

New survey method proves Rhode Island's rarest frog may not be so rare

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The Eastern spadefoot toad, actually a primitive frog, may not be so rare after all according to a study by University of Rhode Island researchers who used a seldom-used methodology that turned up many more of the endangered animals than expected. Credit: Anne Devan-Song

The rarest frog in Rhode Island may not be as rare as scientists once

thought after a study by University of Rhode Island researchers using a seldom-used methodology turned up many more of the endangered animals than they expected.

Eastern spadefoots—often called spadefoot toads, though they are actually frogs—have long been considered highly secretive and difficult to find outside of their one- or two-day annual breeding periods on rainy nights. In some years, they don't breed at all. But after scientists reported just 50 sightings of the frogs over the previous 70 years, the Rhode Island researchers observed 42 spadefoots in 10 nights of searching last summer using the new methodology.

"We collected all the myths and misconceptions about spadefoots that have been published or told to us by herpetologists, and we decided to conduct surveys to show that the frogs aren't secretive, that they don't only come out when weather is suitable, and they can be detected easily using a noninvasive censusing method," said Anne Devan-Song, a former URI graduate student who is now a doctoral student at Oregon State University.

While working as a URI research associate in collaboration with Associate Professor Nancy Karraker, Devan-Song led a team that conducted amphibian surveys in Colonial National Historical Park in Virginia from 2015 to 2017 by using a spotlight at night to detect the animals' eyeshine in forests. A previous researcher conducted amphibian surveys at the park 15 years ago and only detected two Eastern spadefoots, but Devan-Song and her team found up to hundreds of them, even on dry nights, and a total of more than 3,000 individuals."It completely contradicted everything we'd read about them in the [scientific literature](#), with the exception of recent studies in Massachusetts and Connecticut," said Devan-Song, whose research was published this month in the *Journal of Herpetology*. "The perception is that they're difficult to detect in large numbers outside of rainy weather

conditions, but I was stumbling all over them everywhere I went at this particular site, even in drought years when I was nowhere near a known breeding pond."

To be sure that she could distinguish between the eyeshine of spadefoots and the eyeshine of other creatures active at night—a concern expressed by previous scientists who rejected the spotlighting method—Devan-Song confirmed her ability to accurately identify spadefoot eyeshine by capturing every [frog](#) whose eyeshine she detected.

Since the Virginia site may have been home to an uncharacteristically high number of the frogs, Devan-Song collaborated with Rhode Island Department of Environmental Management herpetologist Scott Buchanan to use her spotlighting technique at scattered sites around Rhode Island, where the frogs were believed to be located at only one site and were seldom seen there.

"Spadefoots are at the northern end of their range in Rhode Island and are incredibly rare there," Devan-Song said. "You can't just drive around at night and hear them, and there's little chance of finding them by chance. And yet with just a little bit of spotlighting effort, you can find them." For sites that were occupied, the frogs were detected on nine out of ten survey nights in Rhode Island, the same rate as they were found in Virginia, and a new breeding population was discovered at a site in Westerly. In both states, the majority of spadefoots observed were sub-adults, an age class seldom detected using traditional survey methods.

"The lack of appropriate methods has hindered the study of this species, which is considered endangered in many states, including Rhode Island," said Devan-Song. "Without appropriate field methods, you can't gather information about certain demographic classes and you can't make accurate population assessments.

"By looking for them only on rainy nights or only near ponds, it has hindered the study of this species for decades," she added. "There is a huge amount of information that can be collected, especially on these overlooked demographic categories."

The research team has at least two additional scientific papers in the works that will shed more light on the life history of Eastern spadefoots, both based on the data collected from Rhode Island and Virginia. One describes the social structure of the species, which had been unknown outside the breeding season.

"The general idea had been that these frogs are solitary and don't interact much except when they go to their ponds to breed," she said. "But the reality is that they're doing lots of interesting things in the uplands. Their social structure is much more complex than we imagined."

More information: Anne Devan-Song et al, Confirmation Bias Perpetuates Century-Old Ecological Misconception: Evidence Against 'Secretive' Behavior of Eastern Spadefoots, *Journal of Herpetology* (2021). [DOI: 10.1670/20-044](https://doi.org/10.1670/20-044)

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