Morning Workshop and Field Trip Offerings

8:30 – 10:30am workshop: Getting Started with R and RStudio with Michelle Fonda, Assistant Wildlife Diversity Biologist, West Virginia Division of Natural Resources

R is a powerful programming language and programming environment designed to perform statistical analyses in many different fields, including wildlife science and ecology. R is free and open source and has seen a massive increase in use and development over the last few decades. RStudio is an integrated development environment for R, with additional features and a user interface that makes R easier to use for many people. R can be used to read in and manipulate datasets, produce summary statistics, fit models, plot results, and generate reports all in the same program. This workshop will go over the basics of using R with RStudio, showing some of the utility of R in reading and manipulating datasets, running statistical tests, and plotting data. We will walk through installing packages, writing and running R scripts, data types in R, reading in and simulating data, user-created functions, and more. This workshop is provided as a preface to Donald Brown's afternoon workshop on ordination and will provide you with the basics to be able to follow along with that workshop. It will also serve as an introduction to R and RStudio for people who have never worked with the program before.

Requirements: A computer with R and RStudio already installed prior to the workshop

R can be downloaded from https://cloud.r-project.org/

RStudio can be downloaded from https://www.rstudio.com/products/rstudio/download/#download

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8:30 – 11:30am workshop: Esri Mobile: An overview of Esri's mobile field applications with Julia Wood, Esri Solution Engineer; Robert Rike, Esri Account Executive

Esri has several applications to enable efficient field editing. This session will give you an overview of ArcGIS Field Maps, ArcGIS Survey123, and other related field applications. The basic functionality of each application and its use cases will be given. After this session, you will understand which application is most appropriate based on the kind of editing and environment in which you will be working. Bring your mobile device with you for an interactive experience.

Morning Workshop and Field Trip Offerings (cont.)

9:00am – noon field trip: Vernal Pool Monitoring on the Canaan Valley National Wildlife Refuge with Dawn Washington, Wildlife Biologist, USFWS Canaan Valley National Wildlife Refuge, Davis, WV; Adrianne Brand, Wildlife Biologist, USGS Eastern Ecological Science Center, Leetown, WV.

Vernal pools provide critical breeding habitat for several amphibian species and serve as important habitat and water sources for a variety of wildlife. Join wildlife biologists from the Canaan Valley National Wildlife Refuge and United States Geological Survey as they lead you through the Refuge's vernal pools and discuss their vernal pool monitoring program and recent/ongoing research regarding disease and general vernal pool management. This field trip will require some off-trail hiking and participants are expected to bring knee boots or other appropriate footwear that may be easily decontaminated with a bleach solution. Participants will be required to drive their own vehicle, or carpool with another participant from the meeting venue to the field trip location.

8:30am – noon field trip: Timber Rattlesnake Conservation in West Virginia with Jayme Waldron, PhD., Associate Professor, Marshall University, Huntington, WV, Jim Fregonara, Wildlife Biologist, West Virginia Division of Natural Resources, Elkins, WV

On this field trip, participants will learn about ongoing research and education programs in West Virginia to help facilitate timber rattlesnake conservation. Participants will hike an ~1 mile trail out to a known timber rattlesnake denning area on the Monongahela National Forest, so sturdy hiking boots are required. Participants will be required to drive their own vehicle, or carpool with another participant from the meeting venue to the field trip location.

Afternoon Workshop and Field Trip Offerings

1:00 – 2:00pm Workshop: Introduction to Unconstrained and Constrained Ordination with Donald Brown, Research Assistant Professor, West Virginia University / U.S. Forest Service

Ecologists are often tasked with analyzing data sets that contain a large number of species and environmental variables, with the goal of describing or explaining patterns in the data. In these situations, use of traditional univariate approaches (e.g., generalized linear models) is typically not optimal because each species must be modeled separately, which is time intensive, and it can be difficult to describe community-level patterns using results of many independent models. Furthermore, when sample sizes are small, univariate models can often only handle a small number

of predictors without encountering model convergence problems. Ordination refers to a class of multivariate models that seek to quantify patterns in community data sets. Unconstrained ordination models are commonly used as a data reduction tool, allowing ecologists to create new predictors that represent multiple environmental variables, and use those new predictors in subsequent univariate analyses. Constrained ordination models are commonly used to directly model the influence of environmental variables on a community of species. These models allow ecologists to assess how individual species relate to the environmental variables, as well as how the species relate to each other, with a single analysis. Thus, they are powerful tools for studying ecological communities. This workshop will serve as an introduction to data analysis using unconstrained and constrained ordination. Participants will gain a general understanding of how the models work, data requirements, model assumptions, and model choices. Participants will engage in hands-on exercises to gain experience using two of the most commonly used ordination models, principal component analysis (PCA) and redundancy analysis (RDA).

Audience: The intended audience includes students and professionals with a basic understanding of statistics (e.g., knowledge of statistical distributions), but with little or no experience using ordination models. In addition, participants must have basic skills working with program R (through RStudio). For individuals new to R, an introduction to R workshop will be held prior (8:30 – 10:30am).

1:00 – 4:00pm Field Trip: West Virginia Natural Areas Program - Protecting the Cheat Mountain salamander and other Species of Greatest Conservation Need
with Mack Frantz, PhD., Zoologist, West Virginia Division of Natural Resources, Farmington, WV; Briana Smrekar, Wildlife Biologist, USFWS, Davis, WV

West Virginia recently passed regulations to designate Natural Areas to better protect and manage the state's at-risk wildlife species and ecosystems. On this field trip, participants will ride a ski lift to visit West Virginia's first designated Natural Area on Bald Knob, Canaan Valley State Park. This natural area is Red Spruce dominated and protects habitat for the Federally Threatened, West Virginia endemic, Cheat Mountain salamander. Participants will hike to the Bald Knob overlook and be treated with beautiful views of the Canaan Valley, as well as learn about the Natural Area Program and steps being taken to protect the Cheat Mountain salamander. Sturdy hiking boots are required. Participants will be required to drive their own vehicle, or carpool with another participant from the meeting venue to the field trip location.