NCSE WILDLIFE HABITAT POLICY RESEARCH PROGRAM
Project Overview
Research Project 1G

Assessment of U.S. Habitat Conservation and Provision of Ecosystem Services

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Ecosystems that are conserved as wildlife habitat also provide additional useful services such as support for other biodiversity, watershed protection, recreational values and carbon sequestration.

Key Issue

Tools are needed to quantify the ecological and economic value of additional ecosystem services that will be provided by conserving specific parcels of land as wildlife habitat.

Project Objectives

The primary objective was to develop and package tools to evaluate the ecological value of candidate wildlife habitat sites for supporting biodiversity and the ecological and economic value of watershed services. The investigators also proposed to assess the feasibility of conducting similar evaluations of carbon sequestration potential.

Approach

The project team worked with conservation planners in North Carolina to develop a case study and prototype tools for application in that state. They focused on four services:

1. biodiversity support, assessed in terms of potential habitat for a variety of organisms
2. watershed protection or water quality, measured in terms of nutrient loadings
3. carbon sequestration potential based on land cover and land use
4. aesthetic or recreational value, in terms of green space and views of natural beauty.

In each case, they aimed to develop tools to provide indices of the relative ecological value of these services based on readily available national-scale geospatial data on land cover, terrain and hydrography.

Key Products

The project team developed tools for assessing the relative ecological and economic value of candidate sites for wildlife habitat conservation. The tools use readily available geospatial data and are implemented in the industry-standard geographic information system, ArcGIS.

The toolbox includes modular toolkits for:

- initial data preparation
- biodiversity support potential
- water quality
- economic valuation of water quality.

Deliverables

The tools are packaged as ArcGIS toolboxes, which conservation planners can import into any ArcGIS working session. The technical documentation is in four forms:

1. On-line Help. ArcGIS tools are documented internally, so that users are prompted about specific inputs to or requirements for a particular analysis.
2. Toolkit Technical Documentation. Because the toolkits include dozens of individual tools, high-level technical documentation is provided that explains the overall logic and workflow design for using the tools.
3. Traveling Seminar and Tutorial. The project team is collaborating with the North Carolina Department of Environment and Natural Resources to refine some of the analyses and ensure that the tools address specific planning needs for the state's comprehensive conservation plan. As a result of this collaboration, they have assembled a PowerPoint seminar that highlights the approach and illustrates key analyses. The team will present this seminar to other organizations in North Carolina (Wildlife Resources Commission) and elsewhere (Environmental Protection Agency, National Wildlife Federation) and to explore opportunities to collaborate in conservation planning.
4. Data and Tool Server. Beta versions of the North Carolina data and ArcGIS tools are available on the web at http://lelserver.nicholas.duke.edu:8080 (see Landscape Ecology Toolkit, Water Tools, and Carbon Tools). Users can download the data or the tools or run ArcGIS on the server using remote client technology. This server will be available to the wider public after further testing.