Horse Population Survey of Mesa Verde National Park

Observers from the National Park Service and US Geological Survey flew aerial surveys of the feral horse population in Mesa Verde National Park (MEVE) on September 20 and 21, 2011. Horses did not appear to be disturbed by the helicopter during the surveys. Data were analyzed at Colorado State University, Natural Resource Ecology Laboratory. The surveys and analysis used the peer-reviewed, published method of Lubow and Ransom (2009 JWM 73:1420-1429). In this method, observers make multiple passes over the population and photograph each horse group. Groups can be uniquely identified in the photographs by their natural markings. Using these identifications of individual groups, a dataset was prepared that indicated which groups were seen on each of the passes over the populations.

The statistical analysis of this dataset can estimate the probability that horse groups were observed on any given pass, after accounting for differences in the ability for observers to detect different groups at different times. These sighting probabilities are used to estimate whether all of the horses were seen and, if not, to estimate how many were never seen. The statistics also produce an estimate of the precision (or error) in the population estimate. In this survey, observers identified 100 horses in 32 groups over the 6 passes, with a combined total of 91 group sightings. Group sizes ranged from 1 to 14 horses. Between 9 and 19 groups were observed per pass, representing 28–59% of the total groups seen during the entire survey. The analysis predicted that nearly all of the horses were seen and estimated the population to be 101 horses with a 95% confidence interval of 100-117 horses. Results from this survey also provided information for improving the precision and reliability of future surveys by: (1) taking more photographs of each group to increase confidence in the identification of groups; and (2) dividing up the available survey time make 8 widely-spaced passes instead of 6 more narrowly-spaced passes over the population.