



Careful research. Kevlar gloves protect scientists working with the rare Hispaniolan solenodon.

ECOLOGY

Saving a Venomous Ghost

Despite periodic predictions that it will go extinct, the Hispaniolan solenodon endures, and scientists now want to ensure the rare mammal's survival

In 1907, explorer and naturalist Alpheus Hyatt Verrill went to the small island of Hispaniola in the West Indies to track down the elusive Hispaniolan solenodon (*Solenodon paradoxus*), one of the rare examples of a venomous mammal. Fellow scientists told Verrill the journey was “hopeless,” saying he was “as likely to secure specimens of ghosts.” However, the explorer managed to capture a pregnant female, which he sent back to the United States for examination by his father, zoologist Addison Emery Verrill. In a subsequent report, the father offered this pessimistic prediction: “Owing to the introduction of the mongoose and other causes this creature has become very rare and local. It is, without doubt, on the verge of extinction.”

Back then, things didn't look good for *S. paradoxus*, and little has changed 100 years on for this shrewlike animal, as sightings remain rare. Still, the solenodon is a survivor; scientists have found fossils of it tracing back 76 million years.

Now, U.K. scientists are teaming up to help ensure this little-studied creature survives even longer. Starting in October, Richard Young of the Durrell Wildlife Conservation Trust (DWCT) in Bath, U.K., will lead the most extensive solenodon surveys so far in Hispaniola—an island shared by two countries: Haiti and the Dominican Republic—to find out more about these creatures with the hope of coming up with a conservation plan. Young and Samuel Turvey, a paleontologist and conservation biologist at the Zoological Society of London (ZSL), will also examine the animal's genetics and evolutionary history. “It represents an animal which has not changed much since the time of the dinosaurs,” says Turvey.

In appearance, the Hispaniolan solenodon's tapered claws, stocky body, and long

nose set it apart from most other modern mammals. It and the equally endangered Cuban solenodon—the landmasses of Cuba and Hispaniola were joined 25 million years ago—are also the only living mammals able to inject venom through grooved teeth, much the way a snake does, says Turvey.

In June and July of 2008, as part of a pilot study on Hispaniola to find out how best to catch or count the animals, Amy Hall, animal registrar of DWCT, set up movement-triggered cameras, looked for feces and hair, and deployed traps designed to ensnare live animals. Hall caught only one, protecting herself from the solenodon's poisonous bite with Kevlar gloves as she took pictures of its limbs and teeth and measured it. “It was fighting and letting out the most remarkable noise—a very loud, high-pitched cry—the loudest thing I've ever heard come out of an animal,” she recalls.



Before humans got to the island, Hispaniola was teeming with wildlife, with some 25 species of land mammals, including sloths and monkeys. But almost all of these have been driven to extinction, save the hardy solenodon and the hutia, a large-bodied rodent. “The region has experienced the world's highest level of mammal species extinctions, during both the

historical era and the Holocene as a whole,” says Turvey, who has been studying the island's fossil record. How the solenodon survived is unclear, he notes, but its varied diet and ability to cope in a range of habitats likely helped.

That flexibility may have been key, as once Amerindians arrived on Hispaniola about 6000 years ago, mammal habitats began to disappear, particularly as agriculture increased and human populations rose. The island's subsequent colonization by the Spanish in the late 1400s meant deforestation and the introduction of cats, dogs, and mongooses, all solenodon predators.

It wasn't until 1833 that the solenodon was first described in scientific literature, by German zoologist Johann Friedrich von Brandt. Even then, it was rare. Another specimen was not reported until Verrill captured his lone specimen more than 70 years later.

In an April 2007 survey in Haiti, Turvey led a team that spent 11 days looking for signs of the creatures and interviewing locals: The remains of three dead solenodons were brought to the team, one of which had been partly eaten by subsistence farmers. That evidence, plus Hall's catch of a live animal in 2008, was enough to persuade the U.K.'s Department for Environment, Food and Rural Affairs to allocate £223,341 (roughly \$369,000) from its Darwin Initiative for a 3-year study of solenodons and hutias.

Starting this October, Young, Turvey, and others will investigate the abundance and distribution of solenodons across the island and evaluate what threatens the species. Local organizations, such as the Ornithological Society of Hispaniola, will help with fieldwork and raising public awareness. The ultimate goal is to develop a broad, long-term conservation plan for the solenodon.

Alongside this work, DWCT and ZSL teams are examining the DNA of 10 to 20 specimens, many provided by local partners, to figure out the genetic variation among various isolated solenodon populations across the island. Preliminary analyses suggest there may be up to three branches of solenodon species on Hispaniola, says Young. This would fit with earlier observations in 2001 by biologist Jose Ottenwalder, who described a distinct southern subspecies, *Solenodon paradoxus woodi*, which was markedly smaller than its northern counterparts.

Turvey hopes that in the end, studies of solenodons will provide insight into what primitive placental mammals were like. That's why he and other researchers believe saving the unusual species is so vital. “It's not really like anything else,” says Turvey.

—CLAIRE THOMAS