

Climate change threatens flying squirrels

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By JANET ZIMMERMAN
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Sixteen years have passed since wildlife biologist Kevin Brennan watched a flying squirrel leap from the deck of his Idyllwild home, extend the furry flaps along its sides to create a sail, and glide effortlessly to the snowy ground.

At one time, such a sight was common in the San Jacinto Mountains. But not anymore. Brennan is believed to be one of the last people to glimpse the novel creatures in the mountain range between Palm Springs and Hemet.

"It didn't register with me at the time that it was a rare event," said Brennan, a California Department of Fish and Game scientist who had moved from Northern California where another subspecies of the nocturnal critters are still abundant.

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Photo by Lloyd Glenn Ingles, California Academy of Sciences

IN SEARCH OF FLYING SQUIRRELS

The San Bernardino flying squirrel has not been sighted in the San Jacinto Mountains near Idyllwild in recent years. Environmentalists pushing for Endangered Species Act protections say climate change is the biggest threat to the small, gray-brown animals.

San Bernardino flying squirrels



APPEARANCE: Adult squirrels average 10 to 12 inches in length. They glide by using skin flaps that stretch along their sides between the front and hind legs and "steer" with their brood, but tails.

FOOD: Primarily nutties and lichen. The squirrels play an important role in forest

regeneration because they disperse the spores of the truffles, which help plant roots absorb nutrients.

HABITAT: They live in dense, closed-canopy forests with legs and corridors of dense trees in riparian areas. They favor woodpecker holes and cavities in dead trees for nesting. The squirrels are still present in the San Bernardino Mountains but feared to have disappeared from the San Jacinto Mountains, the southernmost part of their range.

THREATS: Climate change, drought, urban development, logging, forest management practices

PREDATORS: Owls, hawks and carnivorous mammals.



SOURCE: CALIFORNIA NATURAL DIVERSITY INITIATIVE, CALIFORNIA DEPARTMENT OF FISH AND GAME

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Biologists and environmentalists are worried by the apparent disappearance of flying squirrels from the wilderness around Idyllwild, the southernmost of the two Southern California mountain ranges where they have been documented since the 1800s.

"They've just disappeared from our mountain range and we don't understand why," said Anne Poopatanapong, a **Forest Service** biologist in the San Jacinto Ranger District.

Last month, the **Center for Biological Diversity**, based in Tucson, Ariz., petitioned the U.S. **Fish and Wildlife Service** to protect the animals under the Endangered Species Act. The local species are San Bernardino flying squirrels, a subset of the more plentiful northern flying squirrel that lives across much of the United States.

The animals still live in the San Bernardino Mountains around the Big Bear area, though officials don't know how many. Biologists are concerned that whatever drove the squirrels from the southern half of their habitat could also claim that remaining

population.

The threats are many, according to the center's petition. Chief among them is climate change, which shifts the squirrels' forest habitat upslope to cooler temperatures. Other dangers include drought, deforestation, development and pollution.

"They're already at higher elevations, so they have limited options for moving upward," said Shaye Wolf, the center's climate science director. "Eventually, they start to run out of room."

Without A Trace

Few people have seen flying squirrels, which do their roaming and soaring at night. They've been known to clear as much as 300 feet between tree branches using their built-in parachutes and navigating with their squat, rudder-like tails.

The squirrels swoop to the forest floor to dig for truffles, a type of fungus, in the moist underbrush.

"It's fun to think of them at night, digging around on the forest searching for these pungent truffles and gliding from tree to tree. They are fun and charismatic animals," said Wolf, who has yet to see one in person.

In the past couple of decades, after reported sightings of the squirrels dropped off, biologists stepped up efforts to document their existence in the San Jacintos.

In 2005, Poopatanapong set traps for them north of Humber Park in Idyllwild. She placed the traps high in trees, camouflaged them with wood chips and baited them with a fragrant concoction of peanut butter, oats and dried fruit. Other traps were placed on the ground nearby. None got a bite.

Poopatanapong also is looking at one of the squirrel's predators, the rare California spotted owl, which swallows its prey whole. She and volunteers collect and examine owl pellets, the regurgitated remains of their meals that include undigestible parts such as whole skulls and fur, but have found nothing.

"Owls are an indicator of forest health. If the prey population is disappearing, what does it say about the large animals in the food chain? Something's happening at an ecological level that we have yet to understand," she said.

In 2007, she encouraged Idyllwild residents to build nesting boxes, but they didn't draw in the animals, either.

"I'd love to find a piece of bone, something that would give me hope that the species still is here," she said. "The likelihood of finding them is getting lower and lower."

Climate Change

Two years ago, scientists with the San Diego [Natural History Museum](#) began retracing the steps of a landmark 1908 wildlife survey in the San Jacinto Mountains. They are documenting changes in the types of species, their diets and their habitat in those 100 years and how a warming climate may be affecting them.

In that early expedition, one flying squirrel was lured into a trap near Idyllwild by bread, butter and sugar after apricots and dried prunes failed, according to field notes by Joseph Grinnell, whose wildlife expeditions throughout the West were considered groundbreaking.

So far, the modern-day scientists have yet to find a flying squirrel in the area, said Scott Tremor, a mammalogist with the natural history museum. They are building a motion-sensing camera that will be aimed at a speaker emitting flying squirrel chortles,

recorded from their cousins in the San Bernardino Mountains.

"If they exist (there), they're probably in very low numbers or we'd be hearing about them more," Tremor said.

Even small increases in temperature caused by climate change can drive upper-elevation animals such as the flying squirrel from an area, he said.

Accompanying drought affects the cool-weather, moisture-loving truffles that the animals depend on for food, and nitrogen deposits from air pollution kill the lichen they eat.

Their habitat is threatened by forest management practices that remove canopy cover and dead trees to prevent the spread of wildfires, according to the Center for Biological Diversity. Urban development also encroaches on their homes.

The Fish and Wildlife Service has 90 days to decide whether the petition has merit. If so, there will be a 12-month review of the squirrel's status, public comments and finally a determination whether protection is warranted.

Fish and Wildlife spokeswoman Jane Hendron said lawsuits such as the one that prompted the review take manpower and money away from developing comprehensive regional habitat conservation plans -- such as the million-acre multiple species habitat conservation plan in western Riverside County -- that prevent the need for listing individual species.

"It really hamstringing our agency to set what we believe are the conservation priorities. Most of them are being set by these court-ordered deadlines," she said.

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