

Forum Presenter Abstracts

Habitat Restoration to Benefit Pollinators in Decline: Examples from North Carolina

Nell Allen, NC Zoo; Gabriela Garrison, NC Wildlife Resources Commission; Mike Kunz, NC Botanical Garden

Steep declines of native bees and butterflies, linked with habitat loss, have stimulated native plant restoration projects at a variety of scales. Site appropriate plants that produce large amounts of nectar and pollen are of particular interest. Once considered insignificant, small- to medium-sized plantings and gardens with a pollinator focus are now supported by a number of organizations. Innovative public and private partnerships are creating pollinator habitat at larger scales as well. With increasing demand, more research to develop local native seed sources has begun. Habitat restoration for pollinators has the additional benefit of involving individuals and organizations in conservation activities. The panel will discuss several aspects of this development. Nell Allen will talk about the NC Zoo's pollinator plantings; each garden is slightly different but all meet the guidelines of Monarch Watch's Monarch Waystation program. The Zoo provides a variety of resources to encourage visitors to plant their own pollinator gardens. Citizen science activities will be added this year. Gabriela Garrison will describe public and private land restoration projects that benefit pollinators. In addition to the work done with local governments and private landowners, the NCWRC has also been partnering with solar companies to develop an innovative use of solar farms where plantings increase pollinator habitat in areas that would otherwise have little or no wildlife value. Mike Kunz will discuss the importance of local ecotypes and data needs to providing appropriate material to use in restoration. Using an example from a current project in the Uwharrie National Forest in the Piedmont of NC, we will explore collecting seed from wild sources, increasing the native seed supply of local ecotypes, and using them in restoration.

The Maryland Biodiversity Project: Creating a Vibrant Nature Study Community by Documenting All Species in Maryland

Jim Brighton, Maryland Biodiversity Project

The Maryland Biodiversity Project is a web-based endeavor that aims to document all the living things of Maryland. By creating a community through web development, social media, bioblitzes, and acting as liaisons between the public and state agencies, the Maryland Biodiversity Project has become a leader in the citizen science movement. With a network of professional and citizen scientists, the Maryland Biodiversity Project has documented 17,594 species resulting in a database with 387,429 records. Over 700 photographers and naturalists have contributed more than 100,000 photographs with more being added every day. With almost six years of momentum the Maryland Biodiversity Project continues to push the boundaries of conservation and education throughout Maryland.

Prioritizing Natural Areas for Conservation in North Carolina Using Natural Heritage Data

Misty Buchanan, NCNHP

North Carolina's Natural Heritage program identifies areas of land or water that are important for maintaining our state's rich natural biodiversity. Program biologists and contributing partners survey natural areas, map natural ecological boundaries, and enter conservation site records and element occurrence records into the Biotics 5 database (developed and maintained by NatureServe). Under this

approach, each natural area receives two ratings that measure different but complementary values. The Collective Value Rating (C1-C5) reflects the number and rarity of species and habitats contained within a given site, while the Representational Rating (R1-R5) reflects the site's importance in protecting the state's best occurrences of individual species and habitats.

Each year, NCNHP staff update the priority ratings for all 2,400+ natural areas using a Biotics query, review all the updated priority values, and distribute the information to land conservation agencies who use it to prioritize sites for acquisition and management. Maps and GIS data for the natural areas and ratings are available for free download from NCNHP at www.ncnhp.org.

NatureServe Network State Environmental Review Tools

Misty Buchanan and Rodney Butler, NCNHP; Renee Hypes, VANHP; Nicole Lorenz, LANHP; Ian Horn, KYNHP; Lori Scott, NatureServe; Marion Werkheiser, Cultural Heritage Partners

State Natural Heritage Programs (NHPs) serve as repositories of maps and information about rare species and their habitats within each state. By consolidating information about hundreds of rare species and natural communities, State NHPs ensure that the public is able to get the information needed to weigh the ecological significance of various sites and to evaluate the ecological impacts of development. The information aggregated and shared by NHPs, using methodology developed by NatureServe, helps project planners and landowners make land use decisions that have the most benefit for society and the economy, while having the least ecological impact. State Environmental Review Tools, developed by NatureServe using an Esri online mapping platform, provide a searchable map interface for Natural Heritage data including managed areas, natural areas, element occurrences, and a variety of spatial planning data layers. Using these tools, registered subscribers can submit project review requests and receive automated responses within minutes, saving time for project proponents and reducing the workload for NHP data management staff to manually determine project conflicts. States can also use these same tools to streamline project review for cultural as well as natural resources. NatureServe State Environmental Review Tools are online for North Carolina, Virginia, and Louisiana, with one in development now for Kentucky.

Integrating Spatial Data in the Development of Ecological Site Descriptions

Michelle Clendenin, Natural Resources Conservation Service

We will present our process to develop the footprints for the Ecological Sites proposed for the East Gulf and Atlantic Coastal Plains. This process creates these footprints by intersecting the above ground spatial accounting of current land-use of GAP/LANDFIRE with the below ground spatial inventory of soils by USDA-NRCS gSSURGO. Spatial analysis of soils and their mapped extents provides the data-informed process to infer which of NatureServe's Ecological Systems is present on areas still in natural community, and further analysis informs what natural community would likely have been present on current cultural and developed land types. This multi-step process of spatial analysis is potentially widely adaptable as a way to relate spatial observations to soils and the USDA-NRCS gSSURGO soils database.

Applications of NatureServe Data for the North American Land Trust

Lee Echols and Williams Gandy, North American Land Trust

Use of NatureServe data is critical in the day-to-day processes of private natural lands conservation. The North American Land Trust utilizes this information pre-easement to perform desktop surveys prior to site visits, efficiently focus on-the-ground biological inventory work, identify critical conservation values, and prepare baseline documentation. Use of NatureServe data also bolsters post-easement stewardship activities, including annual monitoring, conservation management planning, and additional growing season

field surveys. Ease of access across multiple software and hardware platforms ensures a diversity of applications and greatly improves the data's efficacy.

The Southeastern Grasslands Initiative: Charting A New Course for Conservation in the 21st Century

Dwayne Estes, The Southeastern Grasslands Initiative

The southeastern U.S. grasslands are imminently threatened. They support approximately half of the rare plant communities, two-thirds of the rare plants, and one-third of the rare terrestrial vertebrates in the region. Several groups of organisms, especially birds and pollinators, are in steep decline due to the loss of grasslands and related open habitats. Yet, in spite of the tremendous needs of these species, it seems that much of the focus on conservation, at least in many parts of the South, is still overwhelmingly devoted to forests and forested wetlands. The Southeastern Grasslands Initiative (SGI), established in January 2018, is working to elevate the profile of grasslands and grassland-related communities across a 21-state region of the South in an effort to help chart a new course for conservation in the 21st century. SGI has five primary goals: (1) to establish itself as a clearinghouse for information related to the conservation, research, history, and biodiversity of Southern grasslands; (2) to work with our partners in conservation to identify priorities for grasslands conservation and research; (3) to provide on-the-ground coordination, education, and leadership across our region by employing the Plant Conservation Alliance model; (4) to lobby for continued support of grasslands conservation from local to national levels; and (5) to become a granting organization whereby we hope to offer grants to empower conservation at a scale not presently possible. SGI is currently working with and seeking support from a variety of partners, including private philanthropic foundations, corporations, nonprofit conservation organizations, and state and federal government agencies.

"Comprehensive Conservation Vision"/Essential Conservation Sites

Rob Evans, Virginia Natural Heritage Program

Although various agencies and organizations are implicitly focused on biodiversity conservation, few to none adopt explicit comprehensive goals of protecting representatives of all biodiversity. The reasons for this are multifaceted, but Natural Heritage network data provide a key source for consistent use of biodiversity data to build a comprehensive conservation “portfolio” for a state or region. This presentation will make the case for doing so and discuss an evolving approach in Virginia, built on the results of 30 years of systematic data collection and management by the Virginia Natural Heritage Program. Selected issues and results will be discussed from this, and a narrower effort developed in North Carolina, along with some surprising results from a preliminary analysis of Virginia’s “essential conservation sites.”

Sharing Science with Citizens

Steve Gerkin, NC Zoo

Communicating important scientific work can be daunting when trying to get across the message or outcome to people of varying backgrounds. Scientists often have to present to the public the reasons that the work being done is relevant or, if talking with donors or agencies, to secure further funding for these projects. However, science terms and concepts can come through as a foreign language to some listeners. Important steps must be taken in order to break the message down into component parts that are understandable to the audience at hand. Relying on some tricks of the interpretive trade can help as science communicators begin planning any communication.

Environmental DNA (eDNA) in the Detection and Monitoring of Aquatic Species

James Godwin, Alabama Natural Heritage Program

Environmental DNA (eDNA) is a recent tool that has gained acceptance for the survey and monitoring of aquatic species by merging field and lab techniques. The eDNA is DNA that has become separated from the parent organism and is present within the environment. Fundamentals of eDNA are the collection and filtration of water samples to obtain tissue and DNA, extraction of DNA from the sample, and lab analysis of DNA extract for the presence of the target species' DNA. Environmental DNA has both advantages and disadvantages compared to conventional sampling. We have used eDNA on a pair of aquatic species of the Upper Black Warrior River basin, the Black Warrior waterdog (*Necturus alabamensis*) and the flattened musk turtle (*Sternotherus depressus*), both federally protected species. From our study, we found that eDNA may be more effective in detection than conventional sampling, sampling a stream stretch may be more rapid with eDNA, and that seasonality of collection is important. We are continuing to use eDNA for surveys of the eastern hellbender (*Cryptobranchus alleganiensis*) in Alabama.

Adding It All Up: The Southeast Conservation Adaptation Strategy

Chris Goudreau, NC Wildlife Resources Commission

Species and habitats don't respect jurisdictional boundaries, nor do factors that affect those species and habitats; yet, we often plan and conduct wildlife conservation within these limited frameworks. As we look out over the next 30-50 years we, and the species and habitats we aim to conserve, all face a rapidly changing landscape. In order to meet these challenges, a different framework is needed to assist us in working across jurisdictions to bring about meaningful conservation. The Southeast Conservation Adaptation Strategy (SECAS) is such an attempt to think big. The goals of SECAS are to provide the larger context within which local, state, and regional conservation efforts can fit; to provide tools for planning at a regional scale; and to act as a catalyst for bringing together partners at the appropriate scale.

Plant Conservation Program Preserve Restoration Efforts

Cheryl Gregory, NC Department of Agriculture and Consumer Services-Plant Conservation Program.

The Plant Conservation Program (PCP)'s mission is to conserve the native plant species of North Carolina in their natural habitats, now and for future generations. PCP employs a multitude of instruments and procedures to perpetuate native plants in their ecosystems, including the acquisition and management of imperiled plant preserves and habitats. Creating preserves to protect native species richness in their unique natural habitats is essential to reestablish healthy ecosystems. This statewide system of protected plant preserves receives targeted restoration efforts including prescribed burning, invasive species removal and imperiled species propagation, augmentation, and monitoring.

Use of Biodiversity Websites to Share Information Among Scientists, Conservationists, Educators, Naturalists, and the General Public

Stephen Hall and Harry LeGrand, Jr., NC Biodiversity Project

The North Carolina Biodiversity Project is a private, nonprofit association whose mission is to provide a freely and widely available source of information on the biodiversity of North Carolina. In partnership with the North Carolina Division of Parks and Recreation and the Southern Conservation Partners, our focus is on the creation of websites that provide detailed and scientifically accurate range maps, activity charts, identification guides, ecological associations, and conservation statuses for all members of particular

taxonomic groups. Currently, we have seven websites up and running, covering 3,622 species of animals and with full species accounts now completed for roughly 40%; work on species accounts is just starting for the roughly 3,850 species of vascular plants. We also provide checklists for five additional taxonomic groups and links to a number of other websites having similar aims. Our aim is not only to disseminate this information as widely as possible and to cover as many different uses as possible, but to involve a greater number of people in collecting and sharing these data. We believe that active participation by the public will not only strengthen the depth and coverage of biodiversity information, but will also create a greater interest, appreciation, and concern for the conservation of our native species and ecosystems. Our conservation goals cannot succeed without either strong scientific credibility or the broad-based support of a knowledgeable, interested public.

Improving Distribution Data via Species Distribution Modeling: An Update on the NatureServe Network Modeling Collaborative

Healy Hamilton, NatureServe

Knowing where at-risk species are likely to occur is fundamental to planning for their conservation. Species distribution modeling (SDM) provides a means to address this need, providing conservation practitioners with information not only on where species have been observed, but precise delineations of where else they are likely to be found. Decades of species occurrence data collected by state natural heritage programs is a key input into these models, and programs across the NatureServe network now have a long history of using SDM to guide inventory and inform conservation within their jurisdiction. More recently, the NatureServe Network Modeling Collaborative has been working together to develop best practices for modeling, publish guidelines on the use of models for regulatory decision-making, and advocate with federal and state agencies and other partners for a national library of multijurisdictional modeled distributions for at-risk species.

Automated Delineation of Conservation Sites in Virginia

Kristen Hazler, Virginia Natural Heritage Program

A Natural Heritage Conservation Site (“ConSite”) is a nonregulatory planning boundary delineated by the Virginia Natural Heritage Program to identify key areas of the landscape worthy of preservation. ConSites are built around one or more known occurrences of rare plants, animals, and/or significant natural communities. They include associated habitat and adjacent land to serve as a buffer, with special emphasis on maintaining large contiguous tracts of natural land cover. ConSites are a starting point for proactive conservation efforts such as buying land to be dedicated as Natural Area Preserves. They are also used to flag areas needing further review when evaluating potential impacts of proposed projects such as a new road, pipeline, or residential development. In the past, ConSites were delineated by hand. In addition to being cumbersome and overly time consuming, manual delineation was fraught with inconsistencies in the way different biologists determined where to draw the boundaries. I have developed a suite of Python script tools to delineate site boundaries in a more repeatable, standardized manner. The first step in the process is to generate Site Building Blocks (SBBs), consisting of buffers around individual natural heritage resources. The next step is to automatically cluster the SBBs into sites in an objective and consistent manner, while accounting for the presence of roads, waterways, core blocks of natural land cover, and unsuitable areas to be excluded according to specific criteria. We are working toward updating all of our terrestrial ConSites with this new methodology.

Explore Natural Communities

Erin Lunsford Jones and Alli Kenlan, NatureServe

ExploreNaturalCommunities.org is a conservation tool that anyone can use to identify natural communities. With it, land managers, interpreters, and cultural resource managers can more easily interpret and manage the natural resources at their parks. The interactive website is accessible and mobile friendly, serving information about natural communities and natural history to park stewards and visitors alike. Interactive maps of natural communities in places such as national parks allow users to dig deeper for descriptions, explanations, and photos of the plants, animals, environment, and natural processes. Participants will see the current web development for parks in the NPS National Capital Region, but this website is designed to gradually scale up to include an ever-growing number of public and private places with vegetation maps. This presentation will highlight the website and the features it offers, as well as delve into the benefits and challenges of similar online tools.

Leveraging Biodiversity Data to Empower Kids to Act on Behalf of their Ecosystems

Courtney Kimmel, Captain Planet Foundation

The moment kids learn about threatened and endangered species, we as adults and educators are presented with an opportunity. Their natural empathetic desire to act on behalf of species in danger is strong, but unless we provide guidance for how kids can make meaningful contributions towards a solution to the problem, we risk extinguishing that spark of empathy and unintentionally cultivating a sense of apathy. Project Hero offers a tool for catalyzing that empathy into action. Drawing on NatureServe data, Project Hero challenges kids to accept Quests to help species and ecosystems in trouble, resulting in real-world conservation and advocacy projects. Quests are codesigned with conservation organizations across North America (currently) to leverage existing content and to mobilize young people around their priorities. Project Hero is launching for full use in Fall 2018 with four initial Quests focused on Pollinators across the United States, the Longleaf Pine Ecosystem in the Southeastern United States, Wolves (and their potential reintroduction) in the Southern Rockies, and Freshwater Species in Minnesota.

Plant Identification Tools and Resources: The SERNEC Portal and North Carolina Contributions

Alexander Krings, NC State University Herbarium

Organismal identification is prerequisite to studying and communicating information in biology. Technological advances over the past decades have facilitated development of numerous new “big data” biocollections digitization efforts, as well as novel diagnostic resources. An overview of one of these efforts, the NSF-funded SERNEC portal, and its capabilities, as well as select new plant identification tools developed by North Carolina teams, will be provided.

Longleaf Conservation Roadmap

Hervey McIver, Jodie Lapoint, Margaret Fields, and Liz Kalies; The Nature Conservancy

A conservation target for The Nature Conservancy’s North Carolina chapter is the longleaf pine ecosystem. High quality longleaf pine systems are generally characterized by a canopy of widely-spaced longleaf pines with an herbaceous ground layer and associated wetlands; but this simplified description masks the incredible biological diversity within this system and the significant variation between longleaf forests in different regions. The ultimate goal for TNC is to conserve a “resilient” longleaf pine ecosystem. A resilient

ecosystem is more likely to maintain its composition, structure, and functions, even in the face of disturbance or change. A longleaf pine ecosystem is more likely to be resilient if it has large connected blocks of intact forest, the presence of characteristic natural communities and species, and a periodic fire regime. A spatial analysis was developed to guide TNC's conservation planning and activities across the range of longleaf pine forests in North Carolina. The specific objectives of this assessment were to: (1) map the current extent of longleaf pine and associated habitats in North Carolina based on available data, (2) establish a definition of a resilient longleaf pine ecosystem and use this definition to evaluate the potential ecological resilience of the existing habitat, (3) identify the optimal location of corridors that could connect longleaf pine habitat for the purposes of enhancing ecosystem resilience, and (4) produce a map that would serve to identify areas in which to focus land conservation efforts for the purpose of achieving a more resilient longleaf pine ecosystem. For TNC, conservation of a resilient longleaf pine ecosystem means focusing conservation efforts in places where a longleaf pine ecosystem is likely to persist in the long term and implementing strategies aimed at increasing its resiliency.

Integrating Range-restricted Imperiled Species Conservation into the South Atlantic Conservation Blueprint

Rua Mordecai, South Atlantic Landscape Conservation Cooperative

Most large landscape planning efforts focus on a few charismatic species or broadly defined environmental conditions. While this approach may be sufficient for some species, it often fails to address major drivers of regional biodiversity. The South Atlantic Conservation Blueprint is a living spatial plan identifying priority areas for shared conservation action in the face of future change. The Blueprint prioritizes the lands and waters of the South Atlantic region based on ecosystem indicator models and a connectivity analysis. It covers parts of six states and has involved more than 500 people from over 150 organizations. We will discuss three of the approaches within the Blueprint designed to address the large number of imperiled and range-restricted species of the South: 1) direct and model-based use of biodiversity data, 2) terrestrial and freshwater resilience, and 3) complementarity-based analysis.

Green Growth Toolbox: Wildlife and Natural Resource Stewardship in Planning

Olivia Munzer, Kacy Cook, Gabriela Garrison, and Brooke Massa; NC Wildlife Resources Commission

Spread-out development patterns, driven by land use decisions, are a top threat to wildlife, habitats, and biodiversity in North Carolina. More centralized development patterns that conserve, buffer, and connect priority wildlife habitats will improve natural resources and biodiversity as well as their benefits, including economic vitality and community resilience to climate-related hazards. Access to biodiversity conservation data, information, and conservation planning methods has been identified as a need by local land use and transportation planners in NC to reduce development impacts. In response, the N.C. Wildlife Resources Commission and the N.C. Natural Heritage Program (NCNHP) partnered to provide local governments with the Green Growth Toolbox (GGT), the NC Conservation Planning Tool, and the NCNHP Natural Heritage Data Explorer. These tools make biodiversity conservation data, information, recommendations and maps accessible to planners and communities through training workshops, online resources, and technical assistance. We will discuss these tools and how they have been implemented by communities.

Museum Informatics Data Security: A Need for Collaboration

Zack Murrell and Michael Denslow, Department of Biology, Appalachian State University; Herrick Brown, SC Department of Natural Resources Heritage Trust Program

Museum informatics has received a significant financial boost over the past five years via the National Science Foundation program Advancing Digitization of Biology Collections (ADBC) funding. Through this funding, the iDigBio “hub” at the University of Florida and the 20 Thematic Collections Networks (TCN) have made significant strides in digitization of the estimated one billion museum specimens housed in the USA. Web portals, such as Notes from Nature, have been developed that allow the public to augment specimen records by transcribing label data. Other portals, such as GeoLocate, and software backbones, such as Symbiota, allow the public to assist in georeferencing specimens. The SouthEast Regional Network of Expertise and Collections (SERNEC) is a TCN in its fourth year of NSF funding that is working to mobilize 4 million of the 15 million herbarium specimens housed at 233 herbaria in the Southeast. Working with natural heritage programs in the region, we have made decisions regarding what data should be “masked” to avoid poaching or destruction of rare species and critical habitat, yet these decisions are compromised by political boundaries and taxonomic instability. There is a significant need to formalize this process, to ensure protection of sensitive data while at the same time allowing data access for transcription and/or georeferencing. To meet this need we must identify the agencies and institutions that should be included and facilitate meetings and conferences to address strategies to balance data protection and data acquisition.

Southern Open Pine Rapid Assessments (Level 2 EIA)

Carl Nordman, NatureServe

NatureServe has partnered with NHPs, EDF, the U.S. FWS and the U.S. Forest Service to develop and implement rapid ecological integrity assessments (Level 2 EIA) for longleaf pine and other southern open pine ecosystems. Early in 2016 NatureServe and the U.S. FWS completed a regional rapid assessment method for southern open pine ecosystems. During 2017 we continued this work with partnerships with EDF, Florida Natural Areas Inventory, South Atlantic LCC, and the U.S. Forest Service, with data collection efforts on Apalachicola and Francis Marion National Forests. Areas of work have included project customizations of data collected and metrics, addition of GIS based metrics for landscape condition (Level 1 EIA), development of user friendly tools, use of these metrics for fire effects monitoring, and EIA metrics for herbaceous plant composition.

Florida Forever Conservation Needs Assessment

Jon Oetting, Florida Natural Heritage Inventory

Since 2001 we have conducted the Florida Forever Conservation Needs Assessment, a comprehensive GIS natural resources analysis to evaluate and score projects for the Florida Forever land acquisition program. More recently we’ve been doing similar work for other land acquisition programs including Rural and Family Lands. The work relies on our Element Occurrence data as well as a range of statewide natural resource mapping we’ve done. We’d like to give a broad overview of this work and highlight some current efforts we’re working on or exploring.

Ecological Integrity Assessment in Arkansas

Milo Pyne, NatureServe

Over the past decade, NatureServe has been working with the Arkansas Natural Heritage Commission – Arkansas Heritage Program to develop a new classification of Arkansas Natural Communities and develop Ecological Integrity Assessment (EIA) protocols for identifying high quality element occurrences (EOs) of those natural communities. The Arkansas classification is based on Ecological Systems developed by NatureServe in collaboration with member program networks and other partners that group together similar associations in the U.S. National Vegetation Classification (USNVC). There are 50 systems and 270 associations in Arkansas. Systems are often more easily mapped in the field, facilitating documentation of occurrences. NatureServe developed EIA protocols, including rapid field-based metrics and ranking criteria, for wetland communities of the United States with support from EPA and has worked with various member programs to extend the protocols to upland communities. For this project, NatureServe and Arkansas adopted the wetland EIA protocol and developed new criteria needed to assess upland communities. The Arkansas natural community types were combined into 8 general wetland types (USNVC formations) and 8 general upland types that could be assessed using the same or similar metrics. The metrics assess three primary factors of community occurrences: Landscape Context, Condition, and Size. Each general feature incorporates more specific factors: Landscape Context includes landscape and buffer; Condition includes vegetation, hydrology, soil, and natural disturbance; and Size includes absolute patch size/patch type and change in size. The same general metric often applies across the general wetland or upland types but may have variants that are specific to a particular general type. In Arkansas, Landscape Context is assessed with 6 metrics having no variants, Condition is assessed with 13 metrics with a total of 49 variants, and Size has one metric with 9 variants. All metrics are managed in NatureServe's EcoObs database. Field testing of the EIA protocols and their use for producing EO RANKS (conservation value ratings) will be conducted this season on a number of Arkansas EOs.

Southeastern Partners in Plant Conservation

Carrie Radcliffe, Atlanta Botanical Garden

The inaugural Southeastern Partners in Plant Conservation (SePPCon) meeting was held November 1–3, 2016 on the grounds of the Atlanta Botanical Garden. This event was coordinated by the Atlanta Botanical Garden's Center for Southeastern Conservation and cosponsored by the U.S. Fish and Wildlife Service, U.S.D.A. Forest Service, National Wildlife Refuge Association, Georgia Department of Natural Resources, and the Georgia Plant Conservation Alliance. The meeting was attended by about 160 people from 22 states, the U.S. Virgin Islands, and Puerto Rico and served to fill information gaps for 82 at-risk plant species that have been petitioned for federal protection by the Center for Biological Diversity. Planning sessions helped to validate and supplement critical information on the status and needs for at-risk and federally listed plant species by engaging individuals from a diverse group of organizations to identify information gaps and actions that should be or are already being applied to conserve these species. By creating and enhancing proactive conservation opportunities, such as candidate conservation agreements and conservation alliances, SePPCon has facilitated networking, built capacity, and identified actionable items for conserving imperiled plants throughout the Southeast.

Inventory and Conservation Assessment of the Lepidoptera and Odonata Faunas of Virginia

Steve Roble, Virginia Natural Heritage Program

Since its inception in 1986, the Virginia Natural Heritage Program has been actively inventorying the Lepidoptera and Odonata faunas of the state. Virginia's Odonata (dragonflies and damselflies) fauna consists of 196 confirmed species, ranking second among U.S. states. Extensive inventory during the past 30 years has helped to greatly refine the list of tracked species, which includes several globally rare dragonflies. The Lepidoptera (butterflies, skippers, and moths) fauna of Virginia includes about 170 species of butterflies and skippers and an estimated 2,500 moths. Among these are the federally endangered Mitchell's Satyr (*Neonympha mitchellii*) and more than 100 macromoth species that were previously unknown from the state. The Virginia Natural Heritage Program has developed an online atlas that includes nearly 200 of the state's rarest species of Lepidoptera and Odonata and established two state natural area preserves to protect habitat for Mitchell's Satyr.

Broad-scale Camera Trap Surveys

Stephanie Schuttler, NC Museum of Natural Sciences

Monitoring mammal population trends across large scales is necessary for their conservation and management yet is frequently difficult to achieve. Citizen science, where volunteers participate in authentic scientific research, is uniquely suited to solve this problem as data collection can be crowd-sourced across large scales. Here, we present protocols to camera trap mammals using eMammal citizen science across large scales. In eMammal, volunteers participate in virtual training to ensure camera traps are deployed according to standardized protocols in their backyards, other private sites, or public property. Volunteers collect camera trap images over the course of three weeks, identify and upload species using eMammal software, and receive deployment summaries and feedback on identifications after expert review of the photos. We have several programs integrating eMammal into school classrooms and have developed lesson plans aligning with state and national science standards to broaden participation with youth volunteers. Our results have provided insight on how mammal communities respond to hunting and human recreation, and how they vary across the urban-wild gradient that surrounds most cities. Currently, we are running the largest camera trap study across the state of North Carolina, using eMammal in the Candid Critters program, to survey wildlife in all 100 counties across the state.

Landscape Scale Conservation: What's in Your Toolbox?

Cindy Simpson, NC Wildlife Resources Commission; Lori Scott, NatureServe

The NC Wildlife Resources Commission is responsible for the planning, development, and implementation of the state's Wildlife Action Plan. The Plan provides a statewide conservation vision and calls for supporting outreach and partnerships for landscape-scale conservation action. To accomplish this, WRC uses several important tools that map where existing conservation is on the landscape and that use spatial data to model and analyze areas where species-habitat associations have been identified. The results from the spatial analysis and modeling identify landscape-level conservation needs and potential Conservation Opportunity Areas. One tool in WRC's toolbox is NatureServe's LandScope America. LandScope assembles hundreds of authoritative maps to guide conservation planning and collaboration and now includes the Conservation Registry, an online database that tracks and maps conservation, restoration, and wildlife projects. Using LandScope, state agencies and other organizations can create their own custom portal to guide landscape scale conservation efforts.

Species Distribution Modeling Network Workshop

Regan Smyth, NatureServe; Jon Oetting, FL Natural Areas Inventory; Anne Chazal, VA Natural Heritage Program

In this interactive workshop, we will explore how species distribution modeling (SDM) can best be applied to support the biodiversity information and conservation goals of the NatureServe network. We will provide a brief overview of current distribution modeling initiatives, share network resources for modeling, and solicit feedback on how better to facilitate network collaboration on SDM projects. The remainder of the session will be devoted to discussion of how model outputs are, or could be, used to advance programmatic objectives, from use in environmental review to creating demand for new inventories. Data sharing considerations for multi-jurisdictional modeling, as well as the interplay between element occurrence data and SDMs, will be explored.

North American Coastal Plain Global Biodiversity Hotspot: Botanical Facts and Figures

Bruce Sorrie, NC Botanical Garden Herbarium

The North American Coastal Plain has recently been recognized as the 36th Global Biodiversity Hotspot. Botanically, such a designation requires a minimum of 1,500 endemic plant taxa; in fact, the CP Hotspot supports 1,816. The CP Hotspot supports 6,200 native plant taxa, nearly 1/3 of the entire native flora of North America. The CP Hotspot has a speciation rate of 29.3 percent. Phytogeographic patterns of CP endemics were examined by Bruce Sorrie and Alan Weakley in 2002. The top 10 states with the most CP endemics are discussed here.

Prioritizing Important Plant Conservation Sites of North Carolina

Lesley Stark, NC Department of Agriculture and Consumer Services-Plant Conservation Program

The Plant Conservation Program (PCP)'s mission is to conserve the native plant species of North Carolina in their natural habitats, now and for future generations. PCP uses biodiversity data to set and track priorities across the state with a goal of protecting the most viable populations for each state-listed species in each ecoregion it naturally occurs. The result is a prioritization plan of Important Plant Protection Sites from which PCP can quantify conservation successes and identify future protection projects based on the greatest need. PCP uses this plan to guide acquisition of sites as Plant Conservation Preserves as well as partnerships with conservation organizations and governmental agencies for the protection of North Carolina's imperiled plants.

The Eno-New Hope Landscape Conservation Project: Combining Biodiversity Data, Corridor Analysis, and Collaborative Planning to Promote Regional Habitat Connectivity

Julie Tuttle, Eno-New Hope Landscape Conservation Group

Local county governments, nonprofit conservation organizations, and land managers in the North Carolina Triangle are collaborating to identify high-priority landscape corridors that connect a network of critical wildlife habitats within the Jordan Lake watershed and across the "land bridge" between New Hope Creek (Cape Fear River Basin) and the Eno River (Neuse River Basin). A grant from the North Carolina Wildlife Resources Commission's Partners for Green Growth program supports corridor analysis and development of conservation policy recommendations based on the results. Our approach integrates landscape analysis with biodiversity data from NCNHP, NCWRC, and the North Carolina Biodiversity Project to identify

corridors that are biologically functional or restorable. This presentation will describe our approach, results, and the group's plans to implement policies that help focus and align protection efforts across jurisdictions.

The Chatham Conservation Partnership: A Model for Conservation Planning, Action, and Implementation at the Local Level

Allison Schwarz Weakley, Town of Chapel Hill Stormwater Management

The Chatham Conservation Partnership (CCP) is a collaboration of local, state and federal government agencies; nonprofit organizations; businesses; and individuals whose mission is “to develop and implement strategies for a community conservation vision that builds awareness, protection and stewardship of natural resources in Chatham County, North Carolina.” The CCP serves as a model for local conservation planning, action, and implementation for other communities in North Carolina and beyond. For over 10 years, the CCP has been holding quarterly meetings on conservation and environmental topics and providing a place for resource professionals and community members to learn and share ideas regarding the county's most pressing environmental issues. In 2011, the CCP created the state's first countywide comprehensive conservation plan, which has been used in several other planning projects in the county, including municipal planning and policy projects, and in the county's recent Comprehensive Land Use Plan update. This presentation will highlight the successful use and application of statewide and local conservation data and information in land use plans, in regulations and policies, and in online map applications at the local government level. The CCP is a volunteer-led organization and quarterly meetings are open to anyone who has an interest in Chatham County's natural resources.

Ecological Integrity Framework and Applications (Including and Beyond the EO)

Rickie White, NatureServe

In this session, we will highlight two approaches to ecological integrity assessment (longleaf pine community EIA and Arkansas state EIA) and explain how this methodology and tools we have developed around it can help with more efficient conservation assessment and monitoring and can even be integrated into our standard element occurrence methodology.

Overcoming Challenges to Using eBird Data in Heritage Contexts

Bruce Young, NatureServe

As the largest citizen science project in the world, Cornell's eBird program arguably could have great potential for supplementing Heritage data in a wide range of state-level conservation activities. However, challenges caused by spatial uncertainty, observer reliability, biases in where observations take place, limited ancillary data, and the sheer volume of eBird data can deter its use. Here we will review the results of a year-long study by a team of Heritage zoologists and data managers to understand eBird data and learn how it can best be used in Heritage contexts, from complementing EO databases to supporting species distribution modeling and ranking.