

PRBO Conservation Science (PRBO)
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Using Lasers to Map Bird Habitat

Lasers are providing scientists with new tools for mapping, protecting, and restoring bird habitat along rivers. In a paper published in the October issue of *Ecological Applications*, scientists from PRBO Conservation Science and the Information Center for the Environment at UC Davis used aerial laser technology known as LiDAR (short for Light Detection And Ranging) to predict where different bird species occur in the Cosumnes River Preserve in central California, USA.

LiDAR data are generated using lasers mounted on an airplane that is flown over the study area. Sensors on the aircraft record the laser light that is reflected from the vegetation and the ground. These data are then used to develop detailed maps of the forest structure (for example, the height of the tallest trees). Scientists can then use their knowledge of what types of forest structure birds need to predict where birds will occur. With LiDAR, they can do this over large geographic areas more quickly and easily than with traditional methods.

"By combining this advanced imaging technology with traditional field research, we are able to measure and predict ecosystem components in unprecedented ways. Not only can we provide managers with very detailed information about ecosystem services such as carbon storage and its associated biodiversity, but we can do so over very large areas," says Dr. Josh Viers, Watershed Scientist at UC Davis.

Scientists have long known that many birds are often found in specific types of forest structure. In the past, these associations have been established by counting birds in areas where vegetation was painstakingly measured on the ground. "Using the LiDAR measurements of vegetation, we can predict where the birds will be over areas much too large to survey by foot," explains Dr. Nat Seavy, Terrestrial Ecologist Research Director at PRBO Conservation Science.

Maps of bird habitat help scientists understand what areas should be protected and what forest conditions are important for different bird species. "We want to make sure common birds stay common," says Dr. Chrissy Howell, an ecologist at PRBO Conservation Science. "This technique helps us identify areas to protect and understand how we can design restoration to create new habitat."

Authors were Nathaniel Seavy and Julian Wood (PRBO Conservation Science) and Joshua Viers (UC Davis). LiDAR data were collected by Watershed Sciences, LLC, based in Portland, Oregon. The research was funded in part by the CALFED Science Fellows Program.

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PRBO Conservation Science is a non profit conservation and education organization dedicated to advancing conservation through birds and ecosystem research. Founded in 1965 as Point Reyes Bird Observatory, PRBO Conservation Science partners with hundreds of governmental and non-governmental agencies as well as private interests to ensure that every dollar invested in conservation yields the most for biodiversity -- benefiting our environment, our economy, and our communities. Visit PRBO on the web at www.prbo.org.

Note: Our name is PRBO Conservation Science, not Point Reyes Bird Observatory Conservation Science.

The Information Center for the Environment (ICE) is an environmental information brokerage and research laboratory in the Department of Environmental Science & Policy at the University of California, Davis, under the direction of Professor Jim Quinn and Academic Administrator Mike McCoy. ICE specializes in the development and dissemination of geospatial data and technologies; the development of robust data architectures dedicated to the cataloging of global environmental information; and the creation of decision support systems geared toward improving the capabilities of resource managers in a variety of sectors. Visit ICE on the web at <http://ice.ucdavis.edu/>.

This work was funded in part by the CALFED Science Fellows Program. Beginning with the class of 2003, the CALFED Science Fellows Program has paired graduate students and postdoctoral researchers with CALFED Program agency scientists and senior research mentors. Fellows work on collaborative data analysis and research projects applicable to the California Bay-Delta system. The upcoming class of 2009 will represent the fifth year of fellowships awarded by the CALFED Science Program.

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