Multistate Conservation Grants
CFDA Number: 15.628
Interim Annual Report

Grant Number: NC M-1-HM
Grant Title: Designing Sustainable Landscapes for Bird Populations in the Eastern United States
Grant Recipient (Grantee) Name and Address:
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Report Number: 2008
National Conservation Need Addressed: 2008, NCN #2, Large-scale Habitat Conservation Design, Implementation, and Evaluation for the Conservation of Birds and Other Fish and Wildlife Species.

Costs
Are you within the approved annual budget plan? _X_ Yes; or ____ No
Are you within the approved budget categories? _X_ Yes; or ____ No

Progress Achieved
How does this annual report on accomplishments compare to the overall Proposed Project Work Plan? ____ Ahead of schedule; _X_ On schedule; ____ Behind schedule?
In your prior annual report *(for multiyear grants)*, did you report that your goals/objectives were achieved? N/A

Goal/Objective 1: Assess the current capability of habitats in ecoregions in the Eastern United States to support sustainable bird populations.

Planned Accomplishments:
- Develop matrix of habitat relationships based on existing GAP data
- Develop framework for identification of umbrella species
- Identify umbrella species with state partners based on state working group meetings

Actual Accomplishments:
- A database of habitat relationships for potential species was created to facilitate reviewer input and support modeling efforts.

- Workshops were conducted in each state with local biologists and managers to inform them of the various components of the project (landscape change, avian modeling, and structure decision making exercises). Key umbrella species and habitat characteristics were identified through SDM that should be incorporated into the modeling and decision support process.
- Single and multi-season occupancy models are being used to assess the capability of habitats to support selected avian populations. Breeding Bird Survey and Gap databases (e.g., landcover, urban) are at the core of this assessment. Estimate patch occupancy, local colonization, and local extinction rates are viewed as quantitative criteria to assess current and projected capabilities into the future, and a basis to build decision-support tools and inform conservation planning. We test a priori predictions based on Hamel (1992) and other published reports regarding landscape level habitat variables that might influence the rates of interest.

Goal/Objective 2: Predict the impacts of landscape-level changes (e.g., from urban growth, succession, climate change, and conservation programs) on the future capability of these habitats to support populations of migratory birds (and other wildlife).

Planned Accomplishments:
- Develop spatial data necessary for mapping landscape potential
- Develop framework and data requirements for mapping conservation landscape

Actual Accomplishments:
- SLEUTH models (Clarke et al. 1996, Candau 2002) have been selected to predict urban growth. Input data layers have been developed and compiled for the SAMBI region. These include slope, exclusion, urban, roads, and hillshade. Several dates of data have been compiled for urban and roads to enable growth rates to be calculated. Due to the large processing requirements, models are being run on the High Performance Computing Center at NCSU. Initial datasets have been run for the entire SAMBI extent. Model refinements are continuing.
- Sea level rise and coastal wetland dynamics are to be modeled with Sea Level Affecting Marsh Models (SLAMM; Clough and Park 2008). Initial models in the Charleston, SC area have been produced.
- Global Climate Change models have been used in conjunction with past climate records and reported wild fire events to develop predicted fire probabilities through the next century. These probabilities have been incorporated into the landscape succession models.
- Landscape succession is being modeled with Vegetation Dynamics Development Tool (VDDT; ESSA Technologies 2007). These are state-transition models that incorporate probability of harvest, fire, and succession. The Tool for Exploratory Landscape Analysis (TELSA; ESSA Technologies 2007) is being used to create spatially explicit predictions of the landscape at each year. Initial models in the Charleston, SC area have been produced which incorporate SLUETH, SLAMM, and the changing rate of fire potential due to climate change. Due to the computing requirements of these models, a computing cluster of 14 cpus have been employed to concurrently run models. Model refinements are continuing along with expanding the extent of the model outputs.

Citations

Clarke, K.C., Gaydos, L., Hoppen, S. 1996. "A self-modifying cellular automaton
    model of historical urbanization in the San Francisco Bay area,"
    Environment and Planning B.

Candau, J.C., 2002. Temporal Calibration Sensitivity of the SLEUTH Urban
    Growth Model. M.A. Thesis. University of California, Santa Barbara.

Clough, J.S. and R. A. Park. 2008. SLAMM 5.0.1 Technical Documentation.
    Sea Level Affecting Marshes Model version 5.0.1. 38 pp.
ESSA Technologies Ltd. 2007. Vegetation Dynamics Development Tool User
    Guide, Version 6.0. Prepared by ESSA Technologies Ltd., Vancouver,
    BC. 196 pp.

Goal/Objective 3: Target conservation programs to most effectively and efficiently achieve habitat objectives in State Wildlife Action Plans and bird conservation plans and evaluate progress under these plans.

Planned Accomplishments: N/A

Actual Accomplishments: N/A

Goal/Objective 4: Enhance coordination among the many partners, initiatives, and plans that have initiated efforts to be more effective with planning, implementation and evaluation of habitat conservation through conservation design.

Planned Accomplishments:
- Conduct Northern Bobwhite Conservation Initiative Conservation Design Workshops
- Coordinate with Northeast on Habitat Classification and Mapping

Actual Accomplishments:
- Designing Sustainable Landscape Workshops were conducted with biologists and managers to inform them of the project design and garner their input. These workshops were centered around the identification and selection of umbrella species and habitat characteristics important to ecosystem health and function.
- Project personnel participated in discussions with the Northeast Habitat Classification Workgroup as well as met with personnel creating the Northeast Habitat Map to provide critique and review.

Activities Anticipated Next Year

Goal/Objective 1: Assess the current capability of habitats in ecoregions in the Eastern United States to support sustainable bird populations.

Planned Accomplishments:
- Evaluate umbrella species based on current land cover/land use data

Goal/Objective 2: Predict the impacts of landscape-level changes (e.g., from urban growth, succession, climate change, and conservation programs) on the future capability of these habitats to support populations of migratory birds (and other wildlife).

Planned Accomplishments:
- Complete development of spatial data layers

Goal/Objective 3: Target conservation programs to most effectively and efficiently achieve habitat objectives in State Wildlife Action Plans and bird conservation plans and evaluate progress under these plans.

Planned Accomplishments:
- Develop spatial models for conservation landscapes
- Develop spatial models/decision support tools for avian conservation priorities

Goal/Objective 4: Enhance coordination among the many partners, initiatives, and plans that have initiated efforts to be more effective with planning, implementation and evaluation of habitat conservation through conservation design.
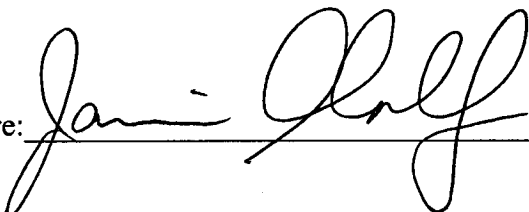
Planned Accomplishments:
- Conduct a series of workshops with regional biologists and managers to review project progress, species models, and develop landscape conservation scenarios.

Annual Report Summary

Primary Project Objective: The overall goal of this project is to develop a consistent methodology and to enhance the capacity of states, joint ventures and other partners to assess and design sustainable landscapes for birds and other wildlife in the Eastern United States.

Overall Benefits Derived by the End of the Year: A major accomplishment of the first year of activities include the development of a framework for modeling landscape change through time with inputs from urban growth, climate change, timber management and natural succession. Other major accomplishments were realized through the series of workshops with regional biologists in developing the list of important physical and biotic conditions impacting the ability of each habitat to support wildlife. This information will play a critical role in both the modeling of wildlife populations and the development of conservation prioritization maps.

Signature:_____ Date:_4/5/09_____