Examining Vulture Movements and Behaviors with GSM/GPS Transmitters

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Globally, vulture species occupy important roles as scavengers, although human perceptions of vultures are often less distinguished. In North America, Turkey Vultures (*Cathartes aura*) and Black Vultures (*Coragyps atratus*) often congregate in unwanted locations (e.g., roosting on buildings/structures) and, due to their large size and soaring flight behavior, can be a collision risk to aircraft. The resulting bird strikes are dangerous to both birds and humans, and can also result in expensive aircraft repairs. In 2013, through funding by the Federal Aviation Administration, the University of Georgia's Savannah River Ecology Laboratory, in cooperation with researchers with USDA APHIS/ Wildlife Services National Wildlife Research Center (Drs. Travis DeVault and Brad Blackwell), initiated a study to examine methods of dispersing birds such as vultures from unwanted locations using an acoustic hailing device (AHD), which projects a narrow beam of loud noise over long distances. The approach to the study includes documentation of typical patterns of movements and behaviors (e.g., attendance at a site) of birds prior to and after treatment by the AHD. Microwave Telemetry solar GSM/GPS transmitters were selected to document vulture movements. Some of the initial results of the data collected using these GSM/GPS transmitters are presented here.

In June and July of 2013, a total of 20 GSM transmitters was deployed on Turkey and Black vultures (10 each) at dispersed locations throughout the U.S. Department of Energy's Savannah River Site in south-central South Carolina. The vultures were captured on bait sites using a Wildlife Control Supplies NetBlaster and transmitters were attached via backpack harnesses. As of mid-March 2014, 15 transmitters are in operation with one recovered and available for re-deployment, and four lost due to harness attachment failures. These transmitters are programmed to provide a maximum number of locations during periods of peak solar/battery charge, although locations are also provided throughout nocturnal and crepuscular periods. During this ~9 month post-deployment period, over 680,000 locations have been received from these 15 birds. Additionally, an average of approximately 200 locations was received per day per vulture, with a minimum average of 121 and a maximum average of 287 locations per day per bird. These transmitters frequently provided a location every 1-2 minutes, especially during the late morning/early afternoon period. The average proportion of locations with time intervals less than 1 minute is 25% (min 18%, max 37%). Roughly 76% of locations have been reported with time intervals less than 3 minutes and 85% with intervals less than 10 minutes (Figure 1). We also receive altitudinal data (Figure 2), which will be vital when we initiate the sound treatments.

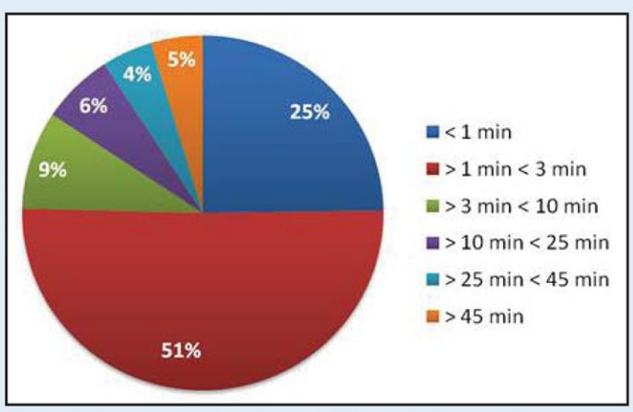

Figure 1. Average proportion of intervals between locations reported by 70g GSM/GPS transmitters.

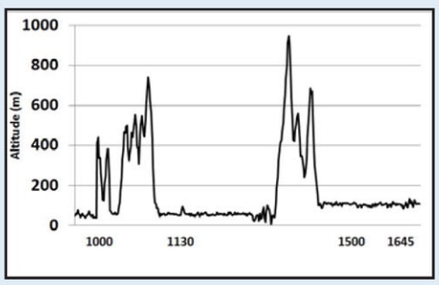

Figure 2. Daily altitude changes of a single Turkey Vulture. Our site is approximately 60-120m above MSL.

Overall the vultures exhibited varying degrees of regional site fidelity. Black Vultures generally remained within 50 km of their SRS capture area throughout the winter whereas a few of the Turkey Vultures exhibited intra-regional movements through Georgia and into Florida, with one Turkey Vulture traveling a one-way distance of approximately 775 km (Figure 3).

Figure 3. Map showing locations (n=71,739) dated June 26, 2013 - March 3, 2014, of a single Turkey Vulture (ID# 173) trapped at the Savannah River Site, South Carolina USA, and tracked by GSM/GPS transmitter.

Prior to conducting the sound treatment tests in the summer of 2014, we are working to establish normal ranges and activity patterns of these vultures. The GSM/ GPS transmitters allow us to monitor fine-scale vulture movements and potential differences in resource utilization among individuals and between species. Results from these analyses will fill important gaps in vulture research by quantifying space use and resource selection patterns of sympatric black and turkey vultures with finer resolution than previous studies conducted on these species. This study will advance understandings of vulture spatial ecology, benefitting conservation of these ecologically important species, and providing managers with enhanced tools for predicting vulture presence and ultimately reducing economic costs of bird-strikes and other conflicts.

Photo by Jim Beasley

Amanda Holland harnessing a Black Vulture with a GSM transmitter.