POSTER SESSION ABSTRACTS

Wednesday, October 8th / **Poster Social & Silent Auction** / 5:30 p.m. – 7:00 p.m. / **Atlantic Foyer**

Visit with poster authors during the designated Poster Social. Poster abstracts are listed here in alphabetical order by primary author's last name.

Tools for Protected Area Monitoring & Management in Belize

Brett Bailey, University of Massachusetts, Amherst; David I. King, USFS Northern Research Station; Matthew Jeffery, National Audubon Society, Washington D.C.; Dominique Lizama, Belize Audubon Society

This project has been undertaken to aid conservation efforts in Belize by identifying indicator species and developing an "Index of Ecological Integrity" using birds as indicators. These tools can then be used to establish baseline conditions of ecological integrity for protected areas and to gauge changes over time or in response to specific influences, natural or anthropogenic. A secondary goal was the evaluation of habitat use by migrants such as the Wood Thrush and Golden-winged warbler. The first phase of data collection took place from January 7th through April 6th 2014. Four field ornithologists worked alongside Belize Audubon staff to survey the avian communities present in the east and west basins of Cockscomb Basin Wildlife Sanctuary (CBWS). Initial findings include: a.) A total of 241 species were encountered. b.)Capture rates were higher than reported from most Central American studies. c.) We detected only 3 Golden-winged Warblers, confirming that CBWS lies outside their core winter range. d.) Point count and banding data revealed that the park hosts a high density of Wood Thrush across all ecosystems. e.) Wood Thrush body condition metrics were positively correlated with habitats dominated by mature trees, young palms, and ferns. f.) Initial analysis of vegetation data revealed significant differences in capture rates by ecosystem, elevation, and Enhanced Vegetation Index. These preliminary data reinforce the fact that the CBWS is a valuable site for birds, particularly Wood Thrush. Since overall bird diversity as well as Wood Thrush abundance and body condition varies with habitat conditions, it will be possible to use these data to highlight areas within the refuge that are most valuable for birds as well as to identify habitat conditions most associated with bird diversity and Wood Thrush numbers. These habitat conditions can potentially be promoted through management to enhance habitat quality for Wood Thrush and other forest birds. Finally, the high numbers of Wood Thrush encountered suggests the CBWS is a premier site for the conservation of this declining priority species and that it would be a suitable site for further detailed demographic study to promote its conservation and management.

Floating Habitat Islands for Salt Marsh-Nesting Birds

Bri A. Benvenuti, University of New Hampshire; Adrienne I. Kovach, University of New Hampshire; David M. Burdick, University of New Hampshire; Jonathan B. Cohen, State University of New York – College of Environmental Science and Forestry; Chris S. Elphick, University of Connecticut; Thomas P. Hodgman, Maine Department of Inland Fisheries and Wildlife; Kathleen M. O'Brien, U.S. Fish and Wildlife Service; Brian J. Olsen, University of Maine; W. Gregory Shriver, University of Delaware

Tidal marsh birds are severely threatened by the impacts of rising sea levels on salt marsh ecosystems. Changes in vegetation, loss of nesting habitat, and increased tidal inundation will reduce, if not eliminate, the reproductive ability of marsh-nesting birds, such as the Saltmarsh Sparrow. Conservation actions are needed in the very near-term to identify solutions to mitigate nest flooding and maintain breeding populations until habitat is created in the longer term by accelerated marsh migration or other habitat restoration efforts. In this pilot study, we explored the potential of floating habitat islands to provide Saltmarsh Sparrows with nesting habitat that is free of tidal flooding. A 10 ft x 5 ft floating island raft was constructed from a 2-inch PVC pipe frame, held together by plastic mesh garden fencing, filled with wrack and flotation devices, and planted with vegetated pieces of peat, 4 x 6 inch squares of marsh sod (Spartina patens), and bare root Spartina alterniflora. The island was deployed on a marsh in the Rachel Carson National Wildlife Refuge in Wells, Maine, in a shallow pool and anchored with cinder blocks, allowing it to rise and fall with the tide but not to flood. We monitored the status of the island for 3 months, confirming that it did not flood during high tides. Preliminary findings suggest floating islands may be a feasible means of providing breeding habitat for salt marsh nesting birds, and we are making modifications to the design for further trials next year.

POSTER SESSION ABSTRACTS

The All-Bird Bulletin: Twelve years of Bird Conservation News and Information

Roxanne E. Bogart, U.S Fish & Wildlife Service; Allison Vogt, Association of Fish and Wildlife Agencies

The All-Bird Bulletin, the newsletter of the North American Bird Conservation Initiative (NABCI), has been presenting bird conservation news and information to North American audiences for the last 12 years. The role of the All-Bird Bulletin is to provide bird conservationists with information on cutting-edge strategies and perspectives that are moving conservation forward, as well as to provide a historical perspective to gauge progress.

Over the last ten years, the publication has evolved to the extent that it is now a theme-based publication that targets specific topics related to all-bird conservation, which reflect priorities of the U.S. NABCI Committee. Such topics have included conservation design, adaptive management, prairie conservation, citizen science, and human dimensions of bird conservation. During this interactive poster session, conference attendees will provide feedback on their knowledge of and attitudes about past issues as well as ideas on future topics and modes or vehicles of transmission. Understanding the perspectives of various audiences will help shape future issues of The All-Bird Bulletin and identify themes of importance to bird conservationists working regionally and locally.

The poster session will also examine all of the thematic issues over the last 12 years and discuss significant events in the evolution of all-bird conservation in North America during this time period. The continued evolution of bird conservation toward landscape-scale conservation, business planning, human dimensions, and addressing issues such as energy demands and climate change will be discussed in the context of the future of bird conservation and its needs and priorities to address these complex 21st century challenges.

Broad-scale Mapping and Monitoring of Migratory Landbird Stopover Sites Using the National Network of Weather Radars

Jeffrey Buler, Department of Entomology and Wildlife Ecology; Deanna Dawson, United States Geological Survey,Patuxent Wildlife Research Center; David La Puma, Department of Entomology and Wildlife Ecology, University of Delaware; Jaclyn Smolinksy, Department of Entomology and Wildlife Ecology, University of Delaware; Tim Schreckengost, Department of Entomology and Wildlife Ecology, University of Delaware; J. Andrew Arnold, Department of Biological Sciences, Old Dominion University; Eric Walters, Department of Biological Sciences, Old Dominion University

Identifying important stopover sites is a critical step in development of comprehensive regional conservation plans for migratory landbirds. The national network of weather surveillance radars continuously records animals in flight and holds enormous potential for coordinated, continental-scale monitoring of migratory bird stopover distributions and movements. We summarized two recently completed studies using data from 24 radars in the eastern US to quantify the spatial stopover distribution of landbirds during fall migration in 2008 and 2009. For each sampling night, we mapped the radar reflectivity (i.e., relative density) of migrating birds aloft at the onset of their abrupt evening exodus from daytime stopover sites within roughly 80 km of each radar. We classified bird stopover use by the magnitude and variation of radar reflectivity across nights, and considered stopover sites "important" for conservation if bird density was consistently high. The resulting stopover map provides evidence that migrant densities are strongly spatially-structured by geography, landscape composition, and position along the migratory route at multiple scales. For example, important stopover sites were generally associated with deciduous forests embedded within landscapes dominated by developed or agricultural lands at a local scale, or near the shores of major water bodies at a broader scale. We developed statistical models that predict potentially important stopover sites in areas not sampled by the radars using various regression techniques including ordinary least squares, boosted regression trees, and geographically-weighted regression. We also describe ongoing studies to calibrate and validate these radar observations and predictive models through ground surveys of birds and supplemental radar observations. We will use ground-truthing data to improve the accuracy and value of our predictive models that can be used for identifying locally and/or regionally important stopover sites for conservation protection or enhancement and for identifying general migratory flyways of landbirds. We discuss the potential for 1) setting up a long-term monitoring program with infrastructure and software that is largely already developed and 2) analyses of the historical radar database to assess responses by migrating birds to changes in land use and climate.

Quantifying Spatial and Temporal Variation in Aquatic and Terrestrial Prey Abundance for a Riparian Songbird

Jenna Dodson, Center for Environmental Studies; Lesley Bulluck, Department of Biology, Virginia Commonwealth University, Richmond, Virginia

Independent pulses of terrestrial and aquatic insects provide significant food resources to riparian species. However, aquatic resources are often ignored in avian food availability studies, despite the fact that they can account for 50-90% of the energy budget for some species. Additionally, aquatic subsidies can harbor contaminants that affect terrestrial consumers. The aim of this study was to investigate the flux of both aquatic and terrestrial prey resources throughout the breeding season and assess how the factors of timing, absolute food supply, and spatial characteristics influence reproductive success of Prothonotary Warblers (*Protonotaria citrea*). Preliminary data from nest provisioning videos from the 2013 breeding season show that caterpillars and mayflies are the primary food items fed to nestling warblers, so those prey items were the focus of our sampling efforts. This study focused on two established nest box sites along the James River: Presquile National Wildlife Refuge and Deep Bottom Park, both in Henrico County, Virginia. Detailed demographic and morphometric data were collected for individuals throughout the breeding season. Caterpillar and mayfly abundance were sampled weekly, beginning in early April and mid- May, respectively. Caterpillar abundance was sampled using branch clipping, and mayfly abundance using black light traps. There were two distinct biomass peaks for each food source. For both sites, the main caterpillar peak occurred approximately ten days before the peak in egg production for the first clutch. A second caterpillar peak occurred two weeks after the peak number of second clutch nestlings. The mayfly peak was synchronous with the timing of peak incubation; a second, smaller peak occurred between the highest egg laying and nestling stages in the second clutch. Mayflies also emerged two weeks earlier along the riverfront than the back creek. Our results suggest that Prothonotary warblers time their breeding to take advantage of early peaks in caterpillar biomass for early egg production. The energy-demanding nestling stage of both clutches coincided with the highest availability of mayflies. Additionally, the spatial location of a nest (riverfront vs. back creek) affects the local food availability during a critical energy-demanding time.

Songbird Response to Forest Disturbance Due to Unconventional Gas Development in the Marcellus Shale Region

Laura S. Farwell, WV Cooperative Fish and Wildlife Research Unit, West Virginia University; Petra Bohall Wood, U.S. Geological Survey, WV Cooperative Fish and Wildlife Research Unit, West Virginia University; Randy Dettmers, U.S. Fish and Wildlife Service; Todd Fearer, Appalachian Mountains Joint Venture; Margaret C. Brittingham, Penn State University

In the last decade, extraction of natural gas from the Marcellus shale has increased exponentially in central Appalachia, a region considered an important conservation area for forest songbirds, including several species of conservation concern. Although drilling has occurred in both forested and agricultural landscapes, the majority of future wells are projected to be drilled on forested lands, many of which comprise core forest habitat. The shale gas industry has the potential to dramatically reduce forest cover in the region, and to leave remaining forests severely fragmented. However, efforts to research and monitor environmental impacts have been largely outpaced by the rapid expansion of the industry. To better understand the impacts of shale gas development on forests and breeding songbirds at a regional scale, we are currently conducting a region-wide, two-year "snapshot" study. We are assessing forest land cover change and songbird abundance, community composition, and distribution across a large spatial area (OH, PA, WV), to identify responses of breeding birds to Marcellus gas development of varying ages, densities, and patterns on the landscape. We seek to quantify how far edge effects extend into surrounding forests, and to identify potential thresholds of species and community response to land cover change due to shale gas disturbance. The extensive horizontal reach (1.5 km or more) of unconventional gas wells allows some flexibility in placement of pads and infrastructure in relation to target gas basins. We hope our findings will help natural resource managers and industry planners make informed decisions regarding optimal location and configuration of new well pads and infrastructure, while minimizing negative impacts to forest interior habitat and area-sensitive species. Coupled with recent Pennsylvania land cover change analyses (USGS) and model projections of hot spots for shale gas development (TNC), the results of this study may help identify forest areas of high conservation concern that stand to be heavily impacted, and which should be excluded from further shale gas development. This study will also provide regional baseline data that can be used to monitor bird populations and assess impacts over a longer period of time.

POSTER SESSION ABSTRACTS

Monitoring Avian Community Response to Landscape-Scale Controlled Burning in the Allegheny Highlands of Virginia

David Fox, Laurel Schablein, Marek Smith, L. Nikole Swaney —The Nature Conservancy

Prescribed fire has been identified as an important tool for addressing several areas of concern related to the health and resiliency of Appalachian pine-oak forest systems, particularly the lack of early successional habitat patches, decreasing structural and compositional diversity and low recruitment of oak and pine seedlings. However, the potential landscape-scale effects of prescribed fire on the avian community is not well-documented.

The Warm Springs Mountain Restoration Project (WSMRP) is a collaborative forest management initiative on 18,000 acres of land owned by The Nature Conservancy and the George Washington and Jefferson National Forests in Bath County, Virginia. Developed by the Central Appalachians Fire Learning Network (FLN), the WSMRP was designed to restore the role of fire to within its natural range of variability for Appalachian pine-oak forests through prescribed fire and to monitor the landscape-scale responses of associated bird and plant communities. Since 2008, FLN partners have conducted controlled burns on seven units totaling approximately 8,782 acres within the project area.

Annually since 2011, fixed radius avian point counts using a time-of-detection methodology have been conducted during peak breeding season at 107 permanent plots also sampled for pre- and post-burn vegetation structure and composition. Individuals were tracked to account for differences in detectability using standard mark-recapture analyses in Program MARK. As of 2014, controlled burns have been conducted on 55 (51%) of the permanent plots.
Our analysis of responses to prescribed fire has centered on the following focal species selected for their abundance, high detection probabilities, foraging niches, and nesting habitat preferences: Scarlet Tanager, Eastern Wood-pewee, Black-and-white Warbler, Hooded Warbler, Worm-eating Warbler, Ovenbird , and Eastern Towhee. We hypothesize that most species will have abundance that is relatively stable through time over the project area, but that species abundance will vary significantly in space in response to prescribed fire.

We report initial analysis on changes in relative abundance, diversity and species richness of the overall bird community and seven focal species over the first four years of the study period. Preliminary evaluation of changes in spatial arrangement of focal species in response to prescribed fire is also addressed.

Using Plasma Metabolites in Trans-Gulf Migratory Birds to Assess Refueling Rates on a Florida Gulf Coast Barrier Island

Mariamar Gutierrez Ramirez, Alan H. Kneidel, Lori A. Lester, Christopher M. Heckscher —NOAA Environmental Cooperative Science Center, Delaware State University Dover, Delaware*

Successful bird migration requires suitable habitat along migratory routes. For birds using a spring trans-Gulf migration strategy, barrier islands along the north coast of the Gulf of Mexico may provide critical stopover habitat, as they present the first opportunity for resting and refueling. These islands are also susceptible to the effects of sea-level rise. Approximately 7 km from the mainland, St. George Island, part of the Apalachicola National Estuarine Research Reserve, is one of four barrier islands at the southern edge of Apalachicola Bay, Florida. To assess the ecological function of this coastal resource, we studied thrushes (Catharus spp.) and Gray Catbird (*Dumetella carolinensis*) during spring 2013 and 2014. We documented the physical condition of birds, including body mass, subcutaneous fat reserves, and pectoral muscle score. We obtained blood samples for molecular sex determination and plasma metabolite profiling, used to assess stopover refueling performance. Triglyceride and beta-hydroxybutyrate assays were conducted on Gray Catbird (n=39, 2013; n=66, 2014) and thrushes (n=39, 2013; n=12, 2014). Upon arrival, birds had depleted fat reserves and low pectoral muscle scores. Recapture data indicated thrushes increased in mass, on average 0.6 g/day (n=6) in 2013. Our data indicate that Apalachicola barrier islands are important stopover sites comparable to those along the central and western Gulf coast. Our data will be integrated into a geospatial model to assess the risk of the resource to future climate change.

Using Genetic Tools to Inform Conservation of Saltmarsh and Nelson's Sparrows in BCR30

Adrienne I. Kovach, University of New Hampshire; Jennifer Walsh, University of New Hampshire; Kathleen M. O'Brien, U.S. Fish and Wildlife Service; Brian J. Olsen, University of Maine; W. Gregory Shriver, University of Delaware; Jonathan B. Cohen, State University of New York; Chris S. Elphick, University of Connecticut; Thomas P. Hodgman, Maine Department of Inland Fish and Wildlife; Oksana P. Lane, Biodiversity Research Institute

Saltmarsh and Nelson's Sparrows are priority tidal marsh species that breed in coastal marshes of BCR30, where they face threats imposed by rising sea levels. The Saltmarsh Sparrow is of highest priority and globally vulnerable to extinction, due to its limited range in the northeastern U.S., declining populations, and obligate habitat requirements. Within the northern portion of its range, the Saltmarsh Sparrow overlaps and interbreeds with the congeneric Nelson's Sparrow, thereby limiting the extent of pure populations and posing additional management challenges arising from difficulties in distinguishing pure and hybrid individuals. To aid in population assessments for conservation planning, here we describe results and ongoing research activities using genetic and genomic approaches to investigate metapopulation dynamics, interspecific interactions, and adaptive capacity of these tidal marsh birds on a regional scale. We used microsatellite genotyping to characterize dispersal, site fidelity and source-sink dynamics of Saltmarsh Sparrows from 21 marshes across the breeding range from Maine to New Jersey. We evaluate patterns of genetic variation and species distribution in relation to marsh-level characteristics. Within the overlap zone of Saltmarsh and Nelson's Sparrows, from southern Maine to northern Massachusetts, we developed a genetic hybrid index and evaluated the efficacy of plumage and other morphological variation in identifying hybrid sparrows. Using the genetic data, we identify patterns of introgression and the potential for movement and expansion of the hybrid zone. Lastly, we overview future research using whole genome and reduced representational sequencing to identify ecological adaptations to species-specific coastal and upriver niches. Understanding the species' adaptive capacity will facilitate predictions about responses to sea-level-rise-induced changes in coastal marsh distribution. Insight from these genetic investigations are integrated with demographic data collected via the Saltmarsh Habitat and Avian Research Program (SHARP) to inform conservation of these tidal marsh birds.

Griffin Groups: A Free Online Tool for Building a Community of Conservation Communities

Edward J. Laurent, Connecting Conservation

Griffin Groups (https://griffingroups.com) is a free online tool for building a community of conservation communities. Connecting Conservation designed Griffin Groups to address the need for integrated knowledge transfer across disciplines, organizations, tools, and geographies in order to assist the transformation of natural resource conservation as a practice from independent to coordinated activities that address strategic public-private partnership goals. In the most basic sense, Griffin Groups is a social network of social networks dedicated to conservation topics. It provides innovative, free, user-friendly methods to 1) create networked forums and websites, 2) aggregate dynamic content about conservation topics published through other web services, 3) integrate Griffin Groups forums into other web sites and services via URL, RSS feed, and an application programing interface (API), and 4) integrate other tools into Griffin Groups via similar methods. Examples of existing groups include those dedicated to Southeast Partners in Flight, Partners in Flight Steering Committee, US-NABCI Monitoring Subcommittee, and several groups dedicated to migratory bird species research and conservation.

Building a Midwest Grassland Network to Support Implementation of State and Regional Conservation Plans

Dan Lambert, High Branch Conservation Services, Hartland, VT; Rosalind Renfrew, Vermont Center for Ecostudies, Norwich, VT; Tom Will, U.S. Fish & Wildlife Service, Division of Migratory Birds, Bloomington, MN; Katie Koch, U.S. Fish & Wildlife Service, Division of Migratory Birds, Marquette, MI

Grassland bird populations are decreasing faster than any other group of breeding birds in North America, with especially pronounced declines occurring in the Midwest. Throughout the region, many organizations have developed plans to address the problem, including state agencies, Joint Ventures, Landscape Conservation Cooperatives, and single-species partnerships. The Migratory Bird Program of the U.S. Fish & Wildlife Service (FWS) is leading a new effort to create a network of grassland landscapes in the Midwest to support implementation of these state and regional conservation plans. The project will generate spatial information, strategic guidance, and cross-sector collaborations that uphold the many ecological and societal values of grasslands. The Midwest Grassland Network will serve the Upper Mississippi River/Great Lakes, Central Hardwoods, and eastern Prairie Pothole regions. During the first phase of the initiative, we will work with collaborators to: integrate spatial information about grasslands and grassland birds into a Midwest bird conservation map; integrate spatial information about grasslands and grassland birds into a Midwest bird conservation map; evaluate strategic options for promoting grassland landscapes; highlight innovative, cross-sector partnerships that work to conserve or restore grasslands; and provide a foundation for continued coordination of grassland bird conservation in the region. The Midwest Grassland Network represents the next step in the progression of the grassland bird conservation area concept, which has been implemented, modified, and evaluated at different spatial scales since it was first proposed in 1996. A common system for delineating and categorizing important areas for grassland birds will better equip bird conservationists to coordinate activities across the region and to forge productive partnerships with other grassland interest groups. In the face of ongoing agricultural intensification and land-use change, such alliances are vital to achieving habitat gains at the scale needed to stem long-term population declines.

POSTER SESSION ABSTRACTS

Distribution, Abundance, and Habitat Associations of Breeding Marsh Birds in Mississippi Tidal Marsh

Alison Leggett, Mississippi Department of Marine Resources and D. B. Warnell School of Forestry and Natural Resources, University of Georgia; Mark Woodrey, Coastal Research and Extension Center, Mississippi State University and Grand Bay National Estuarine Research Reserve; Robert Cooper, D. B. Warnell School of Forestry and Natural Resources, University of Georgia; Nathan Nibbelink, D. B. Warnell School of Forestry and Natural Resources, University of Georgia

Marsh bird abundance and habitat associations for Mississippi tidal marshes are poorly understood and this habitat type is declining at an alarming rate. To study the impacts of marsh loss on breeding marsh birds and to create appropriate protective measures through restoration and management, we must first understand the drivers influencing current distribution and density. From 2012 - 2013, I conducted point counts at 212 sampling locations and determined density estimates for Clapper Rail (*Rallus longirostris*), Least Bittern (*Ixobrychus exilis*), and Seaside Sparrow (*Ammodramus maritimus*). These estimates were used to model a priori hypotheses describing observed patterns in species distribution and life history requirements.

Results indicate high spatial and temporal variability in species densities between sites, routes, and marsh complexes. Investigation into factors affecting this variability indicate that wetland availability, as well as plant community composition and structure, most influenced Clapper Rail abundance. Least Bittern abundance was most influenced by salinity, available emergent wetland, and vegetation height. Seaside Sparrow abundance was most influenced by unsuitable habitat, available emergent wetland, and vegetation composition.

These results will aid managers when determining species conservation strategies and prioritizing restoration and management activities in Mississippi's tidal marshes.

The Canadian Migration Monitoring Network - Réseau canadien de surveillance des migrations: Advancing Migratory Bird Research Across Canada

Tara L. Crewe, Bird Studies Canada; Marcel A. Gahbauer, Migration Research Foundation, McGill Bird Observatory; Marie-Anne R. Hudson, McGill Bird Observatory, Environment Canada; Alaine Camfield, Environment Canada; Stuart A. Mackenzie, Bird Studies Canada, Long Point Bird Observatory

The Canadian Migration Monitoring Network -Réseau canadien de surveillance des migrations (CMMN-RCSM) was formed in 1998 as a cooperative venture among a dozen independent bird observatories with migration monitoring programs, Bird Studies Canada and Environment Canada's Canadian Wildlife Service. The network has since expanded to more than 25 independent bird observatories across Canada, monitoring over 375 species annually, many of which breed in Canada's boreal and tundra regions and are poorly monitored by the Breeding Bird Survey. As a large-scale collaborative network, CMMN-RCSM is uniquely positioned to contribute to the understanding of various aspects of bird migration at a national scale. These include effects of weather and climate change on bird migration, stop-over ecology, timing of migration (e.g. chronology/phenology), as well as energetics, physiology, disease, productivity and survival of birds.

CMMN-RCSM has recently participated in four collaborative national research projects: 1) contributing to the DNA barcoding of North American species, 2) contributing to modelling the spread of infectious disease into Canada through tick-borne vectors, 3) delineating catchment basins and place of origin of Canadian birds based on their isotopic signature, and 4) calculating trends in migratory bird populations across Canada. Trends were calculated for 14 stations with at least 10-years of data; Prairie and Eastern regions showed predominantly declining populations for all species guilds examined, whereas Ontario and Western regions showed predominantly increasing populations. Summarizing across Canada, about half of the species in most landbird guilds showed population increases, while the other half showed population declines. A better understanding of how regional population trends relate to specific geographical regions and overall national trends is a priority for the CMMN-RCSM. An upcoming synthesis of feather isotope analysis paired with band recovery data will strengthen our ability to do so. Additional collaborations among CMMN-RCSM members and with outside partners are being pursued to improve our understanding of the movement and population dynamics of Canada's birds.

Improved Forest Classification to Facilitate Landscape-Scale Conservation for Priority Forest-Breeding Birds

Michael Mitchell, Ducks Unlimited, Southern Regional Office; Randy Wilson, U.S. Fish and Wildlife Service; Daniel Twedt, U. S Geological Survey, Patuxent Wildlife Research Center, University of Memphis; Anne Mini, Lower Mississippi Valley Joint Venture & American Bird Conservancy; Dale James, Ducks Unlimited, Southern Regional Office; Keith McKnight, Lower Mississippi Valley Joint Venture

Lower Mississippi Valley Joint Venture conservation partners have implemented strategic habitat conservation for priority bird species via a landscape-scale approach to bottomland hardwood forest conservation and restoration. Bottomland hardwood forest in the Mississippi Alluvial Valley (MAV) has been dramatically reduced and fragmented, primarily from conversion to agricultural production, with only 20% of the original 10 million hectares remaining. Thus, landscape conservation design for the MAV prioritizes areas for reforestation, but priorities are contingent upon an accurate classification of forest cover. To characterize the forest landscape, we developed a repeatable forest classification system utilizing high resolution imagery, satellite imagery (Landsat 5 TM), and object based image analysis that allowed us to perform a large-scale forest assessment quickly and accurately as compared to traditional pixel based approaches. Our goal is to use this landscape-scale forest classification to refine and update a spatially-explicit decision support tool that defines reforestation priorities for forest breeding birds (Twedt et al. 1999, 2006). That decision support tool focuses on enhancing the core area of forest patches that support source populations of breeding birds. We re-defined forest core as forest that is >250 m from hostile habitats, such as urban or agriculture. The reforestation priority model is weighted based on different sizes of existing forest cores, distance between adjacent cores, and percent of forest cover in local landscapes. Our analysis quantified 1.8 million hectares of forest core and prioritized areas for reforestation. By capitalizing on new analytical tools, we are able to create a forest classification ruleset that produces accurate and repeatable results applicable to large landscapes without introducing interpretation error. The forest classification ruleset, and decision support tool that it will ultimately inform, provides the conservation community with a new tool to facilitate landscape conservation of forested ecosystems, assess the acres of reforestation activities, and quantify partner contributions to achieving objectives in the Partners in Flight North American Landbird Conservation Plan in a repeatable and transparent manner.

Lateral Export of Algal Bloom Toxin from Stream Systems: Effects of Microcystin on an Invertivorous Riparian Songbird

Nicholas Moy, Lesley Bulluck, Ph.D. —Biology of Department, Virginia Commonwealth University, Richmond, VA

The geographical extent of harmful algal blooms has increased over the last several decades and has become a global concern. Although the algal blooms themselves are considered to be natural phenomena, the growing extent and occurrence of harmful algal blooms is directly related to human-caused nutrient enrichment of freshwaters. Cyanobacteria blooms of the genus Microcystis are known for their production of microcystin, a class of hepatotoxins that can accumulate in vertebrates and invertebrates. Microcystin related mass mortality and illness have been documented in humans, fishes, aquatic invertebrates, and aquatic vertebrates making it a serious threat to public, economic, and environmental health. As most studies have focused on microcystin in aquatic ecosystems, this study uniquely investigates the lateral export of microcystin from aquatic to terrestrial ecosystems. Two established nest box sites along the lower tidal James River were studied. Microcystis blooms occur regularly but to varying degrees at each of these sites: Presquile National Wildlife Refuge (a high microcystin site) and Deep Bottom Park (a low microcystin site), both in Henrico County, Virginia. The presence of the toxin throughout a cross-habitat food web is reported in an emerging aquatic insect (*Hexagenia mayfly*), an invertebrate terrestrial predator (Tetragnathidae spider), and a vertebrate terrestrial predator (prothonotary warbler (*Protonotaria citrea*)). Nest provisioning video footage show that Mayflies and other aquatic subsidies make up greater than 60% of what prothonotary warblers feed nestlings during the spring and summer. Since microcystin is shown present in adult mayflies at this time, our results suggest that they may act as vectors passing the toxin to predators when consumed. Mayflies and spiders were sampled weekly, beginning in early April and mid-May, respectively. Mayflies were sampled using black light traps and emergence traps, and spiders were sampled opportunistically. Because the toxin accumulates in the liver seventy prothonotary warblers were mist-netted and sacrificed for testing. Our results show high levels of microcystin present in local Prothonotary Warblers with potential implications for effects on nestling body condition and reproductive success. Assessing the export of microcystin into terrestrial ecosystems via aquatic subsidies is important in understanding the true impact of harmful algal blooms.

POSTER SESSION ABSTRACTS

Cerulean Warbler and Associated Species Response to Silvicultural Prescriptions in the Central Appalachian Region

Gretchen E. Nareff, WV Cooperative Fish and Wildlife Research Unit, West Virginia University; Petra B. Wood, U.S. Geological Survey, WV Cooperative Fish and Wildlife Research Unit, West Virginia University; Todd Fearer, Appalachian Mountains Joint Venture; Keri Parker, VA Cooperative Fish and Wildlife Research Unit, Virginia Tech University; Mark Ford, U.S. Geological Survey, VA Cooperative Fish and Wildlife Research Unit, Virginia Tech University; Jeff Larkin, Dept of Biology, Indiana University of Pennsylvania; Scott Stoleson, Northern Research Station, U.S. Forest Service

We quantified songbird response to a range of forest management treatments in four states within Bird Conservation Region 28 during the 2013 and 2014 breeding seasons. Different silvicultural treatments (e.g., shelterwoods, clearcuts, variable retention harvests) are integrated into a mosaic of harvests at each site. The goal of the study is to recommend ways to improve breeding habitat for Cerulean Warblers (*Setophaga cerulea*) and associated songbird species through operational silviculture. We are using point counts (n=296 points in KY, PA, VA, WV) to evaluate changes in songbird abundance pre- and post-harvest, and spot mapping techniques (n=10 plots in WV) to evaluate changes in abundance and territory density of six focal species (Eastern Towhee [Pipilo erythrophthalmus], Indigo Bunting [Passerina cyanea], Hooded Warbler [S. citrina], Cerulean Warbler, Wood Thrush [Hylocichla mustelina], and Worm-eating Warbler [Helmitheros vermivorum]) representing a range of preferred basal areas pre- and post-harvest. In 2013, there were 17 Cerulean Warbler territories at harvested sites (0.23/ha) and 19 at unharvested sites (0.17/ha). In 2014, there were 27 Cerulean Warbler territories at harvested sites (0.33/ha) and 8 at unharvested sites (0.24/ha). At harvested sites in 2013 and 2014, Cerulean Warblers were detected at 34.6% of point count stations at harvest interior points, 16.0% of point count stations at harvest edge points, and 23.2% of point count stations in reference stands. Data from 2013 and 2014 will be summarized in more detail including pre- and post-harvest comparisons where harvests have been implemented. Ultimately we will quantify Cerulean Warbler selection for various vegetative characteristics (e.g. residual basal area, canopy structure, tree species composition) and for landscape characteristics (e.g. slope position, aspect, landform, and ecological land unit) at the point count and territory levels. We hope to explain how Cerulean Warblers select territories on a landscape-scale within an implemented harvest matrix that offers structural diversity to the birds and how other songbird species may be managed under the umbrella of Cerulean Warbler breeding habitat management. Our results will be used to refine the existing habitat management guidelines for Cerulean Warblers and associated species.

Latitudinal Trends in Saltmarsh Sparrow (*Ammodramus caudacutus*) Nest Failure from Competing Risks

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Saltmarsh Sparrows (*Ammodramus caudacutus*) are endemic to tidal marshes and breed exclusively in the northeastern United States. They are considered globally threatened due to declining populations, habitat loss, and sea level rise. Saltmarsh Sparrows are named on the National Audubon Society's current WatchList as a species of global conservation concern and on the International Union for Conservation of Nature's Red List as vulnerable. Working toward an assessment of the Saltmarsh Sparrow's global population status, we estimated the fecundity of populations across the majority of the species' range. From 2011-2013,
we conducted intensive demographic surveys of breeding Saltmarsh Sparrow populations in Maine, New Hampshire, Massachusetts, Connecticut, and New Jersey. We calculated average probabilities of nest failure for each population via MCestimate, a program created by the Environmental Protection Agency to estimate failure probabilities of competing risks by using a Markov Chain framework. Probability of depredation was greatest in New Jersey, and decreased northward in

Massachusetts and Maine. We also observed a weak latitudinal trend of increased flooding probability at higher latitudes. However, this trend was complicated by high degrees of interannual variability at all sites. Additionally, failure probabilities at the New Hampshire site deviated from our observed trends in depredation and flooding, likely because the site is farther inland and upriver than our other study sites.

Use of High Spatial Resolution Remote Sensing Data to Model Avian and Habitat Field Data From an Appalachian Mature Deciduous Forest, With Implications for Remote Sensing-based Biodiversity Assessment at Larger Spatial Scales

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One advantage of remote sensing data is the capacity for biodiversity and habitat assessment at multiple spatial scales. High spatial resolution aerial and satellite data further refines this assessment to a very fine scale. This is important, because these data may scale up to apply to larger areas or add information to coarse (i.e., landscape or larger) scale habitat maps. To increase its usefulness, the information content of fine scale remote sensing data needs to be compared to what can be obtained by intensive field surveys. I addressed this need for one important habitat type by using a high resolution (0.6 m panchromatic and 2.4 m multispectral) Quickbird satellite image to model habitat characteristics and local scale avian species richness and occurrence on ridgetops in an Appalachian mature deciduous forest in West Virginia. I found that spectral brightness and several measures of image texture (the spatial variability of image pixel values) were related to a gradient in forest composition and structure across the study area, ranging from less complex, chestnut oak-dominated forest to more complex, sugar maple-dominated forest. The richness of a subset of bird species closely associated with the well-developed understory of canopy gaps was positively and most strongly related to one of the simplest image texture measures, the standard deviation of panchromatic image pixel values. The occurrence of Eastern Wood-Peewee (*Contopus virens*) was negatively related to this image texture and its occurrence instead may have reflected a preference for chestnut oak forest. I found considerable overlap in field-collected habitat data at the territory level for the focal species Cerulean Warbler (*Setophaga cerulea*) and Ovenbird (*Seiurus aurocapilla*), and image data provided little differentiation between the territories of these species; instead, topographic aspect appeared to be more important. These findings indicate both the opportunities and the challenges to the use of high resolution remote sensing imagery to model forest birds and their habitat. Remote sensing-based biodiversity assessment at a local scale will likely improve as the technology and its application continues to advance, and make a valuable contribution to such assessments at larger spatial scales.

The Eastern Avian Data Center: A Product of the Eastern Avian Knowledge Network

Ed Laurent, Connecting Conservation; Troy Wilson, U.S. Fish & Wildlife Service

The Eastern Avian Data Center (EADC) is a website that provides access to many tools, including those to upload, integrate, and download bird monitoring data, visualize and query data on maps, and summarize bird data within specified locations and time periods. The overarching goal of the EAKN and the Eastern Avian Data Center is to improve the conservation of birds and their habitats through the use of data, the best available science, and open collaborative partnerships. To accomplish this we: 1) foster dialog among scientists, managers, and other stakeholders about the purpose and use of bird monitoring projects and data through Bird Habitat Joint Ventures, states, universities, NGOs and other EAKN partners; 2) establish and maintain a central location and data management solution for standardizing protocols, data entry tools, data archiving, and data access; 3) improve the quantity, quality, and availability of data for scientific research; 4) advance new analysis and visualization techniques to understand bird population dynamics; and 5) provide interactive tools to inform decisions for managers.