

A biology whodunnit: are rodents helping protect trees from fire?

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Tom Parker (center) and his team setting up trays of fruit to attract rodents at Fort Ord Natural Reserve in Santa Cruz.

Tom Parker has made an unusual find. In California forests and shrubland that burned in 2008, he has spotted Manzanita seedlings sprouting in tight clusters, suggesting that the young shrubs emerged from underground stashes of seeds. But how did they get there?

Each year, wildfires provide the biology professor with new evidence about how California native [plants](#) cope with intense heat and smoke. This fall, Parker is spending nights in the field, tracking mice, meadow voles and [kangaroo rats](#), which he believes are squirreling away Manzanita seeds and helping these plants adapt to fire conditions.

"We believe that rodents open up Manzanita's cherry-like fruit and bury the seeds found inside, similar to a squirrel hiding its nuts to eat later," said Parker, an expert on Manzanita, a group of evergreen [trees](#) and shrubs. "What's critical is that they bury the seeds at a depth that the seeds can survive the heat if a fire breaks out."

Parker's nocturnal experiments near Monterey and Santa Cruz attract rodents to trays of fruit and track their footprints using fluorescent powder that shows up under UV light. "We want to get the rodents to bury the seeds so we can see how many they are burying in one cache and how deep they are burying them," Parker said. "We follow the footprints and where the seed cache is, there is usually a mess of fluorescent powder on the ground where the rodents have been stamping down the soil on top of their seeds."

Parker plans to replicate the depth and distribution of the seeds in lab experiments to test whether the rodent's caches are improving the plants' survival rates.

As an insurance policy against fire, Manzanita species rely on underground stores of [seeds](#) that repopulate the area after a fire. Through such natural means as wind or gravity, botanists believe it takes as many as 25 years for adult shrubs to develop a [seed bank](#) in the soil, but the process could be much faster if rodents are involved.

"Sometimes plants develop survival strategies that use the help of animals, like bees pollinating flowers," Parker said. "If our hypothesis is correct, we'll show that contrary to popular belief, rodents are more of a help than a hindrance to Manzanita -- a finding that will inform the management and conservation of this group of plants, two-thirds of which are rare or listed species."

Like much of Parker's research, his latest project will increase the

understanding of California's native plants and the results will inform park managers' efforts to manage fragile habitats. North America's West Coast is one of the world's biodiversity hotspots, home to more than 2,000 species that only grow in this region, including the 60 species in the Manzanita, or *Arctostaphylos*, genus. In recent years, Parker and colleagues have described two new Manzanita species, one of which has just 100 plants in its population.

Parker has spent more than 30 years researching west coast plant life, including studies of fire ecology and San Francisco Bay's salt marshes and wetlands. He has just assumed a new role as President of the California Botanical Society for 2009-12. Parker hopes to propose special issues of the Society's scientific journal, one devoted to climate change and another exploring how California's growing population is impacting the state's rare plants.

Provided by San Francisco State University ([news](#) : [web](#))

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