



Nest site selection by bald eagles in Montana
by Kent Charles Jensen

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:

To maintain growth and stability in nesting populations of bald eagles (*Haliaeetus leucocephalus*) in Montana it is necessary to ensure the continued availability of suitable nesting habitat. The objectives of this study were threefold: first, to provide detailed information of nest site vegetative and structural characteristics, secondly, to determine prey use and human activity factors relative to habitat use by bald eagles, and third, to develop basic recommendations for nest site management. This study was conducted during the summers of 1985 and 1986. Nest sites were studied in four areas of Montana. A total of 35 variables was measured and recorded at each nest site and the same variables were collected at selected non-use points for statistical comparison. Prey remains were collected from around nest trees to determine prey use. Bald eagles nested in seven different tree species of which the major nest tree species varied between population units. Average nest tree, nest, and nest stand heights were 30.4, 22.8, and 20.2 m respectively. There was no difference ($P > 0.05$) in height, nest height, or nest stand height among the different nest tree species. Used nest trees were significantly ($P < 0.05$) taller than non-use nest trees. Bald eagles tended to select nest sites away from areas of heavy human recreational use and busy roadways. Agricultural activities did not appear to affect use of an area by nesting eagles. Discriminant function analysis selected nest tree diameter at breast height (DBH), nest tree height, canopy closure of the nest stand, human recreational activity, and nest tree decadence as the 5 variables that most separated used from non-used sites. Prey use by bald eagles varied among population units and appeared to be governed by the type of water body the eagles were nesting near. A major factor in bald eagle nest site selection appears to be the structure of the nest tree in combination with an open stand in an area of relatively little human recreational disturbance. Management practices should encourage production of future nest trees, reduced and low levels of human activity and maintenance of present or higher levels of prey populations. Potential bald eagle nest sites should be evaluated according to the variables selected by discriminant function analysis as being the most predictive of use by nesting eagles.

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ABSTRACT

To maintain growth and stability in nesting populations of bald eagles (Haliaeetus leucocephalus) in Montana it is necessary to ensure the continued availability of suitable nesting habitat. The objectives of this study were threefold: first, to provide detailed information of nest site vegetative and structural characteristics, secondly, to determine prey use and human activity factors relative to habitat use by bald eagles, and third, to develop basic recommendations for nest site management. This study was conducted during the summers of 1985 and 1986. Nest sites were studied in four areas of Montana. A total of 35 variables was measured and recorded at each nest site and the same variables were collected at selected non-use points for statistical comparison. Prey remains were collected from around nest trees to determine prey use. Bald eagles nested in seven different tree species of which the major nest tree species varied between population units. Average nest tree, nest, and nest stand heights were 30.4, 22.8, and 20.2 m respectively. There was no difference ($P > 0.05$) in height, nest height, or nest stand height among the different nest tree species. Used nest trees were significantly ($P < 0.05$) taller than non-use nest trees. Bald eagles tended to select nest sites away from areas of heavy human recreational use and busy roadways. Agricultural activities did not appear to affect use of an area by nesting eagles. Discriminant function analysis selected nest tree diameter at breast height (DBH), nest tree height, canopy closure of the nest stand, human recreational activity, and nest tree decadence as the 5 variables that most separated used from non-used sites. Prey use by bald eagles varied among population units and appeared to be governed by the type of water body the eagles were nesting near. A major factor in bald eagle nest site selection appears to be the structure of the nest tree in combination with an open stand in an area of relatively little human recreational disturbance. Management practices should encourage production of future nest trees, reduced and low levels of human activity and maintenance of present or higher levels of prey populations. Potential bald eagle nest sites should be evaluated according to the variables selected by discriminant function analysis as being the most predictive of use by nesting eagles.

INTRODUCTION

The bald eagle (Haliaeetus leucocephalus) was classified as an endangered species in Montana on 14 Feb. 1978, when only 12 occupied nesting territories were known to exist. Increased survey emphasis and a real increase in population has resulted in a much larger number of occupied bald eagle nesting territories. There are currently 54 known occupied nesting territories in Montana. Even though the bald eagle population has been increasing in recent years, the carrying capacity may be decreasing due to a long term trend of habitat alteration and degradation. This trend will probably continue, consequently reducing the availability of suitable nesting habitat for bald eagles in Montana.

This study was initiated in the summer of 1985 with the purpose of evaluating nest site characteristics of bald eagles in Montana. Objectives were:

1. To provide a detailed analysis of onsite vegetative and structural features of nest trees and nest stands used by bald eagles.
2. Determine prey use and human activity factors relative to habitat use by bald eagles.
3. Develop nest site management recommendations.

Results combined with macrohabitat data

currently being compiled and analyzed by the U.S. Forest Service will provide a habitat suitability/potential index for the identification of potential bald eagle nesting habitat, and management prescriptions for existing sites.

DESCRIPTION OF STUDY AREAS

Locations of bald eagle nesting territories were plotted on a 1:1,000,000 scale map of Montana to determine nest distribution (Fig. 1). Nest site locations were obtained from the Montana Department of Fish, Wildlife, and Parks (Dennis Flath pers. comm.). Four areas of nesting concentration immediately became apparent: (1) the Northwest Population (NWP), (2) the West-Central Population (WCP), (3) the Greater Yellowstone Ecosystem Population (GYEP), and (4) the Eastern Prairie Population (EPP). These 4 areas were categorized on a hydrologic and physiographic basis.

Northwest Montana

The NWP includes the Flathead, Kootenai, and lower Clark Fork River (upstream to Fish Creek and Ninemile Valley) drainages. The region is bounded on the east by the Continental Divide, on the north by the Canadian border, on the west by Idaho, and on the south by the crest of the Bitterroot Mountains. The southeastern border of the region is marked by the Rattlesnake Creek and Blackfoot River divides.

