

Postdoctoral Research Scientist

Design and evaluation of long-term monitoring programs using marked individuals

USGS Patuxent Wildlife Research Center

Position Title: Post-doctoral Research Associate

Salary: GS-12 salary (approximately \$86,000 annually) and benefits

Location: Patuxent Wildlife Research Center, Laurel, MD

Performance Period: 13 months (anticipate start date Feb 2021), renewable up to 30 months pending performance review

Application Deadline: Nov 30, 2020 *or until a suitable candidate is found*

Position Summary:

USGS Patuxent Wildlife Research Center is seeking a post-doctoral research scientist with interest in statistical modeling, structured decision making and migratory bird management. Incumbent will develop a decision analysis framework for evaluating monitoring designs that involve marking of individuals (e.g., banding, capture-recapture, mark-resight, telemetry) using principles of decision science (e.g., value of information), statistics (sampling design and power analysis) and make forward-looking recommendations on development of new monitoring initiatives.

Management of migratory birds requires reliable information describing population dynamics, distribution, and migration patterns throughout the annual life cycle. Bird banding has been a foundation of migratory bird research and conservation for >100 years. Much of our current understanding of migratory bird ecology and successful management is based on capturing and releasing birds with bands (i.e., rings) and subsequent recovery of bands through: dead recoveries via hunter harvest, live recaptures, or re-sighting of marked individuals. A variety of analytical methods have been developed to analyze band-encounter information to estimate key demographic parameters including abundance, productivity, survival and movement rates. However, the amount of information obtained per marked bird can be low due to low encounter rates resulting in poor parameter estimation and inefficient programs measured by cost per marked bird or information gained to support conservation efforts. Recent advancements in wildlife marking and tracking technology, crowd-sourcing and citizen science platforms and analytical methods offer new opportunities to advance migratory bird conservation and management based on monitoring marked birds. These offer alternatives to the historical monitoring approach based on banded individuals alone. The FWS Div. of Migratory Bird Mgmt, Branch of Assessment and Decision Support (BADS) is tasked with providing technical and analytical guidance on migratory bird monitoring to support regulatory decision making and conservation planning. The BADS identified the need to assess the performance and costs characteristics of *alternative monitoring designs using new marking technologies to inform regulatory decision making and conservation delivery*.

The goal of this project is to evaluate the performance, benefits, and costs of alternative monitoring programs based on marked individuals. This information will help the BADS provide recommendations

on future funding needs and allocation to support migratory bird conservation and management. This project will be developed around two cases studies: 1) waterfowl, and 2) a non-game species.

The objectives of this project are:

1. To define and clarify the decision context for each of the two case studies;
 - a. Develop conceptual annual life cycle model relative to the specified decision context or use existing life cycle model;
 - b. Identify key model parameters that can/need to be estimated, in part or full, by monitoring marked individuals;
2. Develop a range of alternative monitoring designs to estimate key model parameters;
 - a. Elements of the alternative monitoring designs will include spatial and temporal scales, marking technique, number and timing of capture occasions, and re-encounter process;
3. Conduct a preliminary, qualitative decision analysis to identify a preferred design relative to the number and quality of parameters that can be estimated and the estimated cost of operation;
4. Conduct a quantitative assessment of the preferred alternative e.g., using value of sample information, Williams & Brown (2020, Methods in Ecology & Evolution) and power analysis considerations to develop recommendations for implementation.

The fellow will work closely with a team of quantitative ecologists with USGS Patuxent Wildlife Research Center (Andy Royle and Jim Lyons) and US FWS Branch of Assessment and Decision Support (Pat Devers).

Minimum Requirements:

1. Ph.D. in biology (wildlife), statistics, or related field, with a focus on quantitative methods, survey design, and hierarchical modeling.
2. Applicant must be within 5 years of receiving PhD.
3. Applicant must be a US citizen.
4. Familiarity with statistical models relevant to the study of migratory bird ecology and management.

Desired Abilities:

Competitive candidates will have a strong background in analysis of wildlife surveys. Strong programming skills are required, including a high level of proficiency with R for data manipulation, statistical modeling and Bayesian analysis. The successful candidate will have excellent written and personal communication skills and experience working closely with management agencies on applied questions in wildlife conservation.

Application:

Applicants should email: (1) a letter describing your background and interests – the letter should address specifically how the applicant meets both the minimum requirements and the desired abilities, (2) curriculum vitae, and (3) the names and contact information for 3 references to Andy Royle (aroyle@usgs.gov). Please include “Migratory bird monitoring postdoc” in the subject line.

For further information, contact: Andy Royle, aroyle@usgs.gov, 301-497-5846, USGS Patuxent Wildlife Research Center, 12100 Beech Forest Road, Laurel, MD 20708.