

A New Method of Argali (*Ovis ammon*) Capture using Horsemen and Drive-nets

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Abstract

Argali sheep (*Ovis ammon*) were live captured for radio-collaring using horsemen as the primary means to herd them into drive nets. Two adult argali ewes, one argali lamb, and one adult ibex ewe were captured by drive-netting in five days effort in Ikh Nartiin Chuluu Nature Reserve, Mongolia, in September 2002. This represents the first use of this low tech, efficient, and low cost method for live capture of argali.

Key words: argali, capture, drive-net, *Ovis ammon*

Introduction

Research and management of wild ungulates often requires the use of live captures (Jessup 1982). While helicopter net-gun capture is a commonly used method for capturing bighorn sheep in North America, especially in the deserts of the southwestern United States and Mexico (Kock *et al.* 1987, Jessup *et al.* 1988), this method is not practical in many parts of Asia because of the expense, or the lack of small manoeuvrable helicopters. With helicopter net-gun captures, the helicopter is flown without the rear doors and the net gunner is attached with a harness allowing him/her to safely lean out the door for a clear shot. A four barrel net-gun is used to deploy a 5m by 5m net over an individual animal, while 5m to 10m above it. Legs and horns become entangled in the net, immobilizing the animal. The helicopter lands nearby so the animal may be recovered.

Drive-net capture typically requires the same small maneuverable helicopters, however, other means of driving animals have been substituted, including vehicles and people on foot. Drive-net capture of bighorn sheep has worked by herding animals into a line of nets stretched across an escape route such as a natural gap in rocky terrain. Drive-net capture of Mongolian gazelle has been accomplished by driving animals into an opening in a circle of nets. In drive-net capture, the nets are loosely hung from poles that easily break or fall when animals run into the nets and become entangled. Sometimes nets are set in double or triple rows, to facilitate capture of additional animals that

would otherwise escape by jumping over the first or second row of falling nets.

Argali sheep (*Ovis ammon*) are well adapted to running; they have long legs to outrun their predators (Schaller 1998, Amgalanbaatar & Reading 2000). As such, argali behavior is unlike that of bighorn sheep (*O. canadensis*) because argali run for long distances across open terrain to escape a predator rather than running up into steep, rocky terrain (Valdez 1982). When pursued, argali will typically run in a line, following a lead animal, for several kilometers.

By utilizing local horsemen and drive-nets, it is possible to efficiently capture argali by taking advantage of their anti-predator behavior. We report here on the first successful capture of argali using horsemen and drive-nets in Ikh Nartiin Chuluu Nature Reserve, Mongolia, in September 2002.

Materials and Methods

A total of 250m of drive-nets (3m high by 30m long) were set up in a straight line along the bottom of a dry sandy streambed in Ikh Nart, Mongolia. Nets were constructed of soft 6mm braided synthetic rope knotted into a 15cm mesh. Nets were held up by 6cm x 6cm poles, alternating sides every 5m, with two poles holding up each end of a net. The nets were hung loosely from the top by a rope that was weaved through the netting, passed over the end poles and secured to the ground with rocks. Approximately 30cm of net lay on the ground so that the legs of animals would be easily entangled when they ran into the nets. The poles were 2.5m in length with a shallow notch cut in one end so that the nets would slip off the poles when animals

ran into the nets. Rocks were used to hold the bottom of the nets down in high winds.

We selected two drive-net sites that appeared to be natural argali crossing points in the streambed, and were bordered by rock outcrops or steep terrain on one end. By placing the nets in a dry streambed, below the level of the embankment, less than half of the net was visible to approaching animals. Large rocks were moved from the streambed to minimize the risk of injury to animals caught in the nets.

Driving was done with 3 to 6 horsemen in an enveloping sweep to bring animals towards the capture nets. Each horseman was equipped with a hand-held radio (Motorola TalkAbout and TalkAbout DPS models) and coordinated from a command position located high on an outcrop that had maximum long-range visibility. Additional observers were dispersed among outcrops, and a handling crew was hidden in the streambed near the nets.

We also experimented with using a vehicle to drive argali, but found that the vehicle was most efficiently used to head-off animals that appeared to be avoiding the nets. On one occasion, a motorcycle was used on the final (0.5km) pursuit to the nets.

Once captured, animals were subdued with blindfolds and hobbles, and set in a recumbent position while being collaring. Radio-collars were fitted snugly to ewes but with enough slack that three flat fingers could be slipped between collar and neck. Lamb collars were filled with foam or felt packing to allow expansion during growth, and taped into place.

Results

Two adult argali ewes, one argali lamb, and one adult ibex ewe were captured by drive-netting during five days effort in September 2002. Additional animals escaped capture by jumping over the single line of net that had fallen. The first argali ewe was captured within the first three hours of effort, using three horsemen. An hour later, a three legged ibex ewe was captured. Her lamb was briefly entangled but shook free before we could reach it. Both of these captures occurred on a very wind day when the animals' sense of sight and smell may have been reduced. At a second capture site, nets were set up along a wash extending from the base of the highlands. A group of ibex eluded capture by jumping on top of, and over the nets.

Because a vehicle was not available at that site, we used scarecrows to deter animals from running around the downhill side of the nets. Six scarecrows were constructed of spare clothing and broken net poles, and set 20-30m apart. When we returned to the first capture site, a second argali ewe and lamb were captured from a group of six. The rest of the animals evaded capture by jumping over the fallen net.

Discussion

We safely captured 3 argali and one ibex using horsemen and drive-nets, in five days of drive-netting effort. With more nets, set up in double or triple rows, more animals could be captured with each drive. In comparison to capture using drug delivery darts and immobilization drugs, drive-netting with horsemen is very cost effective. Furthermore, this method of drive-net capture requires no specialized equipment (except radios), no dangerous drugs, or specialized training. All other costs being the same (travel, vehicle, etc.) the cost per animal is approximately \$1,000 per animal for darting with carfentanil citrate, compared to roughly \$33 per animal with drive-netting. The high cost of carfentanil citrate (approximately \$200 per dose), and average number of shots taken to successfully inject an animal (3 shots), plus the cost for one dose of the reversal drug naloxone (approximately \$400 per dose), contribute to the major expense. In contrast, horsemen were hired for \$2 to 4 a day per person, at a cost of about \$33 per argali captured.

To our knowledge, drop-net capture of argali has not yet been attempted. Drop-net capture would require experimentation with various foods that could be used as bait, and then habituating argali to tolerate human presence at the bait site where a drop-net would be used. The wariness argali show towards humans does not make use of this method very promising.

By deploying horsemen in an enveloping sweep, argali can be moved slowly in the direction of the nets until a rapid final push can be initiated with horsemen, people on foot, and vehicles. Although vehicles worked well for reconnaissance, if argali are driven too far or too hard, (which is potentially easy to do with a vehicle) there is risk of them overheating, becoming exhausted, and developing capture myopathy (Kock *et al.* 1987b). Therefore we recommend only using a vehicle for pursuits of

less than 0.5km, in the immediate vicinity of the nets. Also, in our experience, when pursued by a vehicle, argali tend to double back to evade pursuit.

Because argali run single-file behind a lead animal, a single row of nets allows only the first one or two animals in a group to be captured. Additional animals could be captured with each drive if double or triple rows of nets are employed. Experience with bighorn captures has shown that a minimum of two handlers are needed for each animal to minimize risk of injury to the animals and their captors. For the purposes of our research, we did not attempt to capture argali rams in drive-nets, however, from our experience with drop-net and drive-net capture of large bighorn rams, we believe large argali rams can be captured with our method as long as sufficient personnel are on hand for handling the animals.

Horses were the limiting factor in the length of each capture day. We had only one horse per horseman and they typically could work only 2 to 4 drives in a 6 to 8 hour capture day. One or two extra horses for each horseman would allow greater range for each drive, and a longer capture day.

Effective communication was the single most important factor contributing to success. The use of short, essential messages cannot be overly emphasized. Clip-on microphones are ideal for horsemen and reduce the chance of dropping the radios. Batteries are a potential limiting factor and our consumption averaged 1.5 days of use per set of batteries. We used alkaline and rechargeable nickel-metal hydride batteries.

Drive-netting using horsemen is an efficient, low-tech, safe, and cost effective method of capturing argali. The development of this method opens numerous possibilities for conservation research and translocations of argali in Asia.

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Хураангуй

Аргальд (*Ovis ammon*) радио хүзүүвч зүүхийн тулд морьтой хүмүүсээр торруу шахуулан амьдаар нь барив. Бие гүйцсэн хомь хоёр, аргалийн хурга нэг, бие гүйцсэн эм ямаа хоёрыг 2002 оны 9-р сард таван өдрийн оролдлогоор торруу шахах аргаар Монгол Улсын Их Нартын Чулуу Байгалийн Нөөц Газраас барьсан. Энэхүү арга нь хялбар, үр ашигтай, зардал багатай болох нь ТОГТООГДОВ.

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