



AERIAL INVENTORY FOR MULE DEER MANAGEMENT Fact Sheet #33

OVERVIEW

Periodic surveys are a key component of big game management. Wildlife managers use aircraft to quickly survey large areas and observe a large number of mule deer. Information gained from these flights is crucial for population estimation and science-based management of mule deer herds.

AERIAL INVENTORY – AN IMPORTANT TOOL FOR MANAGEMENT

Aircraft, primarily helicopters, are invaluable for efficiently surveying large and often remote geographic areas. Completing surveys quickly minimizes the risk of double counting mule deer, which have the ability to move between and around survey areas. Similarly, most western big game ranges are vast and require a survey to get a representative sample because it's generally not practical or affordable to get complete flight coverage. Biologists have a short window for surveys between the end of hunting seasons in November and December and when mule deer antler drop begins January-March. This is a brief, but critical time for assessing mule deer populations.

Photo: George Andrejko



In the fall, big game animals, and particularly mule deer in mountainous areas, migrate down in elevation to avoid deep snow and to find food. Animals on winter range are concentrated and more visible (because leaves have fallen off trees and shrubs, there is often snow cover, and winter ranges often have fewer trees), making inventory efforts more efficient. Non-migratory herds, especially those in areas with flat topography, can be more challenging to survey because they are spread over larger areas at lower densities.

During surveys, biologists work to get a representative sample for each herd. Data collected on aerial surveys can include herd composition (ratio of bucks per 100 does and fawns per 100 does), age composition of bucks, distribution, concentration areas, data on other species, and sometimes population size and density. Classifying deer by age and sex to estimate herd composition is the most common information collected during aerial surveys.

Aerial surveys allow managers to access areas that are far from roads, blanketed by deep snow, or where land ownership prevents ground access. For example, herd level estimates are often more accurate when they include remote areas or private lands that are inaccessible from the ground. The buck:doe ratios or buck age structure are often different in remote areas when compared to areas that are more easily accessed by hunters and biologists alike.

Aerial surveys also provide a platform with an improved vantage point, allowing observers to look down through relatively dense vegetation. Animals often move during low-level flights, which increases the ability to see them. The 3-dimensional view provided by moving aircraft and running deer allow trained biologists to classify animals by age and sex more quickly and accurately than can be done from a photograph or even video.

Aerial surveys also allow for more formalized sampling designs. These consist of systematic surveys or randomized sample based surveys, such as quadrats, line transects, or points defined by GPS coordinates. These sampling formats can be standardized by density, habitat type, and other population and terrain features to reduce variability. All surveys generally rely on technology such as GPS units, smart devices, or computers for navigation and recording observations.

Regardless of approach, human safety and animal welfare are primary considerations. Animals near or approaching hazards (highways, fences, city limits, livestock, structures, cliffs, or rivers) are not surveyed unless they can be moved away from the hazards. Skilled pilots take advantage of the flight response of animals by directing fleeing animals away from danger, but also to provide biologists a clear view of those animals. While aerial surveys disturb animals, that disturbance is typically brief and animals do not have time to move far before the aircraft has passed.

ISSUES

Observing every mule deer while completing an aerial survey is generally neither possible nor practical. Biologists use aerial surveys typically only to collect samples of population attributes such as sex and age ratios rather than attempt to count all of the mule deer in survey area. For these ratios it's only necessary to obtain a representative sample of the herd and it's not necessary to see all of the mule deer. Total abundance surveys, which attempt to estimate the number of mule deer in the sampling area require a greater investment of effort and cost. When completing abundance surveys, biologists still are unable to actually observe every mule deer. The number of mule deer that weren't observed needs to be estimated by applying a detection probability or sightability correction to the number of mule deer actually observed. This correction can depend on the amount of snow cover, the thickness of vegetation cover, terrain, group size, type of aircraft, distance from aircraft, light conditions, and if mule deer are moving or stationary.



Photo: Jim Heffelfinger

Flying helicopters at low altitude can be dangerous. Wildlife agencies, pilots, and aviation mechanics take every precaution to minimize risks to people and wildlife. Biologists are looking to technologies such as drones, photography, advanced videos, and forward-looking infrared (FLIR) to develop new survey methodologies. New technology and methods may ultimately replace human observers in aircraft; however, these methods still have limited applicability, particularly with respect to classifying animals by age and sex class.

SUMMARY

Aerial surveys are an important tool for assessing mule deer herds in large western landscapes. Aircraft allow biologists to gather a large amount of information in a short amount of time, which significantly informs mule deer management.

More information on Mule Deer can be found at www.muledeerworkinggroup.com

A product of the Mule Deer Working Group - Sponsored by the Western Association of Fish & Wildlife Agencies. - Approved January 2019

Produced with support from the Mule Deer Foundation • www.muledeer.org