Rush to rescue thousands of endangered abalone buried in Big Sur landslides

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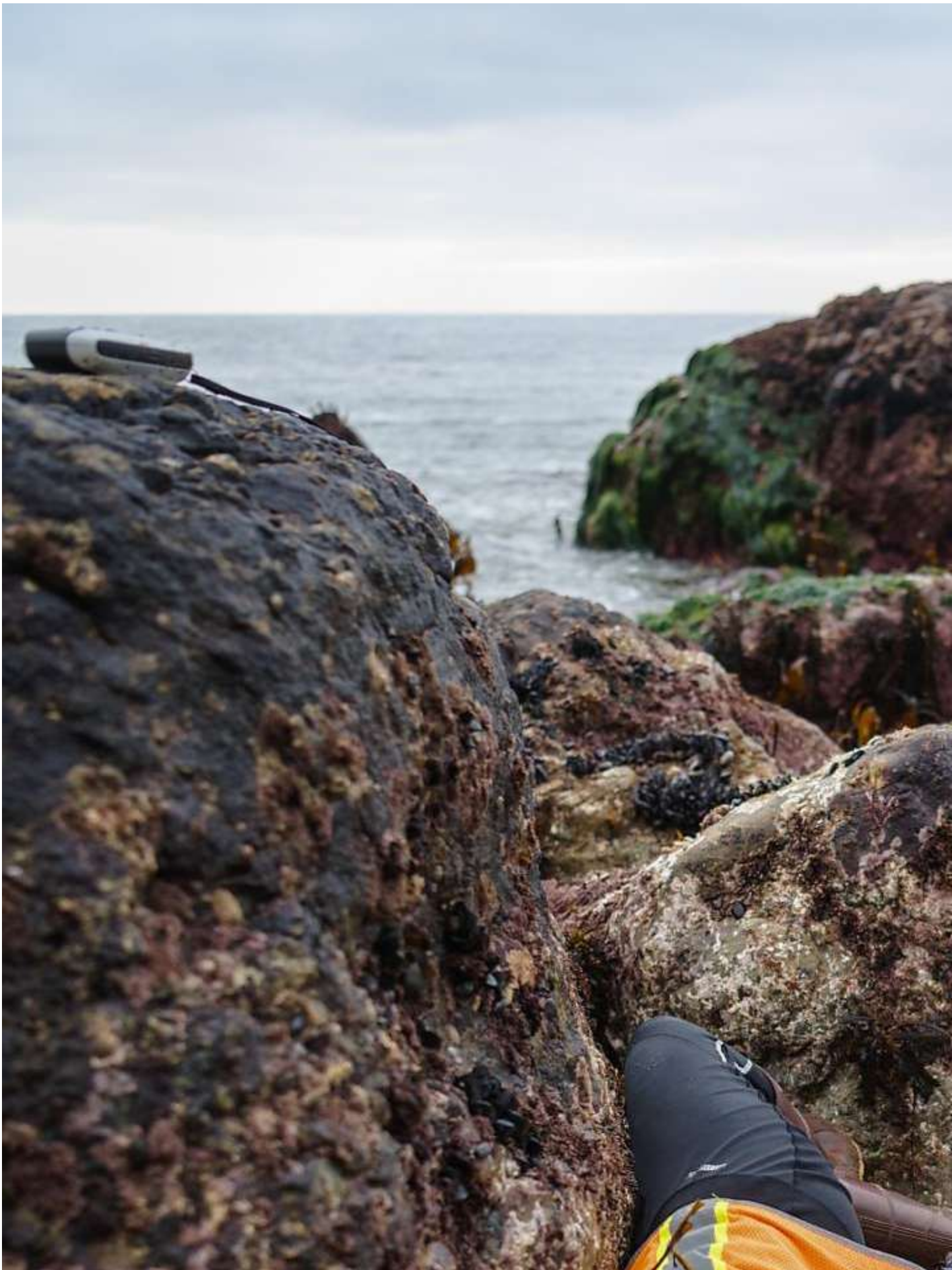
When biologists discovered this abalone, only a portion of its shell was exposed. But after carefully removing sand from the area, it was safely removed using specialized tools called abalone irons.

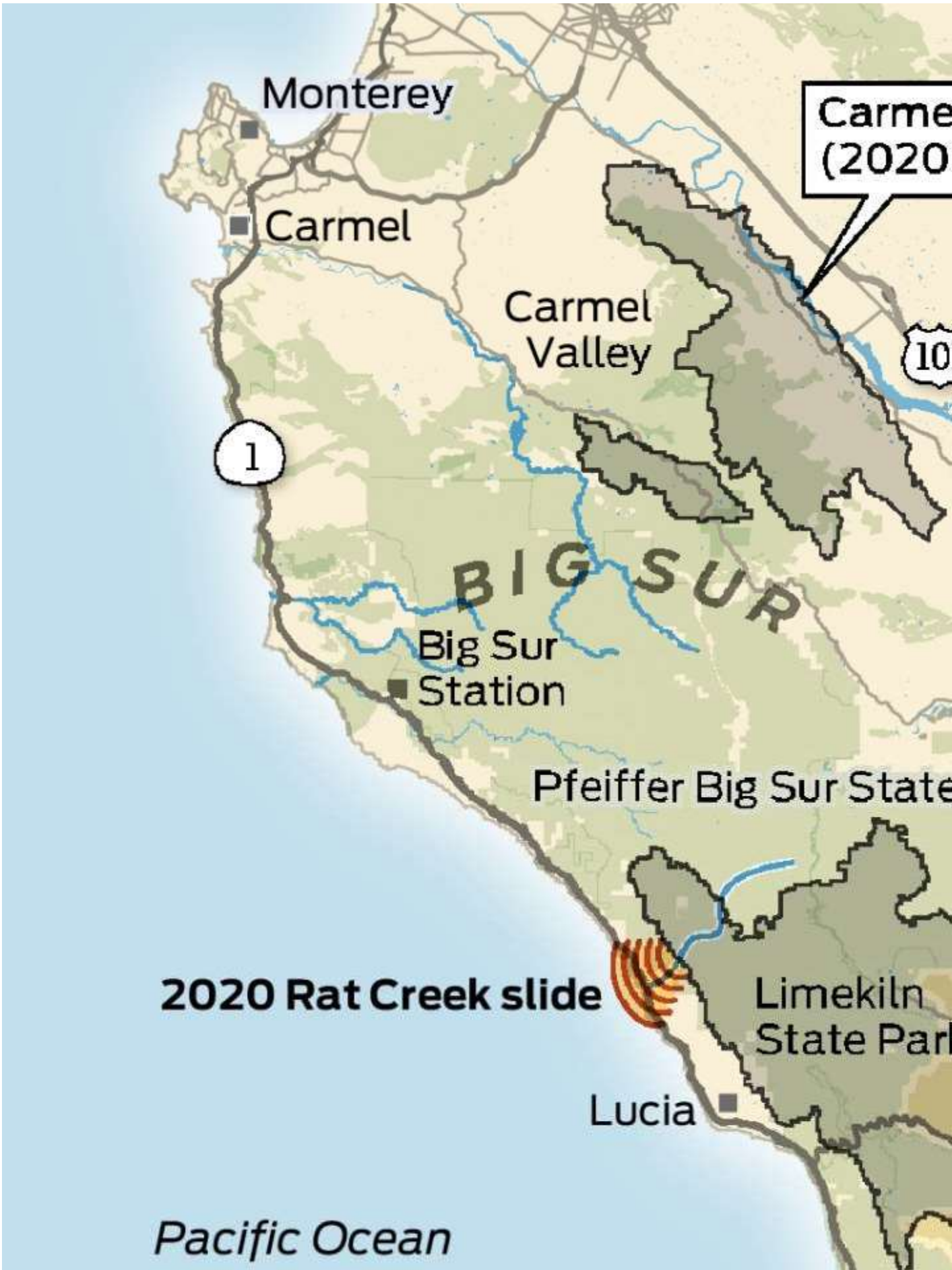
Kenan Chan / Special to The Chronicle



Wendy Bragg knew California's abalone population was in bad shape. The UC Santa Cruz researcher had been leading surveys of black abalone along the remote Big Sur coast, one of the last strongholds of the endangered mollusk.

But how much worse things would get for this small, shelled marine creature, once a common seafood delicacy, Bragg and her fellow scientists could not have imagined.

Three months ago, when a series of winter storms blasted Central California and sent scores of mudflows down steep canyons destabilized by wildfire, thousands of black abalone on the rocky shores of Big Sur were buried alive. As the death toll grew and concern mounted about the survival of the species, Bragg and her colleagues transformed from researchers to rescuers.


Monterey
Carmel
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BIG SUR
Big Sur Station
Pfeiffer Big Sur State
2020 Rat Creek slide
Limekiln State Park
Lucia
Pacific Ocean

For several weeks, the scientists have been digging abalone out of dirt and debris, packing them in coolers and taking them to a makeshift rehab facility. The campaign has continued, as the southern end of Big Sur that burned remains largely unsettled, and rocks, fallen trees and sediment continue to shift and pose hazards to the gastropod.

“When you’re talking about an endangered species and a limited genetic pool, every individual you save has the potential to save the remaining population,” said Bragg, reached by phone as she drove to one of the spots where a charred hillside had unleashed a deadly debris flow to the sea. “We went out expecting to do an initial rescue and thinking that was it. But it’s been going on for a while.”

The majority of abalone at spots where mud poured onto the coast were entirely covered, sometimes by several feet of sediment. Most of the rescues have been on the edges of these large debris piles, where fewer abalone were fully buried.

Crawling around slippery boulders and combing murky tidepools with flashlights, the group has so far collected nearly 200 abalone. These are individuals that were likely to die, the scientists say, either from being smothered or being flushed out of their home in rock crevices and exposed to predators such as coyotes and turkey vultures.

“We saw a seagull carrying one off,” Bragg said. “There’s no way a seagull would normally get an abalone.”

The toll of wildfires, exacerbated by a warming climate, on California’s landscape has been evident. Forests and grasslands, plants and animals and, of course, people, have been ravaged. The effect on the marine world, however, has been less obvious.

The chain of events that led to the mass abalone deaths — starting with flames and followed by rain and then mudflows — underscores the expanding fallout of fire and the devastation that has been carried seaside.

It’s one more trial for an ocean environment already stressed by such climate problems as warming temperatures, acidification and coastal erosion, and one more obstacle for the creatures that live there.

The 4-to-8-inch black abalone is one of seven species of abalone, essentially a marine snail, found in California.

It's distinguished by its dark outer shell and iridescent inner shell. It's one the most familiar because it can be seen on shore, living in the inter-tidal zone and clinging to rocks and reefs. Other abalone typically dwell in deeper water.

The black abalone is one of two species listed as federally endangered, though all have been in decline. Once numbering in the millions in California and Mexico, the black abalone has struggled amid overfishing and a bacterial disease known as withering syndrome, which may be getting more prevalent as ocean temperatures rise.

Today, Big Sur is believed to be home to the most robust pocket of the mollusks. About 70% of the state's healthy black abalone reside in Monterey and Santa Cruz counties, according to researchers at UC Santa Cruz — at least they did until storms hit during the last week of January.

"This was the population that was going to be the seminal population for the recovery of the species," said Pete Raimondi, professor of ecology and evolutionary biology at UC Santa Cruz, who is helping oversee the abalone rescue. "To the degree that it's been taken out, it now needs to be recovered."

Raimondi and Bragg, his graduate student, had suspected that the winter might be hard on the abalone. They had seen last year's Dolan Fire, which seared 125,000 acres of Big Sur south of its namesake town, and they had looked at landslide maps prepared by the U.S. Geological Survey showing that rain could cause the scalded slopes to discharge debris toward the coast.

This prompted them to begin surveying abalone numbers near the burn areas and even planning ways to help the critters if mud and rock came tumbling down.

"We thought we should be ready in case anything happened," Raimondi said. "But then everything happened. Basically every creek became a potentially deadly debris field. It was way worse than we thought.

The California Department of Transportation reported that more than 50 slides spilled across oceanfront Highway 1 after as much as 16 inches of rain fell during what meteorologists describe as a slow-moving atmospheric river. The winding highway remains closed at Rat Creek, near mile marker 30, because of the wreckage. Work crews expect to have the road repaired and opened this summer.

Susan Wang, a fishery biologist at the National Oceanic and Atmospheric Administration's fisheries division and head of the federal management team created under the Endangered Species Act to help with black abalone recovery, said she's monitoring the situation in Big Sur to figure out what it might mean for the future of the species.

While black abalone have recently showed signs of bouncing back in parts of Southern California, where they've suffered the most, the events to the north could pose a setback, she said. The recovery team had been considering taking abalone from Big Sur's healthy stocks and transplanting them southward to hasten the rebound.

"This (recent event) may change our plans a little bit," Wang said.

The total number of abalone lost is yet to be known. But the researchers estimate it could be close to 10,000 and perhaps much higher, meaning at least 10% of the region's population may be gone.

The rescue work has included, in addition to the UC Santa Cruz researchers, a coalition of scientists called the Multi-Agency Rocky Intertidal Network, or MARINe. The effort was launched in coordination with NOAA's National Marine Fisheries, the Monterey Bay National Marine Sanctuary and the California Department of Fish and Wildlife.

The rescued abalone, which are being cared for in tanks at the nearby rehab facility, eventually will be brought back to the coast but not before the shoreline stabilizes and their habitat is deemed safe.

Raimondi, though, worries that this might not be the end of the story.

“There’s tons of debris and sediment in these burned areas that will likely come down in the future,” he said. “When another big storm comes, which will likely be next year, we’ll have to do this all over again.”

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