Saving the woodrats: Zoo raises endangered species for wild release

June 21 2024, by Christine Condon, The Baltimore Sun

Credit: Unsplash/CC0 Public Domain

Inside a hallway of the veterinary hospital at the Maryland Zoo in Baltimore, a popular new program plays 24/7 on a computer screen.

They call it "Woodrat TV," said Erin Grimm, the zoo's mammal curator.

On camera is a singularly important Allegheny woodrat, whose job it is to help repopulate her species, which is threatened by encroachment from human development. She is the first participant in a captive breeding program at the zoo to save the woodrat, a big-eared relative of the pack rat that's about the length of a bowling pin (if you include the woodrat's furry tail).

When she arrived at the zoo from her habitat in Pennsylvania, Allegheny Woodrat 9891, as she is known, was already pregnant. Within weeks, she gave birth to three healthy pups: Must See TV on the Woodrat Channel.

Woodrats are solitary critters who live in remote, rocky outcroppings dotting the Appalachians from Pennsylvania to Georgia, hidden from all but the most determined seekers. Several biologists have watched the zoo's footage eagerly, Grimm said, having never seen a woodrat give birth before, despite years of studying and tracking them.

"They are secretive and live in tiny cracks and crevices in the rocks," Grimm said. "It's nice for us to be able to capture this."

But, for the zoo's program, that's just a cherry on top. The real goal lies with those three rapidly growing woodrats, who will be released into the wild in Pennsylvania and Indiana. The juvenile woodrats will offer something desperately needed in their new homes: genetic diversity.

Underlying the woodrats' precipitous decline is, unsurprisingly, human development. The construction of homes, buildings and roads has isolated individual populations of woodrats, destroying the forested lands through which they traveled to breed with one another.

Scientists call it the "extinction vortex," said Jacqueline Doyle, a Towson

University associate professor who studies the genetics of woodrat populations. As animals are assailed by habitat loss, pollution, hunting or invasive species, their populations shrink and fragment—and so does the gene pool.

Inbreeding and the loss of genetic diversity make entire populations less adaptable to disease and environmental change, and can send species into a tailspin.

"Even if you address the initial problem that resulted in the population decreasing in size—even if you combat habitat loss or you combat an exotic species—if you've lost that genetic variation, it can still be very difficult for the population to recover," Doyle said.

Doyle is assisting with the captive breeding program, which is being administered through a special work group dedicated to the creatures. By comparing DNA samples collected from the baby woodrats, and samples collected in the wild, Doyle will help play matchmaker, by identifying the woodrat populations most in need of the pups' unique genetic background.

But at the beginning of their lives at the Maryland Zoo, these potential species-savers were just like any other kids. As soon as the lights went off each night and the cameras switched to infrared, the nocturnal "rat chaos" would begin, Grimm said. The siblings often sparred with one another, rising to stand on their back feet and box with their paws. That is, until Mom separated them.

The woodrats grew in a multilayer cage with PVC piping for tunnels. And that cage was locked behind latched, lion-proof metal doors, since it sits inside a room previously used to treat the zoo's other, much larger, inhabitants. Now, a whiteboard hangs out front, with a drawing of a rat and the words "Rat Room."

After Mom and the kids spent several weeks together, zoo staff separated them. Now, each woodrat has its own enclosure. Zoo staff are keeping their distance, trying to ensure that the young woodrats don't grow too accustomed to humans, or hearing human voices.

Soon, the woodrats will go to the wild, where they will spend their first two weeks in an enclosed area with natural food items. Then, the gates will open, and eventually the enclosure will be removed, leaving them on their own.

The zoo employees weren't sure how Mom would react to losing her young. But mostly, she just seemed to take some much-needed R&R, sleeping in her nest assembled partially from her favorite nesting material—toilet paper—and munching on the chinchilla chow, seeds, nuts and fresh produce that arrive through a chute.

Along the way, the zoo is picking up meaningful tidbits about woodrat behavior that will help other zoos that are discussing how to replicate the program, Grimm said.

For the Maryland Zoo, the breeding program isn't atypical, said spokesman Mike Evitts. The zoo participates in similar programs for the African penguin and the Panamanian golden frog. Such programs are a bit more rare for mammals that are difficult to breed, Grimm said, though the zoo had a brief breeding program for woodrats decades ago.

Perhaps the program's biggest challenges lie ahead: ensuring that the baby woodrats survive in the wild, and successfully mating Woodrat 9891 in captivity, said Kate Otterbein, a mammal recovery specialist at the Pennsylvania Game Commission, who trapped Woodrat 9891 in central Pennsylvania's Mifflin County and drove her to Baltimore.

"It's not simple as just putting them together, because they're not social

and they are territorial, and they get aggressive when another woodrat is in their territory," Otterbein said.

Staff members will need to carefully monitor the courting, to ensure it doesn't sour to the point that one of the woodrats becomes violent, Otterbein said.

The Allegheny woodrat is listed as endangered in Maryland and several other states, and is "near threatened" on a global scale, as measured by the International Union for Conservation of Nature's Red List.

Woodrats have other environmental factors working against them. Raccoons, for example, pushed by human development, have foraged deeper into the woods, where they are more likely to encounter Allegheny woodrats.

Raccoons can carry a parasite called racoon roundworm, which lies dormant inside them, but is typically lethal when passed to a woodrat. The woodrats' food sources have also taken a hit, such as chestnut trees destroyed by chestnut blight and acorn-producing oak trees imperiled by the spongy moth.

The Maryland Department of Natural Resources is beginning a statewide reassessment survey of its remaining woodrat populations, said Megan Zagorski, the agency's western region ecologist. Historically, the creatures could be found in the state's westernmost four counties and Montgomery County. Over time, the population generally appears to be contracting westward, as sites that formerly hosted woodrats are lost.

Zagorski hopes the holistic survey will provide meaningful answers to explain the decline, but the state's existing survey work has provided clues, including trail cameras that pick up families of raccoons passing by.

"One of the sites … is one mountain and the next mountain, and in between those two mountains, put a highway," Zagorski said. "So it's much more difficult for woodrats to safely cross and mix across that ridge line."

In addition to the captive breeding program, state officials are trying other methods to keep the critters alive. In Pennsylvania, that comes in the form of taxing work: At key times of the year, state employees and volunteers haul 25-pound bags of chestnuts up into the mountains to drop them in crevices only hungry woodrats could reach, Otterbein said. The state game commission also has worked to rebuild rock areas to connect woodrat habitats, she said.

It's not just about the woodrats. Their habitats also are used by rattlesnakes, birds of prey, black bears and other small mammals, such as rock moles, Otterbein said.

"I like to think of it as this complex puzzle of species that fit into this community, and the idea of losing some of those pieces of the puzzle is just not something that we want to face," Otterbein said.

The woodrat also deserves study—and saving—on its own merits, the scientists say. There's a lot of interest among scientists in working with what they call "charismatic megafauna," Doyle said. Think polar bears, golden eagles, dolphins.

"The Allegheny woodrat is—perhaps some would argue—less charismatic. It's certainly not mega," Doyle said. "But it's no less important ecologically than these top predators that many people are interested in studying."