**Why do scientists study the movements of raptors?**

*“You take your car to a mechanic who knows everything about cars. That way he or she can easily identify problems, fix, maintain, and improve your car.”*

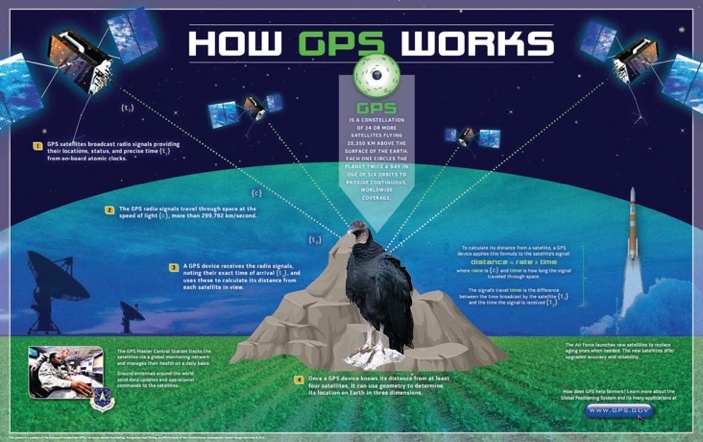
*-Keith Bildstein, Director of Conservation Science at Hawk Mountain Sanctuary*

Simply put, if we want to help protect raptors we need to know as much as possible about them and figure out “how they work.” In order to learn more, we use **tracking devices.** This technology allows raptor biologists to follow or “track” the movements of birds, and therefore answer important questions about their **life histories** and **annual cycles.** We call this method of research **telemetry***,* which means “distance measuring,” in Greek.

There are several devices that can be used to track a bird, and each has pros and cons. Hawk Mountain Sanctuary uses GPS (*Global Positioning System)* units to **tag** black vultures. These units weigh 30 grams (12 pennies) and are placed upon the vulture’s back with a “backpack” made of teflon ribbon. This process does not harm the vulture or prevent it from completing necessary tasks such as feeding, breeding, or soaring.

GPS unit used to track black vultures. Battery to show scale.

These units send signalsthroughout the day, which are then picked up by satellites that calculate the bird’s location. Depending on whether the bird is wearing a GPS unit and a GSM (Global System for Mobile Communications)or only a GPS unit*,* the location will be sent via cell phone network (GSM) or through the unit’s manufacturer (GPS) directly to the waiting scientist’s email.



The black vultures that have been tagged by Hawk Mountain Sanctuary scientists are wearing a mix of GSM and GPS units. All contain batteries that are re-charged by solar panels that provide enough power for long-term data collection. Without solar panels, the unit’s batteries would last only about three years at the most, greatly limiting the type of questions that scientists could answer.

Black vultures are typically non-migratory, meaning they spend most of their time in the same region. However, by using telemetry Hawk Mountain has discovered that some turkey vulture populations migrate long distances. Below are two visuals that demonstrate these movements:

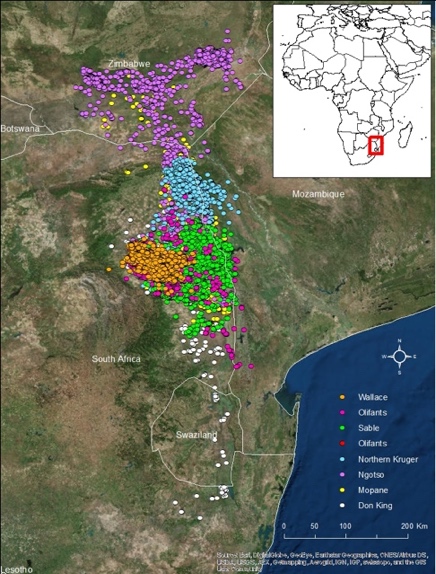
 



Turkey vulture. Photo: The Biomimicry Manual

Each color in the figure above represents a different individual. This visual shows that Florida, Central America, and South America all provide wintering grounds for turkey vultures that live in the United States during the rest of the year.

Figure: Hawk Mountain Sanctuary



Hooded vultures “hugging.” Photo: Keith Bildstein

Figure: Hawk Mountain Sanctuary

This visual shows the movements of hooded vultures in Southeastern Africa. These vultures, like black vultures, are mostly non-migratory and frequently interact with humans.

By gathering information on the movement ecology of vultures, scientists and local communities can work together to better understand why it is important to live in harmony with these amazing animals. Many vulture species (especially black vultures) are **human commensals**, and therefore it matters how landowners and business owners view them. Hopefully, with more knowledge about where vultures are going and why, we can continue to create a culture of understanding in which vultures are accepted as a valuable part of the ecosystem for many years to come.

For more information on tracking devices, visit hawkmountain.org or contact David Barber at [Barber@hawkmountain.org](mailto:Barber@hawkmountain.org).