



Toughing It Out: Africa Wildlife Tracking Addresses Poaching with ORBCOMM's Tracking Technology

Poaching has been a long-standing problem and continues to be. Conservation efforts are made easier with the best data possible. We talk to Africa Wildlife Tracking to find out how ORBCOMM's tracking technology helps to monitor animal behavior and reduce the instances of poaching across continents.



The company

With over 25 years' experience tracking wild animals in 40 countries, Africa Wildlife Tracking (AWT) has seen it all. With a passion for the conservation of the natural environment, the South-Africa headquartered team provide GPS tracking and monitoring for wildlife of all sizes. Working primarily in Africa, they also track animals in India, Malaysia and Borneo—wherever there are elephants! AWT's customers include governments, conservation organizations, universities, researchers and game reserves. AWT helps to reduce and address poaching, monitor and protect animals and deliver insights into animal behavior.

The challenge

Poaching is an ongoing threat to all kinds of wildlife. According to [the African Wildlife Foundation](#), at "current poaching rates, elephants and rhinos and other iconic African wildlife could be gone within our lifetime."

Elephants are threatened by illegal poaching for ivory or meat. Illegal ivory traded as jewellery, figurines or utensils can fetch high prices. Often an animal is slaughtered for a single part of its body like the tusk or skin. In addition, the destruction of habitats is of ongoing concern, with animals forced to move as forests or natural landscapes are cleared for human consumption. In recent times, the threat from COVID-19 has become a real concern too, as now, some animals are being hunted for their meat.

AWT works with its customers like wildlife rangers and conservationists to track, monitor and intervene if necessary where animal welfare is concerned. It ensures scientists can take direct action in preventing poaching and understanding and protecting animals. By using intelligent location tracking, AWT can work to identify other areas where wildlife can be protected. Rangers can track animals if they cross into at-risk areas. Accelerometers monitor sudden changes in movement, indicating a possible incident, and sensors can report back on the health of animals in real-time.

AWT tracks all kinds of animals, from elephants to wild dogs to cheetahs. It can even equip turtles and pythons

with RFID tags. Animals are fitted with tags or trackers. For bigger animals, this is a collar, or in some animals, trackers can be ingested.

In the case of elephants, their collars serve an extra purpose. When equipped with a collar, an elephant also becomes a mobile base communicator. Each of the trackers 'talk' to the elephant collar, that sends data via satellite to the back-end systems. AWT has close to 6,000 animals collared, and every piece of data is collated and documented.

The solution

Working with ORBCOMM's sophisticated OGi modem technology, AWT delivers vital conservation data and helps to prevent poaching throughout Africa and beyond. Originally AWT started with radio-frequency identification (RFID) tracking technology. By attaching RFID tags to animals, it started monitoring animal movements, habits, feeding spaces and other essential information.

As technology grew, so did AWT's equipment. Martin Haupt, who set up AWT with his wife Sophie, says that "in the early days, ORBCOMM had a unit for tracking containers. I took that unit and modified it a bit and put it on an elephant. Originally, we only worked with it on elephants due to the size, because it was fairly big at that stage."

The collars work for elephants, while RFID transmitters are used on smaller animals like wild dogs, cheetahs and even turtles. The RFID transmitters talk to the devices in the elephant collars and the data is transmitted to AWT. The elephant collars become communication hubs, transmitting the RF data from smaller animals, allowing researchers and conservationists to extrapolate and make observations on the information.

AWT then progressed to using ORBCOMM's IDP terminals, which enabled remote tracking and monitoring management in some of the world's most isolated regions with global satellite connectivity over the ISATData Pro network. AWT stripped the IDP terminal and built it into



an elephant collar with further intelligence such as collar temperature monitoring, transmitting the data back to AWT's proprietary software applications. "Where it proved to work very well was with satellites; we got really good coverage in the forests," says Martin. "So, anywhere along the equator, we picked up (coverage) much better than most of the others" (solutions on offer).

In 2019, AWT started to switch to ORBCOMM's OGi modems. Providing secure, near real-time GPS satellite tracking with over-the-air updates, the OGi modem's smaller size and low power consumption transceiver have resulted in improved longevity in the battery-powered collars. The IDP network along with ORBCOMM satellite devices has provided very good communications in some of the densest forests where elephants are found. The transmitters emit a pulse that can be monitored by the elephant collar over a range from a few hundred meters to several kilometres, depending on the terrain. The data is then delivered via the satellite system to AWT's backend platform. The tracking data returned includes alarms, location information, collar temperature, tamper detection and geofence information. AWT now uses approximately 150 OGi modems and more than 500 IDP terminals in the field.

The results

Preventing Poaching in the Future

The data that becomes available through monitoring gives a bigger picture to animal researchers. While poaching is hard to predict, the collars help to identify incidents with alarms and by sending data that can indicate if the animals are under threat.

Haupt says: "You can understand, especially now, the emphasis (for the company) is on anti-poaching. You need a reliable unit that will report regularly. If you don't get a report, you know there's something wrong. If you have a unit which can't send through trees and forests, you're not getting good data back."

Researchers use the information around how elephants move to identify where poaching takes place: "We look at the cross-border movements. For instance, you have

Kruger Park and Mozambique bordering on one another. The elephants move freely between the two. On one side they get poachers, the other side they don't." If one area is suffering from poachers more than another, conservationists can act in that area.

Data Points the Way for Conserving Habitats

In addition to poaching, habitat destruction and fragmentation is an ongoing concern. As human populations change, the habitat for wild animals is shrinking.

AWT says the data provided from the collars is used to predict habitat corridors and provide safe areas for the animals. Haupt says, "One of the big things now is the habitat is getting smaller and smaller, you're getting a lot of disconnected areas. The collars can be used to look at the corridors between these areas. For instance, you have a reserve in Zambia and a reserve in Mozambique or Namibia. What you can then do is look at the corridors between these reserves, where the elephants migrate and where you get a gene transfer between them. A lot of researchers looked at these, and it's one way to establish where these corridors should be."

Collars to Rely On

Monitoring wildlife is not easy. There's a huge expense in placing a collar on an elephant or any other animal. Putting on a collar takes a full team, including volunteers, handlers and helicopter support. The costs involve wages, helicopter fees, veterinary bills and, in some cases, travelling long distances. The team darts the elephant to sedate it and complete a series of studies before fitting the collar. They wake up the animal and thoroughly check it before sending it back to its habitat.

As a result, the reliability of the tracking device is a key concern for AWT. As terminals and modems have evolved, it has become easier to put on collars, but in some cases, like for elephants, the distances they travel, and their size can be a challenge. Haupt says: "It's normally a very expensive operation. The unit itself is negligible, compared to the price of getting vets out there, getting choppers organised, so reliability of the device is a huge thing."

Remote connectivity is also a vital piece of the puzzle for AWT. They track thousands of animals with various data points in remote areas. "Our main use at the moment is on the elephant and mainly in the tropics where there is thick forest. Malaysia, India, Gabon, the Congo, places like that," says Haupt.

Robust Enough for The Great Outdoors

In the areas where AWT works, conditions and the terrain are usually tough. Wildlife lives in complex environments, often dusty, muddy and in dense forestry. The collars and devices need to withstand these conditions, sometimes for years. The canopy too can cause issues between the devices and the satellites.

AWT has worked through these challenges with ORBCOMM and they have the process down to a fine art. It means that AWT has specific requirements for the collars they use. "You need longevity. For instance, from country to country the conditions differ. In India, they still use elephants to catch elephants to put collars on and yes, we use choppers. If you work in Gabon, you work on foot. To put 50 collars on in Gabon is not an easy task. It's working, it's vets on the ground, it's mud and water." Haupt says they've had collars on some elephants for up to eight years. That means a significant cost reduction than if they had to replace them annually.

The future

AWT is looking at the constant evolution of tracking solutions in an ever-changing world. Overall, Haupt sees the evolution in technology as a very positive force in helping to protect animals in the future. "Technology is making collecting the data a lot easier, it's making verification a lot easier."

The projects that AWT is working on all involve data and IoT technology is key in driving results. The units are smaller, the data travels by satellite and there's more live information than ever before."

This evolution of technology is leading to new innovations in what AWT can track. A future use of the collars in protecting herds will be in identifying gunshots via acoustics detection. "On an elephant, you can detect gunshots, what rifle has been fired and from what direction, just by picking up the sound. You can determine when the gunshot goes off and you know which animal is wearing the collar. For a herd, you don't have to use ten collars, you can use one. The big trick is to see how far away from the animal the shot is picked up and it's not an easy thing to pick up in a herd of elephants," says Haupt.

AWT has also recently started tracking pythons. An RF device, which the python swallows, can sit in the stomach for years, gathering intelligent data about it.

While AWT's projects will change, the aim remains the same. The challenge today for AWT and conservationists around the world is in staying one step ahead. With the added threat of COVID-19, Haupt thinks tracking and monitoring wild animals will be more important than ever. COVID-19 has led to the absence of tourists. Without tourism revenue, wildlife game reserves are in danger of closing and being replaced by farms to supply local populations with food. Haupt says, "for me, the biggest problem is this COVID-19 issue. I think poaching will pick up drastically here in Africa, it's a question of food. We need to do something, and if we don't do it now, we're not going to have a lot of the endangered animals like rhino, elephant, things like that. They're going to disappear."

About ORBCOMM

ORBCOMM is a global leader and innovator in the industrial Internet of Things, providing solutions that connect businesses to their assets to deliver increased visibility and operational efficiency. The company offers a broad set of asset monitoring and control solutions, including seamless satellite and cellular connectivity, unique hardware and powerful applications, all backed by end-to-end customer support, from installation to deployment to customer care. ORBCOMM has a diverse customer base including premier OEMs, solutions customers and channel partners spanning transportation, supply chain, warehousing and inventory, heavy equipment, maritime, natural resources, and government. For more information, visit www.orbcomm.com.