina Department of Environment and Natural Resources, Raleigh, North Carolina, United States

**Session 407: Terrestrial Wildlife and Ecosystem Interactions – Part II**

***Cumulative Effects Evaluation Study for a Proposed Interchange at Interstate 75 Highway and Everglades Boulevard, Collier County, Florida***

Mark Easley, Robert Whitman, and Tracey Sansone, Kisinger Campo & Associates, Corp., Tampa, Florida, United States

***Modelling the Combined Effects of Habitat Heterogeneity and Roads on Landscape Functional Connectivity in a Mediterranean Forest Carnivore***

Filipe Carvalho, Rafael Carvalho, and António Mira, Research Center in Biodiversity and Genetic Resources (CIBIO/InBio-UE), University of Évora, Évora, Portugal; and Pedro Beja, Research Center in Biodiversity and Genetic Resources (CIBIO/InBio), University of Porto, Vairão, Porto, Portugal

***Impacts of Highway 40 on the Greater Ocala National Forest Ecosystem, Florida, United States***

Daniel Smith, University of Central Florida, Orlando, Florida, United States

***Being Killed for Nothing; A Case Study from Forest Road SH 28, in the Global Hot Spot, The Western Ghats, India***

Anoop Das, MES Mampad College, Malappuram, Karnataka, India; and Murukesh Divin, Center for Conservation Ecology, MES Mampad College, Malappuram, Karnataka, India



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**Session 408: Emerging Issues and New Directions in Transportation Ecology**

***Leveraging Emerging Technology to Achieve Streamlining Initiatives***

LeiLani Paugh and Morgan Weatherford, North Carolina Department of Transportation, Raleigh, North Carolina, United States; Sarah Schwarzer, North Carolina Department of Environment and Natural Resources, Raleigh, North Carolina, United States; and Thomas Steffens, U.S. Army Corps of Engineers, Washington, North Carolina, United States

***Random Forest Classification and Automation for Wetland Identification based on Digital Elevation Model (DEM) Derivatives***

Sheng-Guo Wang and Jing Deng, University of North Carolina, Charlotte, Charlotte, North Carolina, United States; Ming-Zhi Chen, Fuzhou University, Fuzhou, China; Morgan Weatherford and LeiLani Paugh, North Carolina Department of Transportation, Raleigh, North Carolina, United States

***The Future Of Road Ecology Research and Practice: The Global Perspective of Hundreds of Practitioners***

Rodney van der Ree and Dave Kendal, Australian Research Center for Urban Ecology, Parkville, Victoria, Australia

***Source to Server: Automating the Ingestion, Annotation, and Management of Wildlife Camera-Trap Photographs***

David Waetjen and Fraser Shilling, Road Ecology Center, University of California, Davis, Davis, California, United States