



Yearlong movements and habitat use of mule deer associated with the Willow Creek winter range in southeastern Idaho
by Terry Ross Thomas

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Fish and Wildlife Management
Montana State University
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Abstract:

A study was conducted from May 1984 to November 1986 using radio telemetry to determine the yearlong distribution, movements, migration patterns and habitat use of Rocky Mountain Mule Deer (*Odocoileus hemionus hemionus*) wintering in the Willow Creek drainage of Eastern Idaho. Deer summered 15-115 kilometers (km) from winter ranges with 63 percent summering in excess of 40 km from their winter home ranges. Mean minimum home range size for females was 5.3 square kilometers (km²). Males had significantly larger home ranges than females and females in the eastern half of the study area had significantly larger home ranges than those in the western half. Fidelity to seasonal home ranges was high during the study with only 1 male changing summer home ranges and 1 male and 1 female changing winter ranges. With few exceptions, deer were on summer ranges at the beginning of hunting season. Distance between summer and hunting season geographic activity centers averaged 1.2 km. Livestock operations appeared to cause shifts in habitat use but a single instance of logging on a home range did not. Migration was generally direct and followed bold topographic features oriented toward the alternate seasonal ranges. Deer used the same migration corridors and transition ranges in spring and fall. Deer preferred closed canopy cover types on summer ranges, open canopy cover types during migration, closed canopy cover types early winter and grain fields in late winter. One winter-summer population unit was identified. There was little mixing of deer from different winter range subunits and female home range size for the winter of 1985-86 averaged 1.8 km². Helicopter disturbance during trend counts was shown to not cause shifts in distribution but some apparent shifting occurred in relation to crop rotation patterns. Trend counts indicated a stable population on the winter range 1984-86. Male:female:fawn ratios for early winter 1985-86 were 29:100:89. There was no significant difference between percent fawns in early and late winter (43 and 42 percent, respectively). Discrepancies between trend count indices and population characteristics are discussed.

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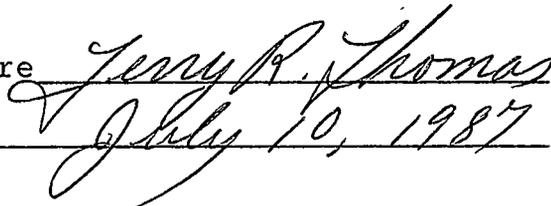
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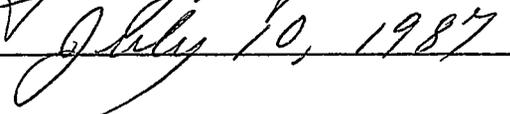
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ABSTRACT

A study was conducted from May 1984 to November 1986 using radio telemetry to determine the yearlong distribution, movements, migration patterns and habitat use of Rocky Mountain Mule Deer (Odocoileus hemionus hemionus) wintering in the Willow Creek drainage of Eastern Idaho. Deer summered 15-115 kilometers (km) from winter ranges with 63 percent summering in excess of 40 km from their winter home ranges. Mean minimum home range size for females was 5.3 square kilometers (km²). Males had significantly larger home ranges than females and females in the eastern half of the study area had significantly larger home ranges than those in the western half. Fidelity to seasonal home ranges was high during the study with only 1 male changing summer home ranges and 1 male and 1 female changing winter ranges. With few exceptions, deer were on summer ranges at the beginning of hunting season. Distance between summer and hunting season geographic activity centers averaged 1.2 km. Livestock operations appeared to cause shifts in habitat use but a single instance of logging on a home range did not. Migration was generally direct and followed bold topographic features oriented toward the alternate seasonal ranges. Deer used the same migration corridors and transition ranges in spring and fall. Deer preferred closed canopy cover types on summer ranges, open canopy cover types during migration, closed canopy cover types early winter and grain fields in late winter. One winter-summer population unit was identified. There was little mixing of deer from different winter range subunits and female home range size for the winter of 1985-86 averaged 1.8 km². Helicopter disturbance during trend counts was shown to not cause shifts in distribution but some apparent shifting occurred in relation to crop rotation patterns. Trend counts indicated a stable population on the winter range 1984-86. Male:female:fawn ratios for early winter 1985-86 were 29:100:89. There was no significant difference between percent fawns in early and late winter (43 and 42 percent, respectively). Discrepancies between trend count indices and population characteristics are discussed.

INTRODUCTION

Long distance migration by Rocky Mountain mule deer (Odocoileus hemionus hemionus) between seasonal ranges can create management problems for the responsible agencies. Groups of deer with markedly different age and sex structures, movement patterns, and vulnerability to harvest may winter on a common ground. Overharvest or underharvest of specific segments may not be detected when deer hunted under varying administrative regulations and philosophies winter together. Kasworm (1981) and Ishle (1982) found that long distance migrating populations of mule deer were subjected to prolonged hunting seasons. Deer were hunted on summer ranges in early fall and on transition ranges later when they crossed an administrative boundary. Ishle (1982) concluded that recovery from overharvest could be slow because long distances and behavioral constraints would limit recolonization rates. Bertram and Rempel (1977) reported increased harvest when deer concentrated on transition ranges easily accessible to hunters.

The first step in determining the extent of this problem involves identification of migration routes,

seasonal ranges and timing of movements between seasonal ranges. Mackie et al. (1980) indicated that this knowledge is crucial in establishing seasons and harvest quotas.

In the Willow Creek drainage (Bonneville County) of southeastern Idaho, preliminary data (Trent, personal communication [pers. comm.]) indicated that some deer migrated long distances to the winter range. The current study (1984-86) was initiated to determine the yearlong distribution of deer using the Willow Creek winter range and to identify factors that might influence population characteristics and harvest/management practices.

Specific objectives were:

1. Determine summer distribution of marked animals
2. Determine hunting season distribution
3. Identify migration corridors
4. Identify discrete winter range
subpopulations and population characteristics
5. Determine habitat use during winter, migration
and hunting seasons.

Supplementary data were gathered on deer from the adjacent Wolverine Winter Range as they were suspected of sharing a common summer range with Willow Creek deer.

STUDY AREA

The principal Willow Creek Winter Range (WCWR) (Figure 1) extends 23 kilometers (km) from Kepps Crossing north to Ririe Dam. Willow Creek is a deep canyon complex 44 km long with 71 km of tributary canyons. Wintering areas currently of minor importance extend 11 km south. Ririe Reservoir occupies 20 kilometers of canyon bottoms in the northern portion of the winter range. Elevations on WCWR vary from 1550 meters (m) to 1950 m.

Climate is cold and dry (Appendix Table 21). The 25-year mean annual precipitation is 42.6 centimeters (cm) and the 25-year mean annual temperature is 5.1 degrees Centigrade (C). The winters of 1983-84, 1984-85 and 1985-86 were severe, average, and mild, respectively (Figure 2).

Plateaus above the canyons were intensively cultivated to winter wheat (Triticum aestivum). Eight hundred hectares (ha) of agricultural fields have been returned to permanent perennial forb cover in the past 10 years on winter and transition ranges. Native vegetation on WCWR was dominated by stands of sagebrush/grassland (Artemesia tridentata and A. tripartita and Agropyron

