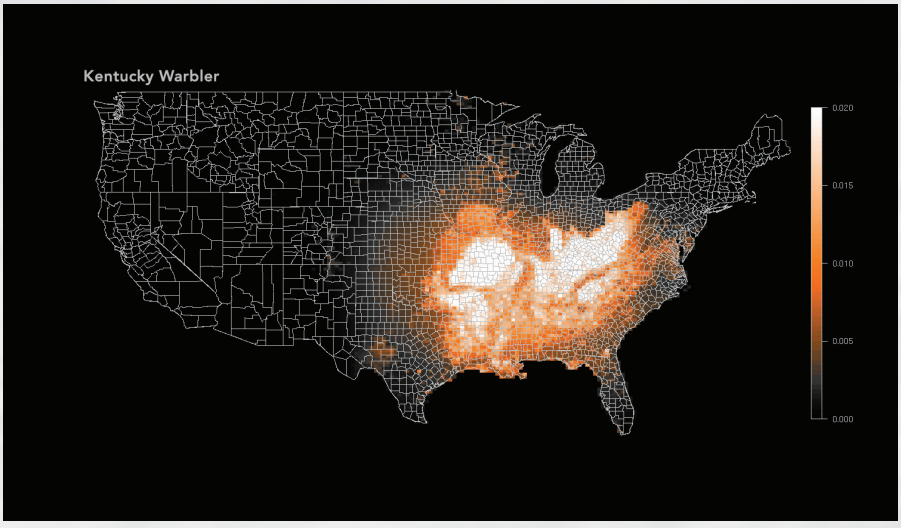
Science behind the State of the Birds Report 2011: A Bird's-Eye View of How Birds Use the Nation's Public Lands

Assessing the distribution of birds on public lands is scientifically challenging, but vital to determining the value of public lands in conserving American birds, as well as the stewardship opportunities for each public land agency. Each year, the State of the Birds Report addresses conservation issues that have far-reaching effects on bird populations. In the 2011 report, bird distribution and land-ownership data yielded the nation's first assessment of birds on public lands and waters. This data demonstrates the tremendous potential for state and federal agencies to help sustain the diversity and abundance of the nation's birdlife. Public lands and waters play a critical role for many bird species, accounting for at least 50 percent of the U.S. distribution of more than 300 bird species.


courtesy USGS

Mapping Bird Distributions: The Arctic to the Everglades: The National Gap Analysis Program at the University of Idaho, the Cornell Lab of Ornithology, the U.S. Geological Survey, and a group of expert scientists from other federal and state agencies and nonprofit groups provided scientific analysis and support for this year's report. In addition, Alaska GAP and NatureServe information was used for birds in Alaska, and state of Hawaii biologists compiled and assisted bird species there; other biologists assisted with information about birds in the U.S. Territories. For most ocean species, the best available colony-nesting data were used. Managers use GAP data to determine how well plants and animals are being protected across the country by using three datasets: land cover, species distributions, and protected areas. GAP scientists used these datasets to examine the location, diversity, and protection status of birds on public lands. The Cornell Lab provided geographic data on the distribution of birds from the citizen-science "eBird" database, which was overlaid with GAP's Protected Area Database of the U.S. (PAD-US) to map terrestrial habitats. By combining these datasets, researchers were able to calculate the percentages of species distributions on public lands and identify public agencies responsible for managing lands where each species occurred. In addition, Cornell scientists used the National Science Foundation's TeraGrid supercomputer to generate simulated observations of bird movements into animated maps, furthering scientists' understanding about how species migrate. These models also enabled scientists to associate bird distributions with environmental factors, including land cover, elevation, local climate and urbanization.


courtesy USGS



Map courtesy of Cornell Lab of Ornithology

Quantifying the Importance of American Lands for Bird Conservation: Ten primary terrestrial bird habitats were identified using USGS GAP National Land Cover Data. Birds in island and ocean habitats were considered in additional analysis. Experts focused their analysis on species primarily restricted to a single of these habitats, called habitat obligates, to extrapolate and provide a comprehensive snapshot of birdlife in the U.S.

"Primary bird habitats." US Geological Survey, Gap Analysis Program (GAP). February 2010. GAP National Land Cover, Version 1.

After knowing which birds occur most frequently in different land areas, scientists next assigned conservation status codes to each land area to emphasize its importance to particular species. Conservation status codes were: *(1) lands maintained for their natural habitats, (2) lands managed for multiple uses, (3) and lands with no permanent protection*. Each code denotes the current protection status and indicates other natural, recreational, and cultural uses that could threaten bird populations on these lands in the future.

USGS Gap Analysis Program:
GAP National Land Cover Data and Protected Areas Database of U.S. USGS GAP, in partnership with the University of Idaho, promotes biodiversity conservation by developing and sharing information on locations where species and natural communities occur and how they are being managed for their long-term survival.

eBird Database and Species Distribution Modeling:
The analyses for this report combined the power of high-performance computing centers with bird observation data from the eBird citizen-science project (600,000 bird checklists and 107,000 unique locations) to generate detailed models of bird distribution across the United States.


courtesy USGS

Sponsorship and Partner Information:
USGS GAP (gapanalysis.usgs.gov) supports the National Gap Analysis Program at the University of Idaho, which was integral to the data development, maintenance, and analysis of PAD-US and GAP National Land Cover Data. USGS GAP also supports Alaska GAP, which supplied the bird range data for Alaska. Results from the Cornell Lab were made possible by support from the National Science Foundation (NSF) and Leon Levy Foundation, and collaborations involving Oak Ridge National Laboratory, DataONE, TeraGrid, the Institute of Computational Sustainability, and the Cornell Lab of Ornithology. NSF's TeraGrid provided 70,000 hours of super computer processor time to generate the models needed for this report.


courtesy USGS

The State of the Birds Report is produced annually and led by U.S. Fish and Wildlife with a consortium of government and non-government agencies. This year's report is available at: **http://stateofthebirds.org**

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U.S. Department of the Interior
U.S. Geological Survey

Printed on recycled paper

May 2011