After a huge wildfire killed a forest in San Diego, California, in 2002, Cody Petterson set his heart on replanting the trees. As a child, he had happily played and hiked among these statuesque conifers, which provide shelter to black bears and black-tailed deer. By the age of 37, he wanted to do his bit to conserve and repair the land.
But in the six years since he began, California has experienced severe drought, which scientists link to global warming, and 650 of Cody's 750 seedlings died. Cody's emotional account of surveying his dying trees struck a chord with thousands of people on social media when it was posted on Earth Day, in April.

"I think of all the love I've put into saving that forest, all the
years, all the
thousands of hours,
all the thought, and
worry, and hope, and
faith," he wrote. "I felt
despair for the world
I've known and loved."

'Early indicator of
climate change'
Globally, human
activity is putting one
million species are
at risk of extinction,
as nature declines at
unprecedented speed,
the UN said last week.
In California, the
effects of climate
change are ubiquitous
- recent years have
produced record-
breaking
temperatures, earlier
springs and less
reliable rainfall.
The tree Cody
planted, the Bigcone
Douglas-fir, is native
to southern California
and does not grow
outside the state. But
now experts believe
its time is limited in
San Diego.
Instead, it will
probably move to
higher elevations in
search of wetter
conditions.
Bigcone Douglas-fir, which grows to 30m (100ft), in the San Gabriel Mountains, near Los Angeles, California.

The species is an early indicator for the impact of climate change, says ecologist Michael Kauffmann, who monitored and mapped Bigcone Douglas-fir for the US Forest Service. The tree's decline in San Diego is a "harbinger for the next 50-100 years".

Nature's emergency in five charts
The teens saving Madagascar's wildlife
The massive CO2 emitter you may not know about

For Cody, an anthropologist and environmentalist, it's a devastating result after years of difficult work on his 300 acres (1.2 sq km) of land in
the Volcan mountain range.

**One-man crusade**

When he bought the property with his wife, in 2013, he realised the trees' seed bank had also been destroyed in the 2002 Pines Fire, making it difficult for the conifers to re-establish alone. After securing government funding to replant the forest, he began what could be called a one-man crusade.

"I read everything I could about reforestation, botany, ecology, soil. I collected acorns, thousands of cones, and seeds," Cody told BBC News.

"To my wife's chagrin, I filled a third of the refrigerator with bags of seeds in various stages of stratification and germination. I filled the backyard with potted seedlings."

Eventually, he began to plant the seedlings out on the mountain.

"I planted every which way I could, learning something new each time, year after year," he said. "The first year I planted in the open, the seedlings baked."
Next, I planted in the shade - and they baked."
When gophers and rabbits ate the fledging trees, he built cages to protect them. **California was in a state of drought** from December 2011 to March 2019, according to the US Drought Monitor. Cody was watering the seedlings across the large area every two to three weeks.

"Winter rains are good but there's no snow-melt anymore and a winter rain doesn't help a seedling survive in October when there hasn't been a drop of rain in
eight months," he said. "The second half of 2017 was the driest on record here. "I've planted hundreds over the years, and filled my patio and yard. I've lost too many to count but I can somehow remember the moment I first saw each one had dried out."

Scientists have found that snowy mountain winters are being "squeezed" shorter by climate change in California. Ecologist Michael Kauffmann says that climate change is "definitely" affecting the tree's ability to survive. "The worst of it is the lower elevations. Trees have always moved in search of good growing conditions," he said. "But right now, because of the acceleration of climate change, the spots favoured by Bigcone Douglas-fir on lower elevation, south-facing slopes are drying out - and the trees just aren't making it."
Other factors are also contributing to the area's changing environment. Invasive species such as grasses, which humans help to spread, compete with native species for moisture, nutrients and sunlight. The changing wildfire regime in California, which is causing more frequent and more ferocious wildfires, is a particular cause for concern for forestry. Despite the fact the Bigcone Douglas-fir can regenerate, even flourish, after it burns, they cannot survive high intensity fires,
The rise of 'eco-anxiety' and what to do about it

Facing the shrinking tree range, Cody says he has accepted he must give up his dream of growing a new Bigcone forest. But he struggles to think how to explain it to his children, who are three and six.

"I thought of this photo we took a couple of years ago, sitting in front of all our hundreds of seedlings - so happy," he said. "How do I tell them that I don't know what to do with the 600 seedlings in the backyard? That there's no place left in
the world for these trees they've grown up with?"
Cody has begun to focus more time on environmental activism and lobbying but he hasn't given up his forest dream entirely. This time he's pinning his hopes on another native but more drought-tolerant conifer - the Coulter pine.