

# HELICOPTER NETGUNNING: A SUCCESSFUL MOOSE CAPTURE TECHNIQUE

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**ABSTRACT:** Since 1992, Helicopter Wildlife Management (HWM) has efficiently and safely captured over 392 moose (*Alces alces*) in 6 states and 4 Canadian provinces. Radio collars were placed on approximately 76% of the moose captured. All captures were made without drugs and with net guns fired from helicopters. Overall mortality at time of capture has been less than 1 %. A technique was developed for carriage of moose under the helicopter that has proven successful in reducing handling time of relocated animals.

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The increasing interest and pressures on wildlife populations, dwindling habitats and reduced management budgets have highlighted the need for more efficient methods of obtaining reliable data on these populations. Essential to the success of many wildlife population studies is the ability to safely, humanely, and reliably capture study animals.

The technique of using a net gun fired from a helicopter was initiated in New Zealand about 1975 and first used in North America in the late 1970s and early 1980s (Jessup 1982, Andryk *et al.* 1983, Krausman *et al.* 1985, Fig. 1). However, it was only in New Zealand, where economic conditions and incentives for meat production and capture for live relocation to deer farms developed, that the methodology was continually challenged by pilots, shooters, and net gunners to efficiently, safely, and economically perform this work (Van Reenen 1982).

In 1992, HWM was established in North America. Pilots, net gunners, and handlers were brought from New Zealand to utilize their skills in North America. During the three ensuing years, HWM has captured over 5000 animals, representing 14 large mammal species throughout Canada, United States, and Mexico.

HWM also introduced the system of charging for capture and animal processing as an all-inclusive price per animal. This method of doing business has been widely accepted by agencies throughout North America. This system, coupled with the skills of HWM pilots and crews, has helped biologists to plan confidently both financially and logistically.

## RESULTS

### Mortality

A total of 392 moose have been captured by HWM during years 1993-95. During these captures there have been three mortalities (0.77%) at time of capture. Mortalities included 2 cows and 1 bull. Most common cause of mortality at capture has been a broken neck.

Based on follow-up with biologists, mortalities from capture myopathy have also been few. From a total of 71 moose captured by helicopter netgunning and relocated a considerable distance from two study areas in Colorado, 5 moose died within two days (Olterman *et al.* 1994). Two deaths were attributed to capture myopathy, while the remaining three were 2 calves and an old cow in poor physical condition and upon necropsy, direct evidence of capture myopathy was not



Fig. 1 Helicopter netgunning technique to capture moose (HWM photo).

evident.

It is recommended that helicopter netgunning captures for moose be done in early winter before they are stressed by severe winter conditions (Olterman *et al.* 1994). To prevent neck injuries at capture it is important to avoid netting moose at full running speed.

Conditions most conducive to capture include a snow depth that is deep enough to slow the animal, but not so deep to preclude movement. In summer, moose are often

associated with water and often shallow water will help reduce running speed as well. The pilot often must utilize considerable skill and patience to maneuver the helicopter and the moose into proper positioning for a successful capture.

#### **Drug-Free**

Currently accepted protocols for capturing and handling free-ranging moose involve darting animals from a helicopter with the immobilization drug carfentanil (Franzmann

*et al.* 1984, Schmitt and Dalton 1987). This drug is potent and hazardous to humans in minute quantities. Few personnel have experience handling and administering carfentanil.

Use of carfentanil can also present potential safety hazards to the public and other wildlife. Although radio-transmitter darts may be used and attempts are made to recover lost darts containing carfentanil, it can be expected that in a project involving capture of large numbers of moose that at least one dart could be lost. If that occurs, and the dart does not discharge its contents, then a public safety hazard could result. In addition, regulatory agencies (e.g., USDA or Health and Welfare Canada) insist that any animal treated with carfentanil must not be consumed. It is possible that a very small quantity of the drug may remain in the animal's system for an unknown period of time, with severe consequences for humans or other wildlife that may take the animal for food.

Carfentanil can also be hazardous to treated animals. A common side effect is extreme elevation of body temperature (Schmitt and Dalton 1987), which must be monitored continuously while the animal is handled. Another problem that is less common, but equally dangerous, is depression of respiration rate. These hazards to individual animals can be counteracted, but there is risk of death. Since HWM does not use carfentanil, these safety hazards are avoided.

### **Efficiency**

In many North American jurisdictions, the ideal period for moose capture extends from the beginning of January to mid-February. Previous capture operations involving darting from a helicopter have shown that about 2-3 moose can be captured each day. Depending upon number of animals to be processed and considering poor weather and mechanical difficulties it may not be possible to complete projects within the specified period. In contrast, HWM crews process 6-

10 moose each day. This allows for larger sample sizes and the capture operation can often be completed within the preferred period, even with weather delays.

### **Cost**

Studies (Jessup *et al.* 1988, Olterman *et al.* 1994, White and Bartmann 1994) have shown that helicopter netgunning was a cheaper and more efficient capture method for desert bighorn sheep (*Ovis canadensis nelsoni*), moose and mule deer (*Odocoileus hemionus*) than were other methods. Much of the lower cost results from the reduction in necessary personnel to carry out capture operations and the higher rate of capture per day.

### **Moose Relocations:**

The first moose relocation project in North America by HWM was in Utah in 1992. Subsequent relocation projects were completed in Colorado and Montana. During these projects the technique for sling carriage of moose upside down by the legs under the helicopter, was developed (Fig. 2). This technique has reduced handling time, lowered stress on animals, and reduced number of people required for each capture.

Although techniques for sling carriage were originally questioned by veterinarians and some biologists, experience by HWM and data on long-term survival of captured moose has proved it both safe and efficient. This technique is now a basic component of transferring moose in capture projects.

### **Radio-Collaring and Collection of Samples:**

Because crews are sufficiently experienced, the entire process from capture to release requires approximately 10-15 minutes. This includes collaring, recording body measurements, and obtaining biological samples. HWM crews are trained to take these measurements and record them accurately,



Fig. 2. Sling carriage of moose. (HWM photo).

which greatly expedites animal handling time. On some projects, the principal investigator accompanies the helicopter crew and assists in the capture operation.

Helicopter crews are also trained in animal handling techniques and very much aware of animal welfare considerations. Personnel are guided by standard operating procedures that include instructions on animal handling, restraint, biological sampling, transport, and euthanasia.

Work is under way to have these capture protocols reviewed and endorsed by various animal care and use committees across North America. Helicopter netgunning for moose significantly broadens the potential for moose projects in North America.

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