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TO THE EDITOR . . .

On Capturing Bighorn Sheep

It is somewhat dangerous for a third party to enter a dispute, particularly a dispute between friends and esteemed colleagues. However, I would like to suggest that statements in the recent letter to the editor by Michael Kock (1991) concerning methods of capturing bighorn sheep and the reply by Jon Jorgenson, Judith Sampson and Marco Festa-Bianchet (1991) are not as contradictory as they might at first seem.

As Dr. Kock observed, very few bighorn populations in the desert southwest are tame enough to be approached or even observed at distances <100 yards. They also are very scattered and only occasionally are groups observable around water. There are a few notable exceptions to this, particularly those herds using the shores of Lake Meade. On the other hand, there are apparently quite a number of free-ranging Rocky Mountain bighorn that are habituated enough to people that they can be routinely and repeatedly observed at close range and darted. I can't explain this apparent dichotomy in behavior. One early observer thought it might correlate with their tongue color (black or pink), but we have not found this to hold true. In any case, desert bighorn generally appear to not be as approachable as Rocky Mountain bighorn. Where they can be habituated and attracted to water or bait, drop nets have proven to be the safest and most cost effective way to capture large numbers of desert bighorn. Alpha-2 adrenergic agonists like xylazine, detomidine and medetomidine act at the same receptor sites as epinephrin and norepinephrine. Excited animals, probably having high circulating levels of these endogenous neurotransmitters, seldom respond as well or predictably to xylazine as they do to other classes of drugs and combinations of drugs. On the other hand calm desert bighorn respond rather nicely to relatively low levels of xylazine, or better, xylazine and ketamine, if anesthesia is desired.

I have observed, however, that xylazine can cause a marked bradycardia at doses much lower than those reported by Jorgenson et al. (1990). I have seen the heart rate of a young adult male desert bighorn (approximately 75 kg) drop from over 140 beats per minute to 20 beats per minute within 15 min of receiving 20 mg of xylazine intramuscularly, to calm it after being driven to a standing net by a helicopter. The heart rhythm was irregular, the respiratory rate was very slow, the capillary refill time exceeded 2 sec, and I believe the animal would have very likely died without yohimbine as an alpha-2 adrenergic antagonist. I have observed many similar responses at dosages in the range of 0.08 to 0.12 mg per pound, when xylazine was used to sedate bighorn captured under a drop net. The report by Jorgenson et al. (1990) would have been considerably more valuable if it had contained observations of vital signs, particularly heart rate and capillary refill time. On the other hand, the numbers of apparently successful immobilizations they report, and have reported previously using xylazine and ketamine (Festa-Bianchet and Jorgenson, 1985), do appear quite impressive.

Xylazine has not proven to be as safe and effective for immobilization of desert bighorn as it apparently has for Rocky Mountain bighorn, but it has not been widely tested under circumstances similar to those reported by Jorgenson et al. (1990). Narcotics have proven to be effective for immobilization of desert bighorn, although they are not terribly safe for man or beast, as noted by Kock et al. (1987) and are rather expensive as noted by Jessup et al. (1988).

There can be little doubt that a helicopter pursuit adds significantly to capture

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stress. If use of helicopters and narcotics to capture bighorn can be avoided, they probably should be. Unfortunately, it is literally impossible to find, approach, and capture desert bighorn in most of their ranges in the desert southwest without a helicopter. Helicopter pursuit and net gun capture of bighorn can be relatively safe and effective as shown by Kock et al. (1987). Since that publication we have net gunned over 400 additional desert bighorn with a capture-associated mortality (immediate deaths or reported mortality within 7 days of capture) of approximately 1%. So it is probably not simply the case that "mortality could at least have been partly due to the chase" (Jorgenson et al. 1990).

I don't believe that Dr. Kock or I would really disagree with Jorgenson et al.'s (1990) statement, "We suggest that a sensible recommendation to wildlife managers would be to not dart sheep from helicopters." And, the data presented in Kock et al. (1987) and Jessup et al. (1988) certainly supports that statement. It would be wrong, however, to assume that those of us who use helicopters to capture bighorn have not considered and/or tried other methods. Nothing could be further from the truth, the costs and safety risks associated with helicopters alone assure that. Also, in very dense brush and certain types of terrain in the southwest, there still may be a need to occasionally dart desert bighorn sheep from a helicopter, and in those cases narcotics can be used successfully.

It appears that Jorgenson et al. (1990) were trying to capture a few bighorn per day for taking biological data, and attaching radio collars for a long term biological study. Many of the captures reported by Kock et al. (1987) were for relocation of herds. In these situations it is most desirable to capture 20 or more bighorn per day, so they can be transported and released together in the shortest possible time.

In summary, Kock (1991) and Jorgenson et al. (1991) are really talking about two rather different capture situations, albeit involving the same species. In professional courses on wildlife capture we teach "There is no single best capture technique or drug. Each situation is different, for optimal results the capture technique or drug must be matched to that situation and to the purpose for capture" (International Wildlife Veterinary Services, 1991). Both Kock (1991) and Jorgenson et al. (1991) may be right, as contradictory as that may seem.

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