

Sky islands: metaphor or misnomer?

August 13 2008

The term "sky islands" sounds intriguing, but it may be more lyrical than useful when discussing mammal distributions, according to new research from Eric Waltari of the Sackler Institute of Comparative Genomics at the American Museum of Natural History and Robert Guralnick from the University of Colorado at Boulder. The team used an emerging technique, ecological niche modeling, to show that the populations of small mammals living on mountaintops in the Great Basin—on islands in the sky—are not as isolated as previously thought.

"Niche modeling is a quick and straightforward approach to addressing problems that molecular data will eventually solve," says Waltari. "Are the animals on 'sky islands' isolated?"

The answer is no. "Sky islands" is a biogeographical term that was coined to describe the habitats of species living high on mountaintops, habitats thought to be solidly isolated. In the new paper published in the early online version of the *Journal of Biogeography*, Waltari and Guralnick test the concept of geographic isolation on thirteen species of jackrabbits, shrews, ground squirrels, and other small mammals.

The species chosen have detailed location records that were mapped with current and past climate data, such as temperature and rainfall, to "backcast" the distribution of each species at the height of the last ice age 21,000 years ago. The predictions of the model are calibrated with known fossil records. Backcasting allows researchers to test whether species had wider ranges or different distributions in the past; the current study, for example, found that most of the species (12 of 13) lived at

lower elevations 21,000 years ago and that the average distribution of each species was larger than it is now.

Determining the area that species inhabited in the past helps researchers understand current population distribution within the western U.S.'s Great Basin and potential linkages between "sky islands," links that can be tested with molecular research now that the models have pinpointed which populations of which species are most likely to intermingle. In this study, Waltari and Guralnick also found that not all species were widespread across the basin 21,000 years ago. For example, one prediction is that Belding's Ground Squirrels inhabited only the western portion of the Great Basin at the last full glacial period. Belding's ground squirrels currently live at higher elevations of the same portion of Great Basin, but some valley connections also appear to currently be suitable habitat according to the model. Many of the species (9 of 13) had suitable habitat below the "sky islands" that may link different populations.

"Connectivity is an important aspect of conservation biology," says Waltari. "Also, testing niche models in the present and past is the first step in making predictions about where species will move in the future given global warming scenarios."

Source: American Museum of Natural History

Citation: Sky islands: metaphor or misnomer? (2008, August 13) retrieved 23 April 2024 from <https://phys.org/news/2008-08-sky-islands-metaphor-misnomer.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.