CARNIVORES OF MADAGASCAR

FINDING FOSSAS

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WHAT'S A FOSSA?

Few people have heard of a fossa (*Cryptoprocta ferox*), a short, stocky animal related to mongosses and civets that lives only on Madagascar. Described as having the claws and body of a wild cat and a dog-like face, this animal climbs trees like a squirrel, helped by an extremely long and muscular tail. Though originally described in the 1800s by colonial-era explorers, little was known about this elusive forest predator until recently.

In 1994, conservation ecologist **Luke Dollar** was a student studying lemurs on Madagascar. One day, one of his lemur subjects disappeared without a trace. When Dollar finally tracked down the animal's radio collar, all that remained of the lemur were some bones and tufts of fur. According to Dollar's guide, the lemur met its unhappy fate

NIGHT AND DAY

When the project began, most people had assumed the fossa was nocturnal, since they were rarely seen. However, the radio tracking data showed the fossa is actually more active in the daytime.

"I think one of the most important aspects of this trip was the fact that we were not able to trap a fossa in the eleven active trapping days we spent on site. Between 700 and 800 trap checks were completed and not one held a fossa for us. This was a huge disappointment, yet it has sent me back to the US with a greater sense of urgency in my message. It has shown me the depth of our need, as a global society, to conserve what natural resources we have. It also showed me how challenging a conservation project actually is."

— Nancy Phear
Earthwatch Volunteer

HOW TO FOLLOW A FOSSA USING RADIO TELEMETRY AND TRIANGULIZATION

1. From a tower or clearing, turn the radio antenna until you get the strongest signal. The antenna is then pointing in the direction of the radio-collared fossa, but you cannot yet determine the distance.
2. Teams at two or three other locations find the direction of the strongest signal. When you plot all of the directions on a map, you can "triangulate" the exact position.
3. By following this process throughout the day, you can map where the fossa travels, and when it is most active.

at the claws of a fossa, a predator that many Malagasy people feared. Dollar's interest was immediately piqued. Two years later, Dollar returned to embark on a field project that would shed light on the mysterious life of the fossa.

Working with a group of scientists, local villagers, school groups and Earthwatch volunteers, Dollar, of Duke University, has been studying the fossa for five years. Researchers hope to find ways of protecting this fascinating animal, as well as the many other species living in the tropical forests: from lemurs, to geckos, to tropical birds and even crocodiles. The project has gone far beyond fossa ecology to understanding and changing the way people in the local village think about the fossa and the forest in which it lives. The project employs 20 people from the local village, as well as many graduate students from Madagascar.

ECOTOURISM: TOOL FOR PROTECTION

Madagascar is a true hotspot of biodiversity, with over 80 percent of the plant and animal species on the island found nowhere else on earth. With fascinating animals, like lemurs and fossas, this area stands to gain from encouraging ecotourism. So far, the project has helped build a campground and walking trails, and a small hotel is in the works. Tourists come from around the world to see the biologically rich forests of Madagascar. These ecotourists hire local guides, buy crafts, and help support the village economy. As a result, the residents of the village have more and better paying jobs, and have come to see the forest, and its animals, as a valuable resource. Education programs have also started to change people's minds about animals like the fossa. Rather than being feared, it is becoming a symbol of the project and its successes.

STARTING FROM SCRATCH

When Dollar began his study in 1999, virtually nothing was known about the fossa. So he started with pretty basic questions: How many are there? What do they eat? Are they active during the day or night? What are their home ranges? What threats pose the biggest risk to the survival of this species?

To study a fossa, first the researchers have to catch one. Over 40 large traps made out of wire mesh are placed at regular intervals along a grid of imaginary lines covering the park. By keeping the spacing regular, and the number of traps consistent, the researchers can learn where in the forest the fossa is most abundant. The next step is to bait each trap with a live chicken. Twelve hours later another team checks the traps.

Captured fossa are anesthetized with a dart shot from a blowpipe. The fossa can then be removed from the trap and measured. This is also an opportunity for any nearby villagers to learn about, and even touch, the sleeping fossa, which helps dispel myths and fears. The fossa is then fitted with

a numbered ear tag and a radio collar. The collar transmits a signal at a particular frequency, allowing the scientists to track the individual animal for the next year.

Meanwhile, other researchers spend the night in a series of towers equipped with radio receivers and large antennas. This equipment allows the scientists and volunteers to tune into each radio collar (much like you use a radio to tune into different radio stations). The teams work iin shifts throughout the day and night to learn where and when the fossa are active, and about the travels and home range of each individual.

COLLECTING DATA

Collecting data in Madagascar's tropical rainforest involves a tremendous amount of walking. In Ankarafantsika National Park, almost everything is done on foot. Since fossa travel for long distances through the trees, scientists and volunteers may walk anywhere from 9 to 12 miles a day as they try to learn about this little-known animal.

Work starts early, while it is still cool; when it gets too hot to work everyone enjoys a siesta. Researchers also work though the night, monitoring the fossa's habits and behaviors.

After five years of work, and many volunteer teams, Dollar and his research team have gathered quite a lot of information: they have captured and radio tagged 35 fossa, collected 10,000 hours of tracking data, and collectively walked more than 12,000 miles, checking traps and conducting ecological surveys. And they have collected over 1500 samples of fossa **scat**.

CANDID CAMERA

The scientists have also devised other ways of tracking the fossa. Camera traps are special cameras designed to automatically take a picture when triggered by an animal walking though an invisible laser beam. Like the other traps, they are set up in the forest, with a chicken to attract the fossa. The camera traps allow the scientists to monitor the fossa without having to catch them.

The scientists also look for more "low-tech" clues: paw prints or scat. These provide information on where the fossa is traveling. Examining the scat also provides a useful, if smelly, way to learn about what these predators are eating. Scientists might find anything from remains of lemurs to digested birds and insects. Who said science is always glamorous?

USING THE SCIENCE TO PROTECT THE FOSSA

Habitat loss is one of the biggest issues for most of the animals in Madagascar, including the fossa. Using the knowledge gained from ecological surveys of the park, Dollar is creating an ecological map of all of Madagascar based on satellite photos. The map will help pinpoint areas with good fossa habitat, and areas where important habitat is being lost.

Dollar has also discovered a new danger facing the fossa: the civet cat. The small Indian civet (*Viverricula indica*) is a species that is not native to Madagascar. When people introduce an **exotic** animal, it often disrupts the local ecology. Often the new animals displace or out-compete the native species. In Madagascar there are fewer fossa in areas where the introduced civets live. The fossa that remain in these areas also have bigger home ranges – probably because they now have to compete with the civets for food.

In the deep forest, the fossa still out-compete the civets, but the civets do better on forest edges. This suggests to the scientists that **fragmentation** — breaking


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GLOSSARY

carnivorous **–** flesh eating or predatory.

exotic **–** from another part of the world; foreign.

fragmentation **–** the act or process of breaking into incomplete or isolated portions.

radio telemetry **–** use of radio receivers with directional antennas to find the location of animals that have been fitted with radio tags (which broadcast radio signals).

scat **–** excrement, especially of an animal; dung.

up large areas of forest with fields, roads, or logging — could pose a big problem for the fossa. Not only do these activities require cutting down forest, but the remaining forest nearby becomes less suitable habitat for the fossa, particularly if what is left is a smaller area than fossa need.

Information from this study can help guide planning for future parks and can help planners minimize the impact of new tourist development in the area.

Whether they are analyzing a satellite photo or measuring a single fossa paw print, researchers, volunteers, and local villagers are working together to understand the ecology of this rare animal. Their goal is to not only protect the fossa, but also its fragile tropical forest ecosystem and the myriad of other threatened animals of Madagascar.

HOW TO LEARN MORE

Visit Dollar's expedition website at **http://www.nicholas.duke.edu/madagascar** to learn more about the fossa research project. You may read more about the research objectives, methods, and application of results, view videos from the field, and read dispatches from volunteers.

Over 80 percent of the plant and animal species found on Madagascar are endemic. What makes this island so special? Check out **http://www.pbs.org/edens/madagascar/eden.htm** to learn why Madagascar is the home to so many unique species. What happened to the elephant birds and the pygmy hippos? What is the fate of the fossa?

Volunteers have joined this project through Earthwatch Institute. Read more about this study and other scientific field research at **www.earthwatch.org**

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