NHCPC 2022 ANNUAL MEETING

Abstracts and Speaker Biographies

Keynote Speakers

Speaker	Amy Lueders
Affiliation	Regional Director, Southwest Region, U.S. Fish and Wildlife Service
Speaker Biography	Amy Lueders [loo durs] graduated from Duke University with a Bachelor of Arts degree in Economics. She began her federal career with the Bureau of Land Management in 1984 holding numerous high level positions including Mineral Economist, Field Manager, and State Director for Nevada and then New Mexico. In 2017, Amy was appointed U.S. Fish and Wildlife Service Regional Director where she leads 800 Service employees based on national wildlife refuges, fish hatcheries, and offices across Arizona, New Mexico, Texas and Oklahoma. Throughout her Federal career she has worked hard to develop mutually beneficial solutions to issues of concern to local communities and the nation.

Speaker	Suzanne Scott
Affiliation	Texas State Director, The Nature Conservancy, TX
Speaker Biography	As State Director for The Nature Conservancy in Texas, Suzanne Scott establishes conservation strategy and public policy leadership to protect the state's cherished landscapes and support ecology, economy, public health, and equity. Working closely with a talented and diverse staff, she oversees the execution of land conservation efforts, freshwater protection initiatives and marine protection measures in the Gulf of Mexico, as well as the development of sound science, projects and policy solutions that promote nature's role in advancing community resiliency through mitigating and adapting to the impacts from a changing climate. Scott has dedicated a significant portion of her life to protecting and restoring the environment, connecting communities with the natural resources around them and spearheading on-the-ground, natural resources projects. Prior to joining the Nature Conservancy, Scott spent more than two decades with the San Antonio River Authority, serving 13 years as its General Manager, where she led the development of projects and programs to reduce the threat of flooding and to improve water quality and enjoyment of the San Antonio River. She obtained her undergraduate degree from Texas Tech University and a Master of Science in Urban Administration from Trinity University.

Welcome Speakers

Speaker	Abigail Fateman
Affiliation	Executive Director, East Contra Costa County Habitat Conservancy, CA
NHCPC Role	Board of Directors Member and Program Committee Co-Chair
Speaker Biography	Abigail Fateman is the Executive Director of the East Contra Costa County Habitat Conservancy, which implements the region's Habitat Conservation Plan/ Natural Community Conservation Plan. She was involved in the development of the Plan (starting in 2003) and after Plan adoption served as the Land and Habitat Manager before becoming the Executive Director. Ms. Fateman earned a M.S. from the University of Michigan's School of Natural Resources and Environment, where her research focused on stream ecology and monitoring stream health in urbanized areas. Ms. Fateman has been involved in conservation efforts including land management, scientific research, and policy development for over twenty years.

Speaker	Valerie Covey
Affiliation	Williamson County Commissioner Precinct 3, TX
NHCPC Role	NHCPC Board President
Speaker Biography	Valerie Covey was elected to represent Williamson County Precinct Three on the Williamson County Commissioner's Court in November 2006 and was reelected to her third full term in November 2016. She serves the county by participating on various boards and committees, including: the Williamson County Conservation Foundation, the Williamson County Mental Health Task Force, the Williamson County Regional Animal Shelter Board, the Williamson County Audit Committee, the Williamson County Investment Committee, Opportunities for Williamson and Burnet Counties, the CAPCOG General Assembly and the National Habitat Conservation Foundation Coalition, of which she chairs. In August 2019, Covey was appointed by Governor Greg Abbott to the Governing Board of the Texas Indigent Defense Commission. She attended the University of Texas at Austin, where she earned a degree in accounting and has been licensed as a certified public accountant for more than 30 years. She and her husband of 34 years, Mark Covey, have lived in Georgetown, TX since 1994, and are blessed with three sons and a daughter-in-law.

Speaker	Robert Mace
Affiliation	Executive Director and Chief Water Policy Officer, Meadows Center for Water and the Environment, TX
Speaker Biography	Robert Mace is the Executive Director and Chief Water Policy Officer at The Meadows Center for Water and the Environment and a Professor of Practice in the Department of Geography and Environmental Studies at Texas State University. Robert has over 30 years of experience in hydrology, hydrogeology, stakeholder processes, and water policy. Before joining Texas State University in 2017, Robert worked at the Texas Water Development Board for 18 years, ending his career there as the Deputy Executive Administrator for the Water Science & Conservation office. While at the Board, Robert worked on understanding groundwater and surface-water resources in Texas; advancing water conservation and innovative water technologies such as desalination, aquifer storage and recovery, reuse, and rainwater harvesting; regional and state water planning; and protecting Texans from floods. Prior to joining the Texas Water Development Board, Robert worked nine years at the Bureau of Economic Geology at The University of Texas at Austin as a hydrologist and research scientist. Robert has a B.S. in Geophysics and an M.S. in Hydrology from the New Mexico Institute of Mining and Technology and a Ph.D. in Hydrogeology from The University of Texas at Austin.

Engaging, Educating, and Empowering Communities and Stakeholders

Title	**Community Engagement and the Balcones Canyonlands Preserve**
Abstract	Sharing stories about Golden-cheeked Warblers and karst invertebrates through social media posts and webinars from Austin Water's Wildland Conservation Division (WCD) Balcones Canyonlands Preserve (BCP) helps biologists and land managers build public understanding of Central Texas conservation efforts. Two different social media series, #WarblerWednesday and bilingual #VireoViernes, occur bi-weekly throughout the months of May-September and cover the nesting season of the endangered Golden-cheeked Warbler and the recently de-listed, Black-capped Vireo over Instagram and Facebook. In addition to these field updates, staff developed a recurring webinar program, the Wild Neighbors Speaker Series, aimed at engaging preserve neighbors in supporting the preserve through actions in their own backyards and communities. Compared to a pre-pandemic walk-and-talk series, the webinar reaches a wider audience and creates a library of recorded webinars to utilize later. Topics have ranged from invasive plants to backyard bugs and birds, to urban wildlife, to dark skies.
HCP	Balcones Canyonlands Preserve
HCP type	Regional Development
Author	Jaya Torres
Affiliation	Austin Water Wildland Conservation Division - Balcones Canyonlands Preserve HCP

Speaker Biography	Jaya Torres is currently one of the Environmental Conservation Information Specialists with Austin Water's Wildland Conservation Division (WCD). She graduated in 2017 from Midwestern State University with a bachelor's in environmental science and a minor in biology. She has previous experience in wetland restoration, aquatic and terrestrial species surveys, and other environmental consulting field work. In her position with the WCD, she is primarily in charge of its social media platforms and creating content for each, helps lead volunteer workdays, has assisted in conducting Golden-cheeked Warbler surveys, and supports land management for both the Balcones Canyonlands Preserve and the Water Quality Protection Lands.
Title	**Garnering Public Awareness, Support, and Understanding of the Complexities of HCPs Through Video**
Abstract	Despite the exceptional work that HCPs provide in helping to strike a balance between effective economic development and the preservation / conservation of the environment, they are typically complex, jargon-filled documents. While the scientists, team members, and stakeholders involved with HCPs are brilliant at what they do, they are typically not marketers or public relations experts. Therefore, these Plans aren't usually presented in an accessible, understandable manner. In most cases, these documents reside on websites in the form of lengthy PDF documents that are little understood (if ever actually accessed) by the very people who benefit from the HCPs. Short form video (5-10 minutes, typically) consisting of expert interviews, footage of HCP site(s), and simple graphic animation offers the opportunity for HCPs to present their plans in an easy-to-understand format that is accessible for people who excel with "visual", "auditory", and "reader" learning styles. Complex issues, processes, and projections can be explained simply with visuals, graphics, and animations. Objections (and potential objections) can be addressed head on, with explanations and evidence. The visual representation of landmarks and iconic, recognizable areas of a community can make a viewer make a personal connection and feel a true "buy-in" with an HCP. As opposed to the standard, agency-created-HCP-PDF, these sorts of videos are perfect content for mailing lists, social media platforms, YouTube, email, lobbying communications, etc…Not only does such a simple effort on the part of HCPs create awareness and understanding–when done thoughtfully, these videos can help to create support and develop a sense of transparency between the HCP and the community…A win-win for all involved.
Author	Marcus Anderson
Affiliation	We Market For Humans
Speaker Biography	Marcus Anderson is a former advertising executive who left the industry to use his superpowers of persuasion and communication to fight the good fight! With his partner Storey Anderson, they are proud to align themselves with local, regional, and national agencies to help them garner attention and support for environmental projects that make our world a better place for everyone (including our two lovely children). www.yourvisionaryvideo.com
Title	**Bridging the Culture Divide between Regulator and Developer: Creating Greater Regulatory Certainty and Better Conservation**
Abstract	The vast majority of USFWS staff biologists have little to no experience in development and view their role strictly as the "protector" of imperiled species. Many HCP applicants have little experience with conservation and view Endangered Species Act compliance as burdensome and unnecessary regulation that should be fought at every turn. Consultants find themselves in the middle, trying to meet two competing and often diametrically opposed demands. We propose that educating regulatory biologists as to the realities of the development process, and educating developers as to the conservation needs of imperiled species creates opportunities to speed the HCP process and result in better conservation outcomes; in other words, better certainty for both sides. Ideas for how to accomplish these include formal and informal education for FWS HCP staff, development of educational materials for HCP applicants, procedural improvements that foster cross-education, and a culture shift from a "regulatory" to a "conservation partnership" mindset.
Author	Rollie White
Affiliation	U.S. Fish & Wildlife Service, Palm Springs, CA

Focus on Early Plan Implementation Actions

Title	**How to Hit the Ground Running with HCP Implementation**
Abstract	Key to successful implementation of a large-scale, programmatic habitat conservation plan (HCP) is early development of the necessary implementation tools. Ideally, these tools are already set up by the time the incidental take permit is issued so the implementing entity (IE) can hit the ground running. These tools include application forms for third party applicants, and participation forms for permittees; user's guides to assist applicants, permittees, and IEs in filling out, reviewing, and approving forms and to provide policy guidance, particularly for important policy detail established by the IE or permittees and not stipulated in the HCP; data management system for tracking take, mitigation, stay-ahead provisions, adaptive management, and other information necessary for annual reports; and an annual report template. These tools should be developed to be user friendly and allow easy transfer from forms to tracking systems to annual reports. A multitude of easy-to-deploy data management platforms, as well as more complex and multi-functional options, are available and IEs should evaluate their needs early to choose the appropriate option. Cloud-based solutions are recommended because they are accessible from anywhere and tend to support simultaneous access, so that applications can be filled out online, data from the forms can be incorporated into the data management/tracking system, users can easily view implementation progress, and annual reports can be automatically generated.
HCP type	Regional Development
Author	Ellen Berryman
Affiliation	ICF
Speaker Biography	Ellen has been a conservation biologist for over 30 years, and she has been preparing and reviewing HCPs for most of her career. She began working on HCPs in the early 90s as a USFWS employee working out of the Carlsbad, California office, when the nation's first large, multiple species regional HCPs were being developed. She later worked on HCPs in northern California, out of the Sacramento USFWS office, then went into private consulting and eventually went to work with ICF because of their experience and capacity for preparing complex regional multiple species conservation plans.

Title	**The New World of Online Portals and Databases for HCP Implementation**
Abstract	We live and work in a digital world where so much of what we do is online, from the data we collect, the reports we write, and the meetings we have. But most HCPs are still managing HCP implementation offline with spreadsheets, static reports, and inefficient data sharing tools. Large, multi-species HCPs require a large investment of time to manage all this information, synthesizing it every year to meet annual regulatory reporting requirements. Every year more HCPs are increasingly using a variety of digital and online tools, but most still don't have a way to easily integrate the data to support decision-making, annual compliance reporting, and data sharing/transparency. In this presentation we identify the parts of HCP implementation that can benefit most from data integration, including tracking of covered activities, mitigation accounting, implementation of conservation actions, adaptive management of threats and stressors, streamlined annual reporting, and public engagement. We identify steps HCPs can take to work towards including these elements in a more efficient and accessible implementation process using online portals and databases. We also review the online tools and portals recently developed by several HCPs to discover which elements of HCP implementation have been included in their tools and portals, and to provide inspiration for other HCPs ready to take the next steps toward online portal and database development.
Authors	Scott Fleury and Jon Walker
Affiliation	ICF
Speaker Biography	Scott is a senior conservation biologist and leader of ICF's habitat conservation planning practice in southern California. His conservation planning work has spanned the last three decades and has focused on the development and implementation of large-scale regional HCPs and other endangered species conservation efforts throughout California and the western US. Scott has been leading the Upper Santa Ana River HCP Program for ICF from the beginning and has worked closely with Valley District to develop a vision for the long-term implementation of the HCP under the CAMMP and with the customized tools created for HCP monitoring, management, and reporting that are a part of the CAMMP portal. Scott earned a Bachelor's in Biology from the University of California, San Diego, a Master's in Biogeography from San Diego State University, and a PhD in Ecology, Evolution, and Conservation Biology from the University of Nevada, Reno.

Title	**Reforesting Degraded Landscapes**
Abstract	Land management goals for the Balcones Canyonlands Preserve include protecting prime habitat, enhancing recovering habitat, and restoring degraded systems for multiple species covered under the Balcones Canyonlands Conservation Plan. Over 150 years of repeated clearcutting and overgrazing have resulted in a loss of top soil and ongoing erosion issues on some sites. Using regenerative techniques and designs, we are working to repair these sites and promote healthy, resilient ecosystems. Starting from the ground up, we begin with earthworks to stabilize eroding sites, capture water on contour high in the landscape to rehydrate dry hillsides, rebuild the soil "sponge", and increase native plant diversity. Restoration is designed within an adaptive management framework to connect and expand forest patches, promote carbon sequestration, increase groundwater infiltration, provide pollinator habitat, and recycle invasive woody material back into the ecosystem. We recently received an award from the Environmental Protection Agency with top honors for Low Impact Green Infrastructure Improvement. What's really exciting about this work is that it is being implemented by a community of volunteers who are teaching others how to regenerate their own land with informed design plans.
HCP	Balcones Canyonlands Conservation Plan
Author	Jim O'Donnell
Affiliation	Forest Ecosystem Biologist, City of Austin, Balcones Canyonland Preserve
Speaker Biography	Jim O'Donnell is a Forest Ecosystem Biologist for the City of Austin's Wildland Conservation Division. An important part of his work is to identify degraded ecological systems for habitat restoration on the Balcones Canyonlands Preserve (BCP), which provides mitigation for multiple endangered and rare species in Travis County. He designs and implements restoration plans using multiple techniques to create functional diverse ecosystems. For over 30 years, Jim has combined his love of teaching, biology, and environmental stewardship to help protect the Black-capped Vireo and endangered Golden-cheeked Warbler in Central Texas. During the 1980s, he was instrumental in setting aside a 214-acre tract of land that once supported the largest concentration of Black-capped Vireos in Travis County and is now part of the BCP. As a result of his efforts and knowledge of the endangered songbirds and their ecosystems, Jim was appointed to the Biological Advisory Team that provided the basis and support for the BCP. After retiring from teaching in 2009, Jim has spent the last 13 years designing and implementing habitat restoration projects. Jim uses his knowledge of the species, plants, and teaching to implement regenerative habitat restoration projects with a community of volunteers. Jim's work was recently recognized by the EPA with top honors for Low Impact Green Infrastructure Improvement. He regularly gives presentations to numerous state and local groups on this topic.

NHCPC Year in Review

Title	**Message from the Secretary and Program Committee Update**
Author	Terah Donovan, NHCPC Secretary of the Board, Program Committee Co-chair
Affiliation	ESA
Speaker Biography	Terah Donovan is Principal Conservation Biologist at Environmental Science Associates. Terah manages an integrated natural resource management program for rare and endangered species and ecosystems in California. She balances at-risk species conservation and recovery with economic development, infrastructure construction, and operations and maintenance. Together with her clients, she ensures project outcomes that meet regulatory requirements and result in better ecological and financial outcomes. Her team integrates best available science, management and monitoring methods, and technology into their projects. She creates project opportunities for her colleagues that allow for professional engagement and growth. Terah has supported the planning of 13 HCPs and implementation of 6. She serves as a Director and Secretary of the National HCP Coalition and Program Committee member. She is a Director of the San Diego Duke Alumni Club, focusing on environmental and diversity programming. She was Alumna-in-Residence at Duke University in 2017. She holds a Bachelor of Arts in Environmental Science from Northwestern University and a Masters of Environmental Management in Conservation Science and Policy from Duke University. She is a returned Peace Corps Volunteer from Bolivia. In 2020, she learned to surf.

Title	**Financial Committee Update**
Author	Nathan Pence, Executive Manager of Environmental Science at DBRA; NHCPC Treasurer
Affiliation	Guadalupe River Authority
Speaker Biography	Nathan Pence leads the GBRA's environmental stewardship initiatives while overseeing day-to-day operations for the Canyon Lake Gorge and Water Quality Lab. Pence leads the ongoing development of a comprehensive Habitat Conservation Plan for the Guadalupe River basin and the administration of the Clean Rivers Program for the Guadalupe River and Lavaca-Guadalupe Coastal basins in partnership with the Texas Commission on Environmental Quality. He is a founding board member for the National Habitat Conservation Plan Coalition and current Treasurer, serves as Vice Chair of the Guadalupe Basin Coalition, is on the steering committee of the Greater Springs Project and is a member of the Texas Water Conservation Association Endangered Species Committee. Pence also represents GBRA as a member of the US Water Alliance One Water Council, the City of New Braunfels Natural Resource Committee, and the New Braunfels Utility Headwaters Center Technical Advisory Committee. Mr. Pence has more than 15 years in watershed management and planning with an accomplished record of collaborating with local officials and stakeholders. Prior to working at the GBRA, Mr. Pence served as the Threatened and Endangered Species Executive Director for the Edwards Aquifer Authority in San Antonio, where he facilitated and managed the Edwards Aquifer Habitat Conservation Plan. He also worked for the City of New Braunfels collaborating with local tourism officials and environmentalists on economic development projects while protecting the integrity of natural resources. Mr. Pence has a bachelor's and master's degree in Aquatic Biology from Texas State University.

Title	**Government Relations Committee Update**
Author	Dave Ramey, Co-Chair Government Relations Committee
Affiliation	Kaddish and Associates
Speaker Biography	Dave Ramey is a Principal at Kadesh & Associates. His career in public service has included over three decades of experience as a senior staffer in the House of Representatives. He served nearly twenty years as Chief of Staff to Representative Ken Calvert (R-CA), Chairman of the California Republican Delegation, where he administered the office's political, legislative, and communications functions. Prior to serving as Chief of Staff to Representative Calvert, Mr. Ramey served as his Legislative Director where he oversaw the office's legislative and budget affairs. From 1985 to 1993, Mr. Ramey served as Senior Advisor on Foreign Policy and Defense Issues for the House Republican Conference; Policy Committee; and Research Committee -- all under the Chairmanships of Congressman Jerry Lewis (R-CA). Prior to departing Congress, Mr. Ramey led the California Republican Administrative Personnel group, and he currently serves as President of the bipartisan California State Society. Mr. Ramey graduated from the College of William and Mary in 1984 with a B.A. in International Relations and received his Master of Arts with Highest Distinction from the Naval War College in National Security and Strategic Studies.

Title	**HCP Improvement Committee Update**
Authors	Paola Bernazzani and Lucas Bare, NHCPC HCP Improvement Committee Co-chairs
Affiliation	ICF
Speaker Biographies	**Paola Bernazzani** is a conservation biologist and planner with 30 years' experience in the environmental field. She is currently a principal at ICF where she manages and directs projects. She also leads the conservation planning practice within the Eastern line of business, supporting marketing efforts, business development, thought leadership, and team growth. Paola's focus is the integration of science with policy, projects, and planning. She works throughout the US and internationally on environmental issues including endangered species compliance, biodiversity and forest conservation, regulatory strategies, conservation of rare species, and compensatory mitigation. She presents frequently on the role of science in the planning process and has published several articles, including papers on participant perspectives of HCPs and climate change in the regulatory environment. She is a reviewer for the journals Conservation Biology and Environmental Management. Domestically, Paola works with state agencies, electric utilities, water companies, foresters, and wind developers. She is also an experienced communicator and speaker. She has done trainings domestically and internationally, including stakeholder outreach, and she teaches ESA compliance regularly at UC Davis extension program. Paola has a Master's of Science in wildlife biology from the Department of Environmental Science, Policy and Management at the University of California, Berkeley and a Bachelor of Arts degree in Environmental Studies from Yale University. **Lucas Bare** is a senior manager in ICF's Conservation Planning and Implementation Practice with over 12 years of professional experience in environmental planning, natural resources

management, and conservation biology. Lucas' expertise lies in advising clients on Endangered Species Act compliance and permitting options (Section 10 and Section 7), preparing Environmental Assessments and Environmental Impact Statements under the National Environmental Policy Act, and developing Eagle Conservation Plans under the Bald and Golden Eagle Protection Act. Lucas manages projects for clients across multiple sectors, including energy development, transmission, water, and local and federal land and resource management agencies. His technical expertise is in conservation biology and impact analysis for natural resources.

HCPs in Practice

Title	**A Landscape-Level Look at the National HCP Program**
Abstract	Founded in 1947, Defenders of Wildlife seeks to protect wildlife and their habitat in North America on behalf of its nearly 2.2 million members and supporters. The Center for Conservation Innovation (CCI) at Defenders focuses on developing innovative technical, scientific, and policy tools to improve conservation outcomes. In this talk, we will discuss some of CCI's work relevant to the Habitat Conservation Plan (HCP) program, and potentially useful to HCP practitioners and other researchers. We will first discuss the results of a large-scale analysis of the HCP program as a whole, which involved collecting documents through a Freedom of Information Act for 596 individual plans spanning across all 7 U.S. FWS regions in the United States approved before 2018 and evaluating them. We will provide an overview of our results, identify potential gaps and barriers to conservation that we found, and offer suggestions to how the program may be improved generally. We will then discuss conservation tools developed by CCI that can help with HCP planning and monitoring, including tools designed to track habitat alterations and create geospatial data collaboratively.
Authors	Heather Harl and Andrew Carter, PhD
Affiliation	Defenders of Wildlife
Speaker Biographies	**Heather Harl** is a conservation policy analyst at Defenders of Wildlife's Center for Conservation Innovation. Heathers expertise is in the Endangered Species Act, and she works on policy implementation and emerging policy issues on federal and private lands. She has an M.A. from American University in Global Environmental Policy with an emphasis in wildlife conservation. Before her time at Defenders of Wildlife, she worked for The Smithsonian's Zoological Park for ten years as a zookeeper specializing in primate care and conservation. She received her undergraduate degree from Northern Arizona University in Anthropology. She grew up in the Midwest but now calls the mid-Atlantic home. **Andrew Carter** is a senior conservation policy analyst at Defender of Wildlife's Center for Conservation Innovation in Washington, D.C., and an affiliate faculty member at George Mason University's Department of Environmental Science and Policy. His work focuses on developing and advocating for innovative policies related to the Endangered Species Act and other United States natural resources laws. Prior to his work with Defenders, he was Research Director at Miami Waterkeeper, taught environmental law and policy courses at the University of Miami, and practiced law in Florida and New York. He received a Ph.D. in Environmental Science and Policy as well as a J.D. from the University of Miami, and an M.A. in Marine Conservation and Policy from Stony Brook University. He is a native of New York City.

Title	**ESA Section 7 and 10: Can Projects with a Federal Nexus be Covered in an HCP or Are They Oil and Water?**
Abstract	One of the great strengths of the habitat conservation plan (HCP) tool is that it is very flexible and can address a wide range of projects and activities. Since the first large-scale multi-species HCPs in the 1990s, HCPs have become a popular tool to streamline Endangered Species Act (ESA) compliance and provide effective mitigation programs. To date, there are over 850 approved HCPs in the country, with an increasing share being large-scale HCPs. However, confusion remains about whether and how to cover in HCPs projects and activities that may have a federal nexus and may be subject to a future ESA Section 7 consultation. Even for approved HCPs, some

	HCP implementing entities get conflicting direction about whether they can cover projects and activities that receive a subsequent federal permit, receive federal funding, or occur on federal land. This talk will explore and answer questions about the intersection of Section 7 and 10 such as: Can federal agencies besides USFWS and NMFS participate in an HCP? Can an HCP cover activities subject to a later Section 7 consultation? How can the Biological Opinion for the HCP streamline future Section 7 consultations? Can a lead federal agency ignore the HCP in a Section 7 consultation? And finally, in an ideal world, how should Sections 7 and 10 work together in the context of a regional HCP?
HCP type	Regional Development, Electric Utility, Gas Utility, Transportation, Water, Forestry, Renewable Energy
Author	David Zippin, PhD
Affiliation	ICF
Speaker Biography	David Zippin leads a large practice in habitat conservation planning and implementation at ICF, a global consulting firm. He has more than 30 years of experience preparing and implementing over 50 HCPs in 25 states and territories for government agencies, water agencies, transportation agencies, utilities, and timber and energy companies. David teaches Endangered Species Act compliance, habitat conservation planning for endangered species, and habitat conservation plan implementation at the University of California Extension Program and at the USFWS National Conservation Training Center in West Virginia. He is also the coauthor of the award-winning book *Understanding the Habitat Conservation Planning Process in California: A Guidebook for Project and Regional Conservation Planning*. He received a Ph.D. in Biological Sciences from the University of Texas–Austin and a B.A. in Ecology from the University of California, San Diego. He is based near Monterey, California. David was a founding member of the National HCP Coalition. He has served on the Board of Directors of the NHCPC since its beginning in 2016.

Bats and HCPs

Title	**Bat Conservation Banks as a Mitigation Solution for Wind HCPs**
Abstract	In this presentation, we share the experience developing the largest bat conservation bank in the United States: the Clermont County Conservation Bank. Located in Ohio, the 1,000+ acre summer maternity roosting project is a landscape-scale project that has provided bat mitigation credits to not less than 4 HCPs in the state. We will walk through the crediting for Indiana bat and northern long-eared bat at the bank and discuss how Magnolia worked with USFWS to develop a unique ledger that could be used for HCPs that leveraged the Resource Equivalency Analysis (REA) model. This presentation is ultimately a story of how species conservation banks can be integrated successfully with Section 10 compliance, even when there are complicated crediting considerations, such as those that arise in the case of wind HCPs addressing direct take of bat species.
HCP	Timber Road II, III, IV, Hog Creek, Blue Creek (Ohio Wind HCPs)
HCP type	Renewable Energy
Authors	John Yarchoan and Abby Singer
Affiliation	Self (Partner at Magnolia)
Speaker Biographies	**John Yarchoan** is a Partner at Magnolia, where he manages client relationships with companies developing Habitat Conservation Plans and seeking Incidental Take Permits. In his role managing mitigation projects for these HCPs, he has developed and provided over 10,000 acres of qualifying species mitigation across several USFWS Field Offices. John holds a B.A from Amherst College and previously worked at the National Oceanic and Atmospheric Administration. **Abby Singer** is a Project Manager at Magnolia. In this role, she has worked to develop conservation and mitigation banks in nine states— including eight pending or approved conservation banks for special status bat species. She most recently led the development of Magnolia's second approved conservation bank in Ohio. Abby also works closely with regulatory personnel and assists with internal due diligence processes on potential mitigation sites. Abby holds a B.A. in Environmental Studies and Economics from Haverford College and is currently pursuing a Master of Environmental Studies with a concentration in Environmental Policy and Sustainability from the University of Pennsylvania.

Title	**Bats in the Belfry: Lessons Learned from Regional Bat HCPs Across Five States**
Abstract	In the United States, several species of bats have seen their populations plummet by over 95% in the past 20 years, some of the steepest declines recorded for a mammal. And they face a highly uncertain future. The USFWS is considering the listing (or uplisting) of several species of bats.

Tricolored bat, little brown bat, and xx are being considered for listing under the ESA and are likely to become listed. This March (2022), the U.S. Fish and Wildlife Service announced that they have proposed to reclassify Northern Long-eared Bats from threatened to endangered species under the ESA, thus precluding the use of these exemptions under the 4(d) rule. With the imminent listing/uplisting of several widely distributed bat species, conservation planning addressing bats is critical. We explore three large-scale HCPs for bats in the Midwest and East – all with permits anticipated by October 2022.

• Forestry Habitat Conservation Plan for Bats on Pennsylvania State Game Lands, State Forests, and State Parks. This HCP addresses forestry practices and related activities on 3.8 million acres of state-owned lands in Pennsylvania. The plan covers two bat species, the federally endangered Indiana bat and the federally threatened northern long-eared bat.
• Missouri Department of Conservation (MDC) Bat Habitat Conservation Plan. The Missouri Department of Conservation developed a conservation plan to protect five species of at-risk bats while allowing forest management covered activities to occur. Of the 42 million acres of MDC-owned and other nonfederal land in the state, 15.7 million acres are forested and may provide habitat for bats.
• Lake States Forest Management Bat HCP. The States of Michigan, Minnesota, and Wisconsin are partnering in the development of this HCP to protect four cave-dwelling bat species while conducting forest management activities on state-owned and state-managed lands. This HCP addresses forestry activities on more than 11 million acres across the three states. This plan also includes a program through which private landowners can participate in the plan by agreeing to implement bat conservation practices on their lands.

These plans implement several conservation measures, including the maintenance of habitat, avoidance of potential roosting trees, protection of hibernacula (where bats hibernate during the winter), outreach, training, and research. These plans also address how climate change is integrated into HCPs using different approaches ranging from adaptive management and monitoring to changed circumstances.
While the future of bats is uncertain due to the primary threat of disease (white-nose syndrome), these HCPs help improve their chances and reduce uncertainty. And with the proposed reclassification of the Northern long-eared bat as endangered, these plans will provide greater certainty for land managers as well.

HCP type	Forestry
Author	Paola Bernazzani
Affiliation	ICF
Speaker Biography	**Paola Bernazzani** is a conservation biologist and planner with 30 years' experience in the environmental field. She is currently a principal at ICF where she manages and directs projects. She also leads the conservation planning practice within the Eastern line of business, supporting marketing efforts, business development, thought leadership, and team growth. Paola's focus is the integration of science with policy, projects, and planning. She works throughout the US and internationally on environmental issues including endangered species compliance, biodiversity and forest conservation, regulatory strategies, conservation of rare species, and compensatory mitigation. She presents frequently on the role of science in the planning process and has published several articles, including papers on participant perspectives of HCPs and climate change in the regulatory environment. She is a reviewer for the journals Conservation Biology and Environmental Management. Domestically, Paola works with state agencies, electric utilities, water companies, foresters, and wind developers. She is also an experienced communicator and speaker. She has done trainings domestically and internationally, including stakeholder outreach, and she teaches ESA compliance regularly at UC Davis extension program. Paola has a Master's of Science in wildlife biology from the Department of Environmental Science, Policy and Management at the University of California, Berkeley and a Bachelor of Arts degree in Environmental Studies from Yale University.

Implementation Partnerships

Title	**A Partnership for Implementation Success: Integrating Recreation into Preserves**
Abstract	A successful partnership is rooted in understanding the needs of all partners. In the SF Bay Area, California, the East Bay Regional Park District (EBRPD) and the East Contra Costa Habitat Conservancy have been successfully implementing conservation elements of the ECCC HCP/NCCP since 2007. With almost half of the total HCP Preserve System acquired in the first 15 years, the Park District and the Habitat Conservancy have recently focused attention on how to successfully integrate passive, compatible recreation onto these lands. The Park District's mission is always to balance conservation with public access to nature, but HCP Preserve Lands require an even higher

	level of care to ensure protection of the conservation values of the land because the priority is conserving and restoring habitat for the HCP's 28 target species. The Park District and the Conservancy, along with their regulatory partners, have planned public access to the HCP Preserve System while prioritizing habitat for special status species in order to provide public access in accordance with the original HCP Implementing Agreement. Representatives from the Habitat Conservancy, Park District, and USFWS will present on the partnership, the recreational planning process, and answer questions about lessons learned.
HCP	East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan
HCP type	Regional Development
Authors	Abigail Fateman, Neoma Lavalle, and Josh Philips
Affiliation	East Bay Regional Park District / East Contra Costa County Habitat Conservancy
Speaker Biographies	**Abigail Fateman** is the Executive Director of the East Contra Costa County Habitat Conservancy, which implements the region's Habitat Conservation Plan/ Natural Community Conservation Plan. She was involved in the development of the Plan (starting in 2003) and after Plan adoption served as the Land and Habitat Manager before becoming the Executive Director. Ms. Fateman earned a M.S. from the University of Michigan's School of Natural Resources and Environment, where her research focused on stream ecology and monitoring stream health in urbanized areas. Ms. Fateman has been involved in conservation efforts including land management, scientific research, and policy development for over twenty-five years. **Neoma Lavalle** is a Principal Planner with the East Bay Regional Park District (EBRPD) where she focuses on interagency planning and leading the Park District's Conservation Lands Program. Ms. Lavalle serves as the EBRPD's primary liaison with the East Contra Costa County (ECCC) Habitat Conservancy helping coordinate and implement a wide variety of joint EBRPD and Habitat Conservancy projects. Her work has included financial analysis, preserve management planning and the development of a recreational planning process that achieves the biological goals and objectives of the ECCC HCP/NCCP, while also meeting EBRPD's public access needs. Ms. Lavalle has worked for EBRPD for 12 years and prior to that she was a Peace Corps Volunteer in Honduras and worked for the U.S. Antarctic Program at McMurdo Station, Antarctica. She has a BA from U.C. Berkeley and a Master of Environmental Management from Duke University's Nicholas School of the Environment. **Josh Phillips** is an Ecological Services Coordinator with the East Bay Regional Park District (EBRPD), where he specializes in guiding projects through the state and federal biological resources permitting process. In this role, Mr. Phillips has worked closely with the East Contra Costa County (ECCC) Habitat Conservancy and partner wildlife regulatory agencies in developing a planning approach for recreation on ECCC HCP/NCCP preserve lands that supports the biological goals and objectives of the ECCC HCP/NCCP. Mr. Phillips has worked for four years at EBRPD and prior to that he worked 20 years as a consultant specializing in endangered species permitting and the California Environmental Quality Act CEQA. He has a BS from U.C. Davis and a Master of Environmental Science and Management from U.C. Santa Barbara's Bren School.

Highlighted HCPs

Title	**Highlighted HCPs: California Department of Water Resources HCPs for Operations and Maintenance of the State Water Project**
Abstract	In 2020, the California Department of Water Resources launched an ambitious effort to prepare two Habitat Conservation Plans to cover Operations and Maintenance (O&M) Activities for the State Water Project (SWP) in two of their "Field Divisions". The SWP delivers water to 27 million Californians, 750,000 acres of farmland, and businesses throughout the state. Historically, critical O&M activities have been delayed or avoided due to the challenges of project-by-project approvals needed from the wildlife agencies and aquatic resource permitting agencies. The Delta Field Division includes SWP properties and infrastructure in nine counties covering a total of approximately 10,000 acres, and the San Joaquin Field Division touches three counties and covers approximately 14,000 acres. In support of these HCPs, DWR is partnering with Dudek to conduct a range of vegetation mapping, aquatic resource evaluations, habitat assessments, protocol-level and modified protocol-level surveys, bat acoustic studies, and wildlife movement studies within each plan area. Focal species considered for coverage in the Delta Field Division HCP include but are not limited to California tiger salamander, Alameda whipsnake, California red-legged frog, Swainson's hawk, vernal pool fairy shrimp and vernal pool tadpole shrimp, and various rare plants. Focal species considered for coverage in the San Joaquin Field Division HCP include but are not limited to San Joaquin kit fox, blunt-nosed leopard lizard, kangaroo rats,

	Buena Vista Lake ornate shrew, and San Joaquin antelope squirrel. The intent of these intensive data collection efforts is to better define habitat within the plan area, identify areas where covered activities will need to implement avoidance and minimization measures, better estimate levels of take from covered activities, and identify locations where habitat restoration or wildlife movement corridor improvements could be made. Surveys and other data collection began in 2021 and is expected to be complete by August 2022, and the Draft HCPs and associated environmental documents are currently planned for release in mid-2024.
HCP	California Department of Water Resources HCPs for Operations and Maintenance of the State Water Project
HCP type	Water
Author	Michael Henry
Affiliation	Dudek
Speaker Biography	Mike Henry has 22 years of experience involving management and analysis for a variety of biological resource projects, including regional and project-level HCPs; planning and permitting for marine aquaculture, offshore wind, and artificial reef construction; and a range of project- and program-level documents in compliance with state and federal environmental laws. He served as the contract manager and senior ecologist for the South Sacramento HCP/ARP and currently manages an implementation contract for that plan, and is also managing preparation of HCPs for the California Department of Water Resources, University of California Santa Cruz. He is also the webmaster for the NHCPC. In his free time he enjoys mountain biking and restoring his vintage sports car, and coaching or cheering on his two kids in basketball, baseball, soccer and equestrian events.

Title	**Guam HCP: A Transformational Conservation Plan for a Pacific Island**
Abstract	The Pacific Island of Guam is 212 square miles and home to 30 species listed under the federal Endangered Species Act (ESA), including eight single island endemics. While 30% of the territory is federally owned or managed, land clearing for commercial and residential development, infrastructure improvement, and utilities maintenance exists as the primary threat for listed species. There is not yet a streamlined approach to being able to complete projects such as these while complying with the federal or local ESA. The U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office is supporting the development of a Habitat Conservation Plan (HCP) that will span the island and provide a comprehensive approach to complying with these laws. Guam Department of Agriculture has partnered with the University of Guam, Center for Island Sustainability and ICF consultants to develop the Guam HCP with the goals of protecting and conserving threatened and endangered species and their habitats, supporting Guam's rich biological and cultural heritage for future generations, facilitating sustainable economic development, and providing regulatory streamlining. This programmatic plan proposes to protect 15 species of plants and animals from a breadth of covered activities. When complete, the HCP will be the first in the Mariana Islands and integral to Guam's ecosystem management into the future. More information can be found at www.guamhcp.com.
HCP	Guam HCP
Authors	Toni Mizerek, Jacqueline Flores, Lauren Taylor and David Zippin
Affiliation	US Fish and Wildlife Service
Speaker Biography	Lauren Taylor is a biologist at the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii. A member of the Mariana Islands Geographic Team in the Ecological Services Program, Lauren's career and education have focused on natural resource policy and the protection of endangered species endemic to the islands of the Pacific. She has broad experience in the development and implementation of habitat conservation plans and safe harbor agreements. Lauren previously coordinated the Conservation Planning Program for Endangered Species Protection at the State of Hawaii, Department of Land and Natural Resources, and served in the U.S. Coast Guard as a marine science technician. Lauren arrived in Hawaii on an open-ended plane ticket sixteen years ago, from the far less tropical island of Great Britain, and has yet to book her return flight.

Title	**HCP for DifWind Farm Decommissioning and Reclamation in Alameda, CA**
Abstract	The HCP covers 3,000 acres to authorize incidental take of CA Tiger salamander and Red-legged frog for activities associated with the decommissioning and reclamation of the DifWind VII and IX wind generation projects in the Altamont Pass Wind Resource Area in eastern Alameda County, California. Site restoration activity is expected to conclude by the end of 2022. Biological monitoring onsite includes hand excacation of mammal burrows and relocation of amphibians. Project will provide compensatory mitigation through a conservation easement of 17 acres of grassland habitat to compensate for habitat loss for both species. Ongoing restoration effectiveness monitoring will be conducted from 2023-2028 to ensure that annual grassland

	habitat is restored in the decommissioning area and remains suitable for California tiger salamander and California red-legged frog.
HCP	Habitat Conservation Plan for the Difwind VII & IX Reclamation Project, Alameda County, California
HCP type	Renewable Energy
Authors	Elise Anderson and Jacquelyn Nwagwu
Affiliation	EDF Renewables
Speaker Biography	Elise Anderson is the Director of Biodiversity & Environment for Asset Optimization at EDF Renewables North America, where Elise leads environmental and wildlife compliance for over 20 GW of operating wind and solar PV farms, including pursuing endangered species permitting and mitigation strategies for eagles, bats, and condors. Elise also manages the decommissioning of the Difwind 7 & 9 wind farms in Altamont, California and biological monitoring of the construction activity. Elise lives in Massachusetts and has worked in the renewable energy industry on environmental compliance issues for over 12 years, in both the public and private sector. Elise enjoys traveling, cooking, scuba diving, and spending time with her husband, two children, and their cats, Techno & Remix.

Focus on Texas HCPs

Title	**Creating Strategic Partnerships to Support Habitat Conservation Plans**
Abstract	Creating strategic partnerships both in and out of your organization is crucial when developing a Habitat Conservation Plan (HCP). The Guadalupe-Blanco River Authority (GBRA) has formed both internal and external partnerships to support the Guadalupe River HCP (GRHCP). The first step of the GRHCP was to get the support of their Board of Directors through a board resolution. This resolution allowed the Environmental Department to begin discussing the HCP in more detail with other departments within GBRA as well as initiating the hiring of contractors and staff to develop an HCP. GBRA has also gained support and good will by collaborating with and assisting other stakeholders in the basin. GBRA often collaborates with and provides assistance to other stakeholders doing research in the Guadalupe Basin. This not only helps partnering agencies but also provides GBRA with firsthand information about new data, like where rare mussels have been collected. GBRA has also assessed internal needs and looked for other researchers, people in the basin in need of resources, and similar organizations that they could collaborate with. Currently, GBRA is setting up a system for second party stakeholders to have the opportunity to support and participate in the GRHCP. By casting a wide net and looking for strategic partners, GBRA has created a robust system to support their HCP.
HCP	Guadalupe River HCP
HCP type	Water
Authors	Chad Norris, Jana Gray and Nathan Pence
Affiliation	Guadalupe-Blanco River Authority
Speaker Biography	Chad Norris is the Deputy Executive Manager of Environmental Science for the Guadalupe-Blanco River Authority. He has a B.S. in Environmental Science with dual majors of Biology and Geology from the University of Houston-Clear Lake and a M.S. in Aquatic Biology from Texas State University. Chad worked for the Texas Parks and Wildlife Department for almost 23 years, where he worked on various issues, including freshwater inflows, coastal restoration, regional water planning, water rights, groundwater management, habitat conservation planning, and groundwater/surface water interactions, although much of his time focused on rare species and freshwater springs. At GBRA, Chad is working on the development of the Guadalupe River Habitat Conservation Plan and also oversees the GBRA Analytical Lab, Water Quality Program, and Biology Team.

Title	**The Williamson County Conservation Foundation – Current Status and Planned Changes**
Abstract	Williamson County's Regional Habitat Conservation Plan (RHCP) has become an important component of the local development and conservation landscape. The RHCP facilitates development and infrastructure installation in environmentally sensitive portions of Williamson County by providing a programmatic, stepwise method for obtaining an incidental take permit of the golden-cheeked warbler and two endangered karst invertebrates in an expedited manner. The first half of this discussion will examine Williamson County's RHCP, the covered species, enrollment methods, and new species being added for incidental take coverage.

	The RHCP is also involved with world-class, cutting-edge research. Significant RHCP time and resources are dedicated to increasing the body of knowledge for the cryptic, subterranean species that occupy Williamson County's vast karst system. Additionally, the RHCP is working closely with researchers to recreate the climate of the Southern Great Plains using stalagmites from local caves, with the first peer reviewed publication being published in Nature Geoscience (2021). The second half of this discussion will provide details regarding ongoing science plus future plans for RHCP scientific endeavors.
HCP	Williamson County RHC
HCP type	Regional Development
Authors	Stephen Van Kampen-Lewis and Josh Renner
Affiliation	SWCA
Speaker Biographies	**Stephen Van Kampen-Lewis** has more than 10 years of experience in natural resources services, business, and project management. His expertise includes Endangered Species Act compliance, Clean Water Act compliance; and due-diligence documentation for many different types of projects, including environmental permitting with local, state, and federal state agency coordination. Through his management role, he is responsible for contract development, project scheduling, agency coordination, client team coordination, and quality assurance/quality control reviews. Mr. Van Kampen-Lewis is SWCA's project manager for the Williamson County Regional Habitat Conservation Plan (RHCP) and provides a wide range of support services, including biota surveys, report preparation, and subject matter assistance for karst invertebrates, Eurycea salamanders, freshwater mussels, and other rare species in the County. He is also the project manager for the Williamson County RHCP amendment which is adding two additional karst invertebrates, three Eurycea salamanders, and one butterfly for incidental take coverage. **Josh Renner** graduated from Texas State University with a Bachelor of Science in Wildlife Biology, earned his Master of Science in Wildlife Ecology from the same university, and is recognized by the Wildlife Society as an Associate Wildlife Biologist. He currently serves as the Environmental Program Manager of Williamson County and is the primary administrator of the Williamson County Regional Habitat Conservation Plan. He also assists the National Habitat Conservation Plan Coalition promote their mission aiding in the organization of board meetings and contributing to various committees within the coalition. He believes that educational outreach and properly informing policy are a priority in ensuring the symbiotic and sustainable relationship between natural resources and development.
Title	**Creative Collaboration – Implementing Groundwater Conservation and Springflow Protection Measures in the South-Central Texas Region of the Edwards Aquifer**
Abstract	The Edwards Aquifer is located along the Balcones Fault Zone in South-Central Texas and is one of the most productive aquifers in the United States. Climate change and human population growth along the Aquifer corridor are major factors causing an increased demand on groundwater resources. The Edwards Aquifer Habitat Conservation Plan (EAHCP) is intended to safeguard suitable habitats for the threatened and endangered species in the two major spring systems which emanate from the Edwards Aquifer. Springflow protection measures are implemented to ensure minimum springflow requirements from the artesian springs that feed into the San Marcos and Comal Rivers where many threatened and endangered species live. The EAHCP uses a variety of springflow protection programs including Aquifer Storage and Recovery (ASR), Voluntary Irrigation Suspension Program Option (VISPO), Stage V Critical Period Management, and Regional Water Conservation Program (RWCP) to conserve water resources during periods of declining aquifer levels. For example, the VISPO Conservation Measure operates to minimize and mitigate drought-induced impacts to springflow by suspending the authorized withdrawal of Edwards Aquifer groundwater by Edwards Aquifer Authority irrigation permit-holders during certain prescribed drought conditions. Irrigation permit-holders that participate in VISPO are financially compensated both to participate in the program and during the time of suspended Aquifer withdrawal. The ASR program uses the San Antonio Water System (SAWS) Aquifer Storage and Recovery for storage and recovery of leased Edwards Aquifer groundwater. The stored groundwater is made available to SAWS when specific historic drought triggers are reached that require SAWS to forbear Edwards groundwater withdrawals. This collaborative forbearance and supply program contributes significantly to protecting flows at the Comal and San Marcos spring systems during periods of extreme and prolonged drought conditions. In 2021, the Edwards Aquifer Authority and SAWS (two permittees of the EAHCP) fulfilled the ASR obligations by certifying 126,000 acre-feet of stored Edwards groundwater. This accomplishment is foundational to securing long-term springflows for the threatened and endangered species covered by the EAHCP.
HCP	Edwards Aquifer Habitat Conservation Plan

HCP type	Water
Authors	Olivia Ybarra, Scott Storment and Roland Ruiz
Affiliation	Edwards Aquifer Authority
Speaker Biographies	**Scott Storment** is the Executive Director of Threatened and Endangered Species. In this role, Scott serves as the Program Manager for the federally approved Habitat Conservation Plan. Prior to joining the EAA, Scott worked at AMERESCO as a Senior Account Executive where he executed energy, water, and solar projects covering the municipal and education markets in Texas and New Mexico, educated public sector clients on energy performance contracting, and led a multi-faceted team in aspects of client engagement and project management. Prior to AMERESCO, Scott worked at the Alamo Area of Council of Governments as Natural Resources Director where he managed a team of experts conducting air quality modeling and monitoring covering the San Antonio region. Additionally, Scott served as a key spokesperson with local elected officials, TCEQ, EPA, and media on air quality issues. Prior to the Alamo Area of Council of Governments, Scott served as Principal/Owner at Green Hub Advisors, LLC, where he managed business development efforts to provide energy, solar, and water/wastewater utility opportunities to clients. While with Green Hub Advisors, LLC, Scott was appointed by then EPA Administrator, Gina McCarthy, to a three-year term on the Good Neighbor Environmental Board. Scott received his Bachelor of Arts from Texas A&M University College Station and his Masters in Community & Regional Planning from the University of New Mexico. **Roland Ruiz** serves as General Manager of the Edwards Aquifer Authority (EAA), a special purpose regional groundwater agency that is responsible for the management of one of the world's most prolific artesian aquifers. In his role as chief executive, Roland reports to a 17-member board of directors that oversees the EAA mission to manage, enhance, and protect the Edwards Aquifer system across eight counties in South Central Texas. Since assuming the General Manager position in 2012, Roland has focused his leadership on creating "shared value" around the effective management of the Edwards Aquifer in the face of environmental, economic and regulatory demands that are often exacerbated by drought, population growth, and competing interests around these issues. He has undertaken an effort to transform the EAA culture into a dynamic, service-minded operation that fosters greater collaboration, transparency, and responsiveness through values-centered critical thinking and stakeholder engagement. Roland has a broad and varied background in public affairs and community service in both the private and public sectors, including 21 years as an elected official serving on the board of trustees of a local school district.

Briefing from Headquarters, Section 6, and NEPA Update

Title	**Briefing From Headquarters and Section 6 Update**
Author	Trish Adams
Affiliation	U.S. Fish and Wildlife Service
Speaker Biography	Trish Adams National Habitat Conservation Planning Coordinator, U.S. Fish and Wildlife Service NHCPC Program Committee Member Federal Partnerships for Streamlining HCP Development and Implementation – USFWS Update Trish Adams serves as the National Habitat Conservation Planning Coordinator for the U.S. Fish and Wildlife Service (Service) in its Headquarters Office in Falls Church, Virginia. Prior to joining Headquarters, for 14 years she was located in the South Florida Ecological Services Office, Vero Beach, Florida. During her tenure, she served as the South Florida Habitat Conservation Planning Coordinator, Coastal Program Coordinator, and served as the lead Fish and Wildlife Coordination Act and Endangered Species Act section 7 biologist for large-scale Federal coastal navigation, beach renourishment, and port expansion projects. She began her career with the Service in 1999. Prior to the joining the Service, Trish gained 8 years of field experience in coastal resource management and fisheries research working for the Florida Department of Environmental Protection, Coastal and Aquatic Managed Areas and the Florida Marine and Wildlife Research Institute, respectively. She holds a B.S. degree in Marine Science from Stockton University, New Jersey.

Title	**NEPA for HCPs: Keeping up with the Regulation Changes**
Abstract	The last 2 years have been full of changes to NEPA regulations and policies. This presentation will address those changes, describe where we are now with NEPA, and where we are headed based on what we know today. When the Biden Administration took office, the Department of Interior

	Secretarial Order 3355 for streamlining NEPA was rescinded. Many speculated that the NEPA-implementing CEQ regulations issued in 2020 under the Trump Administration would also be rescinded. They were not. Instead, the CEQ regulations are being revised in 2 phases. Phase 1 CEQ regulations became effective in May 2022. The intent was to roll back some of the provisions in the 2020 regulations issued under the Trump Administration to restore some of the previous requirements and intent of the regulations. Phase 2 will add new requirements to address climate change and environmental justice. The presentation will provide an explanation of all of these changes and requirements; describe example NEPA documents developed for forestry and utility HCPs; and be followed by a Question and Answer period.
HCP type	Electric Utility, Forestry
Author	Hova Woods
Affiliation	ICF
Speaker Biography	Hova Woods is a managing director in environmental planning with 20 years of NEPA experience at ICF. She has been managing the development of HCP-NEPA documents since 2014. She is currently on the Project Management team for 9 HCP-NEPA projects for plans spanning permit areas across 18 states, primarily for forestry HCPs and utility HCPs.

Considering Climate in Conservation Strategies

Title	**Considering Climate Change in Changed Circumstances and Adaptive Management in Texas HCPs**
Abstract	Climate change in Texas is producing higher average temperatures and may increase drought intensity and duration, leading to greater water demand and reduced instream flows, recharge, and spring flow. Increased air temperature may result in increased water temperature and changes in water quality parameters such as dissolved oxygen concentrations. Several ongoing HCPs in Texas are addressing the potential impacts of reduced water availability and water quality on listed species. Aquatic HCPs in Texas have had shorter permit terms (e.g., Barton Springs Edwards Aquifer Conservation District's at 20 years and Edwards Aquifer at 15 years) as a reflection of the uncertainties posed by climate change among other factors. Climate change may change the potential for incidental take over the life of a permit. Climate change is likely to yield changed circumstances as "downstream" effects (e.g., increased flood magnitude due to atmospheric warming). Identifying changed circumstances upfront and the steps necessary to address and accommodate them to keep a permit in good standing are now key elements of an HCP. An adaptive management framework can aid in responding to either climate surprises or changed circumstances. This talk will highlight approaches to identifying changed circumstances and building adaptive management responsive to climate change.
HCP type	Water
Author	Wendy S. Gordon, PhD
Affiliation	Principal Conservation Biologist, ICF
Speaker Biography	Dr. Wendy Gordon is a veteran of the natural resource world in Texas with a career that spans public service, academia, and environmental consulting. Her work has focused on topics such as setting state environmental flow standards, conserving rare and endangered species, and integrating climate change into resource management. She has degrees that span science and policy from Brown University, the University of Michigan's School for Environment and Sustainability, and the University of Texas at Austin. She has published her interdisciplinary research in peer-review journals. She served as an associate editor for Eos, a publication of the American Geophysical Union, for more than a dozen years. She was a member of the team that authored the National Fish, Wildlife and Plant Climate Adaptation Strategy on behalf of USFWS, NOAA and USGS. More recently, she was appointed to the City of Austin's Environmental Commission and served as vice chair. In 2022, she joined ICF.

Title	**Planning for Conservation Success in a Changing Climate**
Abstract	Habitat conservation planning must consider known and plan for potential future threats. As species and habitat values have largely been conserved in place on the landscape, global climate change and associated shifts in ecosystem boundaries represents a current and future threat to the viability of these conserved spaces. Having a reserve system large enough to account for the migration of habitats is typically a constraint to habitat conservation planning. As such, modeling future conditions that consider an altered climate as well accounting for future across boundary shifts in habitats

	should be integrated into conservation planning. The Upper Santa Ana River Habitat Conservation Plan (HCP) is a draft regional conservation plan that will conserve open space largely within an existing urban matrix. To achieve long-term conservation goals within a changing climate the HCP plans to conserve and manage habitats to enhance resistance to change, manage for geographically redundant and connected ecosystems, facilitate species migration through translocation, and partner with neighboring land managers to allow for management and monitoring across boundaries. To plan and adaptively manage for future change, this HCP has created an integrated surface-groundwater basin model to forecast future climate simulations and the associated effect to aquatic and groundwater dependent ecosystems, as well as an online, interactive dashboard and portal that will integrate with local preserves and monitoring efforts to provide regional support for the sharing of information and resources.
HCP	Upper Santa Ana River Habitat Conversation Plan
HCP type	Water
Authors	Kai Palenscar, Joanna Gibson, Chris Jones and Heather Dyer
Affiliation	San Bernardino Valley Municipal Water District
Speaker Biography	Kai graduated in 2002 from CSU San Marcos with a MS in Biology and 2012 from UC Riverside with a Ph.D. in Plant Sciences. He has a background in botany and aquatic ecology where he as worked as a consultant, researcher, regulator and endangered species biologist (USFWS). Currently, Kai works in Southern California for the San Bernardino Valley Water Conservation District, the lead agency for the Upper Santa Ana River Habitat Conservation Plan. This HCP covers over 863,000 acres and 22 species, and includes 12 permittees. After 8 years of working on the HCP document it was just submitted to the USFWS for final review. He hopes to have the incidental take permit by early 2023.

Working with Surrogate Metrics

Title	**The Power and Promise of Surrogate Metrics for Incidental Take**
Title	The Power and Promise of Surrogate Metrics for Incidental Take
Abstract	What are surrogate metrics, why are they important for HCP development and implementation, how have they been used in the past, and how have recent regulations changed their application? Surrogate metrics are an essential tool for developing HCPs that simplify complex ecological interactions, streamline development of HCPs, and facilitate HCP implementation. How an HCP balances simplicity and precision when applying surrogate metrics can greatly influence how much it costs to develop and implement an HCP.
Author	Lauren Huff
Affiliation	SWCA
Speaker Biography	Lauren Huff is a restoration and natural resources planning director in SWCA's northern California offices with a background in wildlife biology, restoration biology, and project management. She has been working in the scientific field for over 16 years. She has been involved in all aspects of projects, including project management, field surveys, endangered and threatened species surveys, siting/constraints analysis, document preparation, agency coordination and negotiations, impact analysis, and mitigation planning. She has extensive experience in the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), aquatic resources permitting, federal Endangered Species Act (ESA) Section 7 and Section 10 consultation, and other permitting. Ms. Huff has extensive knowledge of federal and state regulations, including the federal ESA, Coastal Zone Management Act, Magnuson-Stevens Fisheries Act, Clean Water Act, Migratory Bird Treaty Act, Porter-Cologne Act, California Coastal Act, California ESA, and California Fish and Game Code.

Title	**Case Study for an HCP Renewal--Updating Old Metrics with New Science**
Abstract	As early HCPs come up on permit expiration dates, the permit renewal process will trigger fresh consideration of old applications of surrogate metrics. We describe how an HCP renewal process updated a habitat-based surrogate metric with new science on the extent of suitable habitat and the distribution of the species, while maintaining the original agreement regarding authorized coverage.
HCP	Washington County, Utah Habitat Conservation Plan
HCP type	Regional Development
Authors	Michael Heimbuch and Cameron Rognan

Affiliation	SWCA
Speaker Biography	Michael Heimbuch joined SWCA in 2017 and is a project biologist whose work focuses on rare, threatened, and endangered species issues. He conducts HCP-related monitoring, habitat assessments, and compliance for clients, as well as HCP drafting, renewals, and amendments. Prior to joining SWCA, Michael received his M.S. from the University of Washington, Seattle studying black-capped and white-eyed vireos in Central Texas. Before attending graduate school, Michael worked as a biologist managing black-capped vireos on Fort Hood for several years. Michael is originally from the Midwest and attended the University of Illinois, Urbana-Champaign for his undergrad; he moved to Texas in 2011 following his work conducting post-assessment monitoring of the BP oil spill.

Title	**Case Study for Collision-based HCPs--Demonstrating "Fully Offset" when Metrics for Take and Mitigation Don't Match**
Abstract	The metrics appropriate for measuring take and mitigation may be very different, particularly when the mode of take is via collision and the conservation needs of the species are best addressed by habitat protection and management. Demonstrating that the impacts of take are fully offset when take and mitigation are measured in different metrics can be a challenge. We describe how a wind energy HCP is translating the ecological effects of take and mitigation measured with different metrics.
Author	Dr. Nicole Smolensky
Affiliation	SWCA
Speaker Biography	Dr. Smolensky is a lead biologist at SWCA Environmental Consultants in the Austin office. She has seven years of experience in permitting and compliance, primarily focused on the scientific and technical quality of Endangered Species Act regulatory compliance. This includes projects related to the preparation of habitat conservation plans, biological assessments, environmental assessments/impact statements, and strategic advice for project planning. Her geographic scope of work spans the southwest region of the United States, including Texas, Arizona, and Oklahoma. Prior to her work as a consultant, she earned her master's and doctorate degrees at Texas A&M University. Her thesis and dissertation focused on conservation biology of threatened and endangered reptile species, which included the dunes sagebrush lizard (*Sceloporus arenicolus*).

Integrating Species Conservation Banks with HCP Conservation Goals

Title	**Integrating Species Conservation Banks with HCP Conservation Goals (panel)**
Abstract	Private mitigation bankers and HCP implementors know that securing the right conservation landscape is more than just finding ground with suitable habitat on it. The changing landscape of regulatory criteria, water rights, and climate change make selecting, implementing, and caring for viable properties more complicated than ever. This panel discussion with private banker (Westervelt Ecological Services- Hal Holland), Ecological Restoration Business Association (Trade Association Executive Director- Sarah Johnson), and HCP representative (Chris Chaput) will explore how banks can help/coexist with HCPs.
Panelist	Hal Holland
Affiliation	Westervelt
Speaker Biography	As the Western Region Director, Mr. Holland oversees the strategic and daily operations of Westervelt's largest region in terms of projects, staff, and revenue. He is responsible for the development of mitigation and conservation projects, business development, sales, project compliance, and long-term land stewardship. In this role, Mr. Holland oversees a team of industry-leading experts in realms of mitigation banking, land acquisition and valuation, ecology, habitat restoration and construction, regulatory permitting, and land management. Mr. Holland is an expert in compensatory wetlands and species mitigation. He has directly led or facilitated the development and operation of all 12 mitigation banks approved in the Western region. He continues to serve as the lead for large turnkey mitigation projects, including the $49 million High-Speed Rail Fresno-to-Bakersfield mitigation contract. In addition, Mr. Holland was the technical lead for the development of California's largest in-lieu-fee program, managed by the National Fish and Wildlife Foundation. Most recently, he oversaw development of two advanced mitigation project for the Placer County Conservation Plan HCP to fulfill mitigation

	and get-ahead-stay-ahead habitat obligations
Panelist	Sara Johnson
Affiliation	Ecological Restoration Business Association
Speaker Biography	Sara Johnson is the Executive Director of the Ecological Restoration Business Association (ERBA) representing species conservation and wetlands mitigation project sponsors across the country. She recently worked closely with the ERBA's Species Committee on development of detailed comments in response to the Service's ANPRM on a compensatory mitigation mechanisms rule. She is an attorney with a background in and passion for conservation and economic solutions to public environmental issues. Prior to her position with ERBA, Johnson worked in the environmental compliance office of Patuxent River Naval Air Station on the Chesapeake Bay and as a law clerk with the Department of Justice, Environment and Natural Resources Division in Washington, D.C. Ms. Johnson holds an undergraduate degree in Environmental Studies from the University of Richmond and a Juris Doctorate from the University of Virginia, where she served as the Articles Development Editor of the Virginia Environmental Law Journal. She is licensed to practice law in Virginia and California.

Panelist	Chris Chaput
Affiliation	Thurston County
Speaker Biography	Christina Chaput is the Planning Manager for Thurston County's Community Planning Division. This Division develops and maintains long-range community comprehensive, shoreline, watershed, and conservation plans, including the Thurston County government's South Sound Prairies Habitat Conservation Plan. She has been with Thurston County since 2014 and has been involved with the development of the HCP since 2016. Currently, Chris leads the development of the County's Habitat Conservation Plan and implementation rules. Chris has 20 years of experience working in both the private and public sectors and draws on her expertise in community planning, environmental regulatory permitting and compliance, and natural resource management. She earned her M.S from American Public University, focused on Environmental Policy and Management.

Improving Landscape Connectivity and Permeability with Wildlife Crossings

Title	**How to Build a New Road and Maintain Landscape Connectivity**
Abstract	Los Patrones Parkway is a 4-lane arterial built in the Orange County, Ca Southern Subregion Habitat Reserve that integrated design features including construction of undercrossings, exclusion fencing, jump-outs, habitat restoration and habitat reserve design changes to maintain landscape connectivity.
HCP	Southern Subregion HCP, Orange County, CA
HCP type	Regional Development, Transportation
Author	Laura Coley Eisenberg
Affiliation	Rancho Mission Viejo

Speaker Biography	Ms. Eisenberg has been with Rancho Mission Viejo (RMV) since 2000. As Senior Vice President of Open Space and Resource Management, Ms. Eisenberg is responsible for regulatory compliance and open space management for the company. On RMV's behalf Ms. Eisenberg was responsible for the approval of three large scale habitat protection programs in cooperation with federal and state resource and regulatory agencies. Combined these programs provide for the perpetual protection and management of 32 sensitive species (7 listed species) and 10 associated habitat types in a 20,868 acre habitat reserve (The Nature Reserve at Rancho Mission Viejo), while permitting development of residential and commercial uses, associated infrastructure and ongoing ranch operations, including cattle grazing. Ms. Eisenberg is now responsible for implementation of the Habitat Reserve Management and Monitoring Program in her capacity as Executive Director of the Rancho Mission Viejo Land Trust. Ms. Eisenberg is also responsible for oversight of the education programming on The Nature Reserve at Rancho Mission Viejo, which annually attracts several thousand visitors. Ms. Eisenberg received her Bachelor of Arts in Geography with an emphasis in Urban Planning from California State University, Fullerton.

Title	**Pacheco Pass: Regional Collaboration for Conservation Success**
Abstract	HCPs are uniquely posed to establish strategic regional conservation partnerships that go above and beyond their biological goals and objectives. The Santa Clara Valley Habitat Agency established a wildlife connectivity working group comprised of local, state, federal, and non-profit staff, researchers, private entities, and interested individuals. Initially, this group met in informally facilitated meeting to discuss wildlife connectivity research, projects, and priorities. Today they are advancing wildlife connectivity projects throughout the HCP permit area. Complimentary efforts—land acquisition, directional fencing, and wildlife connectivity studies—are coming together to construct a wildlife overpass in a critical wildlife linkage across the Pacheco Pass.
HCP	Santa Clara Valley HCP
HCP type	Regional Development
Authors	Edmund Sullivan, Julie King, Tanya Diamond and Terah Donovan
Affiliation	Santa Clara Valley Habitat Agency
Speaker Biography	Edmund Sullivan's over 25 years of professional and academic experience has focused on natural resource conservation, wildlife ecology, habitat restoration, brownfield redevelopment, and sustainable economic development. Mr. Sullivan's is a current NHCPC Board member and has been a member in good standing since the inception of the organization. Mr. Sullivan's is currently the Executive Officer for the Santa Clara Habitat Agency and has served in this role since 2014. Mr. Sullivan's prior experience includes Placer County Planning Department (2003-2014), AKRF, Inc. Technical Director, Natural Resources and Planning (2002-2003), Niagara County Planning, Development and Tourism (1998-2002), Policy Analyst with Dane County in Madison, WI (1994-1996), and the Chevron Corporation (1988-1992). Mr. Sullivan earned his Master of Science in Urban and Regional Planning with a focus on sustainable community development, water resources, and wildlife and landscape ecology from the University of Wisconsin-Madison. Mr. Sullivan earned a Master of Science in Labor and Industrial Relations from Michigan State University and a Bachelor's in Business Administration from University of Wisconsin-Madison.

Monitoring: eDNA

Title	**eDNA: Optimizing sample design and probability of detecting target species**
Abstract	Persistent drought conditions in the Western United States contribute to the stress of endemic salmonids, Chinook salmon (Oncorhynchus tshawytscha) and Steelhead/Rainbow Trout (Oncorhynchus mykiss). Observing acute effects from rapidly changing ecosystem requires monitoring techniques that avoid lengthy permitting processes, produce useful scientifically defensible data, and are easily deployable. Systematic sampling of eDNA and robust analysis by species specific quantitative PCR (qPCR) presents a contextualized snapshot of species distribution across large systems within a short time frame. Additionally, eDNA sampling does not impact the species being observed thus, permits are not required. Yet, without the benefit of having months to prepare and optimize an eDNA sampling strategy that maximizes the probability of detecting target species one must resort to using prior experience and knowledge specific to the study area. Without the benefit of prior experience, we used the publicly available modeling framework artemis in conjunction with a live car experiment to calibrate our eDNA sampling strategy in a matter of days and in advance of actual sampling. Artemis is a nonproprietary R package created to aid in the design of eDNA sampling strategy and eDNA analysis. Using artemis, live car data, and fixed project constraints (22 river Km sample area, time frame for sampling, and

	budget) we determined an optimal sampling strategy of: collecting of 3 liters of water, through 3 filters, at 1 km intervals, and analyzing each filter 9 times for presence of eDNA from both O. tshawytscha and O. mykiss. Applying this sample strategy across the 22km study area on the Lower American River (Northern California) resulted in data indicating a higher concentration of O. tshawytscha eDNA compared to that of O. mykiss eDNA. Continued eDNA survey efforts in both drought and non-drought years will be useful to form a more accurate representation of species distribution. Use of artemis together with live car experiment provide a systematic means to calibrate and maximize probability of detection of target species and optimizes eDNA sampling strategy.
Authors	Gregg Schumer, Yekaterina Karpenko and Myfanwy Johnston
Affiliation	Genidaqs
Speaker Biography	Gregg Schumer has over 20 years of experience conducting molecular biological and molecular ecology studies evaluating the distribution of cryptic aquatic and semi aquatic species. He is an experienced team leader with a history of transferring relevant technology out of universities for use in solving complex environmental issues. Gregg has provided scientific leadership on a variety of projects for both State and Federal agencies to detect the presence of cryptic, evasive, rare, endangered, and invasive aquatic species by developing sampling methods for the detection and evaluation of eDNA.

Title	**Incorporating molecular methods into terrestrial animal surveys: maximizing information content and minimizing uncertainty.**
Abstract	There is inherent uncertainty within population surveys, which may be exacerbated by rarity of target species and handling/permitting constraints. Indirect sampling methods are commonly employed for wildlife surveys (e.g., sound, cameras, scat) to ameliorate survey constraints. Yet, ambiguity often remains regarding both the species and numbers of individuals detected. In cases where action performance or impact minimization (mitigation) is based on confirmation of species presence and their quantity, incorporating molecular methods into existing surveys both enhances information content and minimizes uncertainty. A San Joaquin Kit Fox survey implemented as part of a utility project mitigation assessment will be used to demonstrate molecular approaches. Direct DNA sequencing of scat confirmed presence of protected species, while observation of genetic diversity quantified the number of individuals encountered during survey.
Authors	Scott M. Blankenship and Gregg Schumer
Affiliation	Cramer Fish Sciences - Genidaqs
Speaker Biography	Scott has over 20 years of experience applying genetic data to population monitoring and fishery science, including extensive experience combining the newest tools of molecular biology and genetics theory with field observations of fish populations and their habitat. As Science Director at Cramer Fish Sciences – Genidaqs, Scott has focused his expertise of population genetics to relate population viability metrics to recovery goals for protected species. Scott is skilled at communicating in a practical manner how to pair eDNA approaches that determine where/when species occur with parentage & kinship genetic analysis to quantify important biological measures such as abundance, breeding success and recruitment success.

Innovations in Monitoring and Adaptive Management

Title	**Rapid site inspections inform adaptive management priorities for urban HCP preserve systems**
Abstract	The city of Carlsbad is a coastal city in northern San Diego County. The city, in coordination with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife, developed its HCP as part of a regional planning effort under the North County Multiple Habitat Conservation Program, and officially adopted it in 2007. The conserved lands within the city's HCP preserve system are owned by a variety of entities that provide a range of funding and management. Approximately 30 percent of preserve lands are unmanaged preserves. The unmanaged preserves were established prior to the adoption of the HCP, were not conveyed with an endowment, and receive only basic or no stewardship. The city developed a site inspection program to evaluate and prioritize management of the unmanaged preserves while working within their funding constraints. The site inspection program includes 1) desktop analysis to prioritize unmanaged preserves for site inspections; 2) rapid assessment site inspections using mobile data collection tools to identify onsite threats, adaptive management urgency and recommendations, and opportunities for implementation (e.g., volunteer program, grants); and 3) post-field analysis and discussion to prioritize adaptive management recommendations and implementation. This targeted approach is a cost-effective way of meeting the city's HCP obligation and commitment to conserving the full range of native habitats, species, and wildlife movement corridors within the

	preserve system.
HCP	Habitat Management Plan for Natural Communities in the City of Carlsbad
HCP type	Regional Development
Authors	Rosanne Humphrey, Adrienne Lee and Terah Donovan
Affiliation	ESA
Speaker Biography	Adrienne is a senior biologist and project manager with expertise in land and natural resource management throughout southern California. Adrienne works closely with her municipality clients overseeing over 24,000 acres of conserved lands in San Diego County. She develops preserve management and monitoring plans, coordinates and executes monitoring activities, provides adaptive management recommendations, and collaborates with land managers, consultant staff, and wildlife agencies, to ensure compliance with regional HCPs. Adrienne serves as the Preserve Steward for the City of Carlsbad where she supports city staff in implementing their HCP, confirming preserves are properly funded, appropriate management and monitoring is provided by preserve managers, and all activities are compliant with the HCP.

Title	**Rediscovery of federally threatened salamanders from formerly extirpated locations: monitoring techniques and abundance estimates to inform management**
Abstract	Urban expansion has contributed to the loss of habitat for range restricted species across the globe. Managing wildlife populations within urban settings presents the challenge of balancing human and wildlife needs. Almost the entire range of Jollyville Plateau Salamanders (Eurycea tonkawae) is embedded in the Austin, Cedar Park, and Round Rock metropolitan areas of Travis and Williamson counties, Texas. Even though E. tonkawae is a federally threatened species, individuals can be reliably detected at known occupied sites throughout its range. However, populations at a few sites are thought to have been extirpated since their initial discovery. We investigated two of these “extirpated” populations using visual encounter, trapping, and environmental DNA survey methods. These two sites are contrast by remarkably different environments: extreme anthropogenic disturbance has occurred at one and habitat rehabilitation has occurred at the other. Here, we discuss the history and management of each site, and we report on the rediscovery of E. tonkawae within the surface habitat after decades-long periods without detection. At one location, infrastructure maintenance activities are inevitable. We modeled and predicted E. tonkawae surface abundance to inform when maintenance should occur to avoid unnecessary impacts to this federally threatened species. Further, we highlight how cooperation among transportation, city, and county entities enabled this work at both localities.
Authors	Zachary C. Adcock, Andrew R. MacLaren and Kemble White
Affiliation	Cambrian Environmental
Speaker Biography	Zach Adcock is a Senior Ecologist with Cambrian Environmental (Austin, Texas) and a Ph.D. candidate at Texas State University (San Marcos, Texas). He has worked in the field of endangered and threatened wildlife ecology since 2003. This includes work on over 25 federally listed species with an emphasis on herpetofauna in Texas and Florida. His current academic and professional research largely focuses on the ecology and conservation of federally listed groundwater salamanders in central Texas. This research incorporates field, statistical, and molecular techniques with the overarching intention to inform to the management and conservation policy of these taxa.

Title	**Monitoring and Managing for Covered Species in Habitat Conservation Plans: Percent Area Occupied (PAO) Approach**
Abstract	The Percent Area Occupied (PAO) approach is a powerful tool for land managers and natural resource professionals needing to monitor for endangered and threatened species and assess management actions on protected lands. Here we present a case study involving development and implementation of a scientifically valid, productive, and cost-effective monitoring protocol using the PAO approach for the state and federally listed San Bernardino kangaroo rat (Dipodomys merriami parvus; SBKR). The San Bernardino kangaroo rat is one of five covered species under the Upper Santa Ana River Wash Habitat Conservation Plan (Wash Plan), approved by the U.S. Fish and Wildlife Service in July 2020. The Wash Plan requires status and distribution of SBKR in the Wash Plan Preserve, monitoring of long-term trends, and assessment of the effectiveness of management actions benefitting the species. The monitoring protocol and occupancy model allows for combined analyses with existing preserve-level SBKR monitoring and future range-wide SBKR monitoring. Given the potential widespread value for the management and monitoring of listed species, it is our opinion the PAO methodology should be considered and applied broadly in support of implementation of Habitat Conservation Plans across the country.
HCP	Upper Santa Ana River Wash Habitat Conservation Plan
HCP type	Water

Authors	Cheryl Brehme, Milan Mitrovich, Robert Fisher and Betsy Miller
Affiliation	San Bernardino Valley Water Conservation District
Speaker Biography	Cheryl has been a scientist for the USGS since 2003 and specializes in long-term monitoring programs, conservation ecology and road ecology. She has been integral in the statistical design, field methods and surveys, and dynamic occupancy analysis of data for long-term monitoring of endangered species in areas of southern California to inform species status and trends and to inform effective habitat and species management actions. These include monitoring programs for the arroyo toad (since 2003), Stephens kangaroo rat (since 2005) and Pacific pocket mouse (since 2011).