An Estimate of Unretrieved Deer Following a Muzzleloader Hunt

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Abstract: Air and ground crews conducted a search for carcasses of white-tailed deer (*Odocoileus virginianus*) on Yazoo National Wildlife Refuge (NWR) following a 5-day, either-sex muzzleloader hunt. The search covered 48.4% of the refuge's 5,047 ha. A total of 8 carcasses was found with muzzleloader wounds. Based on the area covered, an estimate of 16.5 unretrieved deer (23.9% of the 69 deer harvested) was calculated. Interviewed hunters reported 16 unretrieved deer or 23.2% of the total harvest. All 8 carcasses found were adult does. This differed from the harvest results in which only 32% were adult does.

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One unknown for many managers is the number of deer unretrieved by hunters through crippling and/or intentional abandonment. Information is available for deer lost following archery and modern gun deer hunts (Robinette 1947, Van Etten et al. 1965, Downing 1971, Hardin and Roseberry 1975, Stormer et al. 1979, Gladfelter et al. 1983). Information regarding unretrieved losses for muzzleloader hunting, however, is limited (Synatzske and Davis 1979). Objectives of this study were to estimate the number of unretrieved deer following an either-sex muzzleloader white-tailed deer hunt, to compare these results with hunter reported loss, and to compare the sex and age composition of harvested deer with that of unretrieved deer found during carcass searches.

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Service, Arkansas Game and Fish Commission, University of Arkansas at Monticello, and Mississippi State University. R. Mathews donated his time and aircraft for aerial carcass searches. Thanks are due Yazoo NWR for providing accommodations for ground crew personnel, conducting hunter interviews, and gathering harvest data.

Study Area and Methods

Yazoo NWR is located 48 km south of Greenville, Mississippi, and 8 km east of the Mississippi River in Washington County. Yazoo NWR is in the Mississippi Alluvial Valley. The refuge's 5,047 ha consist of 1,527 ha of cropland, 357 ha of grassfields, 285 ha of reforested farmland, 28 ha of moist soil management units, 2,259 ha of bottomland hardwoods, and 591 ha of permanent water. For the purpose of this study, the terms open habitat or open area include cropland, grassfields, reforested farmland, and moist soil management units. The NWR was described in detail by Strange et al. (1971). Yazoo NWR was the chosen study area because: (1) habitat conditions are conducive to air and ground carcass searches, (2) there is limited access to the refuge, and (3) all hunters are required to check in at refuge headquarters before and after hunting.

A 5-day muzzleloader, either-sex deer hunt was held at Yazoo NWR from 9–13 December 1986. One hundred participants were allowed to hunt each day but for 1 day only. Hunter limits were 1 deer of either-sex per person. All hunters were notified by mail that a search for unretrieved deer was to be conducted following the hunt, and that they would be required to report any deer fatally wounded and not retrieved. In addition, all hunters were briefed on these same points each morning before permits were issued. Participants were allowed to hunt the entire area with the exception of a 162-ha sanctuary. However, if a wounded animal had escaped into the sanctuary, hunters were allowed to pursue the deer if they notified a member of the refuge staff.

Following the hunt, air and ground crews conducted an extensive 2-day search for carcasses on 15–16 December 1986. As much open and timbered habitat as possible was systematically searched. An attempt was made to select areas on a random basis. Although sampling methods cannot be considered truly random, we feel with the large sample (48.4% of the refuge searched) results can be applied to the entire refuge. Only open habitat was searched by air. Aerial searches were flown at an altitude of 76 to 92 m above ground and at a speed of 150 to 160 km/hour using a fixed wing aircraft. The pilot assisting with this study had over 10 years experience in locating both live and dead deer from the air. Ground crews searched timbered areas, and to check the accuracy of aerial counts, some open habitat. Ground personnel walked parallel lines spaced at varying distances, depending on the thickness of cover, in order for observers to detect all dead deer. Spacing averaged about 10 m in fields and 20 m in forests. All ground crew members wore fluorescent orange to help keep lines straight and spacing constant. The possibility of carcasses being missed by the ground crew is slim.

Each carcass was sexed and classified as adult (≥1.5 years) or fawn (<1.5 years). Carcasses left from previous hunts were reported by hunters and examined by refuge personnel. The last deer hunt, prior to the muzzleloader hunt, ended 29 November 1986. Due to warm weather, muzzleloader cripples could be easily distinguished from those of other hunts by amount of carcass deterioration and size of the wound. The estimated number of unretrieved deer was calculated by dividing the number of deer located by the proportion of the refuge searched.

Results

A total of 2,443 ha was searched (48.4% of the refuge). Ground crews surveyed 432 ha of timbered habitat, and 2,011 ha of open habitat was surveyed by air. Ten percent of open habitat in the aerial survey (202 ha) was also covered by ground crews.

A total of 8 carcasses was found with evidence of wounds from muzzleloader firearms. Six carcasses were found during the aerial search. The ground search yielded 2 deer in the timbered habitat. Ground and air crews each found 2 carcasses in the 202-ha area searched by both methods. All 8 unretrieved deer found during the survey were adult does. Total harvest for the muzzleloader hunt was 69 deer, and harvest was composed of 25 adult males, 11 fawn males, 22 adult females, and 11 fawn females. The percentage of females found in the carcass search (100%) was greater than that in the harvest (48%), and 100% of located carcasses were adults as compared to 68% adults in the harvest.

The number of unretrieved deer for the 5-day hunt was estimated to be 16.5 (23.9% of the checked harvest). Sportsmen participating in the 5-day hunt reported wounding and losing 16 deer of unspecified sex and age (23.2% of the harvest). Both methods produced similar results.

Discussion

Crippling loss in this study is similar to hunter-reported losses from muzzleloaders in other studies. Hunters in Texas reported 21.3% of harvested deer as unretrieved during either-sex muzzleloader hunts on 2 management areas (Synatzske and Davis 1979). During 1976–80, 1982, and 1984, hunters from DeSoto NWR reported crippling losses from either-sex muzzleloaer hunting ranging from 14.5% to 38.3% of the legal harvest (G. Gage, pers. commun.). The 7-year total on DeSoto was 409 deer legally harvested and 95 deer unretrieved, or 23.2% of the harvest. Hardin and Roseberry (1975) reported a 20% loss resulting from either-sex hunting using shotguns with slugs and muzzleloading rifles on Crab Orchard NWR in Illinois.

Results of this study are also similar to studies where modern weapons were used (Robinette 1947, Downing 1971, Stormer et al. 1979). However, comparisons of results among such studies must be viewed with caution because many factors influence crippling loss estimates and results can vary greatly. Nettles et al. (1976)

reported that estimates of crippling loss from hunting with modern firearms varied from negligible to 175% of the legal harvest.

There is concern that muzzleloaders are not as efficient as modern weapons and that crippling losses are therefore much higher. The absence of exit wounds in all of the 8 dead deer found in this study could have adversely impacted the hunters' ability to track. Synatzske and David (1979) also found that the resultant wound from muzzleloader weapons was characterized by limited tissue damage and that success of muzzleloader hunters was half that of hunters using standard rifles. In their study, 350 muzzleloader hunters harvested 75 deer and reported losing 16 (21.3% of the harvest). During the same study, 593 hunters using standard rifles harvested 236 deer, and reported crippling and losing 19 deer or 8% of the total harvest.

The absence of adult bucks among located carcasses in this study suggests that intentional abandonment of does may have occurred. However, abandonment indicates hunters had a choice to tag or not to tag an animal. Fawns are much smaller than adult deer, thus providing more incentive for abandonment, and no fawns were found during the carcass search. A possible cause for the absence of adult bucks among carcasses found is that hunters may expend less effort retrieving an antlerless deer, or be less likely to claim an antlerless deer shot by another hunter (Robinette 1947).

The absence of fawns in the sample indicates that these animals were not lost at as high a rate as adult does. Stormer et al. (1979) suggested that hunters would recover a higher percentage of fawns than adults because unwary fawns present easier targets and are less likely than stronger adults to escape recovery when mortally wounded. Downing (1971) found, during a study conducted within a 302-ha enclosure, that hunters retrieved 93% of fawns that were killed.

Crippling loss based on hunter reports can be biased (Robinette 1947, Costley 1948, Hardin and Roseberry 1975). However, following a controlled hunt on Crab Orchard NWR, Roseberry et al. (1969) found crippling loss, based on carcass searches, was similar to hunter-reported losses (31.6% and 35%, respectively). Estimates of crippling loss from hunter reports were similar to those from the carcass search in this study. We feel preconditioning of hunters and a strictly controlled hunt may influence the accuracy of hunter reports.

Whitlock and Eberhardt (1956) suggested using aerial surveys to complement ground surveys. Helicopter surveys have also been used successfully to count deer in open habitat (Beasom 1979, Beasom et al. 1986). Air and ground crews found the same number of carcasses in open areas searched by both methods. Even though our sample of dead deer found by both methods is quite small, we feel that in open habitat aerial surveys will provide results similar to ground surveys.

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