UC SANTA BARBARA

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# EXTINCTION RATES OF PLANTS ARE HIGHER THAN PREVIOUSLY THOUGHT

Extinction rates of native California plants have been studied by three researchers who found that previously designed mathematical and computer models were biased because they left out the human element in their predictions, according to an article published in the August 20 Proceedings of the National Academy of Sciences. They conclude with the key concern that "understanding the relationship between habitat loss and loss of biodiversity is central to the development of sound conservation policy."

The authors are: Eric Seabloom, a postdoctoral fellow at UC Santa Barbara's National Center for Ecological Analysis and Synthesis (NCEAS); Andy Dobson, professor in the Department of Ecology at Princeton; and David M. Stoms, researcher at the Institute for Computational Earth System Science at UC Santa Barbara. The researchers used a public data set that lists the native plant species in 93 regions of California.

These data are particularly interesting, because of the high plant diversity in California. According to the article, California contains more than 20 percent of all the vascular plant species in the U.S. and 4 percent of the worldwide total.

Mathematical and computer models are important tools to study potential extinctions and find ways -- such as reserves -- to preserve biodiversity. Typically, these assume that development in California is random.

"The random model of species loss is overly optimistic," explained Seabloom. "It doesn't take into account the fact that urban and agricultural development are concentrated in specific types of areas and can wipe out whole species. When there is contiguous human development of the land, the likelihood of losing whole species is greater."

Water is one magnet for development by humans. The article states that "humans have clear habitat preference for coastal or other low-lying lands with adequate supplies of water." It goes on to say that the rate of habitat conversion (the most important cause of extinction) is significantly faster in these areas than in areas less suitable for agriculture."

The authors point out that in spite of attempts to conserve global biological diversity, habitat conversion rates are accelerating, particularly in tropical countries. They caution that policies for the preservation of global biodiversity must be based on accurate predictions of "the effects of habitat conversion on species distributions."

They conclude with the concern that, "The biggest challenge now facing conservation biology is to conserve the 90 percent of biodiversity now residing on low-lying lands that are often privately owned. It is here that rates of habitat loss are increasing most rapidly."

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