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USING REMOTE-SENSING CAMERAS AND TRACK SURVEYS TO ASSESS WILDLIFE MOVEMENT THROUGH A PROBABLE WILDLIFE LINKAGE BISECTED BY TWO MAJOR HIGHWAYS

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Abstract

The Arizona Department of Transportation, Natural Resources Management Section (NRMS), and Sky Island Alliance, a non-profit conservation organization, are collaborating on a project utilizing a combination of motion-sensing cameras and track surveys to assess wildlife activity and movement between the Dragoon and Whetstone Mountains in southeastern Arizona. The study investigates the distribution of wildlife across the landscape as it relates to wildlife utilization of different crossing structures on two major highways.

Through its Wildlife Monitoring Program, Sky Island Alliance identifies at-risk landscape-level wildlife corridors within the region and conducts long-term monitoring and data collection within those corridors. Sky Island Alliance is particularly concerned with the movement of four large, wide-ranging mammals: *Ursus americanus* (black bear), *Puma concolor* (mountain lion), *Panthera onca* (jaguar), and *Canis lupus baileyi* (Mexican gray wolf). Top predators were chosen based on their large spatial requirements and reliance on wildlife corridors connecting the region's mountain ranges. In the Sky Island region, the importance of wildlife corridors is magnified due to the numerous, relatively small mountain ranges separated by valleys varying from 16 to 40 km in width. In addition, data are collected on two smaller species: *Lynx rufus* (bobcat), *Nasua narica* (coati). The region between the Whetstone and the Dragoon Mountains was identified as containing possible critical wildlife-movement routes threatened by the increase of habitat fragmentation in the form of road expansion, subdivision of private land, and loss of open space. The area is bordered on the west by the Whetstone Mountains and on the east by the Dragoon Mountains. The San Pedro River, flowing northward out of Mexico, as well as two high-speed four-lane highways, bisects the study area. These three features, one natural and two human-made, are possible deterrents to wildlife movement across the valley.

Wildlife activity is monitored by conducting "track surveys" along pre-established transects. Tracking volunteers, trained by Sky Island Alliance, search for and document incidences of wildlife sign such as tracks, scat, scratches, scrapes, or kill sites. Occurrence of wildlife sign indicates the presence of that species on the transect. Volunteers record species, type of sign, UTM map coordinates for the location of sign and direction of travel (if applicable). Sign from any of the six species of concern are photo documented. Other species are noted, but not assigned data points or UTM coordinates. Sky Island Alliance has been conducting track surveys in the Dragoon/Whetstone corridor since 2001, concentrating efforts in the area east of State Route (SR) 80 and west of the Dragoon Mountains.

Tracking transects are located in four major drainages: Stronghold Canyon and Slavin Wash (which converge before crossing under SR 80) and Smith and Clifford Washes (which converge east of SR 80). Information gathered from tracking surveys is plotted on a map using the ArcView Geographic Information System to determine the location and distribution of wildlife activity. In addition to the tracking transects, Tucson NRMS recently installed remote cameras under two bridges and three culverts along a 10-km stretch of SR 80 in direct relation to the tracking transects. This section, which is located south of the town of St. David, has been identified as having high levels of wildlife activity and roadkill incidence. Tucson NRMS facilitates film replacement and camera maintenance and the management of collected photographic data.

To date, trackers have documented two focal species—bobcat and mountain lion—on all transects within the project area. In addition, Tucson NRMS personnel documented mountain lion tracks outside one of the culvert sites. Sky Island Alliance verified the species identification. Inspection of the first round of remote-camera photographs reveal travel through the culverts and bridges by deer, javelina, cattle, and domestic dog, as well as humans on horseback, ATVs, or foot. To further test the feasibility of using remote cameras under highways, NRMS has installed four cameras along SR90. Future research will expand tracking surveys throughout the Dragoon/Whetstone corridor, specifically in relation to the camera sites on SR 90. Using tracking data in combination with data from the remote cameras, NRMS biologists and Sky Island Alliance will examine characteristics of wildlife corridors in relation to major roadways, in addition to evaluating wildlife use of different crossing structures and how roadway dynamics influence wildlife movement.