

THESIS

RELATIONSHIP OF PREDATION AND LAND USE PRACTICES
TO DUCK NESTING ACTIVITIES ON
VALENTINE NATIONAL WILDLIFE REFUGE, NEBRASKA

Submitted by

Wilbur N. Ladd, Jr.

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WE HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER OUR SUPERVISION BY Wilbur N. Ladd, Jr. ENTITLED Relationship of Predation and Land Use Practices to Duck Nesting Activities on Valentine National Wildlife Refuge, Nebraska BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE OF Master of Science.

Committee on Graduate Work

Richard W. Hopper

Meredith J. Mann

A. C. Everson

Ronald A. Kyder

Adviser

J. C. Swanson

Head of Department

Examination Satisfactory

Committee on Final Examination

Meredith J. Mann

A. C. Everson

Ronald A. Kyder

Richard W. Hopper

Ronald A. Kyder

Adviser

Permission to publish this thesis or any part of it must be obtained from the Dean of the Graduate School

CHAPTER I

INTRODUCTION

Land use programs on National Wildlife Refuges have been a point of dissension since the beginning of the system in 1903 and continue to be an unresolved matter. Although the economic or recreational program imposed on any refuge must be compatible with its stipulated objectives, receipts accruing to the government for grazing and haying permits alone on wildlife refuges total nearly \$850,000 a year (U. S. Bureau of Sport Fisheries and Wildlife 1968).

Since National Wildlife Refuges and other public land in the United States produce less than 2% of the ducks which are annually added to the North American duck population, and duck production habitat is under stress from conflicting interests, the potential of the remaining habitat must be determined and realized (Hochbaum and Bossenmaier 1965). Leedy et al. (1964) suggested a prime objective of waterfowl production refuges should be to double or triple their current output. As habitat shrinks, under the guise of "progress", the remaining area must produce more ducks.

The Advisory Committee on Wildlife Management appointed by the recent Secretary of the Interior Stewart Udall viewed refuges as a piece of "natural landscape" where the full spectrum of native

wildlife and plants may be seen in a natural setting (Leopold et al. 1968). The committee stated the goal of the Bureau of Sport Fisheries and Wildlife was to maintain a continental waterfowl population between the 1956 and 1962 levels, which included years of both high and low populations, averaging 150 million ducks. Hammond (1966a) implied that most refuge grazing programs are in need of re-evaluation if these goals and objectives are to be met.

With these stated objectives in mind, some skepticism has been advanced toward the large grazing and haying program on the Valentine National Wildlife Refuge, since the refuge's primary objective has been duck production. Many studies to determine the effects of land use upon duck nesting have been conducted on refuges and conflicting results have been reported. However, each geographical region has unique factors which may influence predation and duck nesting within various land use types.

This study at Valentine was undertaken during the duck breeding seasons of 1967 and 1968 to begin the determination of the optimum duck nesting cover for the Sandhills region of Nebraska, an area of considerable importance to duck production. The study was the first of three proposed two-year phases of the investigation and was intended to be a census to determine relative predator activity, duck breeding pair use, and duck nesting densities within major land use types and range sites on the refuge. The study was constructed to

collect data to be used for designing more sophisticated experiments in future phases of the investigation.

Objectives of the present study were: (1) to determine relative predator activity by use of simulated nests in four major land use types: (a) non-use, (b) fall-winter grazed, (c) summer grazed, and (d) hayed; and major range sites: (a) wetland, (b) subirrigated, (c) sands, and (d) choppy sands; (2) to measure duck breeding pair use associated with the land use types, especially shoreline use; (3) to estimate natural duck nest densities from a restricted random sample in the four major land use types and range sites; and (4) to describe the range site, degree of use, and vegetation at duck nest sites within each land use type.

NEST SURVIVAL RATES

VALENTINE NATIONAL WILDLIFE REFUGE 1967, 1968

1967

<u>Non-use</u>	<u>Mowed Meadow</u>	<u>Summer Grazed</u>	<u>Winter Grazed</u>
<u>33.1%</u>	<u>53.0%</u>	<u>55.8%</u>	<u>59.6%</u>

1968

<u>Non-use</u>	<u>Mowed Meadow</u>	<u>Summer Grazed</u>	<u>Winter Grazed</u>
<u>42.1%</u>	<u>43.1%</u>	<u>40.4%</u>	<u>54.9%</u>

SHORELINE USE 1967, 1968
VALENTINE NATIONAL WILDLIFE REFUGE

Number of duck pairs per mile on
seven Valentine Refuge Lakes.

	1967	1968
Use _____	24.2	36.0
Non-use _____	17.3	19.2

NEST DENSITIES
VALENTINE NATIONAL WILDLIFE REFUGE

<u>Nests per 100 acres</u>	<u>1967</u>	<u>1968</u>
Non-use _____	0.9	18.2
Fall/Winter Grazed _____	7.2	33.3
Summer Grazed _____	5.2	21.7
Mowed _____	7.2	21.3