

Growing seed bank is 'Noah's Ark' for Southern California desert plants

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Corina Godoy has an admittedly unorthodox dream.

She hopes to adopt a bird. She's not yet sure what kind of bird, but it

needs to have a taste for feasting on the juicy red berries that grow on lycium, a thorny shrub found throughout the deserts of Southern California.

Sometime after her bird eats those berries, Godoy's dream continues, she'll root through its droppings. Then the petite scientist will pluck out the lycium [seeds](#) that had been nestled inside the red berries, waiting, as nature intended, for the bird's acidic digestive system to free them and prime them for planting.

But instead of sowing the seeds, Godoy's dream is to carefully store them in a refrigerator. That way, if a wildfire or climate change or other disaster decimates the local lycium population, she'll have seeds ready to help ensure the shrub—and the wildlife that depends on it—can live to see another day.

These are what your dreams look like when you're part of a small team tasked with trying to preserve the biodiversity of Southern California's deserts.

Mojave Desert Land Trust started a [seed bank](#) at its Joshua Tree headquarters back in 2017 to help restore and enhance habitat for rare, threatened and culturally important species. Over the past six years, Godoy and her colleagues have collected, processed and secured seeds for some 210 species of plants found in the Mojave and Colorado deserts, including the beloved Joshua tree.

"This seed bank acts as an insurance policy—or, if you want to look at it a different way, like Noah's Ark," Godoy said. "When there is a need for that seed, our mission is to have it ready and here and in prime condition."

Still, so far, the Mojave Desert Seed Bank is safeguarding less than 10%

of the [plant species](#) found in our local deserts.

"We don't think of the desert as this really lush, biodiverse forest," said Kelly Herbinson, joint executive director of the Mojave Desert Land Trust. "But it really is. In fact, we have a higher level of biodiversity than many pine forest ecosystems."

Thanks to a \$3.2 million state grant, and a large contribution from an anonymous private donor, the trust's seed bank is about to get a lot of new deposits.

Herbinson said they plan to use the new funding to collect and bank seeds representing at least 300 more species over the next four years. Eventually, if funding and the climate and Godoy's adopted bird cooperate, the team hopes to have seeds representing all of the roughly 2,400 species of plants now found in our deserts.

Along with preserving "one of the last remaining intact ecosystems in the United States," Herbinson said her team hopes the work they're doing might also help scientists around the world chart a survival strategy for plant life in regions that are starting to turn into deserts because of climate change.

And the secret might just be waiting inside a tiny seed in a refrigerator on the edge of Joshua Tree.

A different kind of bank

Farmers have always informally "banked" seeds, saving and exchanging them to replant and rotate their crops. But picture a seed bank and you might conjure up images of a massive concrete structure jetting out from a hillside in the arctic's frozen tundra.

Appropriately known as the "doom's day vault," Norway's Svalbard Global Seed Vault is arguably the most famous such facility in the world. The structure tunnels deep underground and is capable of surviving a nuclear blast. It's now holding more than 1.2 million seeds representing the most important food crops from nearly every country in the world.

The Norway facility actually stores copies of seeds. Originals stay with one of the estimated 1,700 other banks around the world that collect seeds for crops grown in their communities. And if a natural disaster or conflict strains those crops, whichever government or research group deposited seeds in the Norway facility can make a withdrawal and hopefully fend off any potential famine.

If Norway's seed bank is like Fort Knox, think of the Mojave Desert Seed Bank like your local credit union.

There's no secretive underground tunnel at the Joshua Tree site, which is open to the public. The facility also isn't focused on crop seeds, though Indigenous populations and various wildlife do eat different parts of the plants they preserve here. Instead, this team wants to preserve all plant life found in local deserts.

The concept, Herbinson said, is based on growing awareness of how even plants of the same species can have different genetics in different parts of the world. So if Southern Californians want to plant white sage or smoke tree and order seeds online, the variety they get might not thrive because it's not adapted to our climate or it won't lure local pollinators in the same way. They also could disrupt the genetic lineage of the plants that are here, or introduce invasive weeds that can increase fire danger and choke out native vegetation.

"We kind of joke that we have an artisanal operation," Herbinson said. "All of our seed is locally sourced to this specific genetic population. So

we're able to restore with the genetic lineages that are supposed to be there."

Making deposits

For now, the Mojave Desert Seed Bank team does its work in a small room packed with three refrigerators, tools and a Trader Joe's bags full of plant clippings. The small room does have a big window, making it possible for members of the public who stop by to see the trust's demonstration garden or to buy common seeds can see what they're doing.

Since its founding in 2006, the nonprofit trust has bought up and conserved more than 800 plots of desert land that total some 120,000 acres. They've donated about half of that land to the National Park Service or Bureau of Land Management, where it's preserved as wilderness areas. The trust plans to preserve the other half for its own use, which includes allowing Godoy and others on the team to hunt down seeds from plants still on their wish list.

Timing is key. The desert has blooming seasons each spring and fall. But depending on temperatures and rainfall and other factors, windows to collect seeds from blossoming plants can shift significantly, Herbinson said. Some plants bloom for just a few days, some bloom only once in 10 years. And—particularly in superbloom years like this one—many bloom all at once, miles apart, making it tricky for their small staff to get everything before that window closes.

Once staff or volunteers find a plant on the wish list that's in bloom, Godoy said the labor-intensive process of harvesting and cleaning the seeds (so they don't get moldy or attract bugs) can vary widely between species.

"Each seed has its own sort of story in terms of how we help it become a plant," she said.

For most plants, they first gently grind them by hand on a copper filter. Some then go into a blower, where controlled air pressure helps separate seeds from other plant material.

And seeds range widely from rugged to delicate. Seeds of the honey mesquite tree, for example, are so tough that they use pliers to crack open the outer shell. But when they're handling tiny seeds for, say, screwbean mesquite, Godoy said even a deep breath can be disastrous.

"We can't laugh at that time because one big guffaw will send everything everywhere."

After the seeds are cleaned, most go into jars that are stored in white refrigerators. Some go into the trust's germination chamber, where they try to figure out optimum conditions to make the seeds sprout.

Along with their own trials, the trust also helps agencies such as the BLM do research on seeds. This week, they've got fiddleneck seeds in the germination chamber so they can help BLM learn the best way to grow the plants, which are a food source for the threatened desert tortoise.

In a twist of irony, efforts to get Joshua trees declared endangered have prevented the trust from gathering seeds for a few years.

The plants currently aren't rare. But due to [climate change](#) and increased fire risk—as demonstrated by a blaze that started last week in Joshua Tree National Park—a study out of UC Riverside estimates that up to 80% of the park's Joshua tree habitat might be gone by the turn of the century. For now, with the slow-growing plant's status under contention,

Mojave Desert Land Trust staff can't harvest new seeds, though they thankfully have seeds from several years ago still in their bank.

The trust uses seeds it collects from other common species to grow plants in its own nursery.

About half are set aside for the nonprofit's annual native plant sale each October. The event has become so popular that Herbinson said people come from as far as Las Vegas and Los Angeles, lining up at 3:30 in the morning to get first dibs.

The other half of plants the trust grows are for contracts with different agencies or private businesses. They've helped the Wildlands Conservancy reseed native plants in portions of the nearby Whitewater Preserve that were destroyed by wildfire in 2020, for example. They also grow plants for developers who often are required to add native plants on their property or nearby land to mitigate any negative environmental effects of their projects. Herbinson said that includes companies that aim to mine for lithium near the Salton Sea.

"We just took on a major contract regrowing 30,000 plants for restoration of the Salton Sea," she said, as part of a state plan to use vegetation to hold down soil that triggers asthma and other problems for local residents.

To support such efforts, they're gonna need a bigger bank.

Bigger bank coming soon

In late May, the land trust received a \$3.2 million grant from the California Wildlife Conservation Board. They plan to use the funds to more than double the species of plants represented in the seed bank, with a pledge to collect more than 2,000 pounds of seed over the next four

years and make it available for restoration across the region.

As part of the expansion effort, they also plan to create an inventory of California desert seed and share protocols for the best way to germinate and plant particular seeds. And they'll create a public outreach program about seed banking and the importance of native plants.

Using a donation from a private donor, the nonprofit also will build a new 2,500 square-foot seed bank on the back half of its property, near the nursery. The building will house a seed lab, climate-controlled storage inside a large walk-in refrigerator, a processing room and workspace for staff and volunteers. And it'll be solar-powered, with a generator for backup.

They aren't entirely certain how long refrigerated seeds stay viable, with tests underway now showing some are good for at least two years. But down the road, Godoy said they also hope to start doing long-term storage of some rarer seeds, as the Norway facility does, since such storage can keep seeds viable for centuries.

There's a lot of uncertainty looking that far into the future, Godoy said.

"We can just proactively begin to prepare for what is inevitable, which is the need for this seed bank."

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