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hen the Green Diamond Resource Company purchased over 600,000 acres of Oregon timberland in 2014, there was no evidence that the working forest was occupied by Pacific fishers. Although much of the property is located within their historical range, the landscape had been intensely harvested, and most of the forest consisted of young and smaller trees.

The Pacific fisher is the West Coast distinct population segment of the fisher (*Pekania pennanti*), a member of the Mustelidae family. Since fishers typically require mature trees for denning and resting structures, it seemed obvious they would not be there. But then came a surprise.

On the lookout for fishers on the Klamath Plateau between two known populations — one in Oregon's southern Cascades and another in northern California — biologists from Oregon State University and the Bureau of Land Management started surveying on Green Diamond's land. As they searched, they came across a female fisher denning in a network of large slash piles — heaps of trees and treetops left over from logging that were too small to go to the mill.

"She had her kits there," said Green Diamond Vice President Galen Shuler.

It was a significant discovery. Instead of having to wait for decades or centuries for tree cavities or other features to form, the biologists realized, fishers were making use of a byproduct of logging already on the ground.

A new agreement

Faced with the possibility that Pacific fishers could end up on the federal endangered species list -amove that could impact timber operations -andseeing that some timber activities were benefiting

Credit: Bethany Weeks/U.S. Fish and Wildlife Service

▲ Due to historical logging, trapping and development in West Coast forests, the Pacific fisher has declined and is a candidate for listing under the Endangered Species Act. Recent agreements with timber companies in Oregon have been put in place to try to prevent the need for a listing.



Credit: C. Rowland/USFWS

▲ Timber companies including Green Diamond, Weyerhaeuser, Roseburg, Lone Rock and Hancock signed conservation agreements with the USFWS. fishers, Green Diamond and four other Oregon timberland owners penned letters of intent to the U.S. Fish and Wildlife Service in 2016. They offered to enter into long-term conservation agreements with the Service, and they initiated field research to understand fisher occupancy and use on private timberlands.

In September, Weyerhaeuser, Roseburg, Lone Rock Resources and Hancock Timber Resource Group signed agreements with the USFWS to help protect the species on about 2 million acres of Oregon forestland.

▼ Ten Pacific fishers were released into Mount Rainier National Park in December 2016, about 75 years since fishers were last seen there.

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"Working forests also contribute to species conservation," Schuler said. "So with that in mind, this is one of the leading projects on the West Coast



Credit: National Park Service

demonstrating how conservation without conflict contributes to species conservation."

These agreements, called Candidate Conservation Agreements with Assurances — or CCAAs — allow timber companies to continue operations while adapting their practices to benefit species that are candidates for Endangered Species Act listing.

A 'safe harbor'

Meant to prevent the need for listings by implementing beneficial conservation activities, these agreements allow participating companies to avoid penalties for incidental take of a species — harassing, killing, capturing or otherwise harming it — even if the species ends up being listed.

"They're kind of like a safe harbor agreement for a candidate species," said Paul Henson, the Oregon state supervisor for the U.S. Fish and Wildlife Service.

Companies that don't enter into the CCAAs won't be protected for incidental take if the fisher is listed.

"It's not all sort of 'Kumbaya," Henson said. "They have an incentive to minimize regulation of their land under the ESA."

The hope, he said, is that timber companies can see the appearance of imperiled species on their land not as a liability — as is often the case under ESA protections — but an amenity. "We use these agreements to make it so that the landowner is happy and encouraging and proud to have these endangered species on their property and helping recover them, rather than managing lands to avoid having them on their property, which has happened in the past," he said.

Conservation across three states

Although its population has declined, the Pacific fisher can still be found in isolated pockets of its former range from British Columbia to California. Facing myriad conservation challenges, from habitat loss to genetic isolation to human-caused mortality, the population is up for a listing decision to determine if it should be considered threatened under the Endangered Species Act.

The Oregon CCAAs aren't the first agreement meant to protect the species. A similar agreement is in effect in neighboring Washington. Officials borrowed language from it for the Oregon agreements, said Sue Livingston, a fish and wildlife biologist at the

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Oregon office of the U.S. Fish and Wildlife Service, including provisions that timber companies provide a quarter-mile buffer around fisher den sites to protect them from logging activities and trapping.

The Oregon CCAAs also incorporate research priorities, including radio telemetry projects.

In California, a conservation plan involving Green Diamond and Sierra Pacific Industries benefits fishers on nearly 2 million acres of private working forests. The plan grew from a 140,000-acre fisher CCAA approved in 2008, which allowed California Department of Fish and Wildlife managers to translocate a fisher population to managed forests, where they survived and reproduced.

Important landscapes

While biologists observed fishers denning on Green Diamond's forest, private timberlands may be particularly important to Pacific fishers as they move across the landscape. While the species prefers older trees for denning and resting, Livingston said, they will use younger, logged forests for foraging and to get from one stand of older trees to another.



"Fishers can't read boundary signs," she said. "They're going to move where they're going to move, regardless of land ownership."

With 44% of Oregon land in private hands, maintaining these private timberlands for fishers is critical for their conservation, Livingston said.

Research has also found these private lands, with open shrubby areas growing among Douglas fir (*Pseudotsuga menziesii*) seedlings, are "conducive to fisher prey," Henson said, helping fishers forage as they travel.

Credit: OR Dept. of Forestry

▲ Almost 2 million acres of state and private land are now enrolled in Pacific fisher CCAAs in Oregon.



Courtesy Dave Clayton



Credit: Bureau of Land Management

 U.S. Forest Service biologist Dave Clayton (left) holds a radiocollared fisher in southern Oregon.
The Oregon CCAAs incorporate radio telemetry projects and other research priorities.

The Pacific fisher prefers old-growth, mature forest habitat (right).



Credit: National Alliance of Forest Owners

▲ Historically, tree harvesting has led to habitat loss for the Pacific fisher. Conservation agreements with timber companies require them to follow guidelines to protect remaining fisher populations.

Biologists realized Pacific fishers were occupying private forest land in Oregon after observing them denning in slash piles. Biologists hope the agreements can also help offset landscape losses elsewhere due to catastrophic wildfires. "To the extent you can provide fishers with more and better refugia ... it helps them deal with the undeniable threats and increase in wildfire," he said.

Balancing logging with conservation

As part of the CCAAs, some companies agreed to leave more trees per acre for wildlife than the minimum required in the Oregon Forest Practices Act, helping create more structures for denning and other activities. Once female fishers and their young are detected via radio telemetry or other sightings, timber companies are prevented from destroying those sites, whether it's a tree, snag, log or other structure. Even decayed snags are important.



"They don't make a good log, but they make a good wildlife tree, creating those denning and resting places," Schuler said.

CCAAs also seek to maintain forest edges for fisher prey, such as birds, mice and woodrats. In California, Livingston said, biologists found that conditions that benefit spotted owls (*Strix occidentalis*) — patchworks of harvested areas, riparian zones, mature forests and trees left for wildlife also benefit fishers.

"If an area doesn't have heterogeneity, it could hurt the fishers," said TWS member Chad Hanson, a research ecologist with the John Muir Project, an organization dedicated to ecologically managing federal forests. Logging, however, can't match the natural complexity created by wildfires, he said.

Other regulations in the CCAAs include mitigating structures that present the risk of entrapment. Fishers can fall into water tanks used for fire suppression and get stuck, said Mike Rochelle, a TWS member and environmental operations support manager for Weyerhaeuser. "We're taking specific measures to place logs into structures that reach the top so the animals can climb back out."

The National Council for Air and Stream Improvement, an industry-related research group, has agreed to conduct and facilitate studies on fisher movements, reintroduction radio-tracking and camera traps.

"Hopefully, the conservation measures, if they work as intended, will serve to maintain the population of fisher that we have and also possibly enhance the number of animals out there to expand across the historic range where they were once found," Rochelle said. "From the company perspective, the benefit is, it gives us that regulatory guidance, certainty and confidence for running our business."



Dana Kobilinsky is associate editor for The Wildlife Society.

Credit: R. Green