

High Country News

APRIL 26, 2010

Pika politics

What's the connection between pika populations and climate change? It's complicated.

by Molly Samuel

On a bright, dry day last summer, biologist Lyle Nichols of Santa Monica College took a pika census in the Bodie Hills on the eastern edge of California's Sierra Nevada, something he's done nearly every year since 1996. In recent years, though, he's found that part of the Bodie population has vanished. Earlier in the day, Nichols had heard pikas calling, their chirps echoing off the rocks as they scurried about collecting plants to store for winter sustenance. But by mid-morning, he no longer heard them, so he switched tactics, looking for their hay piles and scat. "I've learned more about pika droppings," he said, "than I ever wanted to know."

The American pika is a small, squeaky relative of the rabbit, found in the Rockies, Cascades, Sierra Nevada and Great Basin. In its northernmost range in Canada, the cold-adapted species lives at sea level, but at more southern latitudes, it's found farther uphill. In the Sierra Nevada, pikas are uncommon below 8,200 feet. With its limited range and sensitivity to warm temperatures, the species seems destined to join the pantheon of wildlife doomed by climate change. As temperatures warm, lower-elevation pikas won't be able to survive at all, goes the thinking, and higher-elevation pikas will be driven ever higher, until they're eventually pushed off the tops of their mountains and into oblivion. But the relationship between pikas and climate change is proving to be more complicated than scientists expected.

In February, the U.S. Fish and Wildlife

Service decided not to protect the pika under the Endangered Species Act. It would have been the second species listed because of the effects of climate change. (The polar bear was first.) The Center for Biological Diversity, which first petitioned and then sued the agency over the pika, says the agency is ignoring the best available science.

Nichols is not the only scientist who believes pikas are in trouble, possibly due to a warming climate. Other researchers, though, agree with the decision not to list. Biologist Andrew Smith of Arizona State University, who's also studied the Bodie pikas, is concerned about the effects of climate change, but believes that most of the West's pika populations are doing fine. "Let the data do the talking," he says.

The Bodie Hills, with their warm summer temperatures, are not typical pika habitat. They lack the loose rocky patches, called talus, where pikas normally live. But Bodie is a ghost town surrounded by abandoned gold mines, and after 19th-century prospectors moved out, pikas moved in to the old ore dumps.

Twenty years ago, the southern half of Bodie's pika population began to disappear, and by 2008, that area was pika-free. It's normal for small patches of pikas to come and go; pikas don't travel well, so if a few patches lose their occupants to predation, disease or skewed sex ratios, they sometimes remain abandoned. Without neighbors to revitalize them, other nearby patches can also go extinct. That, Smith says, is what happened to the southern Bodie pikas.



A pika in the ghost town of Bodie in California's Sierra Nevada, where the rabbit relative's populations are dwindling.

Credit: Petra Nichols

If the cause had been climate change, he says, all of Bodie would have been affected, not just one area: "If you look at just the northern population, they're all over the place."

Nichols, who has been tracking local temperatures, suspects that climate change also played a role in the disappearance of Bodie's southern pikas, though he admits, "there's no smoking gun." In places where pikas have lived for millennia, though, there are definite population changes on a larger scale. A 2008 survey in Yosemite revealed that one pika population had moved upslope. In the Front Range of the Rocky Mountains, low-elevation populations have disappeared, while higher-up ones persist. In Nevada's Great Basin, pika distribution has clearly shifted. Surveys by wildlife ecologist Erik Beever show that by 2007, pikas had vanished from nine of 25 historically

occupied sites. Beaver cites a number of factors, including the amount of habitat available in the mountain range, livestock grazing near talus patches, and precipitation. But, he adds, “numerous lines of analysis suggest that climate is the single strongest thing going on” in the Great Basin.

Although the Fish and Wildlife Service acknowledged the Great Basin pika declines in its decision, agency ecologist John Isanhart, who worked on the finding, says, “It doesn’t make sense to say a species needs to be listed range-wide when it’s just (declining) in one place.” And though the finding does mention that other low-elevation populations, including the one in Bodie and others in the Rockies, around Mount St. Helens and in Glacier National Park, could be at risk from a changing climate, Isanhart says that pikas should be able to persist in most of their range.

The agency’s decision was based on temperature projections from the National Oceanic and Atmospheric Administration that forecast an average ground temperature increase of 2.2 degrees Celsius in pika range through 2050. But the decision also highlights the fact that even though ground temperature plays an important role in pika survival, it’s not the only factor. The temperature below ground level, in the talus, also affects pikas, perhaps more than surface temperature does. Pikas dive into talus piles to escape the heat as well as to dodge predators. This enables them to survive temperatures that are warmer than they could handle if they were fully exposed.

The pikas at Bodie have figured this out. Most pikas are active all day, but the Bodie pikas scurry around only in the morning and in the evening. They take cover during the heat of the day, which is why Nichols stopped hearing them during his survey. Smith says, “If you want to know how pikas will respond to high temperatures, look at Bodie now.” Although pikas may be able to adapt to heat, extremely cold temperatures could prove more challenging, according to

Beaver. If climate change leads to a lighter, less-insulating snowpack, pikas will be exposed to cold they can’t escape from.

Accurately forecasting such changes is extremely difficult, though. Greenhouse gas emission scenarios and precipitation forecasts vary widely, and regional models don’t address details on the local level. For instance, in some mountainous areas climate change may cause more inversions -- days when the temperature is cooler at lower altitudes and warmer at higher ones. That could favor the lower-altitude pika populations. “It’s really complex,” says Isanhart. “We’ve touched just the beginning of it.”

Denying protection to the pika and other species threatened by climate change has become a pattern under the Obama administration, says Shaye Wolf of the Center for Biological Diversity, citing the 2009 decision not to list the spotted seal. The administration has continued a Bush-era policy exempting greenhouse gases from regulation under the Endangered Species Act, taking the position that climate change should be tackled through legislation instead. Wolf argues that the ESA could -- and should -- be used to shield species from the effects of greenhouse gas emissions, as well as from hunting and habitat loss.

But Smith disagrees. Although he is gravely concerned about climate change, he says the science simply doesn’t justify listing the pika: “We should really be frightened about what (climate change) is going to do to our climate. But you have to keep the integrity of the science intact.”

The Center for Biological Diversity hasn’t given up. “We’re considering options for challenging the (federal) decision,” says Wolf. The group also has filed a series of lawsuits seeking protection for the pika under California’s Endangered Species Act.

At the federal level, the Fish and Wildlife Service plans to keep studying the species, and it’s also working on national strategies to reduce the impacts of climate change on wildlife and fish.

“By no means is (the pika) just going to drop off the radar,” Isanhart says. U.S. Forest Service ecologist Connie Millar has just published a study that shows pikas living in a wider elevation range than previously thought. Other studies expand the scope of the research: A two-year-old collaboration between federal and state agencies and the University of California is surveying not only pikas, but also yellow-bellied marmots, Belding’s ground squirrels, golden-mantled ground squirrels, bighorn sheep and alpine plants in the Sierra Nevada.

Meanwhile, during the late summer afternoon at Bodie, Nichols patiently waited for the pikas to re-appear. Golden-mantled ground squirrels scurried over the ore piles as the wind picked up. Then the pikas began to emerge, perching on their rocks before scampering off to gather more brush for their hay piles.

