

Refining Southeast Regional GAP Models for Use in Regional Bird Conservation Planning: A Pilot Project

Steven G. Williams and Alexa J. McKerrow
 Biodiversity and Spatial Information Center, North Carolina State University, Raleigh, North Carolina

habitats. Selected species have been identified as priority species for monitoring and/or conservation efforts by Partners in Flight (Rich et al. 2004).

Introduction

The Southeast Regional Gap Analysis Project (SEReGAP) is partnering with the U.S. Fish and Wildlife Service (USFWS) in a pilot project to explore the potential for refining GAP vertebrate models for priority bird species to more closely meet the conservation needs of the avian conservation community. Traditional GAP models of presence/absence have not provided enough specific information about habitat suitability, which is critical for setting conservation goals and objectives. However, recent advances with inductive modeling techniques with small data sets have given GAP modelers new tools for developing more information-rich models (Phillips et al. 2004).

In September 2004, a meeting of regional biologists and modelers was hosted by the USFWS in Atlanta to review a variety of modeling approaches and the data sets available for modeling in the Southeast. The objectives of the meeting were as follows:

1. To inform partners about current regional modeling efforts by the USFWS, Joint Ventures, and SEReGAP
2. To get feedback on the draft aggregation of Ecological Systems (Comer et al. 2003) into Avian Habitat Types
3. To review the priority bird species selected for each habitat type
4. To review existing avian models for those species
5. To provide the background on ancillary data available for use in modeling and to work with partners to identify specific parameters based on their expertise (e.g., core area, distance to water)
6. To get feedback from partners on additional methods/data that could be used to improve modeling

Project Description

In this collaboration, SEReGAP brings to the table high-quality data sets and spatial modeling expertise, while the USFWS brings biological expertise on habitat quality, a network of experts, and the potential for monitoring and adaptive management (Figure 1).

Three key habitat types—cove hardwoods, nonalluvial forested wetlands, and upland grassland-dominated habitats—have been identified as the focus habitats for this pilot project. Twenty-nine species of birds have been identified for modeling within those

Prior to the meeting, SEReGAP developed a series of models for seven of the priority species. These models were based on a habitat-affinity database derived from the literature and linked

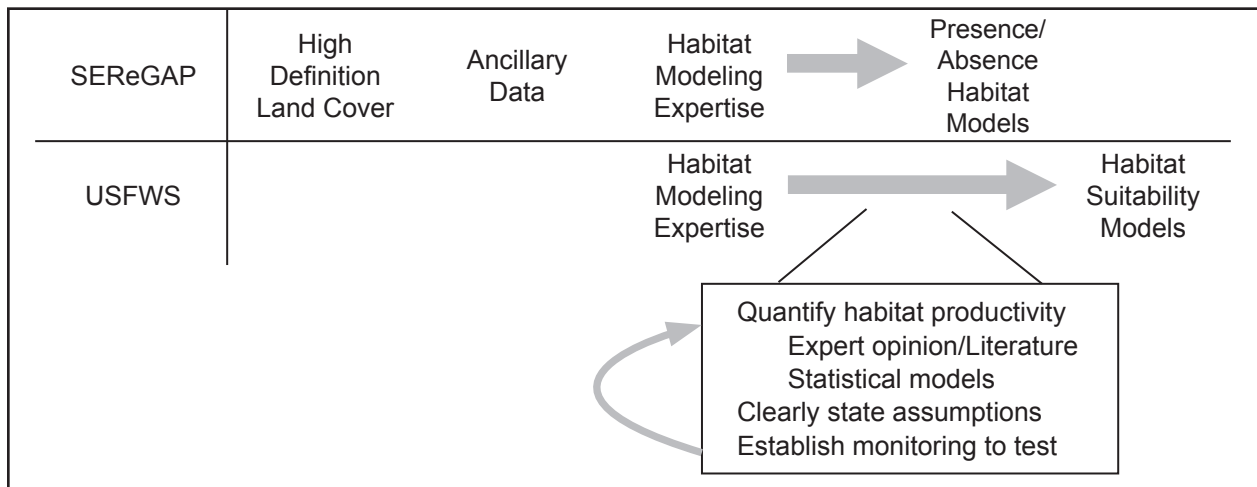


Figure 1. Contributions by SEReGAP and the USFWS to regional habitat-suitability models used in setting regional conservation goals.

to the state-based GAP land cover maps through a habitat list commonly used in the Southeast for describing bird habitats. At the meeting, presentations by the Mississippi Alluvial Valley Joint Venture office (MAV-JV) and the Upper Midwest Environmental Sciences Center (UMESC), as well as SEReGAP, set the stage for the range of modeling approaches that could be taken. Some of the feedback obtained at the meeting was immediately incorporated into changes in the ancillary data set development and the parameters used in the models, while other feedback is helping to shape the process to derive regional conservation goals from the final models.

Currently, SEReGAP and the USFWS are working on compiling the feedback from all participants and updating the cross-walk of the final habitat types to Ecological Systems. Once those changes have been made, habitat-suitability models will be developed incorporating both inductive and noninductive modeling approaches. In addition, sensitivity analyses of the data input layers will be run to identify those data sources that are critical to the model's performance. After models have been created, another round of meetings will be held to review those models and to work on incorporating the results into conservation planning efforts.

Literature Cited

- Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. *Ecological systems of the United States: A working classification of U.S. terrestrial systems*. Arlington, Va.: NatureServe.
- Phillips, S. J., J. Dudik, and R. E. Schapire. 2004. A maximum entropy approach to species distribution modeling. In *Machine Learning*, ed. Carla E. Brodley. Proceedings of the Twenty-first International Conference on Machine Learning (ICML 2004), Banff, Alberta, Canada, July 4–8. New York: ACM Press.
- Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will. 2004. *Partners in Flight North American landbird conservation plan*. Ithaca, N.Y.: Cornell Lab of Ornithology.