

Birds in Human Landscapes

Background

Ecology is the scientific study of the distributions, abundance and relations of organisms, and the interaction between those organisms and the environment. Ecologists conduct research to better understand biodiversity, quantify its loss, and develop strategies for conserving species and ecosystem functions. Ecologists play a prominent role in researching the conservation, restoration, and use of biodiversity and related ecosystem processes. Some ecologists investigate the effects of different land uses and management practices. Others investigate the implications of global climate change for biodiversity conservation. Ecologists study the natural changes in biodiversity at the genetic, species, and ecosystem levels. This allows them to evaluate human impact by comparing natural processes to human-induced changes.

By inventorying and monitoring biodiversity, ecologists can examine species abundance, functions, and interactions. The ecosystem services provided by many species and natural processes have important implications for human health and well-being. The decline of certain species may be indicative of declining environmental health. Questions associated with conservation to which ecologists are seeking answers include:

- How fast and in what locations is biodiversity being lost? And why?
- What are the secondary consequences of those losses?
- What management interventions will prove most effective in preventing the loss of biodiversity?

Ecologists are working with other biological scientists, as well as social scientists, policy-makers, and economists. Such an interdisciplinary approach is necessary to develop strategies to conserve Earth's biodiversity.

This exercise is a part of a broader overview of wildlife conservation and human related impacts on wildlife populations. The lesson focuses on bird populations in New York State that are being monitored via the Breeding Bird Atlas survey. Many once abundant bird species are in decline for a variety of human-related factors. The assignment focuses on examining the impacts that humans may be having on a select group of species with the ultimate goal to understand the connections between bird behaviors, habitat needs, shifting population trends, and the possible factors involved in those changes.

Project Objective

You are an ecologist working for the U.S. Fish and Wildlife Service (USFWS). You and two of your colleagues have been asked to evaluate the status of two bird species that are found in an area slated for "eco-friendly" development. The developers are claiming that they have taken every measure to minimize impacts on the local environment and have evaluated potential impacts through an environmental impact statement (EIS).

You will be given a map indicating the exact area to be impacted by the development, and documents describing the developer's proposed changes to the site.

Your task is to evaluate the legitimacy of their EIS by examining the sensitivity of these birds to habitat change and to determine whether the species have been impacted in other parts of NY State (or perhaps other parts of the country) by land use changes.

Plan of Action

You can use many different resources to help you evaluate the possible impact that habitat change may have on your focal bird species. Examples of these resources are listed below. A combination of resources will allow you to develop the most robust assessment. Although you may use as many resources as you like, you are required to use data from the Breeding Bird Atlas (BBA), as this is one of the most comprehensive bird surveys for the New York area. Instructions to access this database are listed below.

Final Product

You will present your findings as a PowerPoint presentation to the head of your department at the USFWS (your professor and your classmates). This information will eventually be used to inform decision makers in the New York State Assembly Office. These government officials will ultimately determine whether the development will be allowed to take place. Your final product should be supported by sound science.

Suggestions for how to get started

- You and your team should start by brainstorming a list of questions that you would like to investigate. For example:
 - What are the habitat requirements for the target species? How do they forage? Where do they nest? Is this a migratory species?
- Use a variety of resources to determine the biology of the focal species, the current state of the species and any changes in the population over the years. You can examine country-wide changes as well (and possibly global changes if there is sufficient information).
- Use the Breeding Bird Atlas to examine how population abundance has changed in New York State and compare to how land is being used in the state.
- As is often the case when evaluating changes in biodiversity and species abundance, there may be limited data on your species. If this is the case, you may need to extrapolate from information present on other species that may share similar habitat requirements.

Online Resources (New York)

Maps

New York State habitats and ecoregions:

<http://www.dec.ny.gov/animals/9402.html>

New York State Breeding Bird Atlas survey blocks:

<http://www.dec.ny.gov/imsmaps/bbatlas/viewer.htm>

New York State BBA species distribution maps:

<http://www.dec.ny.gov/animals/51030.html>

- Click on “BBA Database”
- Scroll down the page to the heading “Breeding Bird Atlas - Maps By Species.”
- Click on either 1980-1985 or 2000-2005 under the Alphabetic Order heading. (Or, use the Taxonomic Order if you prefer to search by genus and species, as opposed to common name).

Data

Downloadable BBA data for Google Earth:

<http://www.dec.ny.gov/pubs/42978.html>

Viewing NYS DEC Data in Google Earth (pdf):

http://www.dec.ny.gov/docs/administration_pdf/geinstructions.pdf

Natural history information

New York bird species fact sheets: <http://www.dec.ny.gov/animals/54755.html>

Reports

McGowan, K.J. & Corwin, K. (2008). *The Second Atlas of Breeding Birds in New York State*. Ithaca, NY: Cornell University Press.

See: <http://www.dec.ny.gov/animals/7312.html>

Online Resources (U.S. and Western Hemisphere)

Maps and data

USGS North American Breeding Bird Atlas Explorer:

<http://www.pwrc.usgs.gov/bba/>

North American Breeding Bird Survey: [http://www.mbr-](http://www.mbr-pwrc.usgs.gov/bbs/bbs.html)

[pwrc.usgs.gov/bbs/bbs.html](http://www.mbr-pwrc.usgs.gov/bbs/bbs.html)

Partners in Flight Species Assessment Database:

<http://www.rmbo.org/pif/pifdb.html>

BirdNET: <http://www.nmnh.si.edu/BIRDNET/>

Great Backyard Bird Count: <http://www.birdsource.org/gbbc/>

Christmas Bird Count: <http://www.audubon.org/bird/cbc/>

Project FeederWatch: <http://watch.birds.cornell.edu/PFW/ExploreData>

Google Earth: <http://earth.google.com/>

Natural history information

All About Birds: <http://www.allaboutbirds.org/guide/search>

The Birds of North America Online (by subscription): <http://birds.cornell.edu/bna>

Reports on bird population trends and habitat conservation priorities

State of the Birds: <http://www.stateofthebirds.org/>

Saving Our Shared Birds: <http://www.savingoursharedbirds.org/>

Environmental Protection Agency's 2008 Report on the Environment (See especially "Land Cover", "Land Use", and "Ecological Condition > Biological Diversity > Bird

Populations"): <http://www.epa.gov/ncea/roe/>

Conservation-oriented journals for researching the primary literature

The Auk

Biological Conservation

Bird Conservation International

Conservation Biology

The Ibis

Journal of Avian Biology

Journal of Field Ornithology

Journal of Wildlife Management

Living Bird

Proceedings of the National Academy of Sciences

Science

Studies in Avian Biology

The Wilson Journal of Ornithology