



WILDTRACK

Two biologists set out to save endangered species, one step at a time

Industry

Nonprofit

Business Issue

Identify individual animals' footprints to better monitor endangered species, thereby aiding conservation efforts in a nonintrusive and sustainable manner.

Solution

SAS® analytics and JMP® statistical discovery software.

Benefits

Helping to save endangered species around the world.

They don't have databases of millions of contributors. Or even lists of thousands of volunteers. But what this husband and wife team has is huge – collections of animal prints, algorithms for three endangered species and a program that is bound to change the way in which often elusive endangered species are monitored in the wild.

The organization that Drs. Sky Alibhai and Zoe Jewell now call WildTrack actually took root 15 years ago as RhinoWatch. At that time, Alibhai was a teacher at the University of London and Jewell was finishing veterinary school at Cambridge University. Together they took on what they thought would be a short-lived, small-mammal census study in Zimbabwe. But it grew into a full-fledged population project of the endangered black rhino.

So successful was this project that the endangered rhinos' protectors learned that this population was dwindling; the rhinos themselves were more successfully protected from poachers; and Alibhai and Jewell tasted the success of this noninvasive monitoring technique that has evolved into WildTrack.

Ancient tradition meets technology

The black rhino is a clear example of why better wildlife monitoring was needed. Here was an endangered species for which, in many parts of its range, there were no solid head counts or distribution maps. "If you're a wildlife manager in charge of a particular population, you have to know not only how many animals you've got, but where they're going. Obviously, that was

fundamental with the rhino, in terms of protection against poachers," says Jewell. "You may have an area of 100,000 hectares, and you need to know where the animals are.

"At the end of the day," she says, "we can provide a manager with a map showing that this rhino is here, that rhino is there, and where the rest can be found." That wildlife manager can then take appropriate action – in this case, protection from poachers.

Prior to establishing their own tracking program, Alibhai and Jewell, like many wildlife researchers, had been using radio collars. But one big problem with this and some other traditional monitoring methods became clear to the biologists: "The animals who had to be darted and re-darted with very potent drugs for immobilization were suffering a loss of fertility," says Alibhai. "We thought, well, here we are trying to save a species – an endangered species – and yet we're using a technique that seems to be a retrogressive."



"And so we tried to discover a better way of monitoring these animals," says Jewell. "Out of that came the idea of identifying individuals from their footprints." Based on the way that native game scouts and rangers in Zimbabwe so brilliantly track individual animals by looking at their prints, Alibhai and Jewell



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Dr. Sky Alibhai
WildTrack

decided to marry that ancient tradition with state-of-the-art technology.

Custodians of wildlife

In the field, the technology consists of digital cameras, global positioning systems and laptops to get the photos to Alibhai and Jewell, where, from their hub in Portugal, they help field workers around the world identify animals by prints.

But first, the data must be gathered. “We take digital photos of footprints from captive or known animals, then we develop algorithms for these species by putting landmark points on each print and feeding the image into the software,” says Jewell. “SAS is used for getting the measurements in, and JMP is then used for analyzing the data.” Currently, the couple has created algorithms for black rhinos, white rhinos and Bengal tigers.

Then, in the field, someone takes a digital image of a footprint from one of these species and sends it to the office in Portugal. Once

the supplied prints have been compared against the others, Alibhai and Jewell are able to determine if the print belongs to a known animal or if it’s a new subject. “So far, we have found that we can get accuracies of up to 90 percent in terms of being able to assign a particular footprint to the right animal,” says Alibhai.

Alibhai says they’re even getting matches that are as much as 90 percent accurate when they go into areas in which the animal population was completely unknown. “We’ve done this with the Bengal tiger, for example,” he says. “Using an algorithm from data collected from a captive population, we are applying the analysis to animals in the wild.”

As the biologists continue collecting data, they create algorithms for more and more species, helping one field worker after another. They are currently also working with the three endangered tapir species in Central and South America and the most endangered large cat in the world, the Iberian

lynx, in Spain and Portugal. Recently they were awarded a National Geographic Society grant to develop the footprint identification technique for two highly endangered rhino populations: the Sumatran rhino in Borneo, and the black rhino in Cameroon.

As they perform this work, the couple is constantly refining and simplifying the technique so that it can be used by as many conservationists as possible. “It’s not there yet,” says Jewell. “But the technology is changing quickly, and JMP and SAS are evolving so fast that it may not be long before our system is easy for anybody to use.”

“At the moment, though, we do a lot of the processing ourselves. But the idea is that when it’s evolved to the extent that it’s really user-friendly, the whole system can be turned over to the people in their own countries,” says Alibhai. “And they can become custodians of their own wildlife.”



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