



Distribution of white-tailed deer along the lower Yellowstone River  
by Bradley Byford Compton

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 to evaluate factors influencing distribution of white-tailed deer (*Odocoileus virginianus*) along the lower Yellowstone River in eastern Montana during summer 1984, and winter-summer-fall 1985. Relationships between riparian vegetation, cattle grazing, and other land use practices and distribution and habitat use of deer were determined using radio telemetry, spotlighting, and aerial distribution surveys. The influence of cattle grazing on native vegetation within mature cottonwood, green ash, and shrub cover types was evaluated using percentage canopy coverage estimates and vegetational profiles. The amount of riparian cover (forest + shrub) was the most important factor influencing deer distribution along the study area. Deer preferred cover types dominated by woody riparian vegetation during the day and agricultural fields during the night. Alfalfa was the primary crop used in summer. Deer shifted from alfalfa to grain and sugar beet fields during fall. Deer used fields with residual crop material available during winter. Distribution and availability of crop types, season, and cropping practices were factors influencing use and selection of agricultural types. Deer avoided ( $P < .05$ ) areas with cattle. Cattle grazing generally decreased shrub cover and increased grass cover within sampled types. During hunting seasons deer increased movements and used islands and uplands more than other seasons.

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APPROVAL

of a thesis submitted by

Bradley Byford Compton

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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## ABSTRACT

A study was conducted to evaluate factors influencing distribution of white-tailed deer (Odocoileus virginianus) along the lower Yellowstone River in eastern Montana during summer 1984, and winter-summer-fall 1985. Relationships between riparian vegetation, cattle grazing, and other land use practices and distribution and habitat use of deer were determined using radio telemetry, spotlighting, and aerial distribution surveys. The influence of cattle grazing on native vegetation within mature cottonwood, green ash, and shrub cover types was evaluated using percentage canopy coverage estimates and vegetational profiles. The amount of riparian cover (forest + shrub) was the most important factor influencing deer distribution along the study area. Deer preferred cover types dominated by woody riparian vegetation during the day and agricultural fields during the night. Alfalfa was the primary crop used in summer. Deer shifted from alfalfa to grain and sugar beet fields during fall. Deer used fields with residual crop material available during winter. Distribution and availability of crop types, season, and cropping practices were factors influencing use and selection of agricultural types. Deer avoided ( $P < .05$ ) areas with cattle. Cattle grazing generally decreased shrub cover and increased grass cover within sampled types. During hunting seasons deer increased movements and used islands and uplands more than other seasons.

## INTRODUCTION

Riparian areas provide the primary habitat for white-tailed deer in eastern Montana (Allen 1968, Swenson et al. 1983, and Herriges 1986). Many riparian habitats, especially bottomlands associated with large rivers are privately owned and used for production of agricultural crops and livestock. Only limited data are available on relationships between land use and management practices and white-tailed deer ecology and distribution in those habitats.

In 1980, the Montana Department of Fish, Wildlife, and Parks initiated studies to evaluate population ecology and habitat relationships of white-tailed deer along the intensively farmed lower Yellowstone River. These included detailed investigations of population characteristics and dynamics (Dusek 1985) and habitat use relationships (Herriges 1986).

My study was initiated in July 1984 to provide additional data on habitat relationships. Specific objectives were: 1) to determine distribution and habitat use of white-tailed deer in relation to riparian vegetation and land uses along the lower Yellowstone River, and 2) to evaluate possible specific influences of livestock grazing

and other land use practices on distribution, habitat use, and abundance of deer in river bottom habitat. Field studies were conducted primarily during July-September 1984, January-March 1985, and July-December 1985.

## DESCRIPTION OF STUDY AREA

The study area, encompassing 118.9 km<sup>2</sup> of floodplain and islands, extended approximately 50 km along the Yellowstone River between Glendive and the Elk Island Wildlife Management and Recreation Area (EIWMA) near Savage (Fig. 1). Three intensive study units, selected as representative of major land uses within the total area, were located near Glendive, at the mouth of Burns Creek, and in the vicinity of the EIWMA.

Physical and/or biotic characteristics of the river valley within the total study area have been described in various detail by Holder and Pescador (1976), Swenson (1978), Pescador and Brockman (1980), Dusek (1981), Boggs (1984), and HERRIGES (1986). In summary, the Yellowstone River flows north-easterly through a 1-5 km wide alluvial floodplain at elevations ranging from 625 m at Glendive to 574 m on the EIWMA. The floodplain is bounded by terraces, steep "breaks", and rolling uplands interspersed by numerous draws and several tributary drainages emptying into the river from the northwest and southeast. Soils of the floodplain are deep fine sandy loams and silt loams underlain by stratified fine sand loam to silty clay alluvium (Holder and Pescador 1976).

































































































































































