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# WELCOME!

The Massachusetts Department of Transportation Highway Division (MassDOT) and Massachusetts Division of Fisheries & Wildlife (MassWildlife) are delighted to host the 8th biennial Northeastern Transportation and Wildlife Conference (NETWC) in Amherst, nestled in the beautiful Connecticut River Valley region of Massachusetts. We are pleased to have you join the dialogue with experts from across the region to exchange ideas and solutions on transportation, wildlife and sustainability.

We encourage you to fully embrace and be part of the synergy and enthusiasm of this highly interactive and multidisciplinary conference. NETWC, like the Valley of the Connecticut River, provides fertile grounds for planting the seeds of new ideas and opportunities to work together to ensure a more resilient landscape. Your collective contributions help to fuel the energy and excitement, so please join in and share your knowledge and learn from others in this engaging environment.

Thank you to the many people, organizations, and sponsors that helped to organize and bring us together at NETWC 2018. This year's theme, Partnering for Resilient Infrastructure and Ecosystems, strives to showcase projects, programs, and applications that have been implemented through collaboration and innovative thinking.

As we face the challenges of climate change and its impacts on our transportation and ecological systems, we are excited and honored to have Tom Wessels as this year's keynote speaker. Tom Wessels is a terrestrial ecologist and professor emeritus at Antioch University New England where he founded the master's degree program in Conservation Biology. With interests in forest, desert, arctic, and alpine ecosystems, plus geomorphology, evolutionary ecology, complex systems science, and the interface of landscape and culture, Tom considers himself a generalist. He has conducted workshops on ecology and sustainability throughout the country for over three decades. He is the author of numerous books with his latest being *Granite, Fire, and Fog: The Natural and Cultural History of Acadia*.

You are sure to stay busy over the next few days as you involve yourself in the roughly 70 engaging presentations offered in a variety of formats including podium talks, panel discussions, workshops, poster presentations, lightning talks (a series of rapid fire presentations to get your energy and ideas flowing!) and a full afternoon field trip. Topics encompass landscape connectivity and planning, stream restoration, storm response and resiliency, invasive species, lessons from past projects, and other ecological issues related to transportation systems.

We hope you find the 2018 Northeastern Transportation and Wildlife Conference a rewarding and memorable experience as you take in all that the Valley has to offer. Enjoy the conference!

Warm regards,

David Paulson and Tim Dexter  
NETWC 2018 Conference Co-Chairs

# STEERING & PROGRAM COMMITTEES

**Tim Dexter**, *Massachusetts Department of Transportation, Conference Co-Chair*

**David Paulson**, *Massachusetts Division of Fisheries and Wildlife, Conference Co-Chair*

**Dee Blanton**, *U.S. Fish and Wildlife Service - Northeast Region*

**Richard Bostwick**, *Maine Department of Transportation*

**James Brady**, *Vermont Agency of Transportation*

**Melilotus Dube**, *New Hampshire Department of Transportation*

**Jason Dvelis**, *Federal Highway Administration - Massachusetts Division*

**Gretchen Fowles**, *New Jersey Department of Environmental Protection*

**Ed Frantz**, *New York State Department of Transportation*

**Jens Hawkins-Hilke**, *Vermont Fish and Wildlife Department*

**Emilie Holland**, *Rhode Island Department of Transportation*

**Jessica Levine**, *The Nature Conservancy*

**Rebecca Martin**, *New Hampshire Department of Transportation*

**Jed Merrow**, *McFarland Johnson*

**John Perry**, *Maine Department of Inland Fisheries and Wildlife*

**Amanda Shearin**, *Maine Department of Inland Fisheries and Wildlife*

**Chris Slesar**, *Vermont Agency of Transportation*

# SCHEDULE AT-A-GLANCE

## Sunday, September 9

12:00 PM - 7:00 PM	<b>Conference Registration Desk Open</b>	<i>1<sup>st</sup> Floor Concourse</i>
12:00 PM - 6:00 PM	<b>Sponsor &amp; Exhibitor Booth Set-up</b>	<i>1<sup>st</sup> Floor Concourse</i>
6:00 PM - 7:00 PM	<b>Welcome Reception with Sponsors &amp; Exhibitors</b>	<i>1<sup>st</sup> Floor Concourse</i>
Evening	<b>Dinner on Own</b>	

## Monday, September 10

8:00 AM - 9:00 AM	<b>Breakfast Buffet</b>	<i>Campus Center Auditorium</i>
8:00 AM - 5:00 PM	<b>Conference Registration Desk Open</b>	<i>1<sup>st</sup> Floor Concourse</i>
8:00 AM - 5:00 PM	<b>Exhibit Area Open</b>	<i>1<sup>st</sup> Floor Concourse</i>
9:00 AM - 10:00 AM	<b>Welcome &amp; Opening Remarks</b> <b>Patricia Leavenworth, MassDOT</b> <b>Highway Division, Tom French, Division</b> <b>of Fisheries and Wildlife, Natural Heritage</b> <b>and Endangered Species Program</b> <b>and Ronald Amidon, Commissioner.</b> <b>Massachusetts Department of Fish and</b> <b>Game</b>	<i>Campus Center Auditorium</i>
10:00 AM - 11:30 AM	<b>Concurrent Sessions:</b>	<i>See pages 10-11 for details</i>
	• <b>Partnering for Resilient Infrastructure and Ecosystems in Massachusetts Panel</b>	<i>Campus Center Auditorium</i>
	• <b>Research Track</b>	<i>Room 162-75</i>
	• <b>Implementation Track</b>	<i>Room 163C</i>
	• <b>Policy Track</b>	<i>Room 165-69</i>
11:30 AM - 1:30 PM	<b>Awards Luncheon &amp; Keynote Speaker</b> <b>Tom Wessels, Antioch University</b> <b>New England</b>	<i>Campus Center Auditorium</i>

# SCHEDULE AT-A-GLANCE

1:30 PM - 3:00 PM	<b>Concurrent Sessions:</b>	<i>See pages 10-11 for details</i>
	• The Pollinator Plight: Case Studies in Roadside Vegetation Management for Pollinator Conservation Panel	<i>Campus Center Auditorium</i>
	• Research Track	<i>Room 162-75</i>
	• Implementation Track	<i>Room 163C</i>
	• Policy Track	<i>Room 165-69</i>
3:00 PM - 3:30 PM	☕ Coffee Break with Sponsors & Exhibitors	<i>1<sup>st</sup> Floor Concourse</i>
3:30 PM - 5:00 PM	<b>Concurrent Sessions:</b>	<i>See pages 12-13 for details</i>
	• Integrating Stream Habitat, Fish Passage, and Floor Vulnerability Data to Prioritize Culvert Replacements for Restoration and Mitigation in New Hampshire Panel	<i>Campus Center Auditorium</i>
	• Research Track	<i>Room 162-75</i>
	• Implementation Track	<i>Room 163C</i>
	• Policy Track	<i>Room 165-69</i>
5:30 PM - 5:45 PM	<b>Board Buses for Conference Dinner</b>	<i>Flint Lab Circle</i>
6:00 PM - 7:00 PM	<b>Cocktail Reception &amp; Apple Picking at Quonquot Farm</b>	<i>Offsite</i>
7:00 PM - 8:30 PM	<b>Conference Dinner at Quonquot Farm</b>	<i>Offsite</i>
8:00 PM - 8:45 PM	<b>Buses Return to UMass Hotel</b>	

## KEYNOTE SPEAKER: *Tom Wessels, Ecologist & Professor, Antioch University New England*

Tom Wessels is a terrestrial ecologist and professor emeritus at Antioch University New England where he founded the master's degree program in Conservation Biology. With interests in forest, desert, arctic, and alpine ecosystems, plus geomorphology, evolutionary ecology, complex systems science, and the interface of landscape and culture, Tom considers himself a generalist. He has conducted workshops on ecology and sustainability throughout the country for over three decades. He is the author of numerous book with his latest being *Granite, Fire, and Fog: The Natural and Cultural History of Acadia*.



# SCHEDULE AT-A-GLANCE


## Tuesday, September 11

7:00 AM - 8:00 AM	<b>Breakfast Buffet</b>	<i>Campus Center Auditorium</i>
7:00 AM - 12:00 PM	<b>Conference Registration Desk Open</b>	<i>1<sup>st</sup> Floor Concourse</i>
7:00 AM - 12:00 PM	<b>Exhibit Area Open</b>	<i>1<sup>st</sup> Floor Concourse</i>
8:00 AM - 9:30 AM	<b>Concurrent Sessions:</b>	<i>See pages 14-15 for details</i>
	• Analyzing the Hydraulic Capacity and Flood Resiliency of Culverts Across the Northeast Panel	<i>Campus Center Auditorium</i>
	• Research Track	<i>Room 162-75</i>
	• Implementation Track	<i>Room 163C</i>
	• Policy Track	<i>Room 165-69</i>
8:00 AM - 9:30 AM	<b>Poster Set-up</b>	<i>1<sup>st</sup> Floor Concourse</i>
9:30 AM - 10:30 AM	<b>Poster and Pastry Social</b> ( <i>See details page 17</i> )	<i>1<sup>st</sup> Floor Concourse</i>
10:30 AM - 12:00 PM	<b>Concurrent Sessions:</b>	<i>See pages 14-15 for details</i>
	• Bats, Birds, and Fish. Oh My! Endangered Species Act and Migratory Bird Treaty Act Updates and Ongoing	<i>Campus Center Auditorium</i>
	• Research Track	<i>Room 162-75</i>
	• Implementation Track	<i>Room 163C</i>
	• Policy Track	<i>Room 165-69</i>
12:00 PM - 12:30 PM	<b>Field Trip Preview</b>	<i>Campus Center Auditorium</i>
12:30 PM	<b>Grab &amp; Go Lunch</b>	<i>1<sup>st</sup> Floor Concourse</i>
12:30 PM	<b>Board Buses for Field Trip</b>	<i>Flint Lab Circle</i>
12:45 PM - 5:00 PM	<b>Field Trip</b> ( <i>See details page 8</i> )	<i>Offsite</i>
Evening	<b>Dinner on Own</b>	

## Wednesday, September 12

7:00 AM - 8:00 AM	<b>Breakfast Buffet</b>	<i>Campus Center Auditorium</i>
7:00 AM - 10:30 AM	<b>Exhibit Area &amp; Posters Open</b>	<i>1<sup>st</sup> Floor Concourse</i>

# SCHEDULE AT-A-GLANCE

7:00 AM - 12:00 PM	<b>Conference Registration Desk Open</b>	<i>1<sup>st</sup> Floor Concourse</i>
8:00 AM - 10:00 AM	<b>Lightning Talks &amp; Workshops:</b>	<i>See pages 16-17 for details</i>
	• Lightning Talks	<i>Campus Center Auditorium</i>
	• Where the River Meets the Road: MassDOT Training Program for Using Fluvial Geomorphology to Enhance Infrastructure Resiliency Workshop	<i>Room 162-75</i>
	• Implementing Ecological Connectivity from Labrador to Connecticut: A Workshop with the New England Governors and Eastern Canadian Premiers Working Group on Ecological Connectivity	<i>Room 163C</i>
	• Keep it Together: Using the Nature's Network Conservation Design to Support a Resilient Landscape Workshop	<i>Room 165-69</i>
10:00 AM - 10:30 AM	 <b>Coffee Break with Sponsors, Exhibitors &amp; Posters</b>	<i>1<sup>st</sup> Floor Concourse</i>
10:30 AM - 12:00 PM	<b>Lightning Talks &amp; Workshops:</b>	<i>See pages 16-17 for details</i>
	• Lightning Talks	<i>Campus Center Auditorium</i>
	• Where the River Meets the Road: MassDOT Training Program for Using Fluvial Geomorphology to Enhance Infrastructure Resiliency Workshop (continued)	<i>Room 162-75</i>
	• Implementing Ecological Connectivity from Labrador to Connecticut: A Workshop with the New England Governors and Eastern Canadian Premiers Working Group on Ecological Connectivity (continued)	<i>Room 163C</i>
	• Keep it Together: Using the Nature's Network Conservation Design to Support a Resilient Landscape Workshop (continued)	<i>Room 165-69</i>
12:00 PM - 1:00 PM	<b>Closing General Session &amp; Working Lunch</b>	<i>Campus Center Auditorium</i>
1:00 PM	<b>Adjourn</b>	

# FIELD TRIP

**Tuesday, September 11**

**12:45 PM - 5:00 PM**

## **❶ USFWS Hatchery, Sunderland**

*Peter Hazelton, MassWildlife*

The Richard Cronin Aquatic Resources Center is a former state cold-water fish hatchery, and was given to the U.S. Fish & Wildlife Service in 1982 for use as a National Atlantic Salmon Station to assist in efforts to recover Atlantic Salmon in the Connecticut River. In 2012, the USFWS ceased production of Atlantic Salmon as sustainable stocks were not returning to southern New England. Since the closure of the Atlantic Salmon program, the USFWS has worked with other federal, state, and University collaborators to repurpose the station for use in research and conservation of other aquatic fauna in Massachusetts. Currently the Resource Center focusses on rearing of federally endangered Tiger Beetles, freshwater mussels in cooperation with UMass and MassWildlife, and other research on anadromous fishes.

## **❷ Mitchell Brook Culvert Upgrade, Whately**

*Amy Singler, American Rivers*

The Nature Conservancy and the Town of Whately collaborated on replacing a 36" corrugated metal pipe on Conway Road over Mitchell Brook with a new structure to provide aquatic organism and terrestrial wildlife passage. The project included building a stable stream bed at a steep gradient, within a new open-bottom arch structure. Mitchell Brook, a high-quality cold-water tributary to West Brook, has been a long-term research site, and post construction monitoring has documented more brook trout moving upstream into Mitchell Brook, and dace are now being found in the stream for the first time.

## **❸ Route 116 Retaining Wall Project, Conway**

*Roy Schiff, Milone & MacBroom*

The retaining wall along Route 116 (Ashfield Road) near the North Poland Road intersection in the town of Conway, Massachusetts, was replaced in 2015. A geomorphic-based design was selected to provide as much room as possible for the river to create a stable channel. The design also included instream habitat features such as an engineered log jam, a flood bench, boulder deflectors, and root wads.



# FIELD TRIP

## ④ Route 2 Mud Slide/Irene Damage, Charlemont

*Scott Stevens, MassDOT Highway Division*

In late August 2011, Tropical Storm Irene resulted in wide spread damage across many northeastern states, and in Massachusetts damage was greatest in the hill towns within the western part of the state. Of the many roadways and transportation assets impacted by the storm, Route 2 experienced retaining wall and side slope failures, roadway washouts, landslides, culvert failures and bridge damage, resulting in the closure of about 4 miles of the road in the Charlemont-Florida area. With the hard work of MassDOT staff and contractors, the state was able to design, engineer, survey and begin construction in record time. The reconstruction work was completed in 3 months and Route 2 was reopened for traffic on December 15th, and through coordination with permit and resource agencies, specific attention was paid to restoring riverbed habitat.

## ⑤ Henry Street Amphibian Tunnel, Amherst

*Scott Jackson, UMass Amherst*

The Henry Street salamander tunnels, believed to be the first amphibian tunnels in North America, were constructed in 1987 and hosted their first salamander migration in the spring of 1988. Two tunnels were constructed on Henry Street, a busy two-lane road, where local residents had succeeded in getting the town to close the road during periods of spotted salamander migration. The Fauna and Flora Preservation Society (now Fauna and Flora International) initiated the project with assistance from the Massachusetts Audubon Society, Hitchcock Center for the Environment, Town of Amherst, and University of Massachusetts. The two tunnels, donated by ACO Polymer Products, were installed by the Amherst Highway Department. Guide fencing was installed by volunteers coordinated by the Hitchcock Center. Monitoring of the tunnels in the years following construction indicated that the structures were successful for passing spotted salamanders, but that effectiveness was hampered by insufficient light in the tunnels. The tunnels and fences have been maintained over the past 30 years by volunteers from the Hitchcock Center. Much was learned by this project that helped design and implement amphibian crossing structures at other sites throughout the United States and Canada.

# CONCURRENT SESSIONS - MONDAY

Please note: All sessions are listed with abstract authors. To review the full abstract, please visit [www.netwc.org](http://www.netwc.org).

## 10:00 AM - 11:30 AM

	Panel	Research Track
	Room: Campus Center Auditorium	Room: 162-75
10:00 AM	<b>Partnering for Resilient Infrastructure and Ecosystems in MA Panel</b> Tim Dexter, Massachusetts Department of Transportation Highway Division; Brad Chase, Massachusetts Division of Marine Fisheries; Kristen Ferry, Massachusetts Division of Ecological Restoration; Dave Paulson, Massachusetts Division of Inland Fisheries and Wildlife Natural Heritage & Endangered Species Program; Chris Ross, Massachusetts Department of Environmental Protection	<b>Maine Turtle Roadkill Survey – Identifying Hotspots for Mitigation with the Help of Citizen Scientists and iNaturalist</b> Sarah Haggerty, Maine Audubon; Phillip DeMaynadier, Derek Yorks–Maine Department of Inland Fisheries and Wildlife
10:30 AM		<b>How to Build a Better Ecopassage: Evaluating Amphibian Use and Preference of Various Ecopassage Designs</b> Charlene Hopkins, Ecology and Evolutionary Biology Graduate Student, Department of Biological Sciences; Shawn R. Kuchta, Ph.D., Willem M. Roosenburg, Ph.D.–Ohio University
11:00 AM		OPEN

## 1:30 PM - 3:00 PM

	Panel	Research Track
	Room: Campus Center Auditorium	Room: 162-75
1:30 PM	<b>The Pollinator Plight: Case Studies in Roadside Vegetation Management for Pollinator Conservation</b> Bob Moosmann, Maine Department of Transportation; George Batchelor, Massachusetts Department of Transportation Highway Division; Erika Furlong, Delaware Department of Transportation; Leif Richardson, Stone Environmental	<b>Road Mortality Mitigation: The Effectiveness of Animex Fencing vs. Mesh</b> John C. Milburn-Rodríguez, Jeff Hathaway–Scales Nature Park; Kari Gunson, Eco-Kare International; Darrelle Moffat, Scales Nature Park; Dean Swensson, Steve Béga–Animex International
2:00 PM		<b>Plastic Bridges: New Materials for the Integrated Design of Landscape and Infrastructure</b> Nina-Marie Lister, Ecological Design Lab, Ryerson University; Robert Ament, Western Transportation Institute, Montana State University; Marta Brocki, Ecological Design Lab, Ryerson University; Matthew Bell, Montana State University
2:30 PM		<b>Using Landscape-scale Conservation Design to Prioritize Transportation Infrastructure</b> Jens Hilke, Vermont Fish & Wildlife Department; Liz Thompson, Vermont Land Trust

# CONCURRENT SESSIONS - MONDAY

## 10:00 AM - 11:30 AM

	Implementation Track	Policy Track
	<i>Room: 163C</i>	<i>Room: 165-69</i>
10:00 AM	<b>Reducing Vehicular and Wildlife Conflicts: a Case Study of an Urban Wildlife Tunnel in Concord, Massachusetts</b> P. Chase Bernier, CWB, BSC Group; Jessica Kenny, MassDOT	<b>Prioritizing Road-stream Crossings from Ecological and Infrastructure Risk Perspectives</b> Brian Kelder, Ipswich River Watershed Association
10:30 AM	<b>Wildlife Conflict Resolution and Economic Development-The SJTA Experience</b> Steven Balzano, WSP USA; Christopher Boggs, U.S. Department of Agriculture; Nick Marchese, South Jersey Transportation Authority; Darren Stanker, WSP USA	<b>Developing A State Manual for Comprehensive Assessment and Prioritization of Road-Stream Crossing Upgrades</b> Rachael Weiter, Erik Mas-Fuss & O'Neill, Inc.; Nicole Leporacci, Mark Nimiroski-Rhode Island DOT
11:00 AM	<b>First Wildlife Passage Dedicated to Turtles on the Road Network Managed by Quebec's Ministry of Transportation</b> Clément Robidoux, Caroline Daguet*–Appalachian Corridor; Yohann Dubois, Quebec's Ministry of Forests, Wildlife & Parks (MFFP)	<b>The MassDOT Project Intake Tool: Innovation in Environmental Project Screening</b> Mike Bolduc, Massachusetts Department of Transportation Highway Division

## 1:30 PM - 3:00 PM

	Implementation Track	Policy Track
	<i>Room: 163C</i>	<i>Room: 165-69</i>
1:30 PM	<b>Crossing into New Frontiers in Maine</b> Patrick Dockens, Christopher DeVore–U.S. Fish and Wildlife Service	<b>Post-Storm Infrastructure Improvements and Stream Restoration: Three Case Studies</b> Thomas Graupensperger, Dewberry
2:00 PM	<b>NHDOT Stream Passage Improvement Program</b> Matt Urban, Kevin Nyhan, Sarah Large–NHDOT Bureau of Environment	<b>State Level Fisheries Coordination for the Efficient Delivery of Transportation Projects in Connecticut</b> Amanda Saul, Andrew Davis–Connecticut Department of Transportation Office of Environmental Planning
2:30 PM	<b>FHWA Integrating NEPA and Permitting</b> Mike Ruth, FHWA	OPEN

# CONCURRENT SESSIONS - MONDAY

3:30 PM - 5:00 PM

	Panel	Research Track
	<i>Room: Campus Center Auditorium</i>	<i>Room: 162-75</i>
3:30 PM	<b>Integrating Stream Habitat, Fish Passage, and Flood Vulnerability Data to Prioritize Culvert Replacements for Restoration and Mitigation in New Hampshire</b>  Katie Callahan, NH Fish and Game Department; Cheryl Bondi, NH Department of Environmental Services; Lori Sommer, NH Department of Environmental Services, Wetlands Bureau	<b>Modeling Road Crossings for Moose (<i>Alces americanus</i>) and Black Bear (<i>Ursus americanus</i>) in Massachusetts, USA</b>  Katherine A. Zeller, David W. Wattles, Stephen DeStefano–Massachusetts Cooperative Fish and Wildlife Research Unit
4:00 PM		OPEN
4:30 PM		OPEN

# CONCURRENT SESSIONS - MONDAY

3:30 PM - 5:00 PM

	Implementation Track	Policy Track
	<i>Room: 163C</i>	<i>Room: 165-69</i>
3:30 PM	<b>What's in a Landscape? From Data to Decisions at MaineDOT</b> Judy Gates, MaineDOT Environmental Office; Sam Merrill, GEI Consultants Inc.; Bradford Folta, MaineDOT Environmental Office	<b>Land Use Planning &amp; Ecological Connectivity: Case Study from the 1st Municipality in Quebec to Feature Wildlife Corridors in its Urban Plan</b> Mélanie Lelièvre, Appalachian Corridor; Lisette Maillé, Mayor of Austin, Quebec; Stephen Nicholson, Municipality of Austin, Quebec; Caroline Daguet, Appalachian Corridor
4:00 PM	<b>Connecting Habitat Across New Jersey (CHANJ)</b> Gretchen Fowles, Brian Zarate, MacKenzie Hall–New Jersey Division of Fish and Wildlife, Endangered & Nongame Species Program	<b>Connect The Coast: Planning for Wildlife Connectivity across Massachusetts, New Hampshire, and Maine</b> Peter Steckler, The Nature Conservancy, NH
4:30 PM	<b>“No Sport for the Short-winded” Implementing a Successful Wildlife Crossing Project Through a Grassroots and Government Collaboration</b> Chris Slesar, Vermont Agency of Transportation	OPEN

# CONCURRENT SESSIONS - TUESDAY

## 8:00 AM - 9:30 AM

	Panel	Research Track
	<i>Room: Campus Center Auditorium</i>	<i>Room: 162-75</i>
8:00 AM	<b>Analyzing the Hydraulic Capacity and Flood Resiliency of Culverts Across the Northeast</b> Thomas Taggart, NH Department of Environmental Services, New Hampshire Geological Survey; Timothy S. Mallette, New Hampshire Department of Transportation; Josh Thiel, Division of Fish & Wildlife New York State Department of Environmental Conservation; Dr. M. Todd Walter, NYS Water Resources Institute; Steven J. Miller, Massachusetts Department of Transportation; Scott Jackson, University of Massachusetts-Amherst	<b>Going with the Flow: Conserving Resilient and Connected Landscapes</b> David Patrick, Mark Anderson–The Nature Conservancy
8:30 AM		<b>Rights-of-way Management for Native Insect Pollinators in the Northeastern USA: Literature Meta-analysis and Preliminary Summary of Maine's Bumblebee and Butterfly Roadside Surveys</b> Brianne Du Clos, University of Maine; Cynthia Loftin, USGS, Maine Cooperative Fish and Wildlife Research Unit; Frank Drummond, University of Maine; Phillip deMaynadier, Maine Department of Inland Fisheries and Wildlife
9:00 AM		<b>Mussel Relocation – Perspective from a Translocated Biologist</b> R. Jason Dickey, TRC Environmental

## 10:30 AM - 12:00 PM

	Panel	Research Track
	<i>Room: Campus Center Auditorium</i>	<i>Room: 162-75</i>
10:30 AM	<b>Bats, Birds, and Fish. Oh My! Endangered Species Act and Migratory Bird Treaty Act Updates and Ongoing</b> Brian Yanchik, Federal Highway Administration; Tim Dexter, MassDOT Highway Division; Eric Ham, MaineDOT; David Paulson, Massachusetts Division of Inland Fisheries and Wildlife Natural Heritage & Endangered Species Program; Jonathan Reichard, U.S. Fish & Wildlife Service	<b>Wildlife Movement Through Culverts and Bridges in Vermont: Influences of Structure and Site Characteristics</b> Paul Marangelo, The Nature Conservancy, Vermont Chapter; Laura Farrell, Otter Ridge LLC
11:00 AM		<b>“Profiling” Road Segments: A Rapid, Basic Set of Research Tools and Protocols for Understanding How Wildlife in Habitat Cores Are Impacted by Roads</b> Laura Marx, The Nature Conservancy in Massachusetts; Dave Paulson, Massachusetts Division of Inland Fisheries and Wildlife Natural Heritage & Endangered Species Program
11:30 AM		<b>The Vermont Transportation Resilience Planning Tool</b> Evan Fitzgerald, Fitzgerald Environmental Associates, LLC; Roy Schiff, Milone & MacBroom, Inc.

# CONCURRENT SESSIONS - TUESDAY

## 8:00 AM - 9:30 AM

	Implementation Track	Policy Track
	<i>Room: 163C</i>	<i>Room: 165-69</i>
8:00 AM	<b>Amphibian Road Closures: Lessons Learned From a Pilot Season of “Big Night Detours” in Keene, NH</b> Brett Amy Thelen, Harris Center for Conservation Education; Duncan Watson, City of Keene	<b>Road-Stream Crossing Vulnerability to Climate Change in the Deerfield River Watershed</b> Katherin McArthur, Massachusetts Department of Transportation
8:30 AM	<b>MassDOT Case Studies in Tidal Restoration</b> Susan McArthur, MassDOT Wetlands Supervisor; Ryan Lizewski, VHB, Water Resources Engineer	<b>Bringing Flood Resiliency into MassDOT Asset Management</b> Timothy Dexter, MassDOT; Roy Schiff, Milone & MacBroom
9:00 AM	<b>Working with Environmental, Transportation and Emergency Management Agencies to Restore Aquatic Habitat Connectivity and Support Infrastructure Improvement</b> Scott Jackson, Paula Sturdevant Rees, Stephen Mabee–University of Massachusetts Amherst; Katherin McArthur, Massachusetts Department of Transportation	<b>Mitigating Road Corridor Habitat Connectivity Barriers for Increased Terrestrial Ecosystem Climate Change Resilience: A Pilot Project in Vermont</b> Paul Marangelo, The Nature Conservancy-Vermont Chapter

## 10:30 AM - 12:00 PM

	Implementation Track	Policy Track
	<i>Room: 163C</i>	<i>Room: 165-69</i>
10:30 AM	<b>Engineering and Design Features of a Culvert Sliplining Project in Connecticut to Facilitate Brook Trout Passage</b> Brian D. Murphy, Stephan R. Gephard–Connecticut Department of Energy and Environmental Protection (CTDEEP), Fisheries Division	<b>New Jersey’s Adventures in Requiring Wildlife Passages</b> Laurance S. Torok, Karen DiLeo–New Jersey Department of Environmental Protection, Division of Land Use Regulation
11:00 AM	<b>MassDOT’s Innovative Approach to Planning Bridge Replacements</b> Thomas Donald, P.E., Massachusetts Department of Transportation Highway Division	<b>Codes and Standards v. Hazard Mitigation: Funding Post-Disaster Stream-Crossing Upgrades Under the FEMA Public Assistance (PA) Program</b> Thad J. Leugemors, PMP, Massachusetts Emergency Management Agency
11:30 AM	<b>Innovative Fisheries Protection for MassDOT Design-Build Bridge Projects</b> Frank Welch, Massachusetts Department of Transportation Highway Division	<b>What Happens When Your Facility Isn’t Quite Resilient Enough</b> Joshua Grzegorzewski; FHWA

# LIGHTNING TALKS

**Wednesday, September 12**

**8:00 AM - 10:00 AM & 10:30 AM - 12:00 PM**

Room: Campus Center Auditorium

<b>8:00 AM</b>	<b>Development of a State-Wide Program in Massachusetts to Build Municipal Capacity for Replacing Problem Culverts with Crossings that Meet Improved Environmental Design and Flood Resiliency Standards</b> Kristen Ferry and Carrie Banks–Massachusetts Division of Ecological Restoration
<b>8:15 AM</b>	<b>New Municipal Grant Program Helps Advance Culvert Replacements in Massachusetts to Meet Ecological and Flood Resiliency Design Criteria</b> Kristen Ferry and Carrie Banks–Massachusetts Division of Ecological Restoration
<b>8:30 AM</b>	<b>Fist Year Review of Culvert Stream Crossings Designed Using Habitat Connectivity Design Practices</b> Richard D. Bostwick, Charles Hobson–Maine Department of Transportation
<b>8:45 AM</b>	<b>Tidal Road-Stream Crossings: A New Approach to Assess and Prioritize Transportation Infrastructure for Coastal Resilience</b> Pete Steckler, The Nature Conservancy
<b>9:00 AM</b>	<b>The MassDOT Municipal Small Bridge Program</b> Thomas Donald, P.E., Massachusetts Department of Transportation Highway Division
<b>9:15 AM</b>	<b>Review of Effects of Highways on Bats in Context of the Federally-Endangered Northern Long-Eared Bat (<i>Myotis septentrionalis</i>)</b> Marina Fisher-Phelps, University of New Hampshire, Northern Arizona University; Erik Blomberg, University of Maine; Daniel Linden, National Oceanic and Atmospheric Administration; Jeffrey Foster, Northern Arizona University
<b>9:30 AM</b>	<b>Wildlife Mortality Hotspot Locations Identified from Two Different Data Sources: Is There Any Overlap?</b> Sarah Barnum, Normandeau Associates
<b>9:45 AM</b>	<b>Exeter Dam Removal: Managing Public Infrastructure to Increase Resiliency</b> Jacob San Antonio, VHB
<b>BREAK</b>	
<b>10:30 AM</b>	<b>A Review of Three Herptile Passage Systems in New Jersey</b> Gretchen Fowles, Brian Zarate, MacKenzie Hall–New Jersey Division of Fish and Wildlife, Endangered & Nongame Species Program
<b>10:45 AM</b>	<b>Assuming the Mantle: A Cross-Agency Collaboration in Maine to Safeguard Freshwater Mussels During Transportation Projects</b> Leslie Latt, MaineDOT; Beth I. Swartz, Maine Department of Inland Fisheries and Wildlife
<b>11:00 AM</b>	<b>The Hot 200: A New Protocol and Technology for Surveying 200 Culverts Across Vermont</b> Jake Riley, Stantec Consulting
<b>11:15 AM</b>	<b>Wildlife Passage Benefits of Maine's Atlantic Salmon Programmatic Agreement (MAP)</b> J. Andrew Walsh, Maine Department of Transportation
<b>11:30 AM</b>	<b>Critter Shelf Project</b> Ed Franz, New York State Department of Transportation



# WORKSHOPS

**Wednesday, September 12**

**8:00 AM - 12:00 PM**

## **Room: 162-75**

### **Where the River Meets the Road: MassDOT Training Program for Using Fluvial Geomorphology to Enhance Infrastructure Resiliency**

Tim Dexter, Massachusetts Department of Transportation Highway Division; Roy Schiff, Milone & MacBroom; David Nyman, Comprehensive Environmental Inc.; David Paulson, Natural Heritage & Endangered Species Program, MA Division of Fisheries and Wildlife; Carrie Banks, MA Division of Ecological Restoration; Christine Hatch, UMass Amherst

## **Room: 163C**

### **Implementing Ecological Connectivity from Labrador to Connecticut: A Workshop with the New England Governors and Eastern Canadian Premiers Working Group on Ecological Connectivity**

John Austin, Vermont Fish & Wildlife Department; New England Governors and Eastern Canadian Premiers Working Group

## **Room: 165-69**

### **Keep it Together: Using the Nature's Network Conservation Design to Support a Resilient Landscape**

Scott Schwenk, U.S. Fish & Wildlife Service



# POSTERS

**Tuesday, September 11 • Poster & Pastry Social, 9:30 AM - 10:30 AM**

Room: 1st Floor Concourse

<b>P-01</b>	<b>Addressing Road User Behavior When Implementing Wildlife Mitigation Efforts to Reduce Wildlife Crashes</b> Tara Casanova Powell, Casanova Powell Consulting; Shannon Crossen, ICF International
<b>P-02</b>	<b>Cedar Bonnet Island: Coastal Restoration and Compensatory Mitigation Through Multi-Agency Collaboration</b> Steven Balzano, WSP USA; Tina Shutz, NJ Department of Transportation; Vinny Turner, U.S. Fish and Wildlife Service; Bruce Hawkinson, NJ Department of Transportation; Tara Bencivenga, WSP USA
<b>P-03</b>	<b>Connecting Habitat Across New Jersey (CHANJ)</b> Gretchen Fowles, Brian Zarate, MacKenzie Hall – New Jersey Division of Fish and Wildlife, Endangered & Nongame Species Program
<b>P-04</b>	<b>Emerging Best Practices to Reduce Road Mortality and Increase Habitat Connectivity for Turtles in the Northeastern US</b> Tom Langen, Clarkson University
<b>P-05</b>	<b>Evaluating the Success and Monitoring the Usage of Wildlife Crossing Structures in Bedminster, New Jersey</b> Nicole Bergen, Meiyin Wu–Montclair State University
<b>P-06</b>	<b>Innovative Fish Passage Performance Monitoring</b> Eric Ham, MaineDOT Environmental Office, Lead Biologist of the Bridge Team; Katy Stebbins, MaineDOT ENV Bridge Team Support; Nick Koltai, Unity College student
<b>P-07</b>	<b>Investigating Road-Wildlife Interactions in the Chignecto Isthmus Region of Nova Scotia and New Brunswick, Canada</b> Amelia Barnes, Karen Beazley, Tony Walker–Dalhousie University; Craig Smith, Paula Noel–Nature Conservancy Canada
<b>P-08</b>	<b>Maine’s Stream Smart Program: Reconnecting Stream Habitat One Culvert and Partnership at a Time</b> Sarah Haggerty, Maine Audubon; Stream Connectivity Work Group
<b>P-09</b>	<b>Mitigation Strategies for a Proposed Bridge Crossing in a Suburban Floodplain Environment</b> Christopher Samorajczyk, Amanda Saul, Mandy Ranslow–Connecticut Department of Transportation; Matt Arseneault, Jeffrey Simmons–Stantec Consulting Services, Inc.

# POSTERS

<b>P-10</b>	<b>Monitoring of Waterloo Road's Amphibian Crossing Site</b> Allegra Mitchell, Conserve Wildlife Foundation of New Jersey
<b>P-12</b>	<b>Seagrass Mitigation: Challenges and Opportunities</b> Steven Balzano, WSP USA; Tina Shutz, Bruce Hawkinson–NJ Department of Transportation; Megan O'Donnell, Tara Bencivenga–WSP USA
<b>P-13</b>	<b>Stream Crossing Structures' Effects on Aquatic Organism Passage in Two Northern New Jersey River Systems</b> Kevin W. Zerbe, Natalie Sherwood, T. David Hsu, Meiyin S. Wu–Passaic River Institute, Montclair State University, Montclair, NJ
<b>P-14</b>	<b>Use of Remote Cameras to Measure Moose Activity at Roadside Salt Pools on Route 17 in Maine</b> Kameron Culbertson, Unity College; Amanda Shearin, Maine Department of Inland Fisheries and Wildlife; Dr. John Hopkins (III), Unity College School of Biodiversity and Conservation



# ACHIEVEMENT AWARDS

The Northeast Transportation and Wildlife Conference bestows biennial achievement awards for projects and individuals that exemplify innovative science, design, partnership or cost effectiveness in meeting the needs of fish & wildlife movement and safe and reliable transportation infrastructure.

## REGIONAL WINNER

**Project Name:** MaineDOT/Federal Highway Administration/USACOE/ USFWS- Maine Atlantic Salmon Programmatic Section 7 Consultation.

**Project Partners:** MaineDOT, US Fish and Wildlife Service, US Army Corps of Engineers, Federal Highway Administration.

**Total Project Cost:** This effort was mostly collaborative meetings and documenting and was paid for with an Every Day Counts grant from FHWA and was approximately \$65,000.

**Project Description:** Over two thirds of the State of Maine is Critical Habitat for Endangered Atlantic salmon. One of the items that was identified as a potential impact to Critical Habitat and the recovery effort was road stream crossings that were barriers or impediments to Atlantic salmon. These impediments limited the amount of access to habitat that is available to salmon. To determine the level of impact a crossing replacement had, an analysis was required to determine if the crossing was likely or unlikely to adversely affect salmon and its critical habitat. That analysis and subsequent review by USFWS added an unknown time frame into the schedule and made the process unpredictable.

**Importance:** This programmatic consultation and subsequent biological opinion and users guide developed a process that streamlined the individual consultation process by reducing the time needed to determine that a project did not result in jeopardy to Atlantic salmon or adverse modification to Critical Habitat. The process resulted in a completed consultation on a variety of highway project scopes. This consultation will result in a more resilient crossing structure that will have a positive effect on Atlantic salmon habitat and a process that has a positive effect on the recovery effort.

The Biological Assessment (BA) and the Biological Opinion (BO) finalized in early 2017 describe the criteria that a project needs to be consistent with the finding of the BO. The stream crossing needs to be designed with a span of 1.2 bankfull width using Habitat Connectivity Design features. This has resulted in stream crossings that have a natural stream condition through the water crossing structure that results in unconstrained passage for all aquatic organisms. The agreement finds that if a project meets the design criteria set out in it, a Project Notification Form is sent to USFWS for them to verify that it meets the criteria of the Biological Opinion. Since the consultation is already complete, the USFWS has only to verify that it has met the criteria. Individual consultation would

# ACHIEVEMENT AWARDS

result in fewer than 10 projects having complete consultation in a year. Under the programmatic consultation, over 40 MaineDOT projects will have met consultation requirements and be complete in 2018. Since the Army Corps of Engineers is a signatory, this process also expedites their permit review process.

The consultation effort took several years and involved staff from MaineDOT, US Fish and Wildlife Service, FHWA staff from the Maine office (as well as other offices on the west coast and service centers), and the US Army Corps of Engineers Maine Field Office. This was a very large group, but they remained focused on improving habitat and access to habitat for Atlantic salmon.

## LOCAL WINNER

**Project Name:** The MassDOT-MassWildlife Partnership: Linking Landscapes for Massachusetts Wildlife (LLMW).

**Project Partners:** MassDOT Highway Division, MassWildlife Natural Heritage & Endangered Species Program.

**Total Project Cost:** The LLMW program is funded through an interagency service agreement between MassDOT & MassWildlife to streamline the MA Endangered Species Act consultation progress for Highway Division projects. The yearly average for the LLMW portion of the agreement is approximately \$77,000 per year.

**Project Description:** In 2008, the Massachusetts Department of Transportation Highway Division and the Massachusetts Division of Fisheries and Wildlife - Natural Heritage and Endangered Species Program entered into an interagency agreement to streamline Massachusetts Endangered Species Act review. The Agreement provides for: detailed early project coordination, evaluation, and modification of preliminary project designs to reduce impacts; the integration of fluvial geomorphology and bioengineering principles into project development; the investigation of creative cost-effective mitigation and enhancement opportunities; and provides a platform to enhance coordination across the two agencies. The success of the Agreement has led to the initiation of the Linking Landscapes for Massachusetts Wildlife program (LLWM), a proactive non-regulatory wildlife and transportation collaboration to mitigate the impact of the road network on fish and wildlife, their habitats, and ecosystems. Through LLWM, the agencies restore high value wetlands adjacent to highways, manage roadside habitats for rare plant and animal species, implement rare species protection projects, enhance nesting opportunities for rare bird species, enhance habitat for pollinators, conduct research projects in the field of transportation ecology, and collaborate with regional and local stakeholders on long-term ecological connectivity efforts. The partnership is a model for how state fish & wildlife and transportation agencies should work together, within both the regulatory and non-regulatory realms, and has been a critical component to MassDOT implementing

# ACHIEVEMENT AWARDS

several FHWA initiatives, including, Eco-Logical, Geospatial Data Collaboration, Expediting Project Delivery, Pollinator Habitat Enhancement, and northern long-eared bat conservation research.

**Importance:** In a day in age when public agencies are regularly asked to do more with less, is it critically important for regulatory agencies and DOTs to collaborate proactively to ensure compliance under applicable regulations, while efficiently meeting the needs of state transportation improvement programs. To achieve that goal in Massachusetts, the regulatory streamlining component of the MassDOT-MassWildlife partnership ensures the needs and interests of both agencies are addressed in the most efficient means possible. However, the role of the regulatory process is very narrowly focused, and therefore, taking a holistic approach to conserving rare species threatened by roads, while improving ecosystem connectivity for wildlife species and public safety (i.e. wildlife vehicle collision reduction), takes additional effort through non-regulatory, proactive coordination and cooperation. To that end, MassDOT and MassWildlife initiated the LLMW Program. The following is a list of a variety of projects implemented through the LLMW program:

- Copperhead Habitat Management
- American Kestrel Nest Boxes
- Black Bear Research
- Fluvial Geomorphology Assessment & Design
- Wildlife Passage Research & Design
- Moose Vehicle Collision Reduction
- Peregrine Falcon Nest Boxes
- Orange Sallow Moth Habitat Management
- Turtle Research & Protection
- Landscape Connectivity
- Monitoring
  - Reducing Road Mortality
  - Road Mortality Monitoring and Citizen Science Outreach
- Pollinator Habitat Creation
- Proactive Wetland Restoration
- Reciprocal Staff Trainings

# ACHIEVEMENT AWARDS

## LOCAL WINNER CONTINUED



Collaboration between MassDOT and MassWildlife on retaining wall replacement projects has utilized fluvial geomorphological assessment and design techniques to restore natural river processes, improve fisheries habitat, and to increase transportation infrastructure resiliency to severe storm events.



MassDOT Environmental and Landscape Design working with MA Natural Heritage and Endangered Species Program staff to develop the restoration plan for a calcareous bog wetland and its endangered species habitat adjacent to Interstate 90 in Stockbridge, MA.

## LIFETIME ACHIEVEMENT AWARD WINNER

This Lifetime Achievement Award is to recognize **Patricia A. White** for her outstanding accomplishments to road ecology and habitat connectivity in the United States. Trisha was the founding director of Defenders of Wildlife's Habitat and Highways Campaign since 2000, and was instrumental in pulling DOTs, DFW, and NGOs together to address habitat connectivity at the policy level as well as on the ground. Trisha was the driving force behind the original steering committee that developed NETWC, as well as a veteran ICOET rock star. Unfortunately, the Defender's Habitat and Highways Campaign was cut in 2012, and Trisha's unfillable cowboy boots in the world of wildlife crossings remain vacant to this day. The NETWC Steering Committee would like to recognize Trisha for the magic she has done to bring people to "the table" and make habitat connectivity part of the DOT and DF&W lexicon.



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#### Providing a suite of natural resource services including:

- ✓ RTE species compliance, detection, and monitoring
- ✓ NPDES compliance for highway discharges
- ✓ Wetland delineation and mitigation
- ✓ Vernal pool mapping and certification



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## NOTES

[illegible]

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