Reintroduction of greater prairie chickens using egg substitution on Arrowwood National Wildlife Refuge, North Dakota

by Howard Raymond Burt

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

Abstract:
Reintroduction of greater prairie chickens (Tympanuchus cupido pinnatus) to Arrowwood National Wildlife Refuge, North Dakota, was attempted in the spring and summer of 1988 and 1989. The method entailed substituting prairie chicken eggs into sharp-tailed grouse (Tympanuchus phansianellis Jamesi) nests. Thirty-five sharp-tailed grouse hens were captured on dancing grounds or nests and instrumented with radio transmitters. Thirty-five sharptail nests were located by telemetry or cable-chain drag. Most (54%) nests were located in vegetation containing a combination of brush and grass. Success of all nesting sharptail hens was low (48%), with predators destroying 37% of the nests. Twenty-six sharptailed grouse and 1 ring-necked pheasant (Phasianus colchi-cus) nests were provided with 523 prairie chicken eggs. Fifteen nests were provided with unincubated prairie chicken eggs and 12 were provided with prairie chicken eggs incubated at least 20 days. Nests provided with unincubated prairie chicken eggs had a lower (33%) nest success than nests provided with incubated eggs (92%). Hatchability of unincubated prairie chicken eggs (43%) was significantly lower than for incubated eggs (79%). Only 2% of 102 prairie chicken chicks that left the nest with radioed sharptail hens survived until the end of the field seasons. Sharp-tailed grouse with prairie chicken broods were located most often (61%) in vegetation types with a combination of brush and grass, and appeared to select brood habitat which may have been less than optimum for prairie chicken chicks. Only 2 prairie chicken cocks were observed on the study area in 1990. Weather, predation, and lack of optimum prairie chicken habitat may have caused the apparent failure of this reintroduction effort.

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APPROVAL

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Howard Raymond Burt

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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TABLE OF CONTENTS

TABLE OF CONTENTS--Continued

LIST OF TABLES

LIST OF TABLES--Continued

LIST OF TABLES--Continued

LIST OF FIGURES

ABSTRACT

Reintroduction of greater prairie chickens (*Tympanuchus cupido pinnatus*) to Arrowwood National Wildlife Refuge, North Dakota, was attempted in the spring and summer of 1988 and 1989. The method entailed substituting prairie chicken eggs into sharp-tailed grouse (*Tympanuchus phansianellis jamesi*) nests. Thirty-five sharp-tailed grouse hens were captured on dancing grounds or nests and instrumented with radio transmitters. Thirty-five sharptail nests were located by telemetry or cable-chain drag. Most (54%) nests were located in vegetation containing a combination of brush and grass. Success of all nesting sharptail hens was low (48%), with predators destroying 37% of the nests. Twenty-six sharp-tailed grouse and 1 ring-necked pheasant (*Phasianus colchicus*) nests were provided with 523 prairie chicken eggs. Fifteen nests were provided with unincubated prairie chicken eggs and 12 were provided with prairie chicken eggs incubated at least 20 days. Nests provided with unincubated prairie chicken eggs had a lower (33%) nest success than nests provided with incubated eggs (92%). Hatchability of unincubated prairie chicken eggs (43%) was significantly lower than for incubated eggs (79%). Only 2% of 102 prairie chicken chicks that left the nest with radioed sharptail hens survived until the end of the field seasons. Sharp-tailed grouse with prairie chicken broods were located most often (61%) in vegetation types with a combination of brush and grass, and appeared to select brood habitat which may have been less than optimum for prairie chicken chicks. Only 2 prairie chicken cocks were observed on the study area in 1990. Weather, predation, and lack of optimum prairie chicken habitat may have caused the apparent failure of this reintroduction effort.

INTRODUCTION

The original distribution of the greater prairie chicken (Tympanuchus cupido) included much of the eastern Great Plains from approximately the 100th meridan eastward to Kentucky, Ohio, and Tennessee, and northward to Michigan, Minnesota, and South Dakota (Johnsgard 1983). As a result of white settlement and patch farming, the species' range was extended north and west into northern Michigan and southern Ontario, northern Wisconsin, most of Minnesota, Manitoba, Saskatchewan, Alberta, North Dakota, Kansas, and eastern Montana, Wyoming and Colorado. The combination of undisturbed native prairie nesting areas and availability of winter food in farmed areas led to peak numbers of greater prairie chickens in the early 1900's (Evans 1968).

These peak numbers began to decline in the 1930's as native prairie was converted to cropland, agricultural practices became more intensive, and overgrazing and annual haying became more prevelant. Since then the greater prairie chicken has been virtually extirpated from its Canadian range (Hammerstrom and Hammerstrom 1961), and in the United States has had its range and numbers drastically reduced (Fig. 1.).