Something in the air

Endangered species are hard to find. Their numbers are small. Their habitats are hard to navigate. They hide. That's why some researchers are calling out the dogs.

TEXT AND PHOTOGRAPHY BY ISABELLE GROC

Alli, an energetic nine-year-old Australian cattle dog, moved swiftly over the spongy earth, cutting a sharp path through the knee-high grass of the Fraser Valley wetland a couple of hours' drive from Vancouver. Behind her, Monica Pearson, a conservation biologist, and Heath Smith, Alli's trainer, followed in hot pursuit. But Alli paid them no mind. Ears piqued and nose to the ground, she was focused on a mission.

Just as she approached the edge of a nearby pond, Alli stopped suddenly and lay down. She looked over at Smith, fixing him with a gaze that radiated both intensity and expectation. Smith and Pearson approached the dog, and Smith knelt down and started digging through the grass. Within a few seconds, he uncovered what had made Alli stop — a small, golden-eyed frog. "Yeah!" Pearson exclaimed, turning to Alli. "Good girl."

Mission accomplished. Smith reached into his pocket, pulled out a ball and rewarded Alli with a spirited game of fetch. Pearson, meanwhile, focused on the frog, measuring its body length, checking its weight and, with an assist from another biologist, attaching a small transmitter belt. This was no ordinary frog, after all. It was an Oregon spotted frog, one of Canada's most endangered amphibians — and one of the most difficult to find.

That's why Alli was brought to British Columbia in March 2012. She's a veteran member of the Conservation Canines program at the University of Washington, which trains dogs to use their keen sense of smell to help monitor threatened and endangered species. The dogs have been deployed all over the world, and the program is a great relief to scientists working on the Oregon spotted frog conservation. With skin ranging from olive green to dark or reddish brown, *Rana pretiosa* (meaning "precious frog") spends most of its time underwater and is expert at hiding under vegetation and in tunnels. When Pearson looks for frogs in their unstable, spongy, muddy habitat, it can take hours to find one. Alli — who also spent part of her B.C. visit sniffing out at-risk water shrews — makes the job seem like a walk in the park. Not only that, the data the dogs provide is invaluable, says Kym Welstead, species-at-risk biologist with the B.C. government's Ministry of Forests, Lands and Natural Resource Operations. "For Oregon spotted frogs, we are so desperate to make sure we are not missing populations that could be impacted just because we didn't know they existed."

TO BOLDLY GO...
Monica Pearson paddles over a pond in Oregon spotted frog habitat. Tracking dogs are more adept at negotiating the wild terrain.

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Indeed, Oregon spotted frogs are so difficult to find they were believed to be extirpated from Canada until naturalist Denis Knopp stumbled upon one in 1996 during a survey of wetlands in the Fraser River lowlands. The discovery led the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to designate the Oregon spotted frog as endangered in 1999 in an emergency listing, a first for a species in Canada.

Historically, the distribution of the Oregon spotted frog extended from the southwest corner of British Columbia to the northeast corner of California. Today, it is endangered throughout its North American range. In Canada, only three populations are known in the Fraser River lowlands, with the population of breeding females estimated at only 300.

The primary cause for the decline has been the loss of wetland habitat to agriculture and urban development. Over the past century, more than 86 per cent of wetlands in the Fraser Valley have been lost. In recent years, additional threats to the few remaining Oregon spotted frog populations have included pollution, invasive species such as bullfrogs, and resource extraction.

Dogs are well known for their ability to detect everything from drugs to missing persons, but it seems unlikely that they could come to the rescue of endangered frogs. Yet the concept is surprisingly simple. The Conservation Canines program trains dogs to locate scat samples from threatened and endangered species, which can tell researchers everything from the animal's diet and stress levels to their reproductive health and exposure to toxins and population abundance. The dogs are used worldwide to detect animals as varied as tigers, spotted owls, wolves, caribou, salamanders and orcas.

Not any house pet qualifies to become a conservation canine, though. The ideal dog is highly energetic, intensely focused and ball-obsessed. "We are after a dog with a very high play drive," says Samuel Wasser, director of the Center for Conservation Biology. "We go through a thousand dogs to find a couple with that drive." Because of their unique personalities, detection dogs are not suitable as family pets and usually end up in shelters. In fact, all of the 16 dogs in active duty at the program are rescue dogs. "We find an outlet for these dogs and give them a second chance," says Heath Smith, Conservation Canines' program coordinator.

In the field, the dogs are happy to work all day, motivated by the expectation that they will get to play with their ball if they find evidence of their target species. "The ball is an obsession, and that is what allows you to communicate quickly with the dogs. They want the ball more than anything," says Smith (who incidentally describes himself as a cat person). Communication and trust are critical, and in the field, the handlers know right away if the dog has located the right sample. Once the dog has identified the target species, it will lie down next to its find and signal the discovery to the handler. "We call it the 'look.' The dog locks eyes with you, and you know," Smith says.

One of the benefits of using dogs to find species is that the process is non-invasive compared with traditional wild-life detection methods such as radio-collars, hair snags, or trapping. This is what motivated Kym Welstead to use Conservation Canines to look for Pacific water shrew and Oregon spotted frogs. Trapping Pacific water shrew, in particular, is expensive and harmful to the species. "Seven out of 10 of our shrew captures have been dead shrews, so there is a real need to do inventory without handling the animals and without causing harm or death to them," Welstead says.

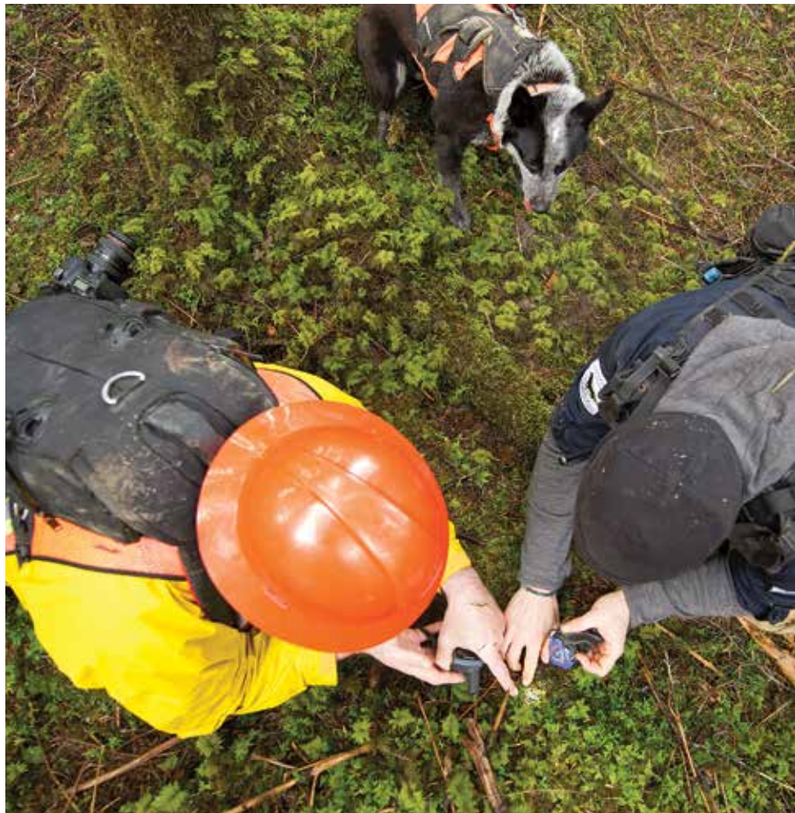
Similarly, radio-telemetry studies of Oregon spotted frogs are expensive, labour-intensive and damaging to the species and its habitat. Pearson must regularly catch the frogs that have radio transmitters attached with a small beaded belt around their waists to make sure the transmitter belts are not causing harm. She uses a radio receiver to try to pinpoint the exact location of a frog, but it still takes several hours of intensive searching through the water and vegetation to catch it. "With the telemetry, you know exactly where the frog is, but you are still not going to get to it unless you tear apart the habitat and destroy everything," Pearson says. "You have to be the hurricane that takes down the building to find that frog and catch it."

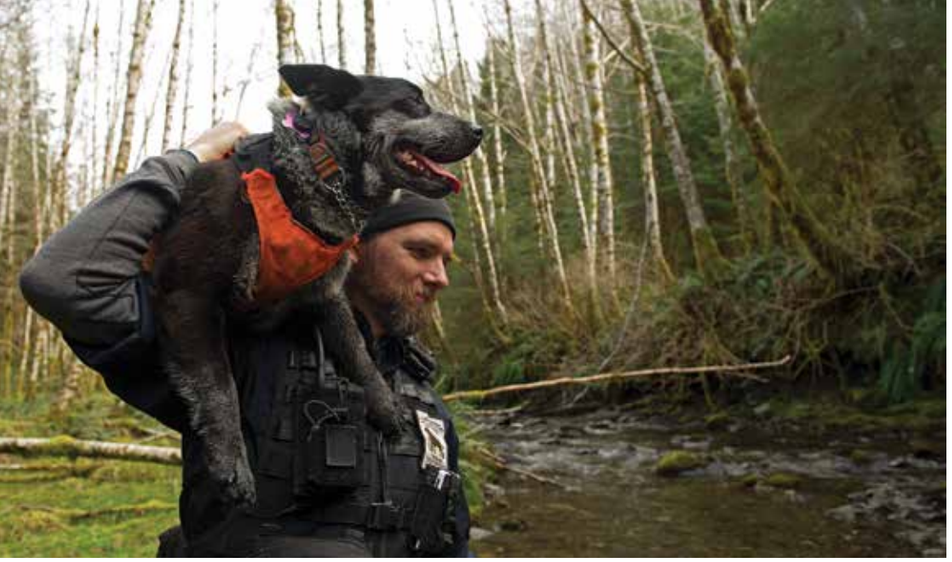
Sometimes, the detection dogs can be the last resort for locating rare species that are almost impossible to find otherwise. In Haida Gwaii, a group of islands 80 kilometres off the coast of British Columbia, Berry Wijdeven, species-at-risk recovery coordinator for the B.C. Ministry of Forests, Lands and Natural Resource Operations, has spent the last nine years looking for a subspecies of ermine endemic to the area. Designated as threatened, this ermine is very rare and almost nothing is known about its natural history, the size of its population, its diet or its habitat.

Track plates, live traps, hair snares, den boxes, automatic camera stations — Wijdeven tried every method to find ermines, but nothing worked. Only two were captured in more than 6,700 trap nights between 1992 and 1997. After all these years of hard work, Wijdeven has yet to see a live ermine. "Recovery begins with knowing something about the species, and if you can't even get a start, you are in trouble. So every time we get a new opportunity for a new start or a new angle, that gives us new hope to get us going on our research path," Wijdeven says.

Pips, an Australian cattle dog from the Conservation Canines program, gave Wijdeven that new start this past spring. Pips tirelessly worked in the forest to find ermine scat, walking alongside creeks, jumping up and down logs, sniffing under woody debris. Over a 16-day period, Wijdeven and Heath Smith followed Pips around 25 different sites in the hope of finding scat the size of a broken-up match, often hidden in mossy patches or carried away by heavy rains.

It seemed it would be easier for the dog to find a needle in a haystack than ermine scat. "You would walk past it. There is so much debris in the forest, it is impossible to see it," Wijdeven says. Yet by the end of the project, Pips managed to find 11 scat samples, and while Wijdeven had hoped to find more, it was the first time that ermine scat had ever been found in Haida Gwaii. If DNA analysis confirms that the samples are indeed ermine scat, Wijdeven will gain valuable information on the





HELPING THE HELP
Heath Smith gives Pips a lift across a stream during a search for scat from a rare species of ermine. Over the 16 days of the project, Pips located 11 samples.

"If the dog can find the frog consistently, the potential is huge."

animals' health, diet, stress and other indicators. "Of all the technologies and techniques we tried, the dog has produced the most results to date," Wijdeven concludes.

Of course, fieldwork comes with challenges. Because the dogs are generally hired to locate rare species, they can become distracted and bored when they don't find anything. "If you are working on a species that is really rare, it takes a lot of effort to keep the dog motivated," Smith says. One of the ways to deal with this problem is to get the dog to look for more than one species in an area. This, however, depends on the ability to train the dogs on samples so they can become familiar with the scent of the species they are supposed to locate. Because these species are so rare, it can be difficult to get the relevant training samples.

For the Haida Gwaii ermine project, Pips was trained on the scat of an ermine that lives off the island. Wijdeven had also hoped to use Pips to find another threatened animal, the northern saw-whet owl subspecies that is found only in Haida Gwaii. He had carefully saved a sample of owl pellets to train the dog on the scent. But dogs sometimes have their own weaknesses, and when Pips came to smell the pellets of this rare species, the dog unexpectedly ate the sample. This does not happen often, but Wijdeven confessed that the sample had been stored in a cat food container. Pips probably thought it was a treat. "That was the end of that study," Wijdeven says.

Although dogs can provide huge benefits to conservation scientists, their value is not always immediately recognized. The idea of using detection dogs for Oregon spotted frogs was initially met with some skepticism. Because the frogs spend most of their time in water, dogs can't go after the scat. They must detect the actual frog, a species that has become a master at avoiding detection. "There you are, trying to get the dog to detect something that has spent its entire evolutionary existence avoiding detection," says Welstead, who coordinated the frog study. Captive-bred juvenile Oregon spotted frogs were used to train Alli the dog, and the experiment concluded that the dog needed additional sensitivity training to improve its nose.

However, Alli successfully detected the species in the field, and biologists are confident that this method can be used to locate not only the frog but also other species at risk in B.C., including northern spotted owl, western screech owl, sharp-tailed snake, coastal giant salamander and even plant species such as the phantom orchid. "If the dog can find the frog consistently, the potential is huge, and we can use it to find out distribution and inventory new sites," Welstead says.

From a conservation standpoint, it is critical to understand where the species lives and how it is using its habitat. Trying to discover new populations of Oregon spotted frogs in pockets of wetlands through traditional surveying is a time-consuming and unreliable process, particularly as it is difficult for people to move through these habitats. Surveyors walk slowly in knee-deep mud during the short frog-breeding season and can easily miss the frogs. "You need to send out an army of people to cover every inch of these wetlands," Pearson says.

By comparison, the dogs are nimble and fast, cover large areas in a short period of time and can catch the scent of a species very quickly, something that never ceases to amaze Pearson, who saw only two wild Oregon spotted frogs during the first three years of her fieldwork on the species. "While you are walking on a straight trail, the dogs are just reading the newspaper all across the landscape."