



AI for Earth Grantee Profile

Wildlife Protection Solutions

Using technology to encourage conservation and protect species

Summary

Poachers are an active threat to wildlife around the globe, particularly in parts of Africa and Southeast Asia. By using a network of sensors, cameras, and AI technology, Wildlife Protection Solutions (WPS) is automating the detection of poachers. When a human intruder is detected through machine learning algorithms, an alert is sent to staff who can dispatch anti-poaching teams much more quickly. The Microsoft AI for Earth grant allows WPS to use cloud resources to scale the storage and processing of images, with a user-friendly interface that's easily customized. WPS also uses virtual reality to share footage of endangered wildlife in an effort to encourage more engagement in conservation. Azure Media Services will make storing and sharing this content seamless.

Combining images and sensor outputs to detect poaching

According to the [World Wildlife Fund](#), there is an unprecedented global spike in illegal wildlife trade, from better-known targets such as elephant ivory and tiger skins through many other animals and even trees and other plants. For instance, between 2007 and 2013, rhino poaching in South Africa increased 7,700 percent. In 2011, authorities seized more than 23 metric tons of illegally acquired ivory, taken from 2,500 elephants. The [United Nations estimates](#) the value of this illegal trade at \$23 billion or more, but the costs are potentially far greater: the extinction of threatened species leading to a loss of biodiversity, not only causing cascading harm to ecosystems, but also threatening human health from emerging diseases.

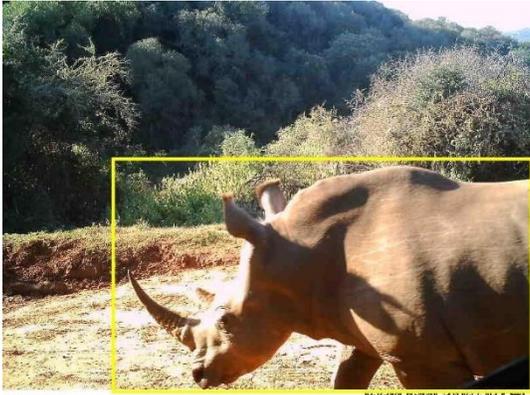
In order to protect these endangered species across vast, often remote areas, [Wildlife Protection Solutions](#) (WPS), a non-profit headquartered in Denver, works internationally to monitor for and automate the detection of threats to wildlife and their ecosystems. Since its initial focus on rhino protection in sub-Saharan Africa and southeast Asia, WPS has expanded its project areas and subjects around the world. With a suite of remote camera traps, sensors, and AI technology, WPS provides the ability for land managers to respond to potential breaches more quickly.

“We use connected camera traps that, upon being triggered by someone walking by, will send a photo through to our software,” says Matt Hron, Director of Product and Customer Success at WPS. “We’re able to analyze that, determine what we should do with it, and notify the people that need to know, fairly close to real time.” By using robust Microsoft Azure cloud computing power and the [MegaDetector](#) AI model, WPS is able to automate image classification and weed through empty images (falsely triggered empty images make up more than 75 percent of all collected data in motion-triggered deployments). The MegaDetector differentiates between blank images and those that contain humans or animals, helping WPS to distill millions of photos down to only those images that need to be reviewed by a person.

This camera trap was triggered by an intruder in a private reserve in South Africa. AI detected the person in the photo, prompting wpsWatch to immediately send a notification to the anti-poaching unit and allowing them to respond before an animal is poached.



Using Microsoft Visual Studio, WPS developed wpsWatch, a mobile-friendly web platform that gives users on the ground full access to the information they need to respond to possible threats. WPS developers are also piloting use of a real-time API to improve their platform. WPS offers wpsWatch as a free solution for conservation organizations, and protected areas can easily connect their own cameras to the platform even when WPS staff aren't able to visit in person. By getting camera traps and this technology out to as many properties (public and private) as possible, WPS hopes to thwart poaching before it happens, even when intrusions do occur, by providing the right information quickly and clearly.



The wpsWatch system is used for ecological monitoring, providing insight into the movement and health of animals like this southern white rhino.

Using virtual reality to build awareness around endangered species

In order to better engage with global citizens that may not have direct visibility to threatened species around the world, WPS has also developed WildX, a collection of virtual reality (VR) videos and experiences hosted remotely on Azure. "We have a big part of our team that is involved in going into the field and getting really neat footage of endangered species and wildlife, and then creating tools to deliver that to people," says Hron. Matt Morrissette, the Director of Technologies for WPS, says, "We're all over the Azure stack, and with adding the VR, we're starting to use Azure Media Services for serving up the videos."

"Not everyone gets to travel to Africa and have that benefit, so this can help to really get people engaged in conservation."—Matt Hron

These immersive experiences serve to make connections that wouldn't otherwise exist between potential conservationists and vulnerable animal populations. "This works more towards outreach, finding ways to bring the experience of seeing a lion to people," says Hron. "Not everyone gets to travel to Africa and have that benefit, so this can help to really get people engaged in conservation. The VR is a great tool to help them make that connection and get to experience some of the wildlife that's around this world."

About Wildlife Protection Solutions

Wildlife Protection Solutions (WPS) is a Denver-based international non-profit that uses technology to further the conservation of endangered species and ecosystems. WPS provides 24/7 monitoring services in a number of international locations to detect intrusions and prompt an immediate response to thwart illegal activities like poaching. Their technology covers over 1.8 million hectares and processes over 100,000 camera trap photos per month in near real time.

Resources

Websites

[Wildlife Protection Solutions](#)

Documentation

Threats: Illegal Wildlife Trade. World Wildlife Fund. Accessed September 19, 2020.

<https://www.worldwildlife.org/threats/illegal-wildlife-trade#overview>

“Three ways the United Nations Environment Programme works to address illegal trade in wildlife.” United Nations Environment Programme. February 17, 2020. <https://www.unenvironment.org/news-and-stories/story/three-ways-united-nations-environment-programme-works-address-illegal-trade>