2019 INTERNATIONAL CONFERENCE ON

ECOLOGY and TRANSPORTATION

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Message from the Chair

Deb Wambach
Montana Department of Transportation

Welcome to the 10th biennial International Conference on Ecology and Transportation in Sacramento, California. We are delighted to have you join the conversation with experts from around the world to exchange knowledge and best practices on the interrelationship of ecology and transportation. As we celebrate our 10th anniversary, it seems appropriate to look back and see how far we've come over the past two decades of growth in the global transportation ecology community. Looking forward to the next 20 years, we are invigorated by the possibilities of the future and the challenges that command collaborative and innovative solutions. One thing is clear — "achieving balance" in ecology and transportation has never been more important than it is right now. An ever-increasing human population continues to drive the need for maintenance of aging infrastructure while planning for and building the new. The unpredictability of extreme weather events and a changing climate challenges our vision for long-range planning and resource allocation. The state of our natural world is fragile, requiring the careful integration of sustainable infrastructure into complex and vulnerable natural landscapes at multiple scales. Our work is vital in preserving what persists today and offering any opportunity for these ecosystem functions and life-forms to thrive into the future.

During the conference, you will be surrounded by the foremost minds in transportation ecology as well as the newest members of our community. ICOET is designed to be highly interactive, international, and interdisciplinary, allowing participants to take in the latest in best practices and leading research in the field. The conference provides a forum to network with a variety of academics, practitioners, researchers, and industry leaders, often resulting in connections

Continued next page.

Message from the Chair (continued)

that grow into lasting relationships, shared experiences, and motivation for success. ICOET is a celebration of the global transportation ecology community and we are so happy you are here!

ICOET 2019 "Achieving Balance in Ecology and Transportation" will feature over 200 oral presentations, panel discussions, and posters from over a dozen countries. Immense gratitude is owed to our co-hosts from Caltrans and California Department of Fish and Wildlife, along with their state and federal agency partners. Six field trips will showcase the many challenges to achieving the balance between vulnerable ecological systems and safe, efficient transportation systems, while providing you the opportunity to take in the stunning beauty and innovative programs abound in California.

We are pleased to have two notable keynote speakers for our Monday and Tuesday luncheons — Dr. Daniel Sperling, Distinguished Professor of Civil Engineering and Environmental Science and Policy, and founding Director of the Institute of Transportation Studies at UC-Davis and Dr. Seth Riley, Wildlife Branch Chief of the Santa Monica Mountains National Recreation Area and Adjunct Associate Professor in Department of Ecology and Evolutionary Biology, UCLA. Other invited speakers, award presentations, film screenings, workshops, and business meetings will round out the technical program. On this, our 10th anniversary, "Achieving Balance in Ecology and Transportation" celebrates the collaborative efforts resulting in innovative solutions answering the challenge of implementing sustainable transportation infrastructure into complex and changing landscapes. Thank you to the many individuals, organizations, and sponsors who helped bring us together for ICOET 2019. Their support and your participation ensure that ICOET continues to serve as an invaluable conduit for transportation and ecology professionals around the world to share applicable research and best practices, and to transfer knowledge between experienced practitioners and future leaders as we strive to achieve balance between ecology and transportation. I sincerely hope that you have a rewarding and memorable experience this week. Enjoy the conference!

Deb Wambach
ICOET 2019 Conference Chair

A Word from the Organizer

ICOET is the #1 conference globally to learn about the environmental impacts of transportation systems and what we can do to reduce these impacts. Participants in the conference straddle the lines among single-discipline conferences, bringing a wide range of expertise and experience to bear in integrated and partner-oriented research and application.

Until recently, ICOET was very ably organized by the Institute for Transportation Research and Education at North Carolina State University. At their request, the Road Ecology Center (REC) at the University of California, Davis stepped in to take over organizing the conference. We have endeavored to both continue many of the traditional elements of ICOET, and to keep evolving as society and transportation evolves.

The REC is co-directed by Alison Berry (ICOET Steering Committee member) and Fraser Shilling (ICOET Lead Organizer). We are excited to both bring ICOET to California and to make sure that ICOET is continuously and expertly managed into the future. We look forward to meeting many of you and to helping you have a great ICOET experience. Feel free to stop us and say hi and come by our table next to the registration desk.

Fraser Shilling
Road Ecology Center Co-Director and ICOET Lead Organizer
https://roadecology.ucdavis.edu

Conference Theme

"Achieving Balance in Ecology and Transportation"

Balance is defined as "a state in which different things have an equal or proper amount of importance." Achieving balance between healthy ecosystems and efficient transportation systems is critical in the pathway to sustainable growth and development, and a difficult task in new and changing environments. The ICOET 2019 theme explores the challenges and successes that transportation organizations encounter in striving for this balance through the delivery of their programs to benefit the public interest. These efforts can include incorporating anticipated climate change effects into long-range planning, mitigating ecological impacts of new construction projects, or adaptively managing existing infrastructure effectively while improving baseline ecosystem functions. Achieving balance in new and changing physical, fiscal, political and social environments relies on science, is reinforced through policy, and is best implemented through collaboration, adaptation and innovation.

The highway and rail transportation organizations in our host state of California exemplify the 2019 theme as they continually face many challenges to achieving the balance between vulnerable ecological systems and safe, efficient transportation systems. Some of these challenges include fluctuating funding, intensified emergency work due to more frequent extreme weather events, and increased accountability to an informed and interested public. Around the world, transportation organizations are responsible for improving or replacing aging and deteriorating infrastructure built decades ago under a very different development paradigm while addressing current ecological needs and in consideration of future environmental changes. Advances in our knowledge of transportation ecology will provide new opportunities to better integrate sustainable transportation infrastructure into complex and vulnerable natural landscapes.

Implementing transportation solutions using the best science and policy guidance while maintaining scope, schedule and budget requires collaboration, adaptation and innovation. As we celebrate our 10th biennial conference year in 2019, ICOET continues to serve as an invaluable conduit for transportation and ecology professionals around the world to share applicable research and best practices, and to transfer knowledge between experienced practitioners and future leaders as we strive to achieve balance between ecology and transportation.

Conference at-a-glance

SUNDAY September 22

12:00 to 5:00 PM	**Road Ecology Workshop for ICOET Participants** (Golden State Room, pre-registration required)
3:00 PM to 6:00 PM	**Registration Open** (Foyer) | **Exhibitor Set-up** (Ballroom F & Foyer)
3:30 to 5:00 PM	**TRB ADC10 and ADC30 Committee Meetings** (Tahoe Room)
5:15 to 6:45 PM	**ICOET Steering Committee Dinner-Meeting** (Tahoe Room)
	Dinner on your own
7:00 to 9:00 PM	**Mini "Wild and Scenic" Film Festival sponsored by Defenders of Wildlife** (Ballroom ABC)

MONDAY September 23

Registration Open | Sponsor Exhibits Open | Wildlife Photo Exhibit (Foyer)

7:30 to 8:30 AM	**Continental Breakfast** (Foyer) | **Registration** (Foyer) | **CDFW Side-Meeting** (Ventura)				
8:30 to 10:00 AM	**Welcome Session Opening Remarks, Invited Speakers** (Ballroom ABC)				
10:00 to 10:30 AM	**Break | Visit Exhibits**				
Parallel Sessions 10:30AM to 12:00 PM	**Technical Session 1** (Ballroom D)	**Technical Session 2** (Ballroom E)	**Technical Session 3** (Golden State)	**Technical Session 4** (Carmel)	**Panel 1** (Big Sur)
12:00 to 1:30 PM	**Keynote Luncheon Speaker: Daniel Sperling — ITS, UC Davis** (Ballroom ABC)				
Parallel Sessions 1:30 to 3:00 PM	**Technical Session 5** (Ballroom D)	**Technical Session 6** (Ballroom E)	**Technical Session 7** (Golden State)	**Technical Session 8** (Carmel)	**Panel 2** (Big Sur)
3:00 to 3:30 PM	**Break | Visit Exhibits**				
Parallel Sessions 3:30 to 5:00 PM	**Technical Session 9** (Ballroom ABC)	**Technical Session 10** (Ballroom D)	**Panel 3** (Ballroom E)	**Lightning Session 1** (Golden State)	**Workshop 1a & b** (Carmel)
6:00 to 9:00 PM	**Welcome Reception** (California Railroad Museum)				

TUESDAY September 24

Registration Open (Breaks Only) | Sponsor Exhibits Open | Wildlife Photo Exhibit (Foyer)

7:30 to 8:30 AM	**Continental Breakfast (Foyer)**				
Parallel Sessions 8:30 to 10:00 AM	**Symposium 1, Part 1** (Ballroom D)	**Technical Session 11** (Ballroom E)	**Technical Session 12** (Golden State)	**Panel 4** (Carmel)	**Workshop 2** (Big Sur)
10:00 to 10:30 AM	**Break | Visit Exhibits**				
Parallel Sessions 10:30 to 12:00 PM	**Symposium 1, Part 2** (Ballroom D)	**Technical Session 13** (Ballroom E)	**Technical Session 14** (Golden State)	**Panel 5** (Carmel)	
12:00 to 1:30 PM	**Keynote Luncheon Speaker: Seth Riley — National Park Service** (Ballroom ABC) | **Awards** (Ballroom ABC)				
Parallel Sessions 1:30 to 3:00 PM	**Technical Session 15** (Ballroom D)	**Lightning Session 2** (Ballroom E)	**Panel 6** (Golden State)	**Workshop 3** (Carmel)	**Workshop 4** (Big Sur)
3:00 to 3:30 PM	**Break | Visit Exhibits | Poster Set-up**				
Parallel Sessions 3:30 to 5:00 PM	**Technical Session 16** (Ballroom D)	**Lightning Session 3** (Ballroom E)	**Lightning Session 4** (Golden State)	**Panel 7** (Carmel)	**Panel 8** (Big Sur)
5:00 to 6:00 PM	**Poster Session** (Ballroom ABC)				**South Western DOT Interstate Meeting** (Golden State)
5:15 to 6:00 PM					**USFWS liaison meeting** (Ventura)
6:00 to 9:00 PM	**Social, Film and Poster Session | Student/Poster Awards** (Ballroom ABC)				**Wildlife films** (Ballroom D)

WEDNESDAY September 25

7:30 to 8:00 AM	**Meet in Foyer**					
Field Trips 8:00 AM to 6:00 PM (exact trip lengths vary)	**Balancing the Needs of Shoreline Ecosystems and Transportation in the Face of Sea Level Rise** Lunch provided	**Planning for California's first Sea Level Rise Adaptation for Transportation** Lunch provided	**Highway 89 Stewardship Team – Partnership for Wildlife**	**Tahoe's Road to Blue** Lunch provided	**Take a Trip to See the Nation's First High-Speed Rail Project** Lunch provided	**Bats at Sundown** (Meet in Foyer at 3:00 pm) Lunch provided
> 6:00 PM	**Dinner on Your Own**					

THURSDAY September 26

7:30 to 8:30 AM	**Continental Breakfast** (Foyer)				
Parallel Sessions 8:30 to 10:00 AM	**Symposium 2, Part 1** (Ballroom A)	**Technical Session 17** (Ballroom B)	**Technical Session 18** (Ballroom C)	**Panel 9** (Ballroom E)	**Technical Session 19** (Ballroom D)
10:00 to 10:30 AM	**Break | Visit Exhibits**				
Parallel Sessions 10:30 to 12:00 PM	**Symposium 2, Part 2** (Ballroom A)	**Technical Session 20** (Ballroom B)	**Technical Session 21** (Ballroom C)	**Technical Session 22** (Ballroom E)	
12:00 to 1:00 PM	**Plenary, Closing Session Remarks** (Ballroom ABC)				
1:00 to 2:00 PM	**Lunch on your own**				

Opening Plenary & Parallel Sessions

Monday, September 23, 2019

Charlton "Chuck" Bonham was appointed as Director of the California Department of Fish and Wildlife, effective September 6, 2011. Prior to his appointment as Director of Fish and Wildlife, Mr. Bonham served in a number of roles for Trout Unlimited over ten years, including since 2004 as the organization's California director.

Vince Mammano is the Division Administrator for the California Division of the Federal Highway Administration. He entered the position in August of 2011. He is a member of the Senior Executive Service of the Federal Government and leads the largest FHWA Division office in the country. He is responsible for directing the delivery of the Federal-aid program and Recovery Act funding and advancing national goals. He leads a multidisciplinary professional staff responsible for civil rights, safety, planning, finance, environment, engineering, and operations.

Jim Davis is the Chief Deputy Director of the California Department of Transportation (Caltrans). A civil engineer and 30-year veteran of Caltrans, he leads California's $5 billion/year highway-construction program. He also oversees the 20,000 employees and many Divisions of Caltrans.

Opening Plenary and Parallel Sessions

Monday, September 23, 2019

Time	Ballroom ABC	Ballroom D	Ballroom E
7:30 - 8:30 AM	**Continental Breakfast** (Foyer)		
8:30 - 10:00 AM	**Plenary, Welcome Session**	No Session	No Session
10:00 - 10:30 AM	**Refreshment Break** (Foyer)		
10:30 - 12:00 PM	No Session	**Technical Session 1: Africa Emergent**	**Technical Session 2: Reconnecting Cascadia**
		Status of road ecology research in Africa: the scope of current knowledge and prioritising for the future — Wendy Collinson	I-90 Snoqualmie Pass East — engineering innovation — Brian White
		Making the economic case to promote avoidance of environmental damage in road development in Africa and South America: cases from Uganda and Peru — Kim Bonine	Connectivity of small mammal populations: moving through and living in wildlife crossing structures in the I-90 Snoqualmie Pass East Project — Kristina A. Ernest
		Eskom/Endangered Wildlife Trust partnership 1996 - 2019, 23 years of partnering together to reduce impacts on business and on biodiversity — Kishaylin Chetty and Lourens Leeuwner	Colonization by fish and benthic macroinvertebrates in restored stream channels associated with the I-90 Snoqualmie Pass Project in Washington State — Paul W. James
		An analysis of Vulture mortalities on power lines in South Africa from 1996 to 2018 — Lourens Leeuwner	Connections made: monitoring amphibian movements in the I-90 Snoqualmie Pass East Project — Jason T. Irwin

All sessions are held at the Hyatt Regency Sacramento
Exhibitors can be found in the Foyer and Ballroom F

7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Golden State	Carmel	Big Sur
		CDFW Meeting: Transportation and Ecology Issues
No Session	No Session	No Session
Technical Session 3: Soup to Nuts	**Technical Session 4: All Abuzz About Pollinators**	**Panel 1: Designing the San Jose to Merced Project Section of California's High-Speed Rail System to Support Wildlife Movement**
Efficient planning for conducting EIS Surveys given the complexities of wildlife species detection — Kimberly M. Andrews	Creating climate resilient habitat for pollinators along roadways — Angela Laws	Organizer: Stephanie Parsons - California High-Speed Rail **Panel:** Stephanie Parsons (California High-Speed Rail), John Hunter (California High-Speed Rail), Rebecca Sloan (ICF), Jake Smith (Santa Clara Valley Open Space Authority), Rosanna McGuire (HNTB) Our panel's presentations will provide an overview of the project, its context, and approach to maintaining wildlife movement; a description of the permeability modeling used to evaluate project effects; stakeholder participation in and contributions to the design process; and the engineering challenges posed by wildlife crossings and how these were solved.
Design and construction of next generation of arched wildlife overpass — Yoho National Park — Terry McGuire P Eng	Arizona Department of Transportation vegetation management guidelines — Kris Gade	
Applying transportation asset management to highway roadsides/balancing ecological opportunities with operational requirements — Raymond Willard PLA	Bumble bee communities along roadsides in the metropolitan area of Minnesota: occupancy, detection and survey methods — Michelle Boone	
The effects of interspecies interactions and human disturbances on wildlife in highway underpasses — Molly R. Caldwell	Pollinator garden for arid regions — Great Basin Desert — Cathy Ford	

Opening Plenary and Parallel Sessions

Monday, September 23, 2019

Time	Ballroom ABC	Ballroom D	Ballroom E
12:00 - 1:30 PM	**Keynote Luncheon: Daniel Sperling (ITS, UC Davis)**	No Session	No Session
1:30 - 3:00 PM	No Session	**Technical Session 5: Challenges in a Changing Climate**	**Technical Session 6: Ocelots on the Brink**
		The U.S. Forest Service Transportation Resiliency Guidebook: addressing climate change impacts on U.S. Forest Service transportation assets — Benjamin Rasmussen	Ocelot resource selection in a highly fragmented landscape — Amanda M. Veals
		Tracking shoreline change for ecosystem and infrastructure adaptation to sea level rise — Fraser M. Shilling	Patterns in landscape characteristics surrounding ocelot-vehicle collision sites — AnnMarie Blackburn
		(2 Presentations) Designing an adaptive pathway to resilient highways and coasts — Alyssa Mann and Tiffany Cheng	Estimating the expected crossing frequency of road mitigation structures in South Texas based on proximity and vegetation — T. Miles Hopkins
			The influence of fences and fence gaps on the distribution of wildlife road mortalities on a South Texas highway — Thomas J. Yamashita
3:00 - 3:30 PM	**Refreshment Break** (Foyer)		

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7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Golden State	Carmel	Big Sur
No Session	No Session	No Session
Technical Session 7: Betting on Biodiversity	**Technical Session 8: Models, Take the Roadway!**	**Panel 2: In it for the long-haul: Education and workforce development for wildlife friendly highways.**
Effects of road infrastructure on biodiversity: The good, the bad and the unknown — Svenja B. Kroeger	Modelling potential wildlife-vehicle collisions (WVC) locations using environmental factors and human population density — Hoe Hun Ha	Organizer: Renee Callahan, ARC Solutions **Panel:** Nova Simpson (Northern Nevada Biological Supervisor and Wildlife Mitigation Specialist, NvDOT), Dr. Michael Sawaya (Research Ecologist, Sinopah Wildlife Research Associates), LeAnne Lorenz (Teacher, Sacajawea Middle School - Bozeman, MT), Nina-Marie Lister (Director, Ecological Design Lab - Ryerson University), Hilary A. Turner (Road Ecology Wildlife Technician, Idaho Department of Fish and Game), Chris Slesar (Environmental Resources Coordinator, Vermont Agency of Transportation), Sandra Jacobson (Retired Wildlife Biologist, USDA Forest Service, Pacific Southwest Research Station)
Science and solutions: systematically identifying priority road sections for improving human and wildlife safety in Alberta, Canada — Tracy Lee	Risk mapping wildlife-vehicle collisions in the state of Montana — Matthew Bell	
Are road verges corridors, biodiversity refuges or ecological traps? — António Mira	Prioritizing road sections for wildlife fencing: Considering scales, thresholds, and trade-offs — Jochen Jaeger	
TBA	Strategic minimization of road effects to the Mojave desert tortoise (*Gopherus agassizii)* — Florence Deffner	

Opening Plenary and Parallel Sessions

Monday, September 23, 2019

Time	Ballroom ABC	Ballroom D	Ballroom E
3:30 - 5:00 PM	**Technical Session 9: California Dreaming**	**Technical Session 10: Wildlife and Roads in the Developing World**	**Panel 3: Building the largest wildlife crossing in the world: the Liberty Wildlife Corridor Partnership**
	Development of a shading model for mapping impacts of over-water structures on submerged aquatic vegetation and mitigation planning — Mark S. Fonseca	Development corridors through ecologically sensitive areas - in Kenya — Lucy Waruingi	Organizer: Beth Pratt (National Wildlife Federation) **Panel:** Beth Pratt (National Wildlife Federation), Sheik Moinddin (Caltrans), Barbara Marquez (Caltrans), Dr. Seth Riley (National Parks Service, UCLA), Rorie Skei (Santa Monica Mountains Conservancy), Clark Stevens (Land Planner, Architect), Fran Pavley (Retired Senator), Mary Ellen Hannibal (Journalist, Author) How do you get the largest wildlife crossing in the world built, under a rapid timeline, and with a price tag of over $60 million? The old adage ""It takes a village,"" proves once again true, as the wildlife crossing at Liberty Canyon project illustrates the vast power of partnerships. In this panel, learn how a focus on core partnerships and leveraging widespread public support has taken this wildlife crossing from a visionary idea to an impending reality.
	The California Department of Transportation's (Caltrans) San Francisco-Oakland Bay Bridge (SFOBB) east span marine foundations removal project — Stefan Galvez-Abadia	Seeking coordination in the complexity: lessons from efforts to mitigate environmental impacts of the Lamu Port-South Sudan-Ethiopia Transport (LAPSSET) Corridor in northern Kenya — Sarah Chiles	
	State of the art technology for plume mapping and water quality monitoring in a dynamic bay environment — Dragomir Bogdanic	Mapping and modelling of wildlife and livestock roadkills from Kyumvi to Sultan Hamud (KENYA) — Peter Kibobi	
	Assessing the effectiveness of a bubble curtain to protect aquatic resources during marine blasting demolition work for the east span of the San Francisco-Oakland Bay Bridge in San Francisco Bay, CA — Tom Taylor	Landmark railway and conservation project in a developing country: Bangladesh — Norris L. Dodd	
6:00 - 9:00 PM	**ICOET Welcome Reception** (California Railroad Museum, Old Town Sacramento)		

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7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Golden State

Lightning Session 1:
Mitigation & Modeling for Transportation Projects

Differences in spatiotemporal patterns of vehicle collisions with wildlife and livestock — Tyler Creech

Sound and light-scapes affect wildlife approaches to crossing structures — Amy Collins

Modeling the full spectrum of habitat connectivity conservation and restoration opportunities in California — Dick Cameron

Integrating landscape connectivity modeling and field data for wildlife crossing design — Megan K. Jennings

Incorporation of ecologically beneficial designs when there is only anecdotal evidence for need — Peter Leete

Compensatory mitigation for transportation projects — Jeff Mathews

Caltrans Division of Environmental Analysis lake and streambed alteration agreement process improvements — Phil Stolarski

How reliable are your data? Verifying species identification of road-killed mammals recorded by road maintenance personnel in São Paulo State, Brazil — Fernanda Delborgo Abra

Carmel

Workshop 1a:
Railway Ecology Workshop (3:30–4:15 pm)

Organizer: Manisha Bhardwaj

The workshop will promote a dialogue between practitioners and researchers, and bring together those working within the field of railway ecology. The body of literature on the impacts of railways on wildlife and environment is steadily growing, and the needs of government transportation agencies and private railway companies to address these issues is also escalating. In this workshop we will start from the basics and known state of the literature, and move towards identifying gaps in knowledge and what information managers need to improve their management of railways.

Workshop 1b:
Developing an International Strategy on Engaging different Stakeholders for Mainstreaming Biodiversity Provisions for Sustainable Linear Infrastructure (4:15 - 5:00 pm)

This workshop will present and host discussion of an 'International Strategy for Sustainable Linear Infrastructure & Stakeholder Engagement'. The strategy development involves global partners and other conferences.

Big Sur

No Session

Parallel Sessions

Tuesday, September 24, 2019

Time	Ballroom ABC	Ballroom D	Ballroom E
7:30 - 8:30 AM	**Continental Breakfast** (Foyer)		
8:30 - 10:00 AM	No Session	**Symposium 1: The Road to Wildlife-Vehicle Conflict Mitigation is Paved with Good Data, Part 1**	**Technical Session 11: If You Build It, They Will... Swim**
		Opening remarks — Pamela Flick (moderator)	Enhancing and streamlining aquatic organism protection for transportation projects — Chris Goodson
		Mitigating for mortality is more important than mitigating for connectivity — Lenore Fahrig	Maintaining, enhancing, or restoring ecological connectivity at culvert structures in Minnesota — Peter Leete
		Opportunities and challenges in analyzing road mortality data — Fernanda Z. Teixeira	Experiments on box culvert design for fish passage: light, roughness, and sediment — Jessica Kozarek
		The upgraded road from big WVC datasets to analyses — Fraser Shilling	Developing a fish barrier enhancement program or how to replace five barriers in two years — Trevin Taylor
10:00 - 10:30 AM	**Refreshment Break** (Foyer)		

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7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Golden State	Carmel	Big Sur
Technical Session 12: One Bat, Two Bats, Fat Bats, Happy Bats	**Panel 4:** Regional Greenprints: Integrating Transportation Agency Goals with Conservation Data for Sustainability and Climate Resilience	**Workshop 2:** Getting the most out of your Monitoring Cameras: A Practical Workshop for Transportation Ecologists
A new manual for Caltrans bat mitigation on bridges with an analysis of bat mitigation structures — Dave Johnston	Organizer: Liz O'Donoghue (The Nature Conservancy of California) **Panel:** Liz O'Donoghue (Nature Conservancy), William Craven (Chief Consultant of the Senate Natural Resources and Water Committee), Abby Ramsden (The Nature Conservancy), Adam Garcia (Greenbelt Alliance), Laura Thompson (Metropolitan Transportation Commission), India Brookover (Southern California Association of Governments) Speakers from transportation agencies, conservation organizations and the California Legislature will present on the what, why and how of greenprints and greenprints' role in meeting conservation and transportation goals; we will have an interactive Q&A and host an interactive session for audience members to test drive greenprints on laptops at the end of the session.	Organizer: Julia Kintsch (Eco-Resolutions) This 90-minute workshop will focus on objective-based camera monitoring techniques to evaluate the effectiveness of wildlife mitigation. The workshop will include discussions about monitoring existing bridges and culverts, pre-construction monitoring and post-construction monitoring, as well as the use of photographic data to communicate about mitigation projects with the public and decision-makers.
Why bat mitigation in transportation infrastructure often fails, and how we can do better: recommended approaches and lessons learned from Southern California — Jill M. Carpenter		
Fat, happy bats and pool noodles: a case study for completing maintenance on a bridge with year-round bat use — Laci Pattavina		
Innovative mitigation for threatened microbats on road projects in New South Wales, Australia- did it work and what happens next? — Josie Stokes		

Parallel Sessions

Tuesday, September 24, 2019

Time	Ballroom ABC	Ballroom D	Ballroom E
10:30 - 12:00 PM	No Session	**Symposium 1: The Road to Wildlife-Vehicle Conflict Mitigation is Paved with Good Data, Part 2**	**Technical Session 13: It's not Easy Being Ectothermic**
		Life safe-crossing: a new project for preventing large carnivore road mortality in Europe — Carme Rosell	Retrofit wildlife ecopassages successfully reduce turtle road mortality in the Lake Simcoe watershed — Kaitlyn Read
		A new road crossing structure for small animals: case study with the Yosemite Toad — Cheryl S. Brehme and Stephanie Barnes	Simplifying the approach to wildlife fencing for herpetofauna to ensure effective implementation: an analysis of global mitigation case studies — Steve Béga
		Modeling black-bear vehicle collision zones in Yosemite National Park — Katie Rodriguez	An improved camera trap for monitoring use of underpasses by amphibians, reptiles, and large invertebrates — Michael T. Hobbs
		A legislative approach to systematically collecting, analyzing and utilizing statewide wildlife-vehicle collision data for transportation and conservation planning — Pamela Flick	Frogs, toads, and roads: the benefits of long-term invasive predator removal as mitigation for transportation projects in sensitive areas — Bo Gould
12:00 - 1:30 PM	Keynote Luncheon (Seth Riley, National Park Service)	No Session	No Session

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7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Golden State	Carmel	Big Sur
Technical Session 14: Beyond the Bumper	**Panel 5: Nature-based Resilience for Coastal Highways**	No Session
Mammal responses to traffic noise and light at wildlife crossing structures — Amy Collins	Organizers: Tina Hodges (Federal Highway Administration) and Mike Ruth (Federal Highway Administration) **Panel:** Mike Ruth (Federal Highway Administration), Tina Hodges (Federal Highway Administration), Bret Webb (University of South Alabama), Stefanie Hom (Metropolitan Transportation Commission), Kristin Tremain (AECOM), Jeffrey K. King (US Army Corps of Engineers), Geoff Crook (Oregon Department of Transportation) This panel will explore how transportation agencies can use nature-based solutions to protect coastal highways from the damage and disruption of flooding and erosion under current and future conditions, while providing habitat and recreation benefits.	
Eco-friendly road lighting and maintenance choices can lessen the impact of anthropogenic light pollution on terrestrial wildlife — Nina Kawalek		
Roads as barriers to ungulate movements: traffic volume and highway permeability — Corinna Riginos		
Are highways stressful for pikas? analysis of stress hormones of *Ochotona princeps* living adjacent to an interstate highway in the I-90 Snoqualmie Pass East Project, Washington State — Thomas McIntyre		
No Session	No Session	

Parallel Sessions

Tuesday, September 24, 2019

Time	Ballroom ABC	Ballroom D	Ballroom E
1:30 - 3:00 PM	No Session	**Technical Session 15: The Shape of Water**	**Lightning Session 2: Policy, Partnerships and Multi-Modal**
		Striking a balance between wildfires and water quality with state agency collaboration — Lorna McFarlane	The Hwy 89 stewardship team mitigation, research and education to improve wildlife passage — Sara Holm
		Let's redefine green infrastructure [for the transportation paradigm] — Brian Smith and Jennifer Taira	A municipal planning toolkit for implementing road ecology best management practices — Kaitlyn Read
		SR 167 Riparian Restoration Program - Thinking outside the box to meet NPDES Permit requirements — Simon Page	Do we need an ethic of road ecology? — A.Z. Andis Arietta
		Environmental DNA - real time results in the field to confirm the presence of target species — Jake Riley	Coyote Valley: a case study for conserving an at-risk wildlife corridor in Silicon Valley — Galli Basson
			Planning for connectivity enhancements between three bay area mountain ranges: a peer-to-peer working session — Neal Sharma
			Wolves in California - a story of biology and major roadways — Justin Dellinger
			The Monarch CCAA: a cooperative conservation opportunity for transportation agencies — Iris Caldwell
			Amphibian and reptile highway crossings: Producing the Caltrans best pracices manual for california for 2020 — Tom Langton
3:00 - 3:30 PM	**Refreshment Break** (Foyer)		

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7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Golden State	Carmel	Big Sur
Panel 6: Animal detection systems: What's the frequency?	**Workshop 3: Wildlife Vehicle Collisions Predictive Analysis**	**Workshop 4: G.U.T.S. 2.0**
Organizers: Renee Seidler (Idaho Department of Fish and Game) and Tim Cramer (Idaho Transportation Department) **Panel:** Jeff Gagnon (Arizona Game and Fish Department), Tim Hazlehurst (CrossTek Wildlife Solutions), Marcel Huijser (Montana State University), Daniel Smith (University of Central Florida), Hao Xu (University of Nevada Reno), Kelly McAllister (Washington Department of Transportation), Leonard Sielecki (British Columbia Ministry of Transportation), Nova Simpson (Nevada Department of Transportation), Danielle Backman (Mount Revelstoke and Glacier National Parks) This panel of experts have all been involved in testing, utilizing, designing, and/or evaluating animal detection systems in various settings across North America. They each have a unique perspective on the science, technology, human dimensions and ecological implications that surround animal detection systems.	Organizers: Dan Buford (Federal Highway Administration) and Julianne Schwarzer (Volpe Center) During this workshop, participants will share current practices, data sets and analysis methodology for identification of WVC hotspots. Participants will also define connections to new and emerging transportation technologies including such as automated vehicles and autonomous vehicles.	Organizer: Elizabeth Fleming (Defenders of Wildlife) The goal of this workshop will be to gather and discuss as a community of conservationists, practitioners, planners, researchers, newcomers and veterans to have a conversation about what we need to better inform each other in the current and changing world of transportation policy & planning, road ecology and conservation priorities in a dynamic and changing environment.

Parallel Sessions

Tuesday, September 24, 2019

Time	Ballroom ABC	Ballroom D	Ballroom E
3:30 - 5:00 PM	No Session	**Technical Session 16: Yes But, Does It Work?**	**Lightning Session 3: Climate Change and Emerging Issues**
		Traffic, habitat change, & time influence wildlife crossing structure use across a decade of monitoring — Leslie Bliss-Ketchum	Balancing transportation demand, climate change, sea level rise, and ecological adaptation through collaborative planning along California State Route 37 — Kristin Tremain Davis
		Wildlife crossing structures in the mitigation for transportation projects: an evaluation of ex post monitoring in Spain — Eloy Revilla	Using translational ecology to communicate climate change and road ecology: a picture is worth a thousand words — Kimberly M. Andrews
		Reduced speed limits: an effective way to reduce wildlife-vehicle collisions? — Elizabeth Fairbank	Using citizen science to survey roadkill at wide spatio-temporal scales: examples from the developing and the developed world — Wendy Collinson
		Wildlife detection system — Ian Steele, P.Eng.	The Korea road-kill observation system: an initial attempt to integrate road-kill data in national scale — Kyungmin Kim
		Effectiveness of wildlife fences in reducing key deer road mortality; the importance of implementing mitigation measures at the appropriate spatial scale — Marcel P. Huijser	The value of volunteers in global and US state roadkill data collection — Fraser Shilling
			Pronghorn Xing: Citizen Scientist's help conserve fastest animal in North America — Megan Jensen
			Road verges and power line corridors support conservation of plants and pollinators in the landscape — Juliana Daniel-Ferreira
			Weed-Suppressive Soil Bacteria to Reduce Downy Brome and Medusahead — Cathy Ford
5:00 - 9:00 PM	**Poster Session & Reception**	**Wildlife Films from Around the US**	

All sessions are held at the Hyatt Regency Sacramento
Exhibitors can be found in the Foyer and Ballroom F

7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Golden State

Lightning Session 4: Terrestrial Wildlife and Ecosystem Interactions with Transportation

Automated detection of (no-)animals in camera trap images
— Christian John

Using multispecies occupancy models to identify target locations for wildlife underpass installation
— Daniel Smith and Madison Hall

New evidences for the rail barrier as a direct source of mortality for small animals
— Rubem A. P. Dornas

Monitoring use of underpasses by Mojave desert tortoise (*Gopherus agassizii)* to inform culvert design and function
— Florence Deffner

Camera trap monitoring of culvert usage under Vasco Road with emphasis on California red-legged frogs and California tiger salamanders
— Jerry Roe

Wildlife overpass design and construction cost saving practices
— Kevin Williams

Winter is coming and there are no caves; northern long-eared bat *(Myotis septentrionalis)* activity during the fall and winter in coastal North Carolina
— Theresa Wetzel

Beyond wildlife movement: integrating wildlife habitat elements within wildlife crossing structures
— Shannon Crossen

Southwestern DOT Interstate Meeting (Private)

Carmel

Panel 7: Caltrans' Advance Mitigation Program:

Organizer: Chris Jannusch (Caltrans - Advance Mitigation Program)

Panel: Chris Jannusch (Caltrans), David Johnson (Caltrans), Katie Rodriguez (Caltrans), Kelly Kawsuniak (Caltrans), Jennifer Moonjian (Caltrans), Scott Quinnell (Caltrans), Stuart Kirkham (Caltrans), Carin Loy (Caltrans)

Part 1: Advance Mitigation: successes, challenges and lessons learned from Caltrans Pilot Projects
Part 2: Caltrans' Advance Mitigation Program and the Advance Mitigation Planning Process

Big Sur

Panel 8: New Mexico's Wildlife Corridors Act: Protecting wildlife migration through state legislation

Organizer: Michael Dax (Defenders of Wildlife)

Panel: Phil Carter (Wildlands Network), Mark Watson (New Mexico Department of Game and Fish), James Hirsch (New Mexico Department of Transportation), Michael Dax (Defenders of Wildlife)

This spring, the New Mexico legislature passed Senate Bill 228, the Wildlife Corridors Act, becoming the first state to enact legislation of its kind. This panel will feature the bill's sponsor, Senator Mimi Stewart, along with representatives from New Mexico Game and Fish, the Department of Transportation, Defenders of Wildlife and Wildlands Network.

USFWS Liaison Meeting (Private)

Poster Session

Tuesday, September 24, 2019

Topic Area	Poster No.	Title	Primary Author
Aquatic Species/Ecosystem and Wetland Interactions with Transportation	1	Environmentally acceptable lubricants	Brian Smith, FHWA
	2	Klamath-Cascades Fish Passage Advisory Committee 12 years of accomplishments to improve passage for fish and wildlife in northeastern California	Richard Lis, Calif. Dept. of Fish and Wildlife
	3	Beaver and roadways: beaver damage mitigation using cost effective solutions that retain habitat benefits	Brock Dolman, Occidental Arts and Ecology Center WATER Institute
	4	Effects of fence opacity on movement of California tiger salamanders toward an underpass system in Stanford, CA.	Cheryl S. Brehme, Western Ecological Research Center, U. S. Geological Survey
	5	Fish passage enhancement program	Jeanne Kinney, Thurston County Public Works
	6	Impact and mitigation of a mega transportation project on the Springs/Crenic Habitats and biodiversity in Uttarakhand Himalaya	Ramesh C. Sharma, Department of Environmental Sciences, Hemvati Nandan Bahuguna Garhwal University, India
	7	Mitigating road mortality of Minnesota's turtles and other small wildlife	Tricia Markle, Minnesota Zoo
	8	Partnering with beaver to benefit watersheds, restore aquatic habitat and mitigate impacts of roadways	Kate Lundquist, Occidental Arts and Ecology Center WATER Institute
	9	Rapid evaluation of fisheries resources upstream of barriers	Derek Acomb, California Dept. of Fish and Wildlife
	10	Boat traffic structures seascape genetic patterns in the Florida Manatee	Madison Hall, University of Central Florida
Emerging Issues & New Directions in Transportation Ecology	11	Plastics in erosion prevention & sediment control practices. Has the band-aid become worse than the wound?	Peter Leete, MnDNR
	12	Preliminary Inquiry Into State DOT LED Installations and Minimizing Effects to Wildlife	John Taylor, US Fish and Wildlife Service

Topic Area	Poster No.	Title	Primary Author
Mitigation for Transportation Projects	13	Wildlife passage modifications on State Route 118 in Ventura Co.	Celina Oliveri, Caltrans
	14	Best bang for the buck: controlled implosion yields greatest net environmental benefit from dismantling the Bay Bridge old east span	Dragomir Bogdanic, Caltrans
	15	Biochar to enhance stormwter management systems	Rawaa Al Tameemi, Morgan State University
	16	Comparison of stream simulation to hydraulic design approaches for constructing fish passage channels in two central California coastal streams: challenges, opportunities, and lots of large rocks	Jeff Peters, ICF
	17	Location, location, location: where bat roosts are installed can be an important factor in mitigating transportation projects	Jill M. Carpenter, LSA Associates, Inc.
	18	Madera pools mitigation site	Dena Gonzalez California Dept. of Transportation
	19	Mitigation at community relevant scales: Integrating habitat, carbon and ecosystem services	Steve Kohlmann, LSA
	20	Mitigation for Arroyo Toad habitat and other listed species at Vessels Mitigation Site, San Diego County	Rush Abrams, California Dept of Transportation
	21	Protecting the protected through assessing driver behaviour in protected areas, South Africa	Wendy Collinson, Endangered Wildlife Trust
	22	Regional conservation investment strategies program: a new conservation tool	Ami Olson, California Dept. of Fish and Wildlife
	23	Regulatory challenges and solutions for successful implementation of advance mitigation	Clifton Meek, U.S. EPA
	24	Relocating a historic cormorant nesting colony through implementation of nesting platforms on New East Span of the San Francisco-Oakland Bay Bridge	Stefan Galvez-Abadia, Caltrans
	25	Restoring coastal lagoons and wetlands on California's Scenic Highway 1	Jennifer Moonjian, California Dept. of Transportation
	26	Tidal marsh mitigation in Connecticut - challenges, successes, & lessons learned	Christopher Samorajczyk, Connecticut Dept. of Transportation
	27	Urban wildlife use of existing highway crossings and access points	Courtney Coon, Felidae Conservation Fund

Poster Session

Tuesday, September 24, 2019

Topic Area	Poster No.	Title	Primary Author
Partnerships and Collaborative Approaches for Improving Transportation Ecology	28	Partnering for results: California's transportation and coastal management agencies	Scott Williams, Caltrans
	29	Cooperative effort: the Highway 50 Connectivity Project	Shelly Blair, California Dept. of Fish and Wildlife
	30	Does size and appearance matter? Folklore as a limiting factor to the success of amphibian roadkill citizen science projects in Ha-Kutama, Limpopo Province, South Africa	Thabo Innocent Hlatshwayo, Dept. of Ecology and Resource Management, University of Venda, South Africa
	31	Got dirt? Build a noise berm!	Kathryn Nuessly, National Park Service
	32	Multi-agency collaboration at the Caltrans Lonestar Mitigation Site, San Diego, California	Michael Galloway, California Dept. of Transportation
	33	Proposal to develop, implement, and assess effectiveness of wildlife-vehicle collision driver awareness and behavior campaign	Tara Casanova Powell, Casanova Powell Consulting
	34	Road warriors: citizen scientist monitoring for Mojave Desert Tortoise road mortality	Florence Deffner, U.S. Fish and Wildlife Service
	35	TRIEKOL - Swedish research on applied road and rail ecology	Jan-Olof Helldin, Swedish Biodiversity Centre, SLU, Sweden
Planning for Transportation Ecology	36	Amphibians hit the road: assessing roadway mortality and ecopassage utilization along a two-lane highway	Charlene B Hopkins, Ohio University
	37	An updated statewide connectivity map for California	Melanie Gogol-Prokurat, California Dept. of Fish and Wildlife
	38	Blackfeet Nation animal-vehicle collision reduction master plan	Elizabeth Fairbank, The Center for Large Landscape Conservation
	39	California FishPACs - collaboration to enhance fish passage on the State Highway System	Melinda Molnar, Caltrans
	40	Connecting habitat across New Jersey (CHANJ)	Gretchen Fowles, NJ Division of Fish and Wildlife

Topic Area	Poster No.	Title	Primary Author
Planning for Transportation Ecology	41	Identifying barriers and prioritizing restoration strategies to improve wildlife connectivity in New Jersey	Neha Savant, The Nature Conservancy
	42	Barriers to dispersal and the challenges facing the southern expansion of endangered New Jersey bobcats	Ariana L. Cerreta, Dept. of Entomology and Wildlife Ecology, University of Delaware
	43	Developing species habitat assessment and survey methodologies for improved project delivery and data quality	Hannah Held, GDOT
	44	Economic and environmental benefits of stewardship tool	Amanda Long-Rodriguez
	45	Emerging best practices to reduce road mortality and increase habitat connectivity for turtles in the northeastern US	Tom Langen, Clarkson University
	46	Environmental communication and collaboration tools for transportation projects during design, construction, and beyond	Patrick Tennant, Environmental Science Associates
	47	Evaluating migratory bird exclusion practices on transportation structures	Jason Morrell, Arcadis U.S., Inc.
	48	Introducing RoadEcology.info: open-access solutions to mainstream sustainable linear infrastructure.	Rodney van der Ree
	49	Methods to engage stakeholders to improve environmental consultation process informing the long range transportation plan	Margaret Minzner, Ohio Kentucky Indiana Regional Council of Governments
	50	Reducing wildlife-vehicle collisions (WVC) through changing driver behaviour in the Kruger National Park	I L Buthelezi, Endangered Wildlife Trust, Tshwane University of Technology
	51	Roadway environmental advancement initiative (READI)	Nicholas Marchese
	52	Statewide connectivity modeling for conservation: the oregon connectivity assessment and mapping project	Dr. Rachel E. Wheat, Oregon Dept. of Fish and Wildlife
	53	Transportation ecology challenges in a biodiversity hotspot: addressing California's rare, threatened, endangered and special species and habitats	Julie Owen, California Dept. of Transportation
	54	Watershed-based consultation guidance for transportation projects	Peter Maholland, US Fish and Wildlife Service
	55	Wildlife crossings and early corridor planning: the State Route 139 Transportation Concept Report and Implications for future wildlife collision reduction and improved wildlife connectivity	Julie Owen, California Dept. of Transportation

Poster Session

Tuesday, September 24, 2019

Topic Area	Poster No.	Title	Primary Author
Policy and Regulatory Developments in Transportation	56	Multilateral development banks in Sub-Sahara Africa: do they have wildlife friendly infrastructure policies?	Rob Ament, Center for Large Landscape Conservation
	57	Programmatic permits covering highway maintenance activities provide regulatory efficiency and achieve environmental outcomes	Gregor Myhr, Washington State Dept. of Transportation
	58	Promoting wildlife connectivity through state legislation	Renee Callahan, Center for Large Landscape Conservation
	59	Transportation and wildlife migration corridors: Secretarial Order 3362	Elizabeth Fairbank, The Center for Large Landscape Conservation
Stormwater and Water Quality Management in Transportation	60	Fish and wildlife passage barriers: a web-based tool identifying opportunities for improved ecosystem connectivity	Shannon Crossen, ICF
	61	Potty Talk: How does treated wastewater effect California biodiversity?	Anna Cassady, UC Riverside
	62	The advantages of implementing the temporary drainage system in the control of erosion processes and silting of water bodies.	São Paulo State Environmental Agency, São Paulo, SP, Brazil
	63	The study to improve the effectiveness and efficiency of roadside infiltration-based trenches in Korea	Dr. Hyejin Cho, Senior Research Fellow
Sustainability and Resilience in Transportation Systems	64	INSTEP - Innovative and sustainable transportation evaluation process	National Park Service - Denver Service Center Transportation Division
	65	Beaver damage mitigation for roadways	Kevin Swift, Swift Water Design
	66	Camera monitoring in the design phase of a wildlife crossing project on California Highway 17 informs project design and underscores the value of the corridor for mountain lions	Morgan Robertson, California Dept. of Transportation
	67	Characterization of vulnerability of road networks against fluvial flooding using their spatial co-location interdependency with flood control infrastructure	Bahrulla Abdulla, Texas A & M University
	68	Creating a model for the prediction of roadkill Kruger National Park, South Africa	Brilliant Mashao, University of Venda & Endangered Wildlife Trust

Topic Area	Poster No.	Title	Primary Author
Sustainability and Resilience in Transportation Systems	69	Developing an extreme weather event risk framework: Houston case study	Jolanda Prozzi, Texas A&M Transportation Institute
	70	Gaviota Creek Watershed: Incorporating wildlife passage improvements and watershed restoration plans in transportation and conservation planning in Santa Barbara County, California, USA	Morgan Robertson, California Dept. of Transportation
	71	Hydraulic crossings: a more sustainable approach	Kevin Williams, Atlantic Industries Limited
	72	Modelling the risk of road networks in mountainous areas exposed to volcanic hazard	Alondra Chamorro & National Research Center for Integrated Natural Disaster Management (CIGIDEN), Pontificia Universidad Catolica de Chile
	73	Using spatio-temporal getis-ord gi* statistic for planning over bike traffic in Valencia (SPAIN)	Maria del Mar Pino, Departamento de Ingenieria Grafica, Escuela TÃ©cnica Superior de IngenierÃa, Universidad de Sevilla, Spain
Terrestrial Wildlife and Ecosystem Interactions with Transportation	74	Ensuring habitat connectivity for transportation projects - Examining the feasibility of wildlife crossings along State Route 101 in northern Sonoma County, California	Christopher Pincetich, Caltrans
	75	Indirect estimation of regional roadkill risk when there is no roadkill data	Eloy Revilla, Estación Biológica de Doñana CSIC, Spain
	76	Temperature affects snake roadkill in a highway, Hainan, China	Qi-Lin Li, Hainan Tropical Ocean University
	77	The comparison of roads and railways: temporal patterns of ungulate-vehicle collisions in Poland	Jasinska K.D., Dept. of Forest Zoology and Game Management, Warsaw University of Life Sciences
	78	The inaudible voice from wildlife habitat: The case of interaction between; wildlife, ecosystem and infrastructure development in Kenya	Odira Walter Ochieng, HOD, Roads and Airstrip Development
	79	Assessing the impacts of roads on British bird populations	Sophia Cooke, University of Cambridge
	80	Carcass data: when fewer carcasses are not better	Sandra Jacobson, US Forest Service
	81	Corridor K wildlife habitat modeling and assessment	Kahl, Samantha, Texas Tech University

Poster Session

Tuesday, September 24, 2019

Topic Area	Poster No.	Title	Primary Author
Terrestrial Wildlife and Ecosystem Interactions with Transportation	82	Determining the barriers to movement of tule elk at San Luis Reservoir	Cristen Langner, CDFW
	83	Determining the permeability of a South Texas state highway for wildlife using expected crossing frequencies	T. Miles Hopkins, University of Texas Rio Grande Valley
	84	Ecological and genetic connectivity of shrews *(Sorex spp.)* across Interstate-90 in the Snoqualmie Pass East Project, Washington State.	Jordan Ryckman, Central Washington University
	85	Environmental and anthropogenic correlates of roadkill distribution at the wildland-urban interface	Samantha E. S. Kreling, Environmental Science, Policy & Management, University of California Berkeley
	86	Estimating the expected crossing frequency of road mitigation structures in South Texas based on proximity and vegetation	T. Miles Hopkins, University of Texas Rio Grande Valley
	87	Freeman Gulch Widening Project Segment 1	Dena Gonzalez, California Dept. of Transportation
	88	From the largest to the smallest mammals — safe wildlife passages across a 4-lane highway provides more than expected	Jennifer Moonjian, California Dept. of Transportation
	89	Grassland bird effect analysis and application to roadway projects	Evan Markowitz
	90	Highway 17 wildlife and regional trail crossings project (Santa Clara County, California)	Julie Andersen, Midpeninsula Regional Open Space District
	91	Impact of transportation on mammalian fauna of Rajaji Tiger Reserve, India	Nitin Joshi, Dept. of Environmental Sciences, H.N.B Garhwal Central University, India
	92	Initial monitoring results of high-mobility species usage of I-90 Snoqualmie Pass Project wildlife crossing structures	Josh Zylstra, Washington State Dept. of Transportation
	93	Jaguars, roads and volcanos	Daniela Araya-Gamboa, Panthera, Turrialba, Cartago, Costa Rica
	94	Multi-tools and multi-species approach to study the impact of linear infrastructures on terrestrial mammals in France	Mergey Marina, URCA-CERFE, 5 rue de la héronnière, 08240 Boult-aux-Bois, France

Topic Area	Poster No.	Title	Primary Author
Terrestrial Wildlife and Ecosystem Interactions with Transportation	95	Old road impact on vertebrates can decrease with proper road zoning and management in the Buenaventura port road in Colombia	Diana C. Stasiukynas Salazar
	96	Opportunities and challenges in analyzing road mortality data	Fernanda Z. Teixeira, Road and Railroad Ecology Research Group NERF/UFRGS
	97	Road crossing patterns of ocelots in South Texas	C. Jane Anderson, Caesar Kleberg Wildlife Research Institute. Texas A&M University - Kingsville
	98	Road ecology through the lens of snakes in the Columbia Basin: patterns of mortality, occurrence, and activity	Adrian Slade
	99	Roadkill Observation and Data System (ROaDS): a standardized wildlife vehicle collision data collection system for Department of Interior agencies	Rob Ament, Western Transportation Institute
	100	Suitable habitat and connectivity limits the viability of fragmented mountain lion populations	Justin Dellinger, CA Dept. of Fish & Wildlife
	101	The influence of structural characteristics and environmental factors on the use of wildlife crossing structures	Anna D Rivera Roy, School of Earth, Environmental, & Marine Sciences, University of Texas Rio Grande Valley
	102	Wildlife use of road mitigation structures during and post-construction along a South Texas highway	Anna D. Rivera Roy, School of Earth, Environmental, & Marine Science, University of Texas Rio Grande Valley
	103	The relationship between human and animal activity at camera trap sites near a south Texas Highway	Thomas J. Yamashita. School of Earth Environmental & Marine Sciences, University of Texas Rio Grande Valley
	104	Toadal isolation? Movement and genetic connectivity of western toads *(Anaxyrus boreas)* in the I-90 Snoqualmie Pass East Project area	Anneliese Myers, Central Washington University
	105	Wildlife connectivity, movement and migration LA-101	Francois O. Appiah, California Dept. of Transportation

Poster Session

Tuesday, September 24, 2019

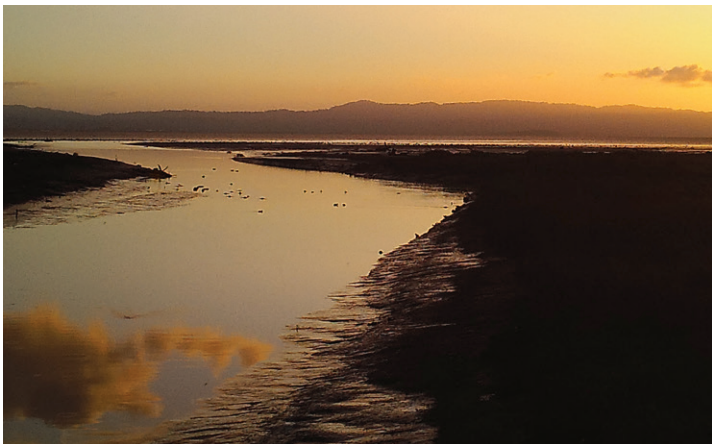
Topic Area	Poster No.	Title	Primary Author
Transportation Ecology in Construction, Operations and Maintenance	106	Assessing biodiversity in railway dry grassland patches	Magnus Stenmark, Ecocom
	107	Ecological consequences of roadway lighting design	Leo F Smith, International Dark-Sky Association
	108	Fire and storm damages to roadways, best practices for emergency projects while protecting ecological resources	Newton Wong, Caltrans
	109	Migratory Bird Treaty Act compliance: noise and vibration of standard bridge maintenance activity pilot project	Neal Goffinet, Felsburg Holt & Ullevig
Vegetation Management in Transportation Corridors	110	Steps toward integrated vegetation management: collecting vegetation data in transportation rights-of-way	Alissa Salmore, Idaho Transportation Dept.
	111	Effects of arbuscular mycorrhizal fungi on plant growth and nutrient uptake of road slope in the Qinghai-Tibet Plateau	Xinjun Wang, China Academy of Transportation Sciences

Kirkwood

Field Trips

Wednesday, September 25, 2019

7:30 to 8:00 AM	**Meet in Foyer**					
Field Trips 8:00 AM to 6:00 PM (exact trip lengths vary)	**Balancing the Needs of Shoreline Ecosystems and Transportation in the Face of Sea Level Rise** This trip makes stops in the North San Francisco Bay, Point Reyes Station, and Bolinas Lagoon. Participants will learn about different potential sea level rise impacts and adaptation methods. Lunch provided	**Planning for California's first Sea Level Rise Adaptation for Transportation** This tour makes several stops along State Route 37 in the North San Francisco Bay. This route has started flooding more often. Participants will learn how agencies are attempting to balance shoreline ecosystem adaptation with infrastructure protection. Lunch provided	**Highway 89 Stewardship Team — Partnership for Wildlife** This trip makes several stops along State Highway 89, looking at built and proposed wildlife crossings. It also includes stops at wildlife crossing structures on US 395 and I 80	**Tahoe's Road to Blue** This tour makes a series of stops along the edge of Lake Tahoe, showcasing various projects that the USFS has built to reduce impacts from paved surfaces to the iconic lake. Lunch provided	**Take a Trip to See the Nation's First High-Speed Rail Project** This trip features stops at construction and mitigation sites for the high-speed railway at its northernmost point. Lunch provided	**Bats at Sundown** (Meet in Foyer at 3:00 pm) This tour takes participants to a wetland and long causeway-bridge that is home to tens of thousands of bats. Participants can see shorebirds and then the dramatic bat fly-out at sundown. Lunch provided
> 6:00 PM	**Dinner on your own**					



Parallel Sessions & Closing Plenary

Thursday, September 26, 2019

Time	Ballroom A	Ballroom B	Ballroom C
7:30 - 8:30 AM	**Continental Breakfast** (Foyer)		
8:30 - 10:00 AM	**Symposium 2: Integrating Wildlife Movement Needs and Transportation Infrastructure: Southern California as a Preview of a Sustainable Future, Part 1**	**Technical Session 17: But Really, Does It Work?**	**Technical Session 18: Connecting Plans To Action**
	Wildlife connectivity and California's future — Chuck Bonham	A Study on the Wildlife Crossings Efficiency Evaluation Criteria — Hyunjin Seo	Reconnecting habitats: The Washington State Department of Transportation's approach to integrating habitat connectivity principles into the State's transportation system — Glen P. Kalisz
	Transportation infrastructure effects on wildlife in California: mountain lions in southern California as a case study — Winston Vickers	Evaluating migratory bird exclusion practices on transportation structures — Jason Morrell and David Hedeen	Integrating wildlife connectivity into long range transportation plans: State Route 68 corridor project — Morgan Robertson
	The public relations aspects of infrastructure projects to benefit mountain lions and other wildlife — Beth Pratt	A green light for blue wildlife reflectors? — Edgar A. van der Grift	Incorporating field data and habitat use modeling to design and locate wildlife mitigation structures on a highway in Alaska — Nathan Jones
	Effective roadway mitigation strategies: the case of State Route 241 wildlife protection fence project in Orange County, California — Doug T. Feremenga	Evaluating the efficacy of enhanced wildlife bridge infrastructure in Durham, North Carolina — Ron Sutherland	Safe Passages for wildlife on Interstate-10 within the Rincon-Santa Rita-Whetstone Mountains Wildlife Linkage — Jessica Moreno

All sessions are held at the Hyatt Regency Sacramento

7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Ballroom D	Ballroom E
Technical Session 19: Keeping Up With the Pace of Latin America	**Panel 9: Wildlife and Transportation Agency Partnerships to Address Wildlife Connectivity in the Western United States**
From Mexicali to Magallanes: collaborative networks in Latin America working towards better governance — Anthony P Clevenger	Organizer: Patricia Cramer (Wildlife Connectivity Institute) **Panel:** Patricia Cramer (Wildlife Connectivity Institute), James Hirsch (New Mexico Department of Transportation), Jeff Gagnon (Arizona Game and Fish Department), Gregg Servheen (Idaho Department of Fish and Game), Alissa Salmore (Idaho Transportation Department), Nova Simpson (Nevada Department of Transportation), Emanuel Vasquez (Wild Utah Project), Katie Rodriguez (Caltrans)
Multi-sectoral negotiation efforts for better environmental public policies for transportation projects in Brazil — Fernanda Z. Teixeira	
Predicting the impacts of lane additions to the Pan-American Highway bisecting the Guanacaste Conservation Area, Costa Rica — Tom Langen	
Road impacts on Brazil's maned wolf population: insights from a mechanistic simulation model — Nathan Schumaker	
Advances in securing connectivity for jaguars along expanding highways of fhe Sky Islands of Mexico — Juan Carlos Bravo	

Parallel Sessions & Closing Plenary

Thursday, September 26, 2019

Time	Ballroom A	Ballroom B	Ballroom C
10:00 - 10:30 AM	Refreshment Break (Foyer)		
10:30 - 12:00 PM	**Symposium 2: Integrating Wildlife Movement Needs and Transportation Infrastructure: Southern California as a Preview of a Sustainable Future, Part 2**	**Technical Session 20: Power of the People**	**Technical Session 21: Mitigation Coast to Coast**
	Regional connectivity management and monitoring program for San Diego County — Trish Smith	Failing forward — lessons learned from local opposition to wildlife crossings — Kim Trotter	Willits Bypass Project (US Highway 101) - the long and winding road of planning, permitting & mitigation implementation and monitoring — Harry Oakes
	Planning for landscape connectivity: examples from Southern California — Sally Brown	Where people and wildlife collide — leveraging high-quality volunteer data to identify wildlife corridors and inform transportation planning — Merrill Hallett	Partnerships and collaborative approaches on the South Coast Rail project — Lars Carlson
	Reconnecting California for nature: from science to action: using our conservation toolbox to advance landscape scale connections and decrease barriers to crossings — Cara Lacey	Automated recording and analysis of wildlife-vehicle conflict — David Waetjen	Wildlife mitigation on the Sterling Highway MP 58-79 project: setting the bar high in Alaska — John M. Morton
	Engineering feasibility study of alternative wildlife crossings over I-15 in Temecula, Southern California — Wen Cheng	Understanding the differences in road kill information sources in Washington State — Kelly R McAllister	From the deer's perspective: a long-term, collaborative study to understand the physiology and behavior of white-tailed deer to mitigate deer-vehicle collisions — Gino J. D'Angelo
12:00 - 1:00 PM	**Plenary, Closing Session Remarks, Introduction to ICOET 2021**		
1:00 - 2:00 PM	Lunch (on your own)		

All sessions are held at the Hyatt Regency Sacramento

7:30 to 8:30 AM Continental Breakfast (Foyer)
Breaks at 10:00 AM and 3:00 PM

Ballroom D	Ballroom E
No Session	**Technical Session 22: Evolving Tricks of the Trade**
	Cracking the code to benefit -cost analysis for wildlife-highway mitigation projects — Pat Basting
	Valuing wildlife crossings: generating mitigation credit for the inclusion of wildlife crossings within the SR 40 corridor in Marion, Lake, and Volusia Counties, Florida — Jason Houck
	Standards and tools for refining at-risk species distribution data — Healy Hamilton
	Using INVEST to bridge sustainability and transportation needs in the Denton Greenbelt — Kate Zielke
	No Session

CONFERENCE COMMITTEES & STAFF

THANK YOU to the many professionals and their organizations who supported our 2019 conference. The individuals recognized below have contributed valuable time and expertise to advise, plan and conduct this year's event. Their dedicated service—along with our presenters, moderators, sponsors, and participants—continue to make ICOET a success.

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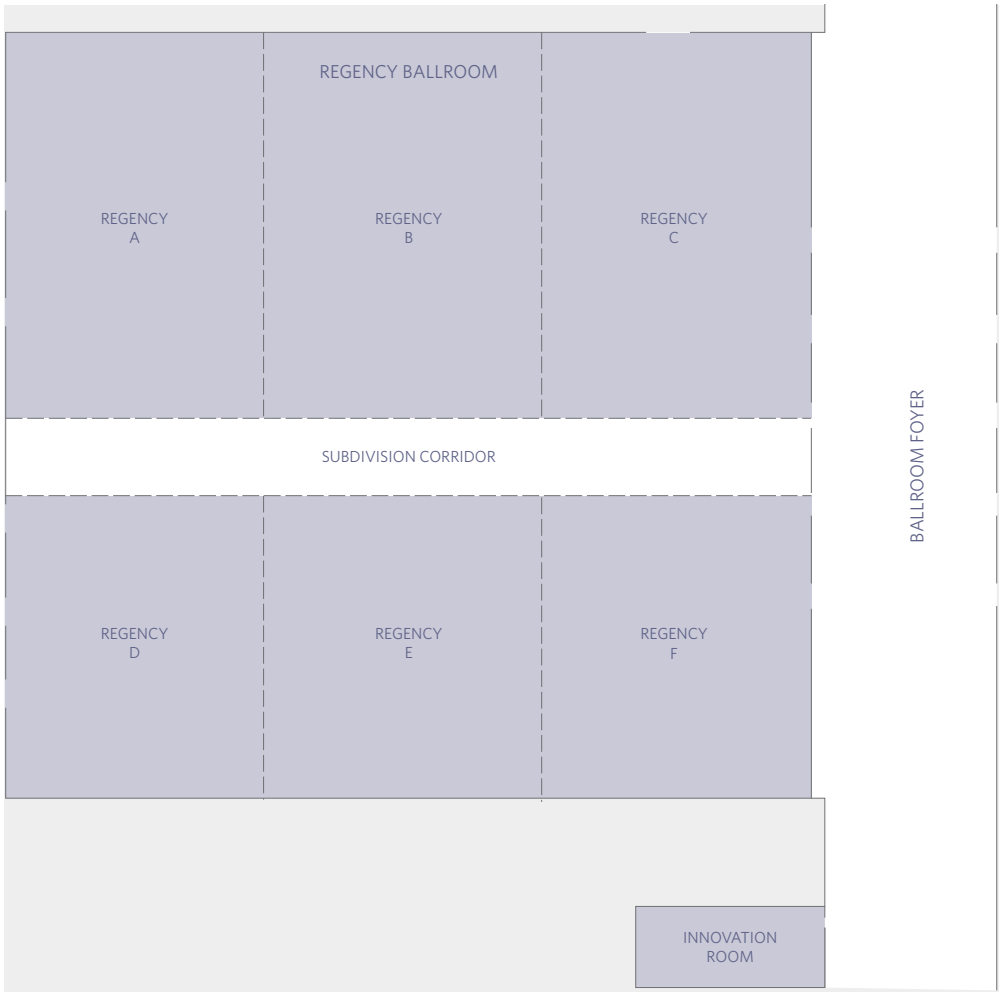

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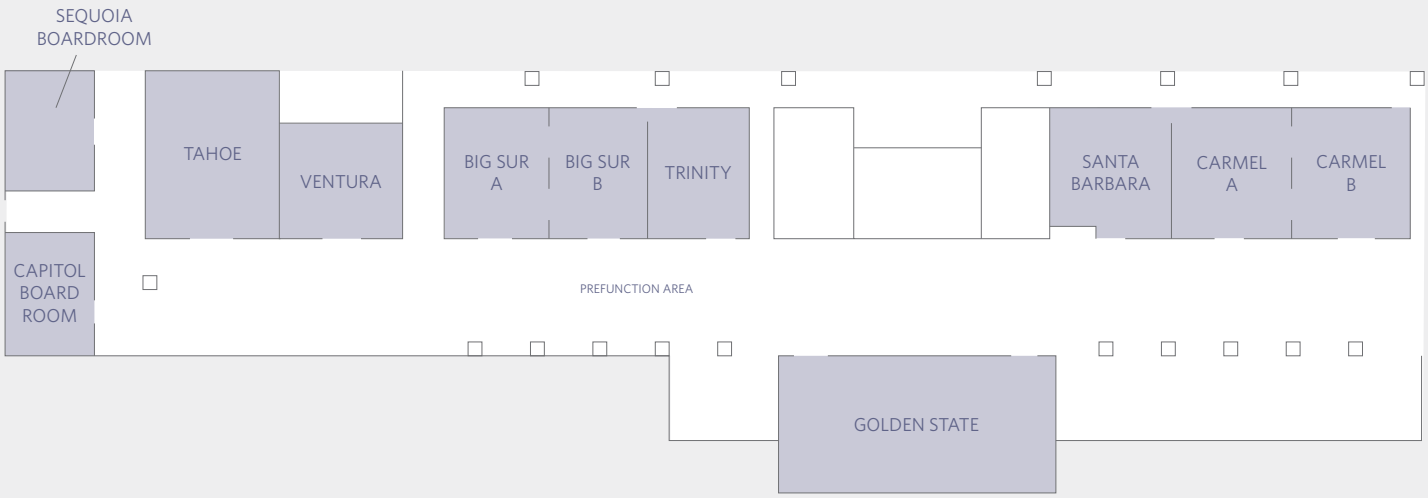

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