The nose of wildlife detection dogs becoming a valuable research tool

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Scientists can identify an individual animal by extracting DNA from a dung sample that is sniffed out and located by a specially trained tracking dog. Credit: harmonicagoldfish via flickr

Maggie, a black Labrador retriever mix, is on the hunt. She zigzags through the deep meadow grasses, her nose sniffing the air. Finally, she homes in on her target: a pile of bobcat dung.

Maggie was trained as a scat-detection dog by Working Dogs for Conservation, a nonprofit organization that provides dogs for wildlife research and management.

Conservation canines are fast becoming indispensable tools for biologists according to Aimee Hurt, associate director and co-founder of Working

Dogs for Conservation, based in Three Forks, Montana.

"It used to be that if anyone in the world was working with dogs in this way, I knew about it," Hurt said.

Over the last few years, though, so many new conservation dog projects have sprung up Hurt can no longer keep track of them all. Her organization's dogs and their handlers are fully booked to assist field researchers into 2012.

"Dogs have such a phenomenal sense of smell," explained Sam Wasser, director of the Center for Conservation Biology at the University of Washington in Seattle. He has worked with scat-detection dogs since 1997.

Wasser said that scat contains a surprising wealth of genetic information. Scientists can identify an individual animal by extracting DNA from a dung sample. Researchers can use that information to track the health and range of every member of a population.

Animal droppings also contain hormones that reveal details of the animal's nutritional health, reproductive status, and even how well its immune system is working. In many cases, scat even contains traces of toxins the animal may have been exposed to in its environment.

"All this is from one [scat] sample," Wasser said. "The power of this method is absolutely phenomenal."

But in order to glean all that information, you first have to find a pile of dung. Dogs, with their powerful noses, are much better at locating scat than humans, who rely on their eyes, said Sarah Reed, a research fellow at Colorado State University and the Wildlife Conservation Society. Reed and Hurt published a study on wildlife detection dogs in the

January issue of the Journal of Wildlife Management.

"Dogs are able to help us find these targets with much less searching," Reed said.

Scat-detection dogs can be trained to locate practically any kind of dung.

"We're now using [the technique] on such a wide variety of species," Wasser said, including pumas, jaguars, armadillos, foxes, and even whales.

For four years, Wasser has taken detection dogs aboard boats on Puget Sound to help him locate killer whale dung. Previously, he would follow a single whale at a time, tracking it closely in order to spot and snag the animal's waste before the dung sank into the ocean. But he said that shadowing whales so closely was stressful for the animals. With dogs, Wasser can simultaneously track multiple whales and detect scat samples from over a mile away.

"Often when we're out sampling we don't see the animal at all," Wasser added. "It's really minimizing the amount of stress you put on the animal."

Scat is not the only thing that wildlife detection dogs are employed to locate. Dogs have been trained to sniff out the pellets regurgitated by spotted owls after meals, for instance, as well as endangered and invasive plants and live animals. Canines from Working Dogs for Conservation recently traveled to Hawaii to help search for non-native land snails that conservationists are trying to eradicate, Hurt said.

Whether dogs are searching for scat, snails, or invasive weeds, the training process is the same. Wildlife detection dogs are usually rescued from shelters, but not just any dog will do. For her recent study, Reed

met with about 300 shelter dogs, but only Maggie made the final cut. Hurt said that detection dogs must be focused, have high energy, and be eager to please. But above all, they must be obsessed with their favorite toys since after locating a sample the dog is rewarded with a chance to play.

The training process can take three or four months. Once the dogs are up to speed on the basics, they can be trained to locate specific odors for various projects.

"They learn to recognize the odor really quickly once they know the game," Hurt said.

And for the dogs, Reed said, "it really is a game." For researchers, though, conservation canines are serious -- and important -- business.

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