WELCOME!

Welcome to the Spring 2017 West Virginia Chapter of the Wildlife Society Conference. This conference promises to be an extremely informative and interesting get together for students, professionals and others all involved with the management and conservation of our wildlife resources all throughout the state.

Our expert speakers come from all over the state and represent various agencies, institutions, consulting companies and more. The officers of the WV Chapter of The Wildlife Society would like to thank each and every presenter. Without them, none of this would be possible. We would also like to personally thank all of the members of the audience for attending this conference.

Any feedback (both positive and negative) is appreciated to make any future conferences better. Please email any of the officers listed below to voice your concerns.

Thanks again for attending!!

West Virginia Chapter of the Wildlife Society Officers

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AGENDA

9:30 – 3:00 Registration

10:00 Welcome and Introductions *Jim Fregonara*
Morning Moderator *Jim Crum*

10:20 Identifying White-tailed Deer Genetic Neighborhoods at a Fine-scale to Evaluate Chronic Wasting Disease Spread *Darren Wood*

10:40 Vulture: the Private Life of an Unloved Bird *Katie Fallon*

11:00 Characteristics Related to the Use of Artificial Roosts by Bats in North Central West Virginia *Jesse L. De La Cruz*

11:20 Assessing Amphibian Ranavirus and Timber Rattlesnake (*Crotalus Horridus*) distribution in West Virginia *Kevin Oxenrider*

11:40 Timber Rattlesnake distribution in and around WVU and Coopers Rock State forests *Frank Jernejcic*

12:00 **LUNCH**

1:00 **POSTER VIEWING**

Afternoon Moderator *Mike Peters*

2:00 Using species distribution modeling to predict new occurrences of rare plants in West Virginia *Crystal Krause*

AGENDA

2:20 Notes on the Life History of the Cheat Mountain Salamander *Thomas K. Pauley*

2:40 Status of Herpetology in West Virginia *Thomas K. Pauley*

3:00 **BREAK**

3:20 West Virginia's Elk Re-introduction *Chris Ryan*

3:40 Lyme disease prevalence as it relates to vector and host Distributions on a temporal and spatial scale on Fort Drum Military Installation, New York. *Samantha Fino*

4:00 The West Virginia Field Office: Conserving Wildlife through Planning and Partnerships *Amanda Selnick*

4:20 Population objectives, bio-energetics and planning for future change for black duck habitat in the Chesapeake Bay *Tim Jones*

5:00 **Conference wrap up, paper & poster awards and door prizes followed by a WVTWS meeting.**

POSTERS

Alice Millikn Factors Influencing Salamander Hormones in Created Wetlands

Alissa Gulette Habitat Suitability of Restored Wetlands for Aquatic Turtles in West Virginia

Carl Jacobsen Terrestrial salamander response to prescribed burns and wildfires in the central Appalachians

Jesse L. De La Cruz Northern Bat Roosting Habitat in the Upper Ohio Valley

Julia Fregonara Salamander fungal disease prevalence in Wooster Memorial Park, Ohio

Katharine Lewis Wintering Avian Occupancy and Richness in West Virginia Agricultural Conservation Easement Wetlands

Thomas F. Rounsville, Jr. Development of a Rapid Presumptive Field Test for White-Tailed Deer Blood

ABSTRACTS

Abstracts are listed as they are presented in the agenda.

Identifying White-tailed Deer Genetic Neighborhoods at a Fine-scale to Evaluate Chronic Wasting Disease Spread

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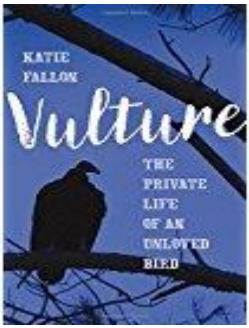
Chronic wasting disease (CWD) is a transmissible spongiform encephalopathy that affects the neurological system of white-tailed deer (*Odocoileus virginianus*) through the accumulation of protease-resistant prion proteins (*PRPcwd*) in the central nervous system. Landscape features have been shown to spatio-temporally influence the dispersal of free ranging white-tailed deer and therefore understanding how landscape attributes affect the movement of individuals can help predict the probability of infection to further populations. Since the discovery of CWD in West Virginia in 2005, an effort to monitor the distribution has included the testing of retropharyngeal lymph nodes for the presence of CWD using enzyme-linked immunosorbent assay (ELISA) and immunohistochemistry (IHC) is resulting in 182 CWD positive individuals. In addition to demographic data, locations of individuals were geo-referenced through harvest location identification to 1-km2 grid cell. To measure the dispersal of male white-tailed deer that are likely contributing most to CWD spread, genetic neighborhoods consisting of females >1.5 years old were created within Hampshire County, West Virginia. Each grid cell with a qualified female was represented and in instances where multiple individuals were located in a single grid cell, a randomly selected individual was utilized resulting in a total of 558 females. Individual genotypes were created through amplification of 16 microsatellite loci and the control region (d-loop) of the mitochondrial DNA. All male white-tailed deer testing positive for CWD (n=113) and 100 randomly selected CWD negative male individuals were assigned to their most likely genetic neighborhood to quantify dispersal distance.

The Private Life of an Unloved Bird

KATIE FALLON, Avian Conservation Center of Appalachia, 286 Fairchance Road, Morgantown, WV, 26508, (304) 685-5292, katie@accawv.org

This presentation is based on Fallon's new book, *Vulture: The Private Life of an Unloved Bird*, which chronicles the natural history of the turkey vulture (*Cathartes aura*). At least fifteen of the world's twenty-three vulture species are of conservation concern, but as one of the most widely distributed and abundant scavenging birds of prey on the planet, the turkey vulture counters this trend. In West Virginia, turkey vultures nest in caves and abandoned structures, soar on thermals and updrafts, and make use of "human subsidies" such as gut piles from hunter-killed game. The Morgantown-based Avian Conservation Center of Appalachia admits several turkey vultures a year for rehabilitation, and it participates in ongoing vulture research, including tagging and taking biological samples from nestling turkey vultures. In addition to natural history information, this presentation will discuss the need for conserving common species such as the turkey vulture.

Katie Fallon's newly published book:
Vulture: The Private Life of an Unloved Bird
will be available for sale throughout the conference.



Landscape Characteristics Related to the Use of Artificial Roosts by Bats in North Central West Virginia

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Abstract – Recent population declines of numerous bat species caused by the fungal pathogen *Pseudogymnoascus destructans*, including the threatened Northern Bat (*Myotis septentrionalis*), has heightened the need to conserve remaining populations and to promote reproduction. Research regarding the establishment and evaluation of effective conservation measures for *Myotis* bats is lacking, particularly summer roosting habitat on the Appalachian Plateau of north central West Virginia. Our research objectives were to evaluate the overall use of 3 artificial roost structures (i.e., rocket box, nursery box, and artificial bark) by bats, and to relate this use to local landscape characteristics. Monitoring of 306 structures detected use of 132 (43.1%) artificial roosts of which 54 (41.6%) were confirmed to house Northern Bats. Overall roost use was associated with southwestern aspects, higher elevation, and steeper slopes when contrasted with unused structures. Additionally, used structures were closer to forest edge, small core (<100 ha), and medium core (100-200 ha) forests. Nursery boxes were used more than expected based on availability, but rocket boxes accounted for 40 (74.1%) of the roosts used by Northern Bats and 77.7% of the structures to house maternity colonies. Furthermore, rocket boxes were the only structure to house maternity colonies at multiple life stages (i.e., pregnant females, non-volant pups, volant pups). Roost locations of maternity colonies and non-reproductive Northern Bats only varied in terms of distance to streams, with maternity colonies being significantly further away from the resource. The results of this study provide land and wildlife managers localized guidance on implementing effective conservation management techniques within the region.

Assessing Amphibian Ranavirus and timber Rattlesnake (*Crotalus Horridus*) Distribution in West Virginia

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Declines in amphibian and reptile populations have been attributed to habitat destruction and fragmentation, emerging diseases, and direct persecution in some species. The West Virginia Division of Natural Resources (WV DNR) has prioritized conservation actions to document and reduce the spread of amphibian and reptile diseases, as well as assess distributions of at-risk species in their 2015 revision of the State Wildlife Action Plan. Ranavirus is a disease that has caused local population declines in amphibians, fish, and reptiles, but large-scale population impacts are currently unknown. Ranavirus has been documented in several counties in West Virginia, but statewide surveillance for ranavirus has not occurred. The WV DNR will be completing a 3-year statewide ranavirus surveillance initiative, beginning in summer 2017. The WV DNR is requesting breeding pond locations of wood frogs (*Lithobates sylvaticus*) and/ or spotted salamanders (*Ambystoma maculatum*) to help in completing this initiative. The timber rattlesnake (rattlesnake) is thought to be declining throughout its range due to habitat loss, snake fungal disease, and direct persecution. The species has been documented in multiple counties throughout West Virginia, but distribution within occupied counties is lacking, making effective implementation of conservation actions difficult. The WV DNR will be using a citizen science approach to collect rattlesnake locations throughout West Virginia. This effort will increase our knowledge of rattlesnake distribution in West Virginia, and better direct conservation activities statewide by identifying occurrence gaps and conservation priority areas. We are requesting rattlesnake observations for individuals observed in West Virginia starting March 2017.

Timber Rattlesnake Distribution in and Around West Virginia University and Coopers Rock State forests

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Timber rattlesnake (*Crotalus horridus*) distribution was first determined by contacts with residents living adjacent to the forests and interviewing WVU and Coopers Rock forests personnel. Posters were displayed at trail heads and parking areas to solicit reports of encounters by the public. Additional encounters were obtained by hiking power line rights-of-ways. When possible, snakes were marked by painting the basal segments of the rattle and then released in place. Snakes encountered in several High Use Areas were captured, marked, and relocated. All encounters were mapped using Terrain Navigator. A total of 151 encounters were documented from April through September, 2016. Thirty snakes were marked and one was recaptured. Efforts will continue in 2017 to recapture marked snakes, mark new snakes, and locate suspected den sites.

Using Species Distribution Modeling to Predict New Occurrences of Rare Plants in West Virginia.

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To better understand the geographic range and habitat requirements of six federally listed threatened and endangered plants of West Virginia we developed MaxEnt species distribution models for Shale barren rock cress (*Arabis serotina*), small whorled pogonia (*Isotria medeoloides*), harperella (*Ptilimnium nodosum*), northeastern bulrush (*Scirpus ancistrochaetus*), Virginia spiraea (*Spiraea virginiana*), and running buffalo clover (*Trifolium stoloniferum*). The goals of this project were to help identify search areas of high quality habitat, gain insight on the physical requirements of each species, and to guide conservation planning. To reach these goals, we collected occurrence data from Natural Heritage Programs across each species range, assembled environmental variables to represent the physical environment, developed MaxEnt species distribution models, and developed a model verification process for field vetting.

Notes on the Life History of the Cheat Mountain Salamander

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The Cheat Mountain Salamander (*Plethodon nettingi*) was first observed in 1935 on Barton Knob (Randolph County). In 1938, it was described as a new species by N. B. Green and named in honor of his friend and colleague, Graham Netting. It was listed as a threatened species by the U.S. Fish and Wildlife Service in 1989. I began studying the Cheat Mountain Salamander in 1976. Here I present 40 years of data describing various aspects of its natural history. There are approximately 81 known populations in a range that extends from Blackwater River Canyon (Tucker County) south to Thorny Flat (Pocahontas County), 57 air miles. From west to east, range varies from 19 miles in the north to less than 2 miles in the south. The habitat consists of red spruce and hardwood forests above 610 m elevation in the north to above 1067 m in the south. Most Cheat Mountain Salamanders emerge in the spring when soil temperature reaches 8^{o} to 10^{o} C and above and submerge in October when soil temperature drops below 8^{o} C. Males show morphological sexual characteristics (squared snout and swollen cloaca) in late August or early September and retain these traits until late May or early June of the ensuing spring. Mature ovarian eggs are first observed though the body wall of females in August or September and remain visible until the following May or early June when oviposition occurs. Females deposit 4 to 29 eggs biennially. Eggs hatch in late August or early September.

Status of Herpetology in West Virginia

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Herpetological studies in West Virginia began with Dr. A. M. Reese, a vertebrate zoologist at West Virginia University from 1907 to 1946. One of his students, Dr. N.B. Green, became the first curator of the state collection located at Marshall University. Other early herpetologists who contributed to our knowledge of species in the state include Mr. M. Graham Netting, Mr. Neil D. Richmond, Professor Maurice Books, and Dr. Albert H. Wright of Cornell University. During the nearly 90 years of herpetological studies in West Virginia, numerous undergraduate and graduate students have contributed greatly to the state's collection and knowledge of herpetology. Presently, there are 49 species of amphibians and 41 species of reptiles known to occur in West Virginia. Dr. Mark B. Watson (University of Charleston) and I are currently putting the finishing touches on the state's first Amphibian and Reptile Atlas. The atlas will contain information from approximately 70,000 records including those of the authors, Dr. N.B. Green, and others who search for and study amphibians and reptiles in the state. It will also include records from the state amphibian and reptile collection housed at Marshall University (nearly 15,000 specimens) and from all major museums. In this presentation, I will discuss species with the least amount of data and areas of the state with the least number of records as well as the future of herpetology in West Virginia.

West Virginia's Elk Reintroduction

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Elk have been absent from West Virginia's hills for nearly 150 years. The 2015 West Virginia Legislature passed enabling legislation and established the *Elk Management Area* as 7 counties, or parts thereof, in southern West Virginia. In 2016, the Division of Natural Resources reintroduced 24 (12M:12F) elk from the United States Forest Service property at the Land Between the Lakes in Kentucky into Logan County on the Tomblin Wildlife Management Area (WMA). Most of the animals were equipped with real-time GPS transmitters to provide habitat, movement and survival data. The DNR plans to monitor these animals and stock additional elk in the future years. Twenty-two of the 24 remain alive and are staying on, or near the Tomblin WMA. In addition to stocking elk, the Wildlife Resources Section, along with many conservation partners, has secured nearly 44,000 additional acres for public access in the Elk Management Area. The Elk Management Plan calls on a stocking of at least 150 animals. The ultimate goal is to have a huntable population in the Elk Management Area.

Lyme disease prevalence as it relates to vector and host distributions on a temporal and spatial scale on Fort Drum Military Installation, New York

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In the Northeast, Lyme disease is the most common vector-borne zoonotic infectious disease spread by black-legged ticks (*Ixodes scapularis*). While host densities influence tick encounters, host specificity influences successful transmission due to varying reservoir competences. Due to the potential for impact, our objective was to estimate abundance and distribution of host populations on Fort Drum to better assess the potential risk of exposure of Lyme disease to active troops and their dependents. Sherman and Tomahawk traps were used to estimate small mammal abundance and diversity through mark-recapture in six habitat cover types. Ticks and ear punches removed from animals were screened at the Army Public Health Command at Fort Meade, MD with a real-time PCR multiplex for *Borrelia burgdorferi*. Species composition among 97 captured individuals was: 36% *Tamias striatus*, 30% *Peromyscus spp.*, 21% *Tamiasciurus hudsonicus*. Although approximately 52% of captured mice had an attached tick, compared to 26% of chipmunks, 100% of attached ticks on chipmunks tested positive, compared to approximately 33% of attached ticks on mice. The highest exposure rate of 47% occurred in developed landscape where trapping success and Simpson's diversity index were greatest at 13.54% and 0.57 respectively. We will continue to analyze 2016 field data and develop models for presentation, with our overall goal of developing temporal and spatial management recommendations for troop training, recreation, and habitat management on Fort Drum.

The West Virginia Field Office: Conserving Wildlife through Planning and Partnerships

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The West Virginia Ecological Services Field Office provides endangered species act consultations and coordinates the Partners for Fish and Wildlife program for the entire state of West Virginia. Located in Elkins, WV, the office consists of the program manager, four Endangered Species biologists, one Partners for Fish and Wildlife biologist, one administrative officer, one student trainee, two Americorps interns, and one Special Agent law enforcement officer. The staff works closely with many private and public partners to conduct restoration programs and to conserve habitat for threatened and endangered species. They also participate in internal efforts to review species for listing, delisting, or down listing, as well as for the designation of critical habitats. Biologists review project proposals to evaluate impacts to any listed species, and they work with project proponents to avoid and minimize any of those impacts, often incorporating conservation measures into project planning. Some accomplishments for our office include the removal of three dams on the West Fork River, continued protection and restoration of forested habitat and streams throughout the state, and increased efficiency through a streamlined project review process for WV Highways and WV Oil and Gas consultations.

Population objectives, bio-energetica and planning for future change for black duck habitat in the Chesapeake Bay

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Since the early 2000's, the Black Duck Joint Venture (BDJV) has partnered with the Atlantic Coast Joint Venture (ACJV) to implement a strategic habitat conservation process for American black ducks (*Anas rubripes)*. Together the BDJV, ACJV and their partners at state wildlife management agencies, Ducks Unlimited and several universities have conducted a series of replicated field studies, laboratory studies, and modeling efforts to estimate habitat carrying capacity for non-breeding black ducks using a bio-energetics approach (Cramer 2009, Lewis et al. 2010, Plattner et al. 2010, Jones 2012, Coluccy et al. 2014, Ringelman et al. 2015). We have developed a Decision Support Tool (DST) built on this previous research in an effort to help habitat planners quantify how much habitat is needed and where. Urbanization and sea-level rise are believed to be the two most important drivers of black duck habitat over the next 100 years. We incorporated both factors while assessing the amount of habitat available to support black ducks at the continental objective specified in the 2012 North American Waterfowl Management Plan. Estimates were aggregated to HUC12 watershed and can are presented as number of hectares of appropriate habitat to support population objectives for conditions at the present, 2030 and 2080.

POSTERS

Abstracts are listed alphabetically by the last name of the presentor.

Northern Bat Roosting Habitat in the Upper Ohio Valley

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Limited research has been conducted in regard to suitable roosting-habitat of Northern Bats (*Myotis septentrionalis*) in the Upper Ohio Valley. As Northern Bats continue to decline due to the fungal pathogen *Pseudogymnoascus destructans,* it will be necessary to understand habitat interactions of a remaining population stronghold in hopes of preventing regional species extirpation. Our research objectives were to determine average roost tree use and home range size, and to assess roosting-habitat suitability and availability across the landscape. We used a maximum entropy (MAXENT) approach to determine if the distribution of various ecological factors influenced roosting-habitat suitability of Northern Bats. We conducted mist-netting capture and radio-telemetry tracking across Monroe and Noble Counties in eastern Ohio, and Doddridge, Harrison, Marshall, Ritchie, and Tyler Counties in western West Virginia. Tracking efforts found 44 Northern Bat roosts comprised of 10 tree species and 1 man-made structure (i.e., telephone pole), with cavities (78.6%) of Sassafras (*Sassafras albidum*; n = 13) and Red Maples (*Acer rubrum*; n = 13) used equally and most often (59.1%). Furthermore, roosting home range size, based on 6 minimum convex polygons (MCP), was $\bar{x}$ = 7.4 ± 5.8 ha. Based on roost tree locations, MAXENT (AUC = 89.3 ± 2.9) characterized highly suitable roosting-habitat as being forest tracts of 100–200 ha that were non-forest $\geq$ 53 years ago. Additionally, suitable roosting areas were associated with elevations of 300–365 m and aspects of 200–300°. Slope and area solar radiation contributed little to the model and may not be limiting ecological factors. High (81–100%) and medium-high (61–80%) roosting-habitat suitability classes were uncommon across the landscape (0.9% and 3.1%, respectively), with the broad medium-to-high classes (41–100%) collectively comprising 13.8% of the study area. These results add to current knowledge of roosting-habitat of the Northern Bat and provide land and wildlife managers localized guidance on conservation priorities.

Salamander Fungal disease prevalence in Wooster Memorial Park, Ohio

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Salamanders worldwide have been experienced a decline in population due to a variety of potential causes, including climate change, pollution, and disease. Two of these diseases are Bd and Bsal (*Batrachochytrium dendrobatidis* and *Batrachochytrium salamandrivorans*, respectively). Bd is already known to be present in North American amphibians, while Bsal is not yet known to have entered the US. In my study, I examined the frequency of infection in several common salamander species in Wooster Memorial Park, (Wayne Co. Ohio), to compare infection frequencies between species, between microhabitat types (streams, floodplains, slopes, and ridgetops), and between seasons. Of the 188 skin swabs collected, three tested positive for Bd and 0 tested positive for Bsal. The three infected samples were all from northern two-lined salamanders (*Eurycea bislineata*) and were from stream microhabitats. All three of the infected swabs were collected in late summer. Although the small infection frequency precluded statistical analysis, this low infection rate is consistent with other studies done on salamanders in the eastern US. This study also provides important baseline information for disease occurrence and frequency in this area.

Habitat Suitability of Restored Wetlands for Aquatic Turtles in West Virginia

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Wetlands provide important habitat to many fish, birds, amphibians, and reptiles. Wetland loss in the United States has been remediated in part by wetland restoration on agricultural lands through the Wetlands Reserve Program, operated by the Natural Resources Conservation Service. Aquatic turtles are particularly common in permanent and semi-permanent wetlands and serve as apex predators. In this study we are seeking to quantify habitat suitability of restored wetlands in West Virginia for aquatic turtles, relative to reference wetlands on nearby agricultural lands. At each wetland, turtle populations will be sampled using baited hoop-nets, and habitat characteristics will be recorded. Data collected from trapped turtles will include sex, species, morphometric data, species, sex, location, and presence of ectoparasites. Habitat characteristics recorded will include water quality (pH, conductivity, dissolved oxygen, and temperature), surrounding land cover type, soil type, canopy cover, proportion of emergent plant cover, and wetland size and depth. We will be comparing habitat characteristics of restored and reference wetlands, and quantifying relationships between habitat characteristics and turtle species richness, abundance, and demographic characteristics. The results of this study will provide quantitative data on the habitat suitability of restored wetlands for aquatic turtle species, and this information could be used to guide future wetland restoration actions.

Terrestrial Salamander Response to Prescribed Burns and Wildfires in the Central Appalachians

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Prescribed fires are used by land managers across the Appalachians to prevent succession from mixed-oak and pine dominated forests to hardwood dominated forests. Understanding wildlife community responses to fire is important for promoting greater biodiversity at a landscape scale; however, little is known about the long-term impacts of fire on terrestrial salamander populations, despite their ecological importance in this region. Prescribed fires alter the microhabitat characteristics of a forest, raising potential concerns for amphibians which require moist environments. I will use a chronosequence and paired sampling approach to examine the influence of fire history on salamander abundance and occupancy on the George Washington National Forest in western Virginia and east West Virginia. This study is a community-level analysis with a focus on Cow Knob salamanders (*Plethodon punctatus*), which is considered a species of special concern by the Virginia Department of Game and Inland Fisheries and the West Virginia Division of Natural Resources. Cow Knob salamander abundance will be measured using visual encounter surveys (VES) and salamander communities will be quantified using cover board surveys and daytime cover object searches. Species-specific responses will be analyzed using Occupancy or *N*-mixture models, while community level salamander-habitat responses will be analyzed using Redundancy Analysis (RDA) or Canonical Correspondence Analysis (CCA). This study will provide quantitatively-based recommendations for land managers to balance maintenance of vegetation communities with salamander communities.

Wintering Avian Occupancy and Richness in West Virginia Agricultural Conservation Easement Wetlands

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The Agricultural Conservation Easement Program is a program that creates or restores wildlife habitat on developed and agricultural land. In West Virginia, there are 24 wetland easements established through the Agricultural Conservation Easement Program. Little has been done to evaluate these wetlands in terms of their suitability as wildlife habitat and whether they fully perform the functions of a wetland ecosystem. Avian species are known indicators of habitat quality and health; therefore, a comprehensive study of the diversity, abundance, and richness of avian use of these wetlands is a necessary component of determining the effectiveness of conservation practices. Our objectives are to study the habitat characteristics affecting occupancy, abundance and richness of wintering waterfowl and sparrows on easement wetlands during 2016-2017 by conducting point counts and transects through wetlands and taking vegetation measurements. We compared our results of the easement program wetlands to reference wetlands throughout West Virginia to evaluate how the easement wetlands compare to wetlands not protected under the Agricultural Conservation Easement Program. Our preliminary results indicate that song sparrows (*Melospiza melodia*), swamp sparrows (*Melospiza georgiana*), white-throated sparrows (*Zonotrichia albicollis*), dark-eyed juncos (*Junco hyemalis*), and eastern towhees (*Pipilo erythrophthalmus*) are present on both reference and easement wetlands. Waterfowl are not frequently present on wetlands owing to the small size of most wetlands and the lack of standing open water on the sites. This indicates that wetlands established under the Agricultural Conservation Easement Program are functioning similarly to other West Virginia Wetlands in terms of wintering bird habitat.

Factors Influencing Salamander Hormones in Created Wetlands

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Small isolated wetlands are critical breeding habitat for many amphibians. Many of these wetlands are susceptible to destruction due to lack of regulation. Therefore, it is important to create new suitable habitat that can sustain healthy wildlife populations to mitigate loss. Concentrations of corticosterone, a hormone related to stress, development, and growth, can indicate a populations' health and habitat quality. The objective of our research was to determine if certain habitat characteristics in created wetlands influence corticosterone levels of Spotted Salamander (*Ambystoma maculatum*) larvae. From May-June in 2015 and 2016, we sampled Spotted Salamander larvae (n=10/wetland) in 26 wetlands created between 2011 and 2014 in the Monongahela National Forest, West Virginia. We collected environmental data including vegetation cover and water quality at each wetland. Analysis indicates that larval total length and wetland water temperature are positively correlated with corticosterone and the best predictors for corticosterone levels. Vegetation cover also showed a positive correlation with corticosterone levels. Our results can improve understanding of the relationship between physiological conditions and habitat quality and how it can be used to interpret wildlife population health and habitat degradation.

Development of a Rapid Presumptive Field Test for White-Tailed Deer Blood

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In the field of criminal justice, rapid collection of appropriate evidence is a key component of a successful prosecution. However, it is often difficult for wildlife conservation officers to quickly determine which samples are of interest to their investigation. The adaptation of new techniques from human forensics to the field of wildlife forensics can provide valuable new tools to use in the prosecution of violators of game law. In the eastern United States, in particular, the most commonly hunted and poached species is the white-tailed deer (*Odocoileus virginianus*), so new techniques related to this species would be the most valuable. The goal of this study was to create a rapid field test that would allow for wildlife conservation officers to determine whether or not a blood sample originated from a white-tailed deer. With knowledge of species of origin in hand, this would allow wildlife conservation officers to conduct more efficient investigations and assess the value of different materials at a crime scene to collect as evidence. To meet this need, a lateral flow immunoassay was successfully developed that provides presumptive white-tailed deer species identification from unknown blood samples in less than 200 seconds. Following thorough optimization as well as specificity and sensitivity testing, this product will be made available to wildlife law enforcement officers in the near future.

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