Great Basin Naturalist 52(3), pp. 290–292

HYBRIDS OF WHITE-TAILED AND MULE DEER IN WESTERN WYOMING

Charles E. Kay[1,2] and Edward Boe[1,3]

Key words: white-tailed deer, mule deer, Odocoileus virginianus, Odocoileus hemionus, *interspecific hybridization, Wyoming.*

Though successful matings of captive mule deer (*Odocoileus hemionus*) and white-tailed deer (*O. virginianus*) have frequently been documented (Cowan 1962, Whitehead 1972, Day 1980, Wishart 1980), interspecific hybridization in most natural populations appears to be rare. Kramer (1973) reported only 10 hybrids out of over 17,000 deer killed in Nebraska, 2 out of 983 deer from Kansas, and only 6 out of several thousand observations in Alberta. In 34 years of fieldwork in Arizona, Knipe (1977) observed only 8 definite hybrids.

In recent years protein electrophoresis of serum albumin and restrictive endonuclease analysis of mitochondrial deoxyribonucleic acid have been used to characterize gene flow between mule and white-tailed deer populations (McClymont et al. 1982). Based on protein electrophoresis of 201 deer from 31 localities, mainly in the southwestern states, Derr (1991) found little evidence of nuclear gene introgression between the two deer species. Cronin et al. (1988) reported that mitochondrial DNA and serum albumin appeared to be distinct between mule deer and white-tailed deer throughout Montana, suggesting that interspecific gene flow was very low. This was in contrast to data from Texas that showed a 5.6% hybridization rate for 319 deer examined (Carr et al. 1986, Stubblefield et al. 1986) and Alberta where hybridization reportedly is increasing (Lingle 1989).

Though whitetail–mule deer hybrids have been observed in eastern Wyoming (Oceanak 1978), they have not been previously reported from western Wyoming. On several occasions during the winter and spring of 1990–91 we observed and photographed three female hybrid deer west of LaBarge, Wyoming, in the Green River Basin. The hybrids were always associated with female mule deer and fed with the mule deer in sagebrush (*Artemisa* spp.) habitats. The hybrids were often seen within a relatively short distance (0.5 km) of willow (*Salix* spp.) communities and hayfields along LaBarge Creek, but we never observed the hybrids keying on riparian areas, as whitetails commonly do in the arid West (Wood et al. 1989). Instead, the hybrids wintered in open sagebrush with the mule deer, where there was little hiding or thermal cover, even though temperatures of −45 C or lower are common in this part of Wyoming.

During the winter and early spring of 1991–92, we made additional observations and photographs of hybrid deer in the Green River Basin. On two separate occasions we saw a male hybrid 8 km south of Big Piney, Wyoming, in an alfalfa (*Medicago sativa*) field with approximately 100 mule deer of both sexes. We also made numerous observations of hybrids along the section of LaBarge Creek where we observed hybrids the previous year. But in 1991–92 we saw more hybrids including at least two males, four females, and three fawns. The three hybrid fawns appeared to follow a single mule deer doe and may have been triplets. These deer were usually observed with mule deer and occupied primarily nonriparian areas as the hybrids had the previous year.

Based on published characteristics and measurements (Cowan 1962, Oceanak 1978, Day 1980, Wishart 1980), the deer that we observed appeared to be first-generation hybrids. The length of the ridge on their metatarsal glands

[1] Department of Fisheries and Wildlife, Utah State University, Logan, Utah 84322.
[2] Present address: Institute of Political Economy, Utah State University, Logan, Utah 84322.
[3] Present address: Box 26, La Barge, Wyoming 83123.

was intermediate between typical whitetails and typical mule deer, and the color of the metatarsal tuft was primarily white. Their tails appeared to be slightly longer than normal whitetail tails and were brown merging to black on the dorsal side and pure white on the underside. When frightened, the hybrids used a bounding gait with or without tail-flagging typical of whitetails. As reported by Lingle (1989), the hybrids did not appear to stott but used locomotion patterns intermediate between mule and white-tailed deer. On all occasions female hybrids were dominated by female mule deer they associated with and were frequently displaced from feeding sites by mule deer.

Kramer (1973:298) postulated that hybridization between mule and white-tailed deer may be more frequent where whitetails occur in very small numbers. This may be true in western Wyoming. Prior to European settlement, whitetails were apparently distributed throughout Wyoming, but unrestricted year-long meat hunting eliminated them from most of western Wyoming by the turn of the century.

> Whitetails have been in the process of either reoccupying formerly occupied areas in western Wyoming or rebuilding severely depressed populations for at least 30 years (Harry Harju, Wyoming Game and Fish Department, personal communication, 1991).

Based on hunter surveys conducted through the mail or over the telephone by the Wyoming Game and Fish Department, 85 whitetails were killed in all of western Wyoming in 1974, while 159 were killed in 1989 (Harju 1991, personal communication). Since few of these deer were checked by trained observers, there is no way of knowing how many deer reported by hunters as whitetails were actually hybrids.

In contrast, the Wyoming Range mule deer herd that winters between Big Piney and Fontenelle Reservoir, including LaBarge Creek, numbered approximately 20,000 animals after the severe winter of 1983–84. Since then, a series of seven mild winters coupled with limited doe harvest allowed this herd to increase to 55,000 in 1990 (Harju 1991, personal communication). In five years of observation we saw over 40,000 deer in the Big Piney–LaBarge Creek area, and all but a few were mule deer. One was a typical male whitetail, and the others were the hybrids described above.

Though most of these mule deer summer in the Wyoming and Salt River mountain ranges 60–100 km to the west, some reside year-long in riparian areas on LaBarge Creek and the Green River. Moreover, by the November breeding season thousands of migrating mule deer have already returned to their lower-elevation wintering areas and then commonly cross the Green River to winter in the breaks to the east. So large numbers of mule deer occupy typical whitetail riparian habitats during the rut. With the marked difference in their respective populations, it may be difficult for white-tailed deer to find appropriate mates during the breeding season. This may lead to a high hybridization rate relative to the whitetail population as appears to be the case in western Washington, where a remnant population of Columbian white-tailed deer (*O. v. leucurus*) is surrounded by a much larger population of black-tailed deer (*O. h. columbianus*) and where 18% of the whitetails tested possessed blacktail alleles at two of three diagnostic loci (Gavin and May 1988).

ACKNOWLEDGMENTS

We thank V. Geist and an anonymous reviewer for helpful comments.

LITERATURE CITED

CARR, S. M., S. W. BALLINGER, J. N. DERR, L. H. BLANKENSHIP, and J. W. BICKHAM. 1986. Mitochondrial DNA analysis of hybridization between sympatric white-tailed deer and mule deer in west Texas. Proceedings of the National Academy of Science 83: 9576–9580.

CRONIN, M. A., E. R. VYSE, and D. G. CAMERON. 1988. Genetic relationships between mule deer and white-tailed deer in Montana. Journal of Wildlife Management 52: 320–328.

COWAN, I. MCT. 1962. Hybridization between the black-tail deer and the white-tail deer. Journal of Mammalogy 43: 539–541.

DAY, G. I. 1980. Characteristics and measurements of captive hybrid deer in Arizona. Southwesten Naturalist 25: 434–438.

DERR, J. N. 1991. Genetic interactions between white-tailed and mule deer in the southwestern United States. Journal of Wildlife Management 55: 225–237.

GAVIN, T. A., and B. MAY. 1988. Taxonomic status and genetic purity of Columbian white-tailed deer, an endangered subspecies. Journal of Wildlife Management 52: 1–10.

KNIPE, T. 1977. The Arizona whitetail deer. Arizona Game and Fish Department Special Report 6. 108 pp.

KRAMER, A. 1973. Interspecific behavior and dispersion of two sympatric deer species. Journal of Wildlife Management 37: 288–300.

LINGLE, S. 1989. Limb coordination and body configuration in the fast gaits of white-tailed deer, mule deer and