

# A rare orchid survives on a few tracts of prairie. Researchers want to learn its secrets

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The western prairie fringed orchid is seen blooming on Wednesday, July 3, 2024, on the Sheyenne National Grassland in North Dakota. The orchid has declined due to loss of its native prairie habitat, among other factors, and is classified as a threatened species under the federal Endangered Species Act. Credit: AP Photo/Jack Dura

On a remote tallgrass prairie in North Dakota, a secretive orchid pokes up from the ground. You'll only find it if you know where to look.

The striking, bright white blooms of the western [prairie fringed orchid](#) are elusive to fans who try to catch a glimpse—and as a [threatened species](#) protected by the federal Endangered Species Act, it is also a puzzle for researchers trying to learn more about the orchid's reproduction and role in its ecosystem.

Loss of its native prairie habitat has threatened the orchid. About 60% of native orchids in the U.S. and Canada are rapidly disappearing due to climate change, [habitat loss](#) and pollinator declines, said Julianne McGuinness, program development coordinator for the North American Orchid Conservation Center. Those showy, flowering plants beloved for their beauty can be an early indicator of decline occurring unnoticed in its environment.

"They're sort of like the canary in the coal mine for the rest of our ecosystems," McGuinness said.

Graduate students from North Dakota State University in Fargo are hoping to learn more about the pollinators and reproduction of the [western prairie fringed orchid](#). Their work includes logging the GPS coordinates of orchids at 20 various sites in Minnesota, North Dakota and Manitoba, Canada, swabbing orchids for tiny amounts of genetic material from insects, and attracting pollinating insects at night with blacklights and sheets.



This July 9, 2024 photo provided by Steve Travers shows Josie Pickar and Kiana Sayler recording GPS coordinates of a western prairie fringed orchid on Tuesday, July 9, 2024, near Gardenton, Manitoba. Credit: Steve Travers via AP

Years ago, Steve Travers, an associate professor at the university's Department of Biological Sciences, was fascinated to learn about the orchid—"these big, beautiful, 2-foot tall, ginormous, gorgeous things that were pollinated at night."

"I have a hell of a hard time finding it sometimes," he said. "And when people see it the first time, there's like almost this rapid intake of breath. I mean, it's so big and it's just spectacular."

The orchid is a unique insight into its nearly vanished ecosystem—the tallgrass prairie—as well as for understanding connectedness with pollinators and other plants, and is a good model system for studying rarity, Travers said.

The orchid's only known pollinators are hawkmoths, big moths that are just the right fit and size to reach the orchid's nectar, in a long spur, while also pollinating the plant.

The western prairie fringed orchid is mostly found in reserves, such as the Sheyenne National Grassland in North Dakota and the Manitoba Tall Grass Prairie Preserve. The peak of the orchid's bloom was roughly mid-July.



A bloom of the western prairie fringed orchid is seen Wednesday, July 3, 2024, on the Sheyenne National Grassland in North Dakota. The orchid is a threatened species protected by the federal Endangered Species Act. Credit: AP Photo/Jack Dura

Populations can be as small as one plant or as large as 500 to 1,000, Travers said. Once located, the researchers log the individual orchids' GPS coordinates to within 10 centimeters (4 inches) accuracy so they can return later. Finding the orchid when it isn't flowering is like looking for a brown stick in a big, green field, Travers said.

Graduate student Josie Pickar's work is focused on what affects the

orchid's reproductive success, including soil nutrients and pollinator service. She's been traveling to about 20 sites, looking at subsets of orchids, to gather soil samples and [moisture content](#), count flowers, and record plant heights and conditions, as well as monitoring the orchids via trail cameras for what might be eating them. In September, she'll go back and count the orchids' seed capsules, which are extremely hard to find.

To find the orchids, the researchers used rough coordinates from land-management agencies. They've dealt with ticks galore, crossed a beaver dam while wearing waders and seen bear tracks in the process.

"It's been pretty wild," Pickar said.

She's put in days of more than 12 hours, visiting about two orchid sites per day that could be up to three hours away—her team donning gear such as long pants, long-sleeve shirts, hats and sometimes mosquito-thwarting head nets. She called the orchid "almost alienlike when you see it out on the prairie."



This photo provided by Steve Travers shows Josie Pickar, Kiana Sayler and Megan Okke gathering soil samples near western prairie fringed orchids on Monday, June 17, 2024, near Gardenton, Manitoba. Credit: Steve Travers via AP

Graduate student Trinity Atkins, who was out from 7 a.m. to 2 a.m., is looking at the orchid's pollination networks: the pollinators that visit the orchid and what other plants they visit, too.

She swabs the orchids at all her sites, collects moths to see where they are going and uses a molecular technique called eDNA metabarcoding to see which pollinators visited the orchid, she said. Environmental DNA is genetic material left behind from, for instance, a butterfly visiting a

flower. Some studies indicate daytime pollinators might be at work, she said.

Studying the orchid's pollinators requires work at all hours of the day.

In the morning, Atkins would swab orchids for eDNA before it degrades. In the afternoon, she would survey for other nearby plants that could be attracting pollinators. And at night, she would be blacklighting at prairie sites, collecting moths and taking measurements.

Travers said the research is important in terms of biodiversity, of which rare species are an integral component for their contributions to their ecosystem.





This photo provided by Steve Travers shows Trinity Atkins extracting DNA from a sample of a western prairie fringed orchid on Wednesday, March 6, 2024, at the U.S. Army Construction Engineering Research Laboratory in Champaign, Ill. Credit: Steve Travers via AP

While orchids are found all over the world, the western prairie fringed orchid is specifically adapted to the tallgrass prairie, he said.

"I kind of find that really interesting that you get all this variety in the genus and then, boom, it comes here and it turns into this huge, nocturnally pollinated thing, and I'd love to know why. Why did that happen? But that's a whole other question," Travers said.

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