

PREDATOR CONTROL IN DEER MANAGEMENT: SOUTH TEXAS

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Abstract: Research on predator control in deer management in South Texas is reviewed. Research falls into 2 categories: (1) studies of the scat of predators or cause of death attributed to recently-dead deer carcasses, and (2) predator (all coyote) removal studies. Mountain lions (*Felis concolor*) and bobcats (*F. rufus*) do not appear to be important predators in most South Texas deer populations. Coyotes (*Canis latrans*) have had an impact on fawn survival in some studies conducted in the 1970's. The most likely-to-be-effective predator control practice in deer management is intensive removal of coyotes before and during the fawning period.

This paper is a review of research on predator control in deer management in South Texas. Predators have been a subject of debate in wildlife management for years. Originally, South Texas contained the following predators that normally would kill and eat white-tailed deer (*Odocoileus virginianus*): jaguar (*Panthera onca*), mountain lion, wolf (*Canis lupus*), coyote, and bobcat. Perhaps black bears (*Ursus americanus*) should be added as an occasional predator of deer. Additionally, humans have preyed on deer for the past 12,000 years or so, but will not be considered herein. Of course, the jaguar, wolf, and bear are gone, and research attention has concentrated on the coyote, with only a few studies of mountain lions and bobcats.

Research on deer predators in South Texas has taken 2 approaches: (1) investigation of scat of the predator or recovery of recently dead carcasses of deer (usually with the aid of radio telemetry) where cause of mortality is discerned, and (2) experimental removal of predators with subsequent assessment of the response of deer populations. I will give a general

review of some of the studies under (1) above by species, and then address the "experimental removal" studies, all of which involved coyotes, in somewhat more detail.

MOUNTAIN LIONS

Harveson (1997) conducted a comprehensive mountain lion study in South Texas. He examined both mountain lion kills and scat. White-tailed deer made up 49% (37 of 75) of the kills found, far exceeding any other prey species. For scats, deer were about equal to feral hog in the samples. For the scat analysis (25 scats), deer were present in 28% and made up 26% of the volume. In a study of mortality in adult male white-tailed deer in South Texas, DeYoung (1989) reported that 13% (2 of 15) mortalities classed as natural causes were due to mountain lion predation. Fifty-eight bucks were monitored by radio telemetry in this study. Harveson (1997) reported that South Texas mountain lions preferred riparian habitat. Since this does not constitute a large part of the region, lions may not be an important deer predator overall. However, ranchers and managers

occasionally report significant localized predation by lions on deer in or near the riparian habitat that exists.

BOBCATS

Blankinship (2000) studied bobcats near Sinton, in South Texas from 1992-98. Based on scat analysis, white-tailed deer were found in the diet only during the months of May-August, with the highest occurrence in June. This corresponded to the peak fawning season for deer on the study area. Year around, deer occurred in only 2.7% of the scats between 1993-98. However, deer had as high as 20% occurrence for May, June, July, and August of 1994.

I have an unpublished observation of a bobcat killing an adult doe in South Texas. It appears, however, that this is not common and that bobcats are usually a minor predator on fawns.

COYOTES

Cook et al. (1971) radio collared fawns near Sinton, Texas in the summers of 1965 and 1966. Fawns were located several times per week. Eighty-one fawns were monitored during the study and 50% were judged killed by coyotes. An additional 32% died of other factors. Carroll and Brown (1977) conducted a similar study in Lavaca and Gonzales counties during 1971-73. They found over 3 years a 17% loss (10 of 60) of fawns due to coyote predation in Lavaca County, whereas the rate in Gonzales County was 26% (18 of 60). The researchers speculated that cover and nutrition associated with poor range conditions resulted in higher predation losses.

DeYoung (1989) studied mortality causes in adult male deer in LaSalle and Webb counties during 1984-86 using radio telemetry. He attributed 20% of natural mortalities (3 of 15) to coyote predation.

EXPERIMENTAL REMOVAL STUDIES

Several South Texas studies have used experimental removal of coyotes to assess affects on deer populations. Beasom (1974) worked on the King Ranch in 1971-72. He removed 188 coyotes from a 5,400 acre experimental area during the study, and compared deer response in a like-sized control area. There was a 74% higher loss of fawns to coyotes in the control area in 1971 and a 61% greater loss in 1972. Deer numbers were much higher on the experimental removal area versus the control.

Guthery and Beasom (1977) removed 132 coyotes from a 3,830 acre study area in Zavala County during 1975 and 1976. They also compared to a control area where fewer coyotes were removed. Fawn/doe ratios did not differ on the 2 areas during the study, but number of fawns produced per unit area was 70 and 43% greater where coyotes were reduced during 1975 and 1976, respectively.

Kie et al. (1979) removed coyotes from a 966-acre fenced area and measured deer population response as compared to adjacent deer exposed to coyotes during 1972-76 near Sinton, Texas. Deer numbers initially expanded greatly in the absence of coyotes and this was attributed to increased fawn survival. Deer numbers inside the fenced area expanded until nutritional and disease problems became common, after

which the population declined.

Heffelfinger et. al. (1990) removed coyotes from a 5,000 acre area in Dimmit County and a similar area in LaSalle County during 1987-89. They monitored response of adult male white-tailed deer, versus nearby populations exposed to coyotes. For the LaSalle County area, 142, 163, and 106 coyotes were removed during 1987, 1988, and 1989, respectively. In Dimmit County, 94, 100, and 94 coyotes were removed for the same years. Coyotes did at times kill adult male deer. However, there was no detectable change in the number of adult males between experimental and control areas. Unpublished data during the same study revealed that intensive removal of coyotes had no effect on fawn survival on either study area over 3 years.

DISCUSSION

Coyotes appear to be the main predator of concern for deer management in South Texas. Mountain lions can have a local impact at times, but region-wide, do not seem to be an important threat to deer populations. Bobcats kill some fawns and an occasional adult deer, but likewise do not appear to be much of a region-wide concern.

Several of the studies on fawns present evidence of a strong effect of coyote predation. The experiment of Kie et al. (1979) perhaps had the best experimental design and the most dramatic effect of the deer population to removal of coyotes. However, studies by Kie et al. (1979), Carroll and Brown (1977), Beasom (1974), and Guthery and Beasom (1977) were all conducted during the decade of the 1970's, a period that experienced the highest rainfall in South Texas during the 20th century.

Whereas there were individual dry years during several of the 1970's studies, deer densities in all were at very high levels. It is unknown how representative results of these studies are of "normal" rainfall periods and deer population densities. As indicated above, unpublished data of Heffelfinger et al. (1990) showed no affect on fawn survival after intensive coyote removal for 3 years on 2 study areas in the late 1980s.

Other factors in the coyote-deer management mix are the hiding cover for fawns and nutrition of does during the time of nursing. Carroll and Brown (1977) felt that cover and nutrition were important factors in the rate of coyote predation on deer fawns. Little research has been done in this area. Hyde et al. (1987) found that deer fawns in Brooks County were selecting bed sites with more screening cover versus random points in the vicinity. Coyotes have been described as hunting using a visual searching strategy (Wells and Lehner 1978), so bedding cover is presumably important. Zaiglin and DeYoung (1989) showed that fawn survival in Webb County could be significantly increased by improved nutrition provided through supplemental feed. Coyote numbers were not manipulated during this nutrition study. Thus it appears that there is still much to learn about the interactions of coyotes and deer density, nutrition, and the availability of fawn hiding cover.

Regarding predator control as a deer management tool in South Texas, it appears the best bet is to focus on removal of coyotes to improve fawn survival. However, it seems there are times and conditions where this will not work. Coyote control should be concentrated just before fawns are born and continue through the

nursing period for greatest impact. This is because coyotes rapidly “fill in” after predator control ceases (Beasom 1974, Heffelfinger et al. 1990). Managers should also remember that the studies where there was a significant deer population response to coyote removal (Beasom 1974, Kie et al. 1979) used very intensive methods. In most situations, it will be very expensive to duplicate this intensive control.

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