



2021 YEAR
IN REVIEW

FORGING PROACTIVE PARTNERSHIPS TO CONSERVE AMPHIBIANS, REPTILES, AND THE PLACES THEY LIVE.

- PARC'S MISSION

ACKNOWLEDGEMENTS

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PARC IS GRATEFUL TO THESE AGENCIES AND ORGANIZATIONS FOR
THEIR SUPPORT IN 2021:



WHO IS PARC?

Partners in Amphibian and Reptile Conservation (PARC) is an inclusive partnership dedicated to the conservation of the herpetofauna - reptiles and amphibians - and their habitats.

We are a diverse network of partners that includes representatives of government, industry, nongovernmental organizations (NGOs), zoos, and aquariums as well as private consultants, private citizens, and academics. We are driven by our shared dedication to the conservation of amphibians, reptiles (herpetofauna), and their habitats.

WHAT'S IN THIS ANNUAL REPORT?

This report celebrates PARC's 22nd year. Even in the face of a continuing pandemic, our members' numerous accomplishments during 2021 helped move the needle forward on our herpetofaunal conservation mission. Strong and diverse partnerships form the foundation of PARC, and that theme is reflected in the many accomplishments presented in this report. These accomplishments have been organized within the framework of our Strategic Plan which focuses on three key areas: Network Growth, Habitat Conservation, and Species Conservation. We thank our many members for their contributions, both past and present, towards our conservation goals.



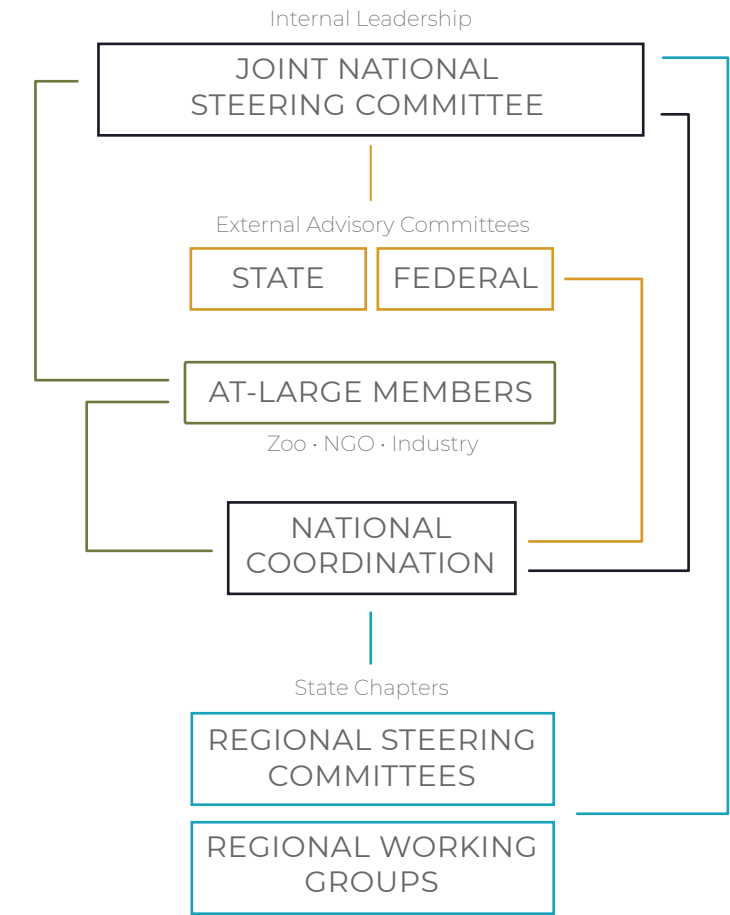
GUIDE TO ACRONYMS & ABBREVIATIONS

If you’re new to PARC, our use of acronyms can be a little confusing, so here’s a handy quick reference guide to some of our most frequently used abbreviations:

- AFWA** - Association of Fish and Wildlife Agencies
- ARC** - Amphibian and Reptile Conservancy
- AZA** - Association of Zoos and Aquariums
- CAP** - Conservation Action Plan
- CCITT** - Collaborative to Combat the Illegal Trade in Turtles
- DEITT** - Diversity, Equity & Inclusion Task Team
- DoD** - Department of Defense
- DTT** - Disease Task Team
- FASC** - Federal Agencies Steering Committee
- IUCN** - International Union for Conservation of Nature
- JNSC** - Joint National Steering Committee
- NGO** - Nongovernmental organization
- NPS** - National Park Service
- PARCA** - Priority Amphibian and Reptile Conservation Area
- TNT** - Turtle Networking Team
- USFS** - United States Forest Service
- USFWS** - United States Fish and Wildlife Service
- USGS** - United States Geological Survey

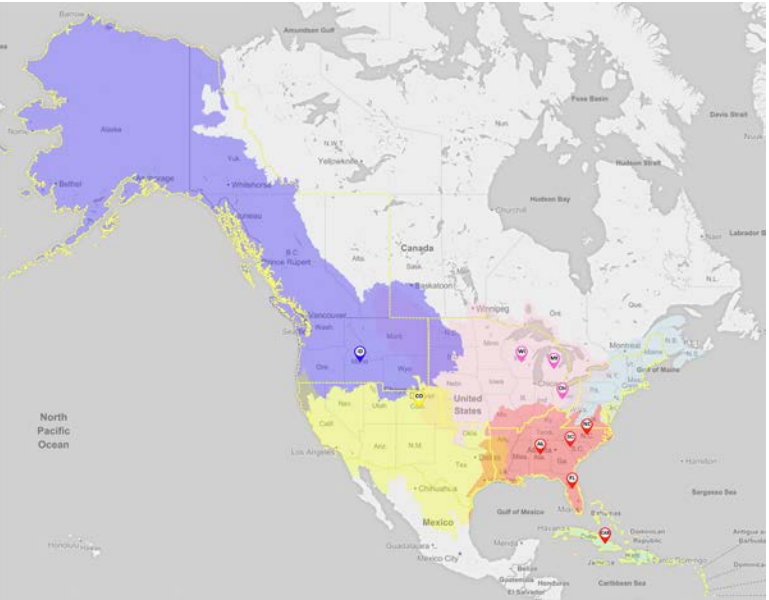
PARC Regions and State Chapters:

- MWPARC:** Midwest region
- OHPARC:** Ohio
- MIPARC:** Michigan
- WIPARC:** Wisconsin
- NEPARC:** Northeast region
- NWPARC:** Northwest region
- IDPARC:** Idaho
- SEPARC:** Southeast region
- ALAPARC:** Alabama
- CARIBPARC:** Caribbean
- NCPARC:** North Carolina
- SCPARC:** South Carolina
- SWPARC:** Southwest region
- COPARC:** Colorado



PARC’s organizational structure. Lines depict the general flow of communication.

Our membership extends from western Canada throughout the continental United States and into the Caribbean. Anyone with an interest in herpetofaunal conservation is welcome, regardless of experience or expertise.



PARC’s regional and state working groups are our foundation, where on-the-ground issues are translated into actions and products. *Credit: Scott Hove*

A SPOTLIGHT ON LEADERSHIP

The PARC network includes steering committees, task teams, working groups, and other leadership teams helping to coordinate activities across the national, regional, and state levels. We thank all individuals involved in our leadership teams for their ongoing, dedicated service to PARC.

Here, we highlight the members of our Executive Committee and Joint National Steering Committee (JNSC) as well as the Co-chairs of our national task teams and state chapters. Our list includes anyone who served during the calendar year of 2021. Asterisks (*) denote individuals who joined during the year, while carets (^) denote individuals who left their leadership position during or at the end of 2021.

Executive Committee



Michelle Christman, National Federal Agencies Coordinator

Michelle is a Fish and Wildlife Biologist with the Natural Resource Program Center of the US Fish and Wildlife Service (USFWS) and serves as PARC's Federal Agencies Coordinator. *Credit: June Christman*

Kerry Wixted, State Agencies Coordinator*

Kerry is the Program Manager for Amphibians, Reptiles, and Invasive Species with the Association of Fish and Wildlife Agencies (AFWA) and serves as PARC's State Agencies Coordinator. *Credit: Kerry Wixted*



Brian Zarate, JNSC Sr. Co-chair

Brian works for the New Jersey Division of Fish and Wildlife's Endangered and Nongame Species Program coordinating the state's reptile and amphibian conservation work and helping to lead a statewide wildlife habitat connectivity initiative called "Connecting Habitat Across New Jersey". Brian joined NE PARC's Steering Committee in 2011 and served in a variety of roles, including meeting planner, treasurer, working group Co-chair, and region Co-chair. *Credit: Jim Anglely*

Rebecca (Becca) Cozad, JNSC Jr. Co-chair*

Becca is a research biologist at Nokuse Plantation, a private conservation site in Florida. She has been an active member on SEPARC's steering committee for several years, spearheading their mentoring program, leading a working group, and serving as regional Co-chair. *Credit: Rachel Walman*



Christopher Petersen, JNSC Ex-officio

Chris is a Senior Natural Resources Specialist at Naval Facilities Engineering Command Atlantic and the DoD PARC National Representative. He has served on the PARC JNSC/Executive Committee for the last three years, initially as a Co-chair and now in ex-officio status. *Credit: Hayden Bassett*

Mark Mandica, DEITT representative

Mark Mandica is co-founder and Executive Director of the Amphibian Foundation and serves as the DEITT Representative for the Executive Committee. Mark prioritizes inclusivity and engagement as vital components to creating lasting solutions to the global amphibian extinction crisis. *Credit: Amphibian Foundation*



Joint National Steering Committee Representatives

NWPARC Co-chairs

Katy Weil, Metro Parks and Nature^
Laura Sprague, US Fish and Wildlife Service*

SWPARC Co-chairs

Cristina Jones, US Fish and Wildlife Service
Joe Ehrenberger, Adaptation Environmental Services

MWPARC Co-chairs

Jen Buchanan, Missouri Department of Conservation*
Melissa Youngquist, Shedd Aquarium*

NEPARC Co-chairs

Andrew Adams, Harford Community College
Jessica Meck, Smithsonian Conservation Biology Institute

SEPARC Co-chairs

Todd Pierson, Kennesaw State University
Robert Hill, Zoo Atlanta

DoD PARC Representative

Dave McNaughton, Naval Facilities Engineering Systems
Command Southwest

Zoo Representative

Shelly Grow, Association of Zoos and Aquariums

FASC Co-chairs

Michael Westphal, US Bureau of Land Management
Jennifer Schultz, NOAA Fisheries*

ARC Representative

JJ Apodaca, Amphibian and Reptile Conservancy
Executive Director

AFWA Representatives

David Golden, AFWA Amphibian and Reptile
Committee Chair
Thomas Eason, AFWA Amphibian and Reptile Committee
Vice-chair



National Task Team Co-chairs

DEITT

Jen Lamb, St. Cloud State University
Anat Belasen, University of Texas, Austin*

DTT

Katie Haman, UPenn and Washington Department of
Fish and Wildlife
Daniel Grear, US Geological Survey

TNT

Cristina Jones, Arizona Game and Fish Department
Noelle Rayman-Metcalf, US Fish and Wildlife Service

CCITT

Scott Buchanan, Rhode Island Department of
Environmental Management
Jennifer Sevin, University of Richmond
Julie Slacum, US Fish and Wildlife Service
Lori Erb, Mid-Atlantic Center for Herpetology
and Conservation
Michelle Christman, US Fish and Wildlife Service
Kerry Wixted, Association of Fish and Wildlife Agencies*

State Chapter Co-chairs

Alabama

Taylor Cook, Virginia Tech
Andy Coleman, Urban Turtle Project/Talladega College

Caribbean

Nicole Angeli, US Virgin Islands Department of Planning
and Natural Resources
Alberto Puente, University of Puerto Rico

Colorado

Tim Warfel, Nova Inventa
Andrew DuBois, Jefferson County Open Space

Idaho

Charles Peterson, Idaho State University

Michigan

Katherine Greenwald, Eastern Michigan University
Melissa Sano, Potter Park Zoo

North Carolina

Jeff Hall, North Carolina Wildlife Resources Commission
Jerry Reynolds, North Carolina Museum of Natural Sciences

Ohio

Matt Cross, The Toledo Zoo and Aquarium^
Nick Smeenk, Envirosience*
Greg Lipps, Ohio State University^
Megan Seymour, US Fish and Wildlife Service*

South Carolina

Jeff Camper, Francis Marion University
Jake Zadik, Brays Island Nature Center

Wisconsin

Gary Casper, Great Lakes Ecological Services

THE PEOPLE OF PARC

The PARC network operates much like a complicated piece of machinery, relying on the individual components with interconnected cogs to function well. The people of PARC contribute in a multitude of ways, from working groups, steering committees, task teams, leadership teams, and more, spinning the cogs that coordinate activities across the national, regional, and state levels. We thank all individuals involved in PARC; it's the People of PARC that make PARC-PARC!

One of the most impressive and important aspects of PARC and its respective regions is the diverse array partnerships across stakeholder backgrounds, including state and federal agencies, academia, private companies, NGOs and nonprofits, wildlife rehabilitation, and even law enforcement. Massive collaborative efforts like these are absolutely essential to not only herp conservation and education but also to overall environmental stewardship.

According to our members, here are a few examples of the partnerships and collaborations that make up the "People of PARC":

Southeast PARC (SEPARC)

SEPARC is proud to work with the state chapters in our region, which include ALAPARC, SCPARC, NCPARC, and CaribPARC. In particular, they have been so impressed to see the hard work and growth of our newest state chapter—South Carolina PARC (SCPARC)—in the last year.



Northeast PARC (NEPARC)

In NEPARC, many of these organizations are represented on our steering committee and working groups which have led to products like scientific publications, awarded grants, and useful educational tools. It's hard to select only a few people or groups - there are so many that have been important to NEPARC's mission.

PARC is a team made up of everyone, from all walks of life, interested in conservation of amphibians and reptiles. Team PARC functions optimally when all interested parties get a seat at the table.

Midwest PARC (MWPARC)

Members of MWPARC come from all stages of careers, from students through to professionals. Most are actively working on amphibian and reptile conservation, in academia, agency, and industry.

South Carolina PARC (SCPARC)

From researchers and naturalists, to outdoor enthusiasts, to children that found their first snake, to parents who touched their first turtle... SCPARC members come from all different backgrounds, but all share a fascination in reptiles, amphibians, and the natural world.



Ohio PARC (OHPARC)

OHPARC includes anyone and everyone interested in herps. Our members include: backyard herpers; research scientists; zoo biologists; conservation professionals; university and high school students; environmental consultants; citizen scientists; state and federal government biologists; naturalists; park district employees; land managers; law enforcement officers; teachers and professors; land conservancy members; wetland ecologists; educators; photographers; hikers; and many others.

“

PARC IS MADE UP OF EVERYDAY PEOPLE WHO HAVE A PASSION FOR AMPHIBIANS AND REPTILES.

– CHRIS PETERSEN, DOD PARC

”



STRATEGIC AREA ONE

— NETWORK GROWTH

Our Goal: To strategically grow and enhance the PARC Network with partnerships that directly impact conservation actions.

The **Association of Fish and Wildlife Agencies (AFWA's)** Amphibian and Reptile Conservation Committee convened at the 111th AFWA annual meeting held virtually in September 2021. PARC coordinated with AFWA staff and Committee chairs on the development of the Committee agenda, as well as the agenda for AFWA's Law Enforcement Committee. PARC members and partners presented on PARC's role in addressing the illegal collection of turtles.

The **Diversity, Equity, and Inclusion Task Team (DEITT)** helped increase PARC's capacity for inclusion in 2021. They gained voting positions on the Executive Committee (ExComm) and Joint National Steering Committee (JNSC). Through those positions, the DEITT can directly support PARC in acting on its core values of inclusivity and collaboration. The team also disseminated Best Meeting Practices documents for accessible virtual, hybrid, and in-person meetings. Additionally, the DEITT modified the Demographic and Atmospheric Survey to assess virtual events and collaborated with regions to implement the survey in

the Northeast, Southeast, Midwest, and Northwest Meetings.

The DEITT created opportunities for the members and leadership of PARC to grow in cultural competency. They presented or discussed diversity, equity, and inclusion at three regional meetings (Southeast, Midwest, and Northwest PARC). Furthermore, the DEITT Co-chairs led a workshop about equity and conservation initiatives at the Joint National Steering Committee (JNSC) annual meeting. They shared the DEITT Safety Statement with the PARC listserv, which included resources on the intersections of race, injustice, and conservation. They also created space on the JNSC's monthly calls to discuss these topics and reflect on their individual roles and responsibilities.

The DEITT took steps to expand and support a diverse community of herpetologists. The PARC Increasing Professional Advancement (PIPA) Team shifted their awardee selection methods to a more equitable randomized lottery system and organized a critical and inclusive mentoring workshop led by David



Credit: Herpetological Review

Muñoz. Virtual sticker sales generated funds to support PIPA Scholarships and other DEITT activities. Finally, they hosted their first DEITT Retreat in November 2021. At the retreat, members co-created goals for 2022 centering on inclusion and equity.

Department of Defense PARC (DoD PARC) conducted two live presentations during the virtual 2021 National Military Fish and Wildlife Association (NMFWA) workshop to approximately 150 participants. In the first presentation, they provided an update on recently completed and ongoing research projects, products, and initiatives of their network. The second presentation provided an overview of the DoD PARC Herpetofaunal Database, a DoD-wide comprehensive inventory of amphibians and reptiles on 507 military properties. Although conducting the presentations virtually was enjoyable, the team is looking forward to presenting in-person at the 2022 NMFWA workshop in Spokane, Washington.

DoD PARC also held their third in-person Strategic Planning Meeting August 2-5, 2021 at the Fort Huachuca Military Reservation in southern Arizona. The purpose of the meeting was to review the DoD PARC Strategic Plan and discuss a wide variety of amphibian and reptile conservation and management topics specific to supporting military readiness. The group also conducted a herpetofaunal inventory

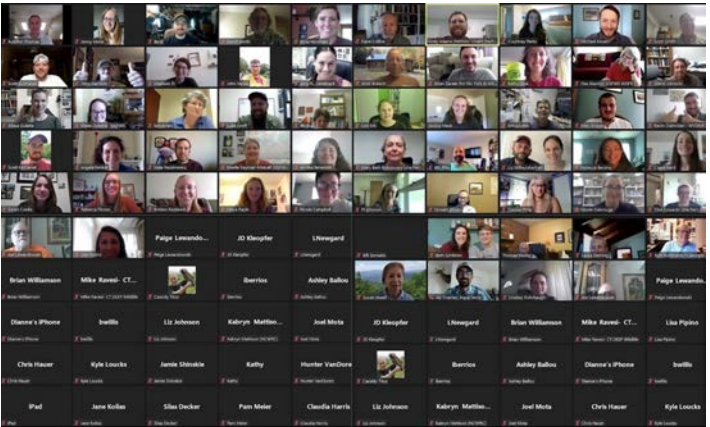
of Fort Huachuca, confirming the presence of 19 species, two of which (Mediterranean Gecko and Zebra-tailed Lizard) were the first documented observations of these species on the installation!

Finally, in June 2021, DoD PARC released their third podcast titled “The What For – Keeping Common Species Common”. The focus of this episode was on federally-listed and at-risk amphibians and reptiles on DoD lands, species recovery, and keeping common species common. Discussion topics also included DoD PARC’s products, tools, and partnerships to help prevent at-risk species from becoming listed under the Endangered Species Act. Check out the podcast here: <https://youtu.be/HQ9BQR7MloE>.

The **Disease Task Team (DTT)** has been super busy this year! In March 2021, the Co-chairs of the DTT presented to the Amphibian and Reptile Conservation Committee (ARCC) at the annual AFWA/North American Wildlife and Natural Resources Conference. This presentation focused on the importance of herpetological diseases for management and conservation of diversity taxa.

Also in March of 2021, nine members of the DTT contributed to the publication “Enhanced between-site biosecurity to minimize herpetofaunal disease-causing pathogen transmission” (Olson et al., 2021), which was published in Herpetological Review. This paper expands considerations for field biosecurity measures to help prevent transmission of disease-causing pathogens. The paper focuses on pathogen contexts, host contexts, geographic contexts, and the integration of these three (pathogen, host, and geographic) to provide guidance on standard and enhanced biosecurity practices.

In early December, the DTT launched a webinar series that will cover various topics related to reptile and amphibian health and disease. The first talk in this series provided a general overview of major herp disease issues, pathogens of concern that may impact the management, conservation and/or recovery of North American reptiles and amphibians. The primary objective of the talk was to introduce major herp disease issues that the PARC DTT plans to focus on during the series to translate the most current science of herpetofaunal diseases to policy makers and managers at the state and federal level(s). The webinar had over 150 participants, and the DTT is excited to produce more in 2022.



Virtual meeting attendants. Credit: Andrew Adams

Member agencies of the **Federal Agencies Steering Committee (FASC)** continue to build capacity and cooperation within the FASC and the PARC network. The FASC has made advancements in the role and function of the FASC, while continuing to communicate among partners on a variety of issues and topics such as Priority Amphibian and Reptile Conservation Areas (PARCAs), *Batrachochytrium salamandrivorans* (Bsal), turtle trafficking, promoting amphibians and amphibian conservation through Amphibian Week, and more.

They congratulate and thank Jim Castle on his retirement from the Army Corps of Engineers and from serving as Co-Chair of the FASC in 2021. Jenny Schultz, with NOAA, Endangered Species Division has stepped in to join Mike Westphal, of the Bureau of Land Management as Co-Chairs of the FASC.

Midwest PARC (MWPARC) has been going strong! They hosted their virtual annual MWPARC meeting in October 2021. The meeting had around 100 attendees and resulted in the initiation of two new task teams– the Crawfish Frog Task Team and Outreach and Communications Task Team. Four student presenters were awarded with the Brodman Student Award.

MWPARC saw increased member engagement this year, and one factor was a quarterly newsletter that was sent to members and followers. The newsletters highlighted upcoming events, updates on MWPARC activities, and recent publications. In 2021, over 40 new people joined MWPARC as members, increasing their membership level to over 400 participants. In addition, 200 new followers were added on Twitter and 150 new followers were added on Facebook.

Ohio PARC (OHPARC) hosted their 2021 annual meeting virtually in March. The keynote speaker, Lauren Pond, spoke on her documentary, the “Test of Faith: Signs, Serpents, Salvation,” which focused on religious serpent handling. The meeting had 80 attendees and featured six speakers and a poster session with nine submissions.

Northeast PARC (NEPARC) held its first virtual meeting in August 2021. The meeting was a success with roughly 200 registrants taking part in various research presentations

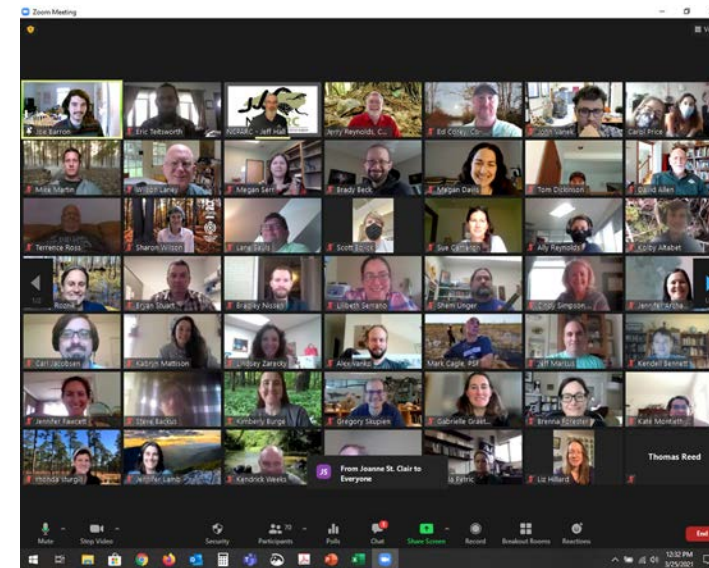


and updates from around the region, an interactive poster session, and even a virtual “herpy” hour with herp-related trivia. Dr. Thomas Pauley was awarded the NEPARC Excellence in Herpetofaunal Conservation Award for his extensive work in herpetofaunal research and teaching, wildlife management agency partnerships, student mentorship, and contributions to communities through conservation outreach events throughout the state of West Virginia and beyond. Despite being virtual, it was still great to convene with professionals across the northeast region to learn and interact for the betterment of the region’s herpetofauna, and they were glad to carry on NEPARC’s mission in this time of a pandemic.

For the first time, **Northwest PARC (NWPARC)** has geographic representation from all states and provinces on their Steering Committee. They thank all representatives for their service (especially new recruits) from: Alaska, Yukon, British Columbia, Alberta, Montana, Wyoming, Idaho, Washington, Oregon, and Northern California. Representatives span numerous affiliations including universities, environmental consultants, and state, provincial, and federal agencies. Their broadened leadership capacity is contributing to expanded outreach and communication functions, especially with social media.

The 2021 NWPARC Annual Meeting was held as a virtual conference March 7-9 in cooperation with the Association of Professional Biologists, a society based in British Columbia, Canada. The meeting was well attended with over 125 registrants. The theme “Threats, Stressors and Solutions” covered topics like wildfires; aquatic invasive species, hazard analysis and critical control points and Biosecurity; Diseases; and Roads and Habitat. There were 38 presentations, including Dr. John Richardson, Dr. Whit Gibbons, and Mark Thompson. In partnership with the Society for Northwestern Vertebrate Biology which spans the same geography as NWPARC, abstracts were published in the Fall issue of *Northwestern Naturalist*.

Idaho PARC (IDPARC) held its annual meeting in late February in conjunction with the Idaho Chapter of The Wildlife Society.



Screenshot of NCPARC 2021 annual meeting via Zoom. Credit: Jeff Hall



SWPARC’s announcement for their virtual happy hour featuring Alligator Snapping Turtle conservation. Credit: SWPARC



Alligator Snapping Turtle (*Macrochelys temminckii*). Credit: Sam Stukel

In February 2021, **Southeast PARC (SEPARC)** welcomed just over 300 registered attendees to SEPARC’s first virtual annual meeting. This event was highlighted by a dynamic keynote panel entitled “Working Together For Diversity in Conservation,” while an additional panel focused on career development for early professionals. The event included over 15 symposium presentations, over 30 speed talks, and over 20 poster presentations. SEPARC made this meeting accessible by providing a free registration option, hosting a mixture of live and pre-recorded events, and providing closed captioning.

North Carolina PARC’s (NCPARC’s) 2021 annual meeting was held virtually via Zoom. Although virtual meetings come with their drawbacks, it did allow for speakers to be from all over the country to participate. The virtual format also allowed a greater number of people to participate than might be able to attend an in-person meeting. Over 130 participants registered for the virtual meeting.

Southwest PARC (SWPARC) has kept busy networking in 2021. Their virtual Annual Networking Extravaganza was co-hosted with **Colorado PARC (COPARC)** and reached nearly 400 individuals. In addition, they celebrated their Charlie Painter Award winner, Dr. Cecil Schwalbe. SWPARC hosted two virtual Hoppy Hours which were fun and included discussion of conservation of amphibians in the southwest and conservation of Alligator Snapping Turtles.

All of SWPARC’s 2021 virtual events were made possible by key partner and co-host, the Turtle Survival Alliance (TSA). These events had an unprecedented reach, fulfilling diversity, equity, and inclusion goals.

Dr. Cecil Schwalbe, SWPARC’s 2021 Charlie Painter Award winner, has made herpetological conservation his life’s work. Beginning with his position as the first Arizona state herpetologist in 1984 and continuing to his role as a professor within Renewable Natural Resources and University of Arizona and as Ecologist at United States Geological Survey (USGS), Dr. Schwalbe’s career has been one of mentorship, applied conservation, and herpetological research.



Meg Hussey, our Social Media Specialist, in a neon pink reflective vest holding a spotted salamander on a rainy spring migration night. Credit: Sam Hussey



Kerry Wixted looking at the camera and wearing a floppy hat. Behind her are white and pink marsh mallow flowers in bloom. Credit: Kerry Wixted

PARC's Partner Database Continues to Grow!

Did you know that PARC created and maintains a partner expert database for your use? We developed this database to increase partnerships and collaborative working relationships among the herpetofauna conservation community. Users of the database can enter information about themselves (name, contact information, areas of expertise, species of expertise, etc.) and can also search for other members based on these data fields. Find a partner or sign up today at <https://parcplace.org/network/parc-partners/>

Let's Get Social!

In addition to completing her first year as PARC's Social Media Specialist, Meg Hussey found time to help with amphibian migrations as a Harris Center volunteer this past spring. From November 2020 to November 2021, PARC gained 443 Twitter followers and 236 Facebook followers. Check out PARC on Facebook and Twitter (@PARCorg) to keep up with product release promotions, partner features, announcements, and more!

Digital connection has proven to be more important than ever this past year, and **Northeast PARC (NEPARC)** has stepped up to the plate! Thanks to a steady stream of content including monthly themed educational posts, member spotlights, merchandise releases, annual meeting news, and the infamous #HellbenderSeptember, NEPARC has gained 631 followers this year on Facebook, 178 on Twitter, and has skyrocketed to 1,100 Instagram followers—more than doubling those gained in 2020!

New State Agencies Coordinator Spotlight

Beginning at the end of July 2021, Kerry Wixted started her position as the State Agencies Coordinator for PARC. Kerry Wixted formerly worked with the Maryland Department of Natural Resources as a regional biologist and more recently as an education and outreach specialist. She holds a Master of Science degree in Environmental and Evolutionary Biology from West Virginia University and Bachelor of Science in Wildlife



A spring peeper (*Pseudacris crucifer*) sits on a thumbnail to offer a sense of how tiny these loud harbingers of warmer weather are. Credit: Meg Hussey

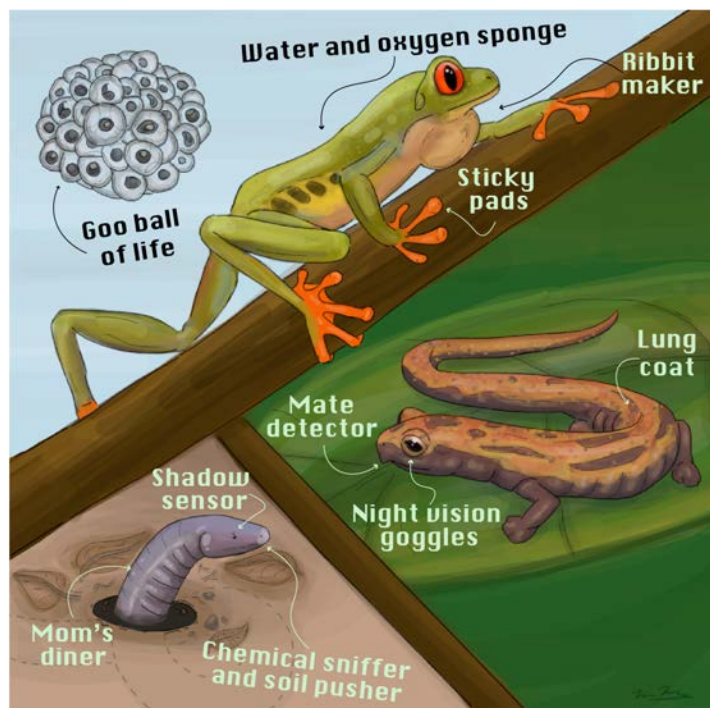
and Fisheries Management from Frostburg State University. She now serves as the Amphibian, Reptile, and Invasive Species program manager for the Association of Fish and Wildlife Agencies (AFWA).

what 2022 brings! She can be reached through parc_coordinators@parcplace.org or at kwixted@fishwildlife.org.

Kerry is a lifelong learner and self-proclaimed nature nerd with a penchant for education and outreach. She loves combining her science skills with communication, facilitation, and design. In Maryland, Kerry worked to introduce and inspire audiences about nature in their neighborhood. Her favorite focus was bringing awareness and appreciation to traditionally unloved fauna such as spiders, snakes, and wasps.

Kerry is excited to learn and implement her skills to further reptile and amphibian conservation through the Partnership. She has already 'hopped' feet first into multiple PARC projects and can't wait to see





Un-science: an Amphibian infographic Credit: Nina McDonnell



Celebrating Amphibian Week 2021

The virtual celebration of Amphibian Week (May 2-8, 2021) kicked off with a bonus spring day on May 1. The internet was “crawling with excitement” with the celebration of Salamander Saturday, sponsored by the Foundation for Salamander Conservation. Hot on those salamander heels, audiences could learn more about amphibians by checking out the “un-scienced” version describing all three major types of amphibians created by Nina McDonnell (see photo). PARC partners created a suite of infographics which were produced in four languages to share around the world. It was exciting to see tweets celebrating amphibians from all the continents where they occur!

Thank yous go out to the entire 2021 Amphibian Week Planning Committee, with a special thanks to Nina McDonnell, Sydney Horan, and Mikaela Oles for their creative scientific artwork, Molly Bletz for copy editing, and Luis Fernando Marin, Aura Muñiz Torres, Eria Rebollar, and Lise Anne Corbeil for translating infographics into Portuguese, Spanish and French! The **Federal Agencies Steering Committee (FASC)** also played a dominant role in developing and promoting content.

Partnering with the Bsal Task Force

In 2021, PARC strengthened our partnership with the North American Bsal (*Batrachochytrium salamandrivorans*) Task Force, a group of experts who come together working to maintain the abundance and diversity of salamanders and the vital ecosystem functions that they provide. Specifically, the Bsal Task Force is concerned with developing strategies to keep Bsal out of North America and have specifically developed a rapid response template that can be customized and enacted by local officials, should Bsal be detected in North America, to limit or eliminate the spread of the pathogen. PARC’s National Coordinators serve on the Bsal Technical Advisory Committee, helping to bridge communications among scientists and managers, as well as promote strategies and resources for this ongoing threat to North American salamanders.



An eastern box turtle (*Terrapene carolina*), one species discussed frequently during the “Enhancing Cross-jurisdictional Partnerships to Confront the Illicit Turtle Trade in the Southeastern United States” workshop hosted by Southeast PARC and PARC TNT. Credit: Todd Pierson

Combating the Illegal Trade in Turtles

Continuing with last year’s momentum, PARC’s **Collaborative to Combat the Illegal Trade in Turtles (CCITT)** partnered with the Association of Fish and Wildlife Agencies (AFWA) and regional PARC networks to plan and host two virtual workshops and a special conference session.

In February 2021, **Southeast PARC (SEPARC)** worked with the **PARC National Turtle Networking Team (TNT)** to organize and host a free, two-day workshop entitled “Enhancing Cross-jurisdictional Partnerships to Confront the Illicit Turtle Trade in the Southeastern United States”. This workshop was open to state, federal, and tribal law enforcement officers and biologists and stimulated many productive discussions about shared challenges in turtle conservation. This virtual workshop was well-received and was attended by over 100 participants.

Following the SEPARC workshop success, **Northeast PARC (NEPARC)**, PARC, the Association of Fish and Wildlife Agencies (AFWA), the Collaborative

to Combat the Illegal Trade in Turtles (CCITT), and the Turtle Networking Team (TNT) partnered to host a “Northeast Turtle Workshop: Enhancing Partnerships to Combat Poaching and Trafficking” in February 2022. The purpose of the workshop is to provide state, federal, tribal, and provincial agency biologists and law enforcement the time and space to share information, network, develop new partnerships, and identify next steps in addressing issues related to the illegal collection, trafficking, and confiscation of native turtles in the northeastern United States. Stay tuned for updates!

In March 2021, AFWA, the CCITT, and the Bsal Task Force partnered to host a special session at the North American Wildlife and Natural Resources Conference, “Turtle Trafficking and The New Amphibian Chytrid Fungus (Bsal): A Workshop to Protect Biodiversity” to provide natural resource managers information and resources to take steps towards reducing the impact of two significant threats to North American wildlife.

PARC AWARDS

Susan (Su) Jewell 2021 Alison Haskell Award Recipient

Susan (Su) Jewell 2021 Alison Haskell Award Recipient
PARC is pleased to announce Susan (Su) Jewell as the 2021 recipient of the Alison Haskell Award for Excellence in Herpetofaunal Conservation!

The Alison Haskell Award is presented annually by PARC in memory of Alison Haskell (1956-2006), PARC's first Federal Agencies Coordinator. This award is intended to recognize individuals in North America who exemplify extraordinary commitment to herpetofaunal conservation. Through this award, PARC recognizes Su's outstanding passion for, and dedication to, conservation of amphibians and reptiles through leadership, science, and collaborations.

Su's contributions to herpetofaunal conservation exemplify all of our Core Values (Collaboration; Proactive Approaches; Scientific Integrity; Value in All Biodiversity; and Maintaining Optimism) and fits our desire to acknowledge "unsung heroes" in herpetofaunal conservation. Su has fostered herpetofaunal conservation by her career-long service in the US Fish and Wildlife Service where her expertise in aquatic conservation has had significant results for amphibians. In particular, her knowledge of the US Lacey Act and invasive species laws and guidance has helped forestall the transmission of the deadly chytrid fungus *Batrachochytrium salamandrivorans* (Bsal) to the USA through trade markets. Her work with the Bsal Task Force on effective policy development to permit fast action if Bsal were detected at a USA field site provides



Su Jewell, recipient of PARC's 2021 Alison Haskell Award.
Credit: Su Jewell

ongoing support for maintenance of our US-wide amphibian natural heritage.

Having Su as a ready partner has been pivotal for raising the profile of US national amphibian conservation, especially relative to pathogen threats in trade markets. She has been a guide in process and policy, mentoring others on how the complex system works at her level and providing an important perspective on the need for thoroughness, science support, and timing to get conservation actions approved. Thanks for all that you do, Su!



Neha Savant 2021 Visionary Leader Award Recipient

In 2011, PARC initiated the Visionary Leader Award. This award recognizes an individual in North America who exemplifies extraordinary leadership, vision, and commitment, specifically to PARC, in a manner that has carried PARC to new heights and has significantly forwarded the PARC mission.

Neha's contributions to PARC are exemplified in her commitment to PARC's Core Value of Inclusivity and Collaboration, including the strategic goal of enhancing inclusion and equity within the herpetofaunal conservation community. PARC strives to provide inclusive spaces and a diverse network for participation. Neha has served as a leader in PARC at both regional and national levels over several years. Most notably, she co-created the National Diversity, Equity, and Inclusion Task Team (DEITT) to improve cultural competency, which has increased PARC's capacity for inclusion and ability to engage and attract diverse audiences and members. The DEITT serves a vital role in the vision and success of PARC by helping it reach its strategic network growth goal. Neha served as Co-chair of this task team for three years, and her efforts led the DEITT to receive an award from The Pollination Project Grant program in 2018. Neha also oversaw the development and implementation of PIPA (PARC Increasing Participation Award), which aims to broaden participation at regional PARC meetings and expand the PARC network. In 2018 and 2019, Neha co-led the first two DEI break-out workshops at NEPARC's annual meetings. Neha's leadership



PARC's 2021 Visionary Leader Award recipient, Neha Savant, overlooking the Grand Canyon. *Credit: Cassandra Utt*

was crucial to the launch and accomplishments of the DEITT. Her inspiring guidance and passion created a space primed for growth and learning, ensuring the success of all team members. Her communication skills have been vital in facilitating difficult and essential DEI discussions both within and outside of PARC.

Thank you, Neha, for your perspective, experience, and contributions to increase diversity and advance inclusion of underrepresented groups of people in herpetofaunal conservation.





STRATEGIC AREA TWO

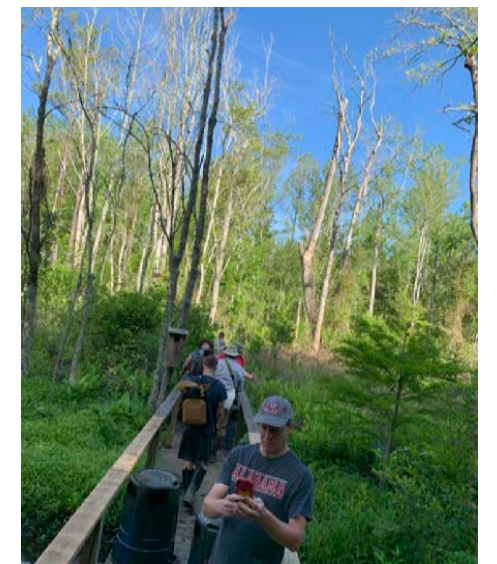
HABITAT CONSERVATION

Our Goal: To identify, restore, and create important amphibian and reptile habitats and connectivity.

Working in partnership with the **Amphibian and Reptile Conservancy (ARC)** and the national PARC network, Department of Defense PARC (DoD PARC) developed a report summarizing the newly developed Priority Amphibian and Reptile Conservation Areas (PARCAs) that overlap or are in close proximity to military sites. In total, 317 PARCAs have been identified in 26 U.S. states. Of these PARCAs, 68, or 21%, partially or fully overlap with 103 DoD properties, indicating the importance of DoD installations to herpetofaunal conservation and the PARCA effort.

DoD PARC and the U.S. Fish and Wildlife Service jointly developed best management practices (BMPs) for the Alligator Snapping Turtle in 2021 and are in the process of developing BMPs for the Gopher Tortoise, Blanding's Turtle, Western Spadefoot, and Florida Pinesnake (to be completed in 2022). The management practices described in these documents are intended to serve as guidelines that DoD resource managers can use to plan, prioritize, and implement conservation and management actions. Previously developed BMPs for the Spotted Turtle, Wood Turtle, Western Pond Turtle, Red-bellied Cooter, Gopher Frog, and Eastern Diamond-backed Rattlesnake can be downloaded at: <https://www.denix.osd.mil/dodparc/parc-resources/>

In May 2021, **South Carolina PARC (SCPARC)** members had the special opportunity to visit the private property of Whit Gibbons in Salley, South Carolina to survey for herps. This is the second annual visit they have paid to this property, and they plan to make many more visits for years to come. The continued visitation of this property, year after year, allows members to see the annual changes that occur in herp populations. Furthermore, this provides inventory data to the landowner.



SCPARC members surveying for herps on a private property in South Carolina Credit: Jacob Zadik

STRATEGIC AREA THREE

SPECIES CONSERVATION

Our Goal: To support range-wide species conservation collaborative actions and complementary efforts.

PARC's **Disease Task Team (DTT)** continues to maintain the North American Herpetological Disease Alert System (HDAS) which promotes early detection and rapid response to emerging diseases. In 2021, the HDAS received nine reports from seven different states. Five reports involved amphibians, including cases of skin lesions, deformities, and/or deaths. Four reports were of possible *Ophidiomyces* infections [Snake Fungal Disease (SFD)]. All reports were forwarded to the appropriate state authorities. The HDAS received responses back from these authorities in five of the nine cases, from five different states. One amphibian death report was investigated with negative *Batrachochytrium salamandrivorans* (Bsal) and Bd results, one reporter was not able to provide a specific location to the area of concern in order to allow further investigation. All other results remain open or unknown.

The PARC DTT has also finalized eight fact sheets focused on providing general information on herpetological disease and

morbidity. The following topics are the focus of these fact sheets: aural abscesses, *Batrachochytrium salamandrivorans* (Bsal), Bd, Ophidiomycosis, ranavirus, snake lung worm, sea turtle stranding events, and frog deformities. The fact sheets, along with other resources, can be found on this page: <https://parcplace.org/resources/parc-disease-task-team/>.

Species profile videos are Department of Defense PARC (DoD PARC)'s newest effort to inform and educate base residents and natural resource managers of the exciting amphibian and reptile species that may be encountered in the places they live and work. These videos are approximately three to seven minutes in duration and contain narration, pictures, and footage of a particular species on a military site. They developed nine videos this year, which are posted both on our DoD PARC YouTube Channel (<https://m.youtube.com/channel/UCwcQ84H1oEHerSRFbK4DetA>). In total, the videos have collectively had approximately 40,000 views!





Katherine Brandewie, recipient of a MWPARC travel award, holds her study organism - a snapping turtle (*Chelydra serpentina*). Credit: Melissa Youngquist

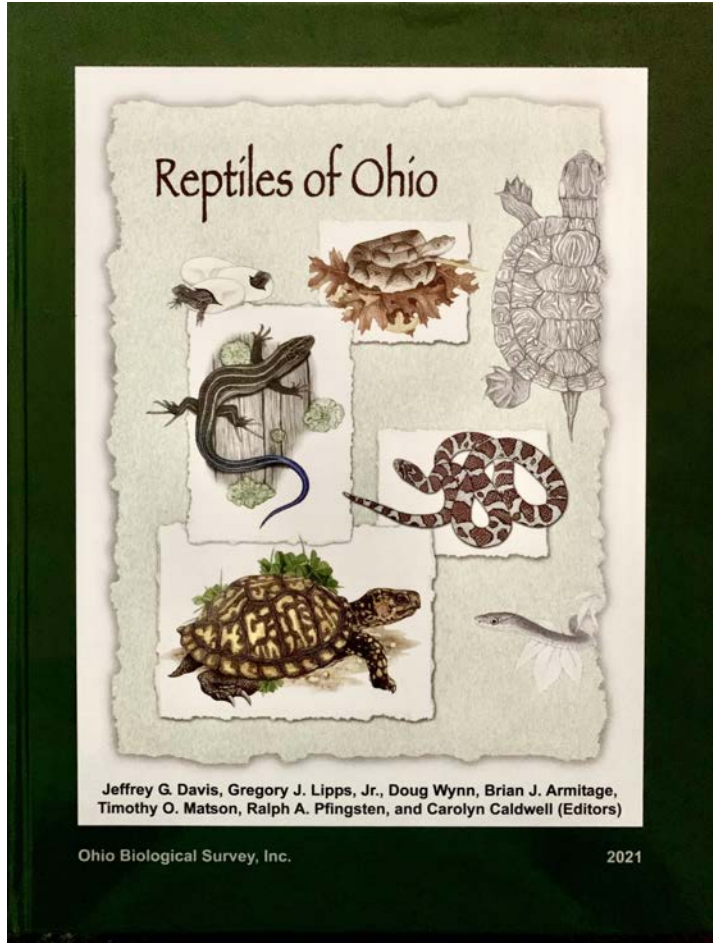


Alligator Snapping Turtle. Credit: Jim Goodwin

DoD PARC conducted sampling for Snake Fungal Disease (SFD) on military sites in 2021. They used a “citizen science” methodology for the 2021 data collection effort. Military natural resource managers and other interested parties volunteered to collect swabs from snakes on military installations and sent them to a cooperator at the University of Illinois for analyses. All of the supplies needed for collecting field data and the analysis of the samples were provided at no cost. To date, they have received 1,058 swabs from 38 installations in 27 states! The study will continue in 2022.

Midwest PARC (MWPARC) awarded ten Student Travel Awards to support conservation field research efforts by students. These students are studying urban turtle communities, ranavirus prevalence in amphibians, amphibian communities in restored wetlands, Eastern Box Turtle immune function, the interaction between Green Frog occurrence and algal blooms, Gray Treefrog biofluorescence, genetic diversity of Marbled Salamanders, and Prairie Massasauga surveys.

Reptiles of Ohio, a 1,112-page labor of love written, edited, and with contributions from many of Ohio PARC’s members, was published by the Ohio Biological Survey in 2021. This comprehensive resource includes a fascinating history of herpetology in Ohio, key natural history elements for reptile habitat, systematics, taxonomy, Family treatments, biology, identification keys, distribution, conservation efforts, field studies, and more. Part I encompasses 11 species of turtles, five lizard species, and Part II includes 26 species of snakes. More info: http://www.ohiobiologicalsurvey.org/pub_highlight/.



Cover of Reptiles of Ohio, cover art by Michael Wright. Credit: Michael Wright



Camera traps deployed in northwest Ohio detected over 29 individual frogs in 2021, including this food chain interaction of a tick feeding on a Virginia opossum (*Didelphis virginiana*) that was eating a green frog (*Lithobates clamitans*). Credit: Reconyx HP2X cameras



An ornate chorus frog (*Pseudacris ornata*) - one of the species of conservation concern for which SEPARC is developing a CAP. Credit: Todd Pierson



A Wood Turtle (*Glyptemys insculpta*) staring at the camera. Credit: Andrew Adams

Ohio PARC announced a new camera trap loan program in late 2021. To increase knowledge about Ohio’s herpetofauna, Ohio PARC will loan Reconyx HP2X professional research cameras, for use at no charge, to qualified organizations and individuals. In addition, they will also provide instruction for setting up AHDriFT arrays to funnel animals toward the cameras. These arrays have been successful in detecting a wide variety of herps and other critters at many different sites in Ohio. For more information and to apply: <http://ohparc.org/cameratraps/>.

A group of states that are part of Northeast PARC (NEPARC’s) Wood Turtle Working Group received ~\$990,000 from the U.S. Fish and Wildlife Service’s Competitive State Wildlife Grant program. The grant, “Regional Conservation for Wood Turtles and Related Emydine Turtles”, was awarded to the lead state of Massachusetts and their partners in Connecticut, Maryland, Maine, New Hampshire, New Jersey, Pennsylvania, Rhode Island, and Virginia with participation also from New York and West Virginia.

Congratulations to Southeast PARC (SEPARC) for publishing its first Conservation Action Plan (CAP). Led by Rebecca McKee, the CAP focused on Green Salamanders (*Aneides aeneus* species complex). This process inspired the revitalization of SEPARC’s Editorial Board and has led to the creation of plans for additional CAPs—including one focused on the Ornate Chorus Frog (*Pseudacris ornata*) - to be published in 2022.



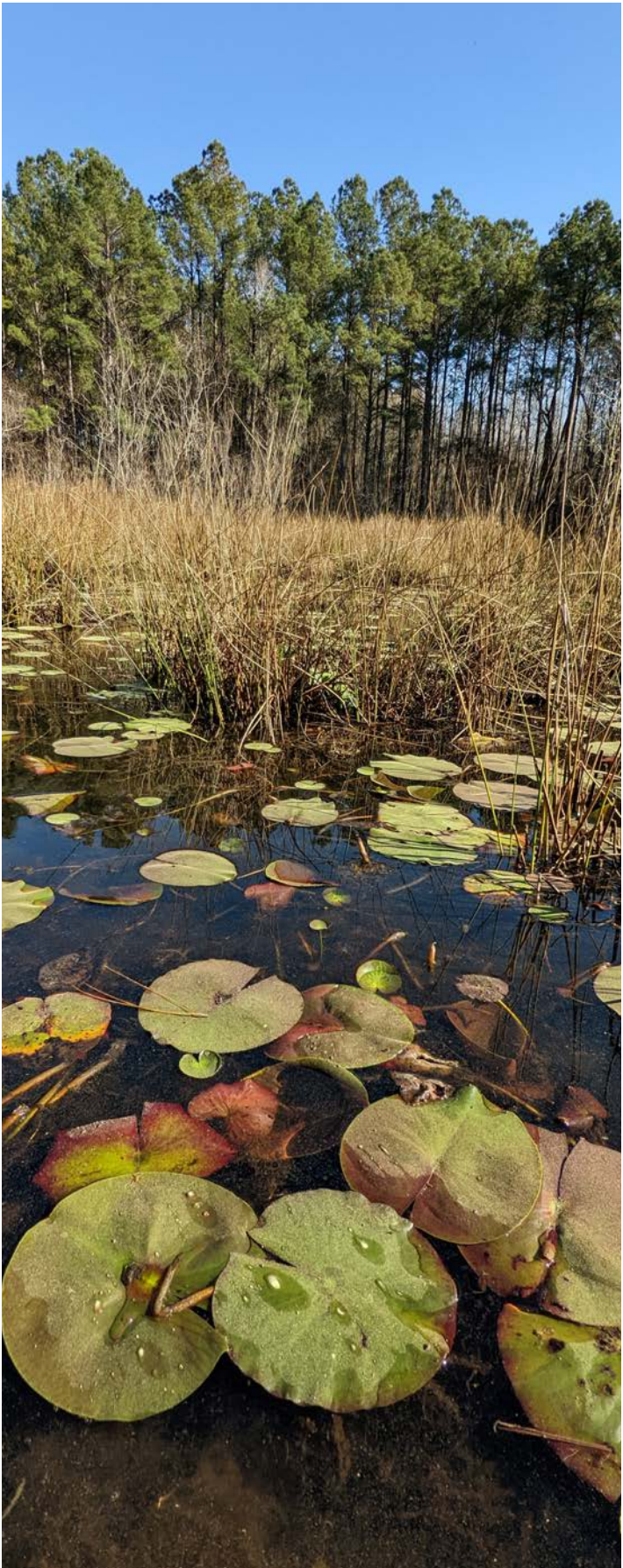
Timber Rattlesnake (*Crotalus horridus*) at a newly discovered gestation site in western North Carolina. Credit: Jeff Hall



SCPARC members pulling a seine net to capture Diamond-back Terrapins in the salt marsh surrounding Kiawah Island. Credit: Jacob Zadik

North Carolina PARC’s (NCPARC’s) brochure, “Rattlesnake Sightings Wanted,” continued to be a big success in 2021. To help make it easier to report sightings, a new email address (rattlesnake@ncwildlife.org) was created. This email helped lead to over 300 sightings in 2021, up from 100 sightings in 2020! These reports from the public led to many records for Timber and Pigmy Rattlesnakes, and again led to the discovery of several new gestation sites. They look forward to even more sightings in 2022!

In October 2021, **South Carolina PARC (SCPARC)** members assisted with a Diamond-back Terrapin project on Kiawah Island. Started in 1983, this project is the longest continuous survey for Diamond-back Terrapins in the world! Trekking through the mud and pulling long seine nets to capture these turtles for mark and release provided a spectacular educational opportunity for members. One turtle captured during this survey was first captured in 1991, making it older than several members participating in this event.



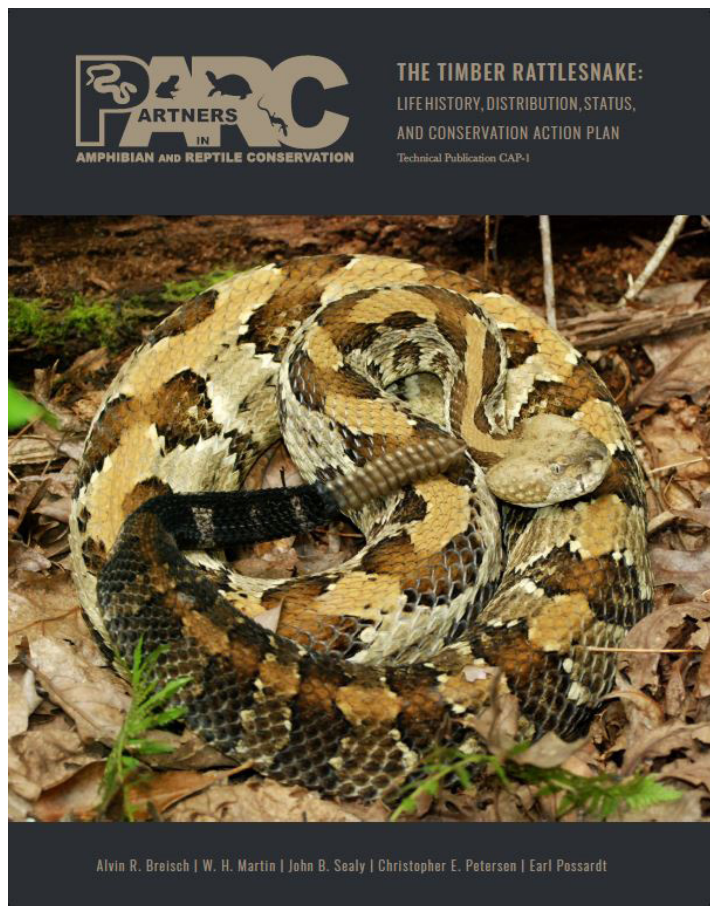
Pond Ecosystem. Credit: José Garrido

U.S. Forest Service Highlight

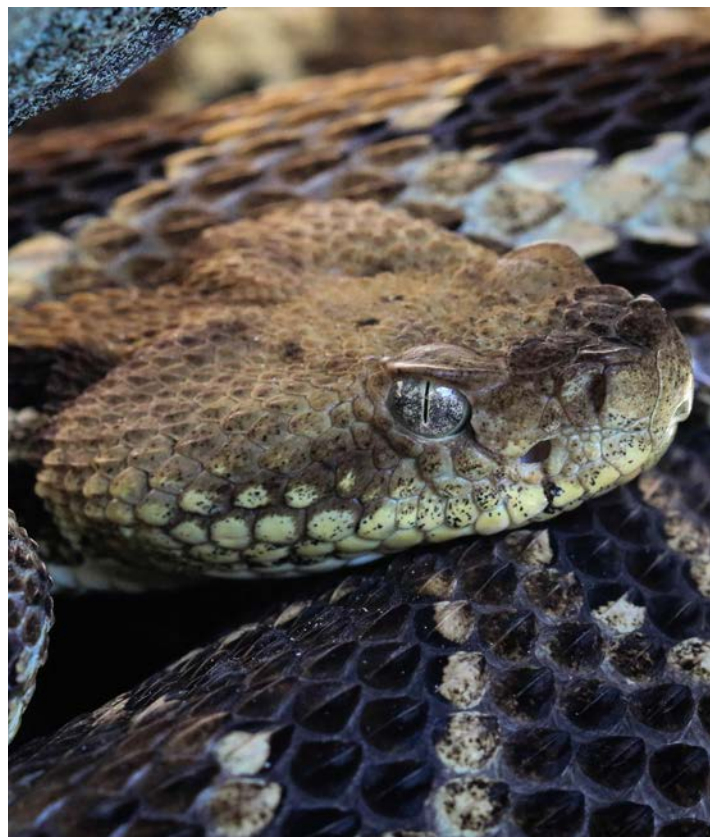
Staff with the U.S. Forest Service are engaged in numerous activities with amphibians and reptiles nationwide. The ad hoc herpetology group convenes by conference call before and after the summer field season to share ongoing and completed projects. In 2021, several projects addressed herpetofaunal monitoring, habitat and population restoration, application of emerging technologies to expedite inventory and monitoring assessments, and research. This work often was conducted in collaboration with partners.

Forest Service monitoring addressed population to ecosystem scales, including monitoring of flatwood salamanders (Florida), mud turtles (Virginia), snake hibernacula ingress (Black Hills, South Dakota), and implementation of the Sierra Nevada bioregional monitoring program (California). Restoration activities spanned anuran captive rearing, and habitat management such as wetland construction, and examining effectiveness of underpass crossings and beaver reintroductions. Several ongoing projects are applying eDNA for aquatic organism inventory and monitoring, while selected projects are using pit tags and camera traps to gain population ecology insights. Lastly, research led by Dr. Donald Brown in West Virginia was multifaceted including development of a salamander sexing guide, effects of landscape condition on turtle abundance and body condition, salamander cover object survey biases, pesticide bioaccumulation effects in salamanders, prescribed fire effects on salamanders, and climate vulnerability of the high-elevation Cow Knob Salamander, *Plethodon punctatus*. Cathy Brown completed two studies of the Sierra Nevada yellow-legged frog, *Rana sierrae*: a multi-scale habitat selection study; and a five-year demography and movement study.

Dr. Dede Olson advanced disease ecology and management work with recent papers addressing the ranavirus and amphibian chytrid fungus web portals, disease biosecurity, and integration of herpetological disease-causing pathogens into invasive species management for forests and grasslands.



The Timber Rattlesnake: Life History, Distribution, Status, and Conservation.



Timber Rattlesnake Conservation Action Plan Highlight

PARC was very pleased to complete **The Timber Rattlesnake: Life History, Distribution, Status, and Conservation Action Plan** (Technical Publication CAP-1) which was published by The Amphibian and Reptile Conservancy in 2021.

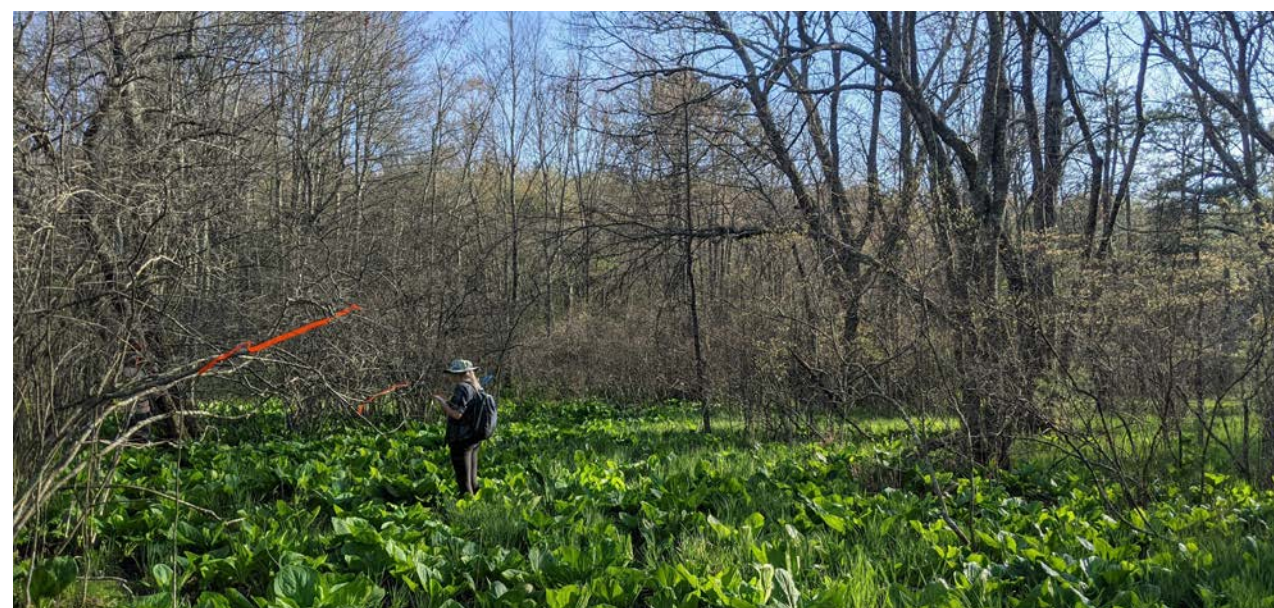
A team of more than 75 concerned rattlesnake biologists from federal and state agencies, universities, and private institutions, as well as environmental consultants and private citizens developed this plan. The 457-page book is divided into two parts and contains more than 300 images from 90 photographers plus more than 40 maps. Part I of the document presents an overview of the life history, genetics, ecology, distribution, status, and threats to the continued existence of Timber Rattlesnakes from a range-wide perspective along with recommendations for conducting population assessments. Part II of the document presents the legal status, distribution, population status, habitat needs, active period, threats, and management actions for Timber Rattlesnakes on a state-by-state (or province-by-province) basis.

The information provided in this plan can serve as a reference for landowners, land managers, and government agencies at all levels to enable them to develop science-based management and conservation plans for Timber Rattlesnake populations and protect habitats for which they have responsibility. The guidance provided in this plan will also be of value to environmental consultants as they develop recommendations for developers, and to researchers who endeavor to fill in gaps in our knowledge concerning the species' distribution and ecology.

Approximately 250 copies of the plan have been sold since August 2021. There are less than 100 hard copies of the document remaining in stock. Orders yours today at: <https://trcap.portalpro.com>.



ARC's Conservation Program Coordinator, José Garrido holds up a bog turtle target species after spending dozens of hours probing North Carolina wetlands for a turtle in a haystack [bog]. This turtle was handled with proper permits and returned shortly after data collection. Credit: José Garrido



In Southern Appalachia, ARC works with landowners to survey potential bog turtle wetlands using techniques such as environmental DNA (eDNA). Credit: José Garrido

Amphibian and Reptile Conservation (ARC) Highlight

2021 and early 2022 have been an exciting time for the Amphibian and Reptile Conservancy (ARC). In June of 2021, they welcomed a new Executive Director, Dr. JJ Apodaca (a former National Co-Chair of PARC). Jeff Holmes, who served as Executive Director for nearly a decade is now their Founding Director. They also welcomed José Garrido as the new Conservation Programs Coordinator. This growth has allowed ARC to expand on the ground conservation programs in Priority Amphibian and Reptile Conservation Areas (PARCAs), which you will see happening in 2022, with new programs in the Southern Appalachians, the Gila in New Mexico, and many more are in the works. ARC is also continuing their impactful work in the Francis Marion PARCA, with new restoration and head starting programs kicking into gear. In addition to on the ground programs, ARC continues to work on identifying PARCAs across the nation and hosting the PARCA data.

ARC also spent the last year revamping their website, social media, and messaging. Please visit their new website to see all the hard work (www.ARCprotects.org)! You can also follow them on social media platforms under their new handle of ARCprotects. In 2022, they will also be launching a new web store with some amazing ARC merchandise including a spectacular new coloring book featuring a number of amazing herps.



PHOTO CREDITS

Cover	Greater Short-horned Lizard (<i>Phrynosoma hernandesi</i>) Bruce Christman
Page 4, 5	Six-lined Racerunner (<i>Aspidoscelis sexlineata</i>) Kerry Wixted
Page 6, 7	Green Tree Frog (<i>Hyla cinerea</i>) Kerry Wixted
Page 9	Egyptian Spiny Agama (<i>Agama spinosa</i>) Paul Block
Page 10	Green Salamander (<i>Aneides aeneus</i>) Paul Sattler
	Spring Peeper (<i>Pseudacris crucifer</i>) Paul Block
Page 11	Eastern Box Turtle (<i>Terrapene carolina carolina</i>) Kerry Wixted
Page 12, 13	Timber Rattlesnake (<i>Crotalus horridus</i>) Andy Adams
Page 15	Texas Night Snake (<i>Hypsiglena jani</i>) Bruce Christman
Page 16	Canyon Treefrog (<i>Hyla arenicolor</i>) Bruce Christman
Page 19	Painted Turtle (<i>Chrysemys picta</i>) Courtney Celley
Page 20	Jemez Mountains Salamander (<i>Plethodon neomexicanus</i>) Bruce Christman
Page 22, 23	Burmese Python (<i>Python bivittatus</i>) J.D. Willson
Page 24, 25	Marbled Salamander (<i>Ambystoma opacum</i>) Andy Adams
Page 26, 27	Bog Turtle (<i>Glyptemys muhlenbergii</i>) Andy Adams
Page 32	Timber Rattlesnake (<i>Crotalus horridus</i>) Andy Adams

