



Pikas of Crater Lake National Park

Project Summary and Results

Pikas in Peril Project Background

The American Pika (*Ochotona princeps*) is a charismatic indicator species of the potential effects of climate change on mountain ecosystems. Pikas are sensitive to summer heat and rely on winter snowpack for insulation from harsh winter temperatures. The National Park Service stewards pika populations in more than a dozen parks and seeks to understand the vulnerability of pikas and other mountain species to climate change. Pikas in Peril, funded in 2010, is a collaborative research program directed by scientists from the National Park Service, Oregon State University, University of Idaho, and University of Colorado-Boulder. To help the National Park Service better prepare for the ecological changes anticipated in the coming decades, the team pursued three objectives in eight of these parks.



NPS/Devin Stucki

Objectives

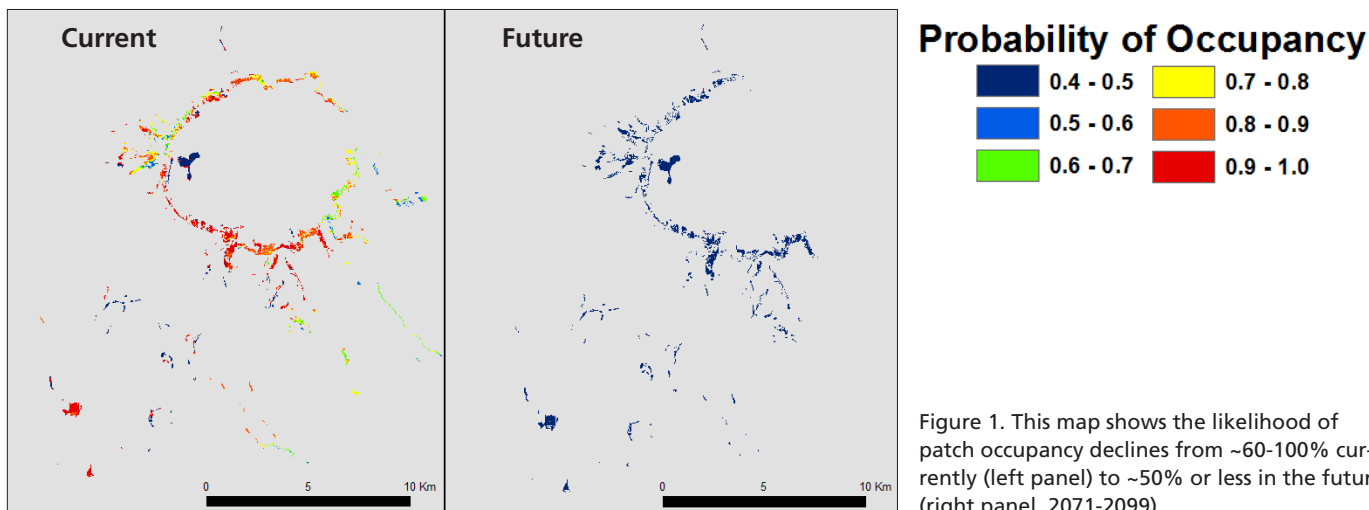
1. Identify the factors (e.g., temperature, precipitation, habitat connectivity, topography, etc.) that shape contemporary pika distributions.
2. Assess the connectivity and gene flow of pika populations, including how landscape features affect movement of pikas between patches of suitable talus and lava flow habitat.
3. Evaluate climate change vulnerability of pika populations in each park by integrating pika distribution and gene flow models with forecasted regional changes in temperature and precipitation.

Results

Pika habitat within Crater Lake National Park (CRLA), such as talus slopes (photo at right), is concentrated around the crater itself and in few patches elsewhere in the park. Nearly all of this habitat is currently occupied by pikas, indicating high habitat suitability. Of the eight parks studied, CRLA is one of the warmest in winter, coolest in summer, and receives the most snow. Precipitation, in particular snowpack, strongly influences pika occurrence in CRLA. Although pikas are predicted by previous studies to shift to higher elevations in the coming decades, at CRLA pikas already occupy the highest available habitat. As a result, the overall extent of pika distribution at

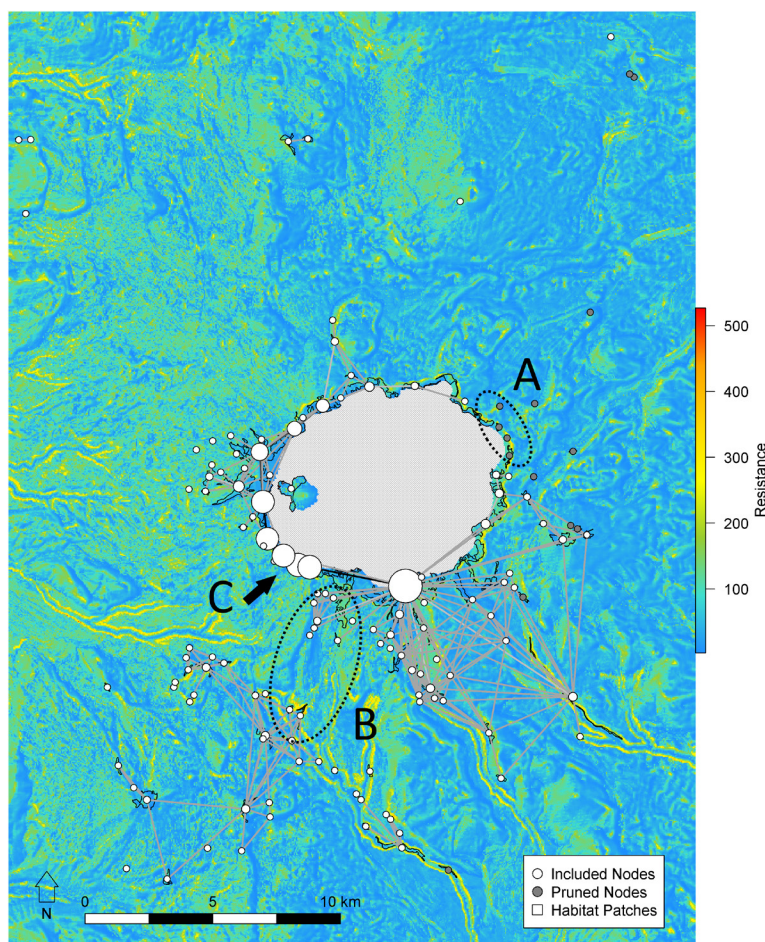


NPS photo



CRLA is not expected to change. However, the likelihood of patch occupancy is predicted to decline to 50% under all climate change scenarios that were studied (Figure 1).

Pika dispersal in CRLA is limited by cliffs, ravines, and hot southwest facing slopes. Streams and the lake also act as barriers. Due to limited habitat and these restrictions on dispersal, gene flow models suggest that pikas in the southwestern portion of the park are already isolated from those around the lake (Figure 2).



Conclusions

Deep and persistent snowpack in CRLA protect pikas from harsh winter conditions and is a major influence on their distribution in the park. With recent snowpack decline in the region expected to continue, this research has revealed a steep drop in the chances that pika habitat patches in CRLA will be occupied in the coming decades. Warming temperatures will make dispersal among patches more difficult, further fragmenting pika habitat. Maintaining connections among areas occupied by pikas will be a key management challenge in this park.

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For more information, visit the UCBN pika monitoring webpages:

http://science.nature.nps.gov/im/units/ucbn/monitor/pikas_in_peril.cfm
<http://science.nature.nps.gov/im/units/ucbn/monitor/pika.cfm>