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An Assessment of Field Method Efficacy to Monitor Wildlife Presence Near Interstate 70 at Vail Pass

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Abstract

The 2002 National Cooperative Highway Research Project found a need among many state transportation departments for the development of "standard analytic techniques for assessing wildlife ecology and transportation." These agencies use several methods to assess wildlife activity in areas of highway construction projects. However, there have been very few comparison studies of the different techniques and none have been conducted near a high traffic roadway. For this study, I am ascertaining the utility of various field methods to monitor wildlife near Interstate 70 at Vail Pass, Colorado.

Interstate 70 is a major east-west transportation route running through the Colorado Rockies. The associated human development that comes with this transportation corridor has resulted in varying degrees of habitat fragmentation across the region and represents a potentially significant barrier to wildlife movement. To alleviate this potential barrier effect, the Colorado Department of Transportation is proposing to build a wildlife bridge across I-70 just west of Vail Pass. The Southern Rockies Ecosystem Project (SREP) and other Colorado non-profit organizations are developing a monitoring strategy that will inform the placement of the wildlife bridge and determine baseline movement patterns and activity levels of various wildlife species before, during, and after the project. In order to gather a greater wealth of data with this strategy, a Citizen Science Wildlife Monitoring program was created in 2006 by these organizations.

My study is aimed at assessing which monitoring techniques are most effective at documenting species presence across this important wildlife linkage. In this study, "effective" is used to define any method: 1) that detects a mammal, and 2) by which the user is able to identify the mammal to the species level. This paper analyzes four sampling techniques (remote sensing digital cameras, track transect surveys, scat transect surveys, and hair snare surveys) during baited and non-baited sampling sessions. Results from this study will be used by SREP to develop a cost-effective monitoring strategy for the Vail Pass region.

In July and August 2006, eight lines were placed perpendicular to a two-lane dirt road called Shrine Pass Road (SPR) which runs relatively parallel to I-70. Each line consisted of four plots; two directly on the roadway shoulder (roadway sites) and two 100-150m (328'-492') from the road (approach sites). Each plot had a 100m (328') long x 2m (6.6') wide track and scat transect that ran as parallel as possible to SPR. At the midway point in each approach site transect, there was a hair snare station, a track bed and a camera station. The roadway sites only had a camera station at the midway point.

Two study sessions were completed. An unbaited study period ran for two weeks and included both roadway and approach stations. On day one of this session, data from all the stations and transects were collected and the survey areas were cleared. On the final day of this session, the stations and transects were again walked and all track, scat and camera data were collected. For the baited session, only the approach sites were used and the hair snares were baited with a non-rewarding scent lure. The stations and transects were sampled every day for ten consecutive days. The hair snares were re-baited every third day. All tracks, scat and hairs found were recorded and any scat and hair samples were collected. Any samples that could not be positively identified by species in the field were labeled "unknown."

Preliminary results indicate that species detection varies greatly depending on the sampling method and whether a scent lure is present. Twelve different species were positively identified by the cameras, four by scat surveys and two by track surveys. No species could be positively identified using the hair snares without genetic analysis.

Interestingly, for deer and elk, preliminary analysis indicates that detections with track surveys were significantly greater than those with camera and scat surveys. In contrast, scat was a better indicator of American marten presence compared to most other techniques. In fact, preliminary results suggest that detections of marten with scat and camera surveys are significantly greater than detections with track surveys. No difference was found between scat and camera surveys. Overall, however, scat surveys were a fairly ineffective technique without genetic analysis as several scat samples were unidentifiable in the field.

Furthermore, it seems that the baited session was more effective than the non-baited session for monitoring wildlife. For instance, all twelve species identified at camera stations were recorded during the baited session whereas only six species were recorded during the non-baited period. Non-baited cameras did not detect certain rodent species, domestic dogs, gray fox, porcupine, and American marten. In addition, scat detections for marten were significantly higher for the baited session than for the unbaited session. Finally, activity indices were higher for domestic dog, mule deer, red and gray fox, mice, chipmunks and squirrels at the baited camera stations. Comparatively, during the non-baited session, the activity index was notably higher solely for rabbits.

These results will aid in assessing what sampling methods are most appropriate for certain species given time constraints, seasonal environmental conditions, and availability of funding for monitoring equipment. The results from the field study will be reinforced by additional research on each method to evaluate their effectiveness in other studies. In the end, this study will contribute to developing an appropriate long-term monitoring strategy for the Vail Pass linkage.