Ecological Statistician

Bozeman, MT

Montana State University

First, white-nose syndrome (WNS) is a fungal disease that has decimated bat communities overwintering in large cave hibernacula in the eastern and central United States. These losses have led directly to the listing of some bat species (including one that has a range extending into Montana) as well as petitions to list others. The slow but continued westward movement of WNS points to a need to evaluate species information collected to date in the context of a pre-disease environment.

This position will work in collaboration with the US Geological Survey (USGS), Montana State University (MSU), Montana Cooperative Fishery Research Unit, and Montana Fish, Wildlife and Parks to analyze existing bat acoustic survey data to develop predictive maps of species distributions and a monitoring plan with known power to detect population changes of a given magnitude due to WNS. Results will inform conservation of Montana’s bats.

Second, NPS’s Upper Columbia Basin Network and the Greater Yellowstone Network developed a long-term monitoring protocol for assessing changes in sagebrush steppe vegetation over space and time in response to biological invasion, disturbances and park management actions, and broader global environmental changes. Tools used to analyze these data now must be modified to accommodate more flexible and biologically-realistic models to incorporate a variety of latent cover class distributions and observer errors.

This position will work in collaboration with the USGS, MSU, and NPS to develop statistical models and related tools for analyzing vegetation monitoring data collected as categorical visual estimates of above-ground cover, a central component of the upland vegetation monitoring protocol.

Duties and Responsibilities

The successful applicant will support these monitoring programs by taking a lead in the following activities, as well as the resulting manuscripts and reports:

- Inform a WNS surveillance plan using occupancy estimates for bat species known or thought to be susceptible to WNS as well as a monitoring plan with known power to detect population changes due to WNS of a given magnitude and potentially by different wintering habitats.
- Develop an integrated, comprehensive hierarchical modeling framework that can support inferences about both distribution (invasive weed establishment) and abundance (population size of invasive weeds and native perennials) within and among park units, and that can consume ordinal cover class data with an over-abundance of non-detections (zeros), right- and left-skewed abundances (percent cover), and multiple sources of observation errors.
Required Qualifications – Experience, Education, Knowledge & Skills

- MS in Statistics with a strong background in Ecology
- Strong research experience in occupancy modeling, model assessment, developing predictive distribution maps, and informing sampling effort for long-term monitoring programs
- Experience with bat acoustic data
- Experience with Bayesian method development for modeling observation errors
- Experience writing statistical code in R, JAGS, and STAN languages
- Documented success publishing in peer-reviewed literature

Preferred Qualifications – Experience, Education, Knowledge & Skills

Previous experience with field data collection for wildlife and/or plants

The Successful Candidate Will

- Possess excellent written and oral communication skills
- Have a strong work ethic
- Have the ability to work independently as well as collaborate with diverse partners and practitioners

Position Special Requirements/Additional Information

This job description should not be construed as an exhaustive statement of duties, responsibilities or requirements, but a general description of the job. Nothing contained herein restricts Montana State University’s rights to assign or reassign duties and responsibilities to this job at any time.

Physical Demands

To perform this job successfully, an individual must be able to perform each essential duty satisfactorily with or without reasonable accommodations. The requirements listed above are representative of the knowledge, skill, and/or ability required.

There is a growing need for monitoring information that can be used to guide conservation decisions. This position will provide quantitative guidance to inform monitoring programs for two different agencies.