

Path of the Puma

By Michelle Timmons

At dusk one evening, high in the Santa Cruz Mountains, a young male mountain lion rises from his slumber, stretches his cramped legs, and silently begins his prowl. The setting sun still shines through bunches of redwood trunks, allowing the last hikers to make a swift exit before thick night fog camouflages their trail. They keep their eyes open and their ears alert, for the looming threat of a mountain lion's hunger and curiosity make them reconsider their decision to remain in the forest this late.

The hikers safely enter their truck and drive along Highway 17, a major corridor connecting Santa Cruz to the greater Bay Area. The highway also slices straight through the mountain lion's habitat, creating a dangerous barrier between him and the surrounding landscape.

A new project at UC Santa Cruz promises to reveal how roadways and urban development affect the local mountain lion population. The study, known as the Bay Area Puma Project, is the first of its kind. Now in its second year, the study examines the lives of mountain lions—also known as pumas—using innovative technology, with hopes to shed new light on one of the region's top predators.

The project leader is Dr. Chris Wilmers, a wildlife ecologist and assistant professor at UCSC. Together with Dr. Terrie Williams, an animal physiologist, also at UCSC, he is aiming to answer several unexplored questions about mountain lions: What is their habitat range? How do they

move through this environment? What physiological features allow them to do this? What are a puma's predatory habits?

Humans continue to encroach on the habitat of mountain lions, leading to more frequent encounters between them. The team is using equipment developed at UCSC to learn about these mysterious creatures and determine how they survive in a rapidly developing area.

The team estimates that 28 adult mountain lions and 42 cubs reside in the Santa Cruz Mountains, which stretch from south of San Francisco to Monterey County. For instance, a 5-year-old 133-pound male puma, named No. 3, is the first mountain lion under observation. Scientists now know that No. 3 regularly roams through the Bonny Doon area near Santa Cruz. It occasionally crosses Bonny Doon Road, a hilly two-lane road through the woods, and it tends to occupy a range of 70 square miles.

“Nobody is in danger,” says an assured Wilmers. “Mountain lions are generally uninterested in human affairs.” None of the cats shows signs of poor health.

Mountain lions are solitary animals. They spend most of their time in their territory alone, defending it from invaders. They prefer to eat deer, but pumas will also prey upon coyotes, raccoons, and other small animals. These cats stalk their prey until the opportunity arises to pounce. They grasp their victims tightly with their claws, sinking their teeth into the back of the neck with a fatal bite. Pumas hide carcasses too large to finish in one sitting and save them for a later meal.

Since June 1890, sixteen people

have been victims of a mountain lion attack in California. Six of the attacks were fatal. The California Department of Fish and Game warns that mountain lions, like any wild animal, can be dangerous, but a person is 1,000 times more likely to be struck by lightning than attacked by a mountain lion. Disease, such as rabies or feline leukemia, may cause a mountain lion to display unusually bold behavior toward humans. As more people move into the cats' habitat, it has become more common for the mountain lions to prey on livestock and pets. Any mountain lion that attacks a person or acts strangely near a civilized area is hunted down and killed.

Scientists want to know how individuals from one mountain lion population can disperse to neighboring populations. Their findings may suggest ways to reduce mountain lion encounters with humans. Wilmers, who received his Ph.D. at UC Berkeley by studying wolves in Yellowstone National Park, has always been interested in studying the impacts of predators on an ecosystem. He is especially curious to learn how a large predator like the mountain lion can coexist with humans in an area surrounded by urban and agricultural settings. Pumas risk their lives as they continually wander across major thoroughfares and mountain ranges.

“For a large-bodied animal, they need to be able to get to other ranges. The Santa Cruz Mountains aren't enough,” Wilmers says. “Without connectivity between other ranges, such as the Diablo Mountains, they will eventually go extinct.” This top predator is essential to maintain balance in the local ecosystem, Wilmers notes.

During the project's first year, the team gained permission and signed contracts with land owners in the Santa Cruz Mountains. Learning the landscape of the mountain range requires time and patience. Since then, they have caught six mountain lions and collared each one with a global positioning satellite (GPS) tag. The collars were developed by UCSC electrical engineering graduate student Matthew Rutishauser. The device records each lion's location every 20 minutes, as well as continuously measures its physical activity. The researchers get a record of every sprint, every moment of rest, every time the animal takes a drink of water—and every kill.

“The movement during a strike is so different from other movements that it will leave a unique signature in the data,” says Williams. She plans to use this information to calculate how many calories the animal burns through daily activities. The data assesses how vulnerable the pumas are to disturbances in their environment. Williams conducted previous research on dolphins, Antarctic seals, cheetahs, and elephants using many of the same methods.

Capturing mountain lions has proven difficult. Researchers first collect deer carcasses from roadkill and place them in areas where mountain lions range. Every morning, they check to see if a lion has fed on it. If they see signs of nibbling, researchers place a cage or snare to hold the animal captive. If the deer is left untouched, then the team uses hound dogs to search for mountain lion signs. If a dog finds a lion, it chases the lion up a tree where the

researchers tranquilize it with a dart gun.

“The process never goes smoothly,” states Wilmers. The ground needs to be just wet enough to mold footprints, and the cat's scent does not carry well enough in hot, dry air for a hound to sniff out. Throughout the region, cameras capture images of pumas and other species roaming through the area to help the researchers track their movements.

Anyone coming within range of a mountain lion should not run. Instead, biologists advise people to face the animal, make loud noises, and try to look bigger by waving arms. Rocks or other objects thrown at the puma may scare it away.

While the Bay Area Puma Project does entail conservation of the species and its habitat, researchers do not expect the population to grow from their efforts. Rather, the team hopes to have a full picture of the area's puma residents and their activities within five to ten years.

Williams and Wilmers have recruited the help of Zara McDonald, executive director of the Marin County-based nonprofit organization, the Felidae Conservation Fund. This group is dedicated to protecting all wild species of cats and their habitats. She would like to see a combination of scientific research, education, and public outreach improve the connection between humans and mountain lions. “We need to educate people on how to respect the mountain lions' habitat and their need to move within their range, as we encroach more on their habitat and guarantee increased encounters,” McDonald says.

The Bay Area Puma Project plans

to expand its research to include the Diablo Range in the East Bay, as well as the North Bay. Wilmers and Williams also plan to adapt the collars to other large predators, especially wolves.

Most hikers walking along the moist, dirt paths of the Santa Cruz Mountains aren't aware that they are deep in the territory of the beautiful and elusive mountain lion. Even if we never see one, it will be good to know what these lions are up to.

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