ARTIFICIAL NEST STRUCTURES AND GRASSLAND RAPTORS

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Abstract

During a four-year study at the Birds of Prey National Conservation Area in Idaho, nest structures were placed in three different habitat types. Two species, the Ferruginous Hawk (*Buteo regalis*) and the Raven (*Corvus corax*), successfully nested on these structures. Ferruginous Hawks utilized sites where no raptor nests had previously been found. Component factors are discussed that may affect the selection of artificial nest by raptors. Applications are presented in which artificial nest structures may serve to mitigate loss of natural nest sites and associated habitat.

Introduction

Interest in the role of artificial nest platforms as an enhancement technique has encouraged many investigators to place them in a variety of habitats. Postupalsky and Stackpole (1974) and Reese (1970) have demonstrated the effectiveness of these structures for Osprey (*Pandion haliaetus*). Dunstan and Borth (1970) found that a pair of Bald Eagle (*Haliaeetus leucocephalus*) would accept a reconstructed nest. Fyfe and Armbruster (1977) pioneered the improvement of potholes for the Prairie Falcon (*Falco mexicanus*) and the use of basket structures for grassland raptors. Bohm (1977) erected a number of nest platforms in Minnesota to encourage nesting of the Great Horned Owl (*Bubo virginianus*) and Red-tailed Hawk (*Buteo jamaicensis*). Anderson and Follett (1978) reversed a downward trend of available nest sites and productive Ferruginous Hawk (*Buteo regalis*) pairs on the Pawnee National Grassland by providing new supporting structures.

The impetus for the present project was suggested by Olendorff and Stoddart (1974) and was motivated by projected habitat loss due to agricultural conversion and energy development on rangelands in the west.

Methods

In 1975, a survey was conducted to determine the presence of nesting raptors in three selected habitat types within and near the proposed Birds of Prey National Conservation Area (BPNCA). An assessment was made of the available prey base in these habitat types utilizing data generated by studies at BPNCA. By 1976, a plan was implemented

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whereby nesting structures designed to attract Ferruginous Hawks were built in and adjacent to the BPNCA (see figures 1 and 2). The plan called for placement of a total of 24 nesting structures in these three habitat types. Two structures in close proximity (150 meters), one with a shade cover and one without, were placed at each of twelve selected sites.

The experiment was designed to test the hypothesis that: (1) Ferruginous Hawks can be attracted to nest on artificial platforms; (2) platforms will attract breeding pairs to nest in an area where none were previously known; (3) higher productivity will result from structures that are shaded than from those that are unshaded.

The three habitat types selected for the nest sites are typical of western Idaho Great Basin vegetation. They include native shadscale/winterfat (*Atriplex confertifolia/Cerratoides lanta*), sagebrush/bluegrass (*Artemisia tridentata/Poa sandbergii*), and forbs/grass (Pure forbs or 1–20% blue grass or cheat grass (*Bromus tectorum*). Four nest sites, a total of eight nest structures, were placed in each habitat type.

The structures were surveyed twice each spring—once in March, to check for occupation and to repair any damage sustained during the winter, and again in June, to count and band young.

Results

Our results show that raptor nest platforms provide a feasible technique for increasing the local nesting population within certain limits. Our first hypothesis, i.e., Ferruginous Hawks can be attracted to nest on artificial platforms, was demonstrated one year after placement of structures (see table 1).

Table 1. Ferruginous Hawk Nesting Success, 1976–1979

Year	No. of occupied nests	No. of successful nests	No. of young fledged	$\bar{X}$. No. of young fledged/ occupied nests
1976	0	0	0	0
1977	1	1	2	2
1978	3	2	5	1.6
1979	3	2	5	1.6
TOTAL	7	5	12	1.7

The pair that nested in 1977 also confirmed our second hypothesis, i.e., platforms will attract breeding pairs to nest in the area where none were previously known. The forbs/grass habitat type was the area where all pairs except one nested. This habitat type supports a substantial population of rodents (138/hectare) and Townsend Ground Squirrels (*Spermophilus townsendi*) (14/hectare) (DOI Report 1979). The third hypothesis was not confirmed, i.e., higher productivity will result from structures that are shaded than from those that are unshaded. No pairs of Ferruginous Hawks nested on shaded structures. In 1979, we moved a shading device to the nearby unshaded nest

platform, which had been occupied by a successful pair for two years. When the birds returned in 1979, they utilized the platform from which the shading device had been removed.

Ravens were very successful in pioneering the use of the platforms in 1976 but declined thereafter (table 2). They nested within the shadscale/winterfat and sagebrush/bluegrass habitat types but did not nest in the forbs/grass type where the Ferruginous Hawks nested.

Table 2. Raven Nesting Success, 1976-1979

Year	No. of occupied nests	No. of successful nests	No. of young fledged	$\bar{X}$. No. of young fledged/ occupied nests
1976	4	4	13	3.2
1977	2	1	4	2
1978	3	2	9	3
1979	1	1	3	3
TOTAL	10	8	29	2.8

Somewhat to our surprise, ravens used the shaded structures quite readily. They fledged 29 young during the four-year study, of which 23 were from nest structures with shade covers. One can only conclude that we now have a marvelous technique for raven management.

Discussion

As more human demands are placed on areas where Ferruginous Hawks and other raptors exist, it may become crucial to find other areas where they might exist but can't because of a missing requirement. We have demonstrated the application of nest structures as a technique to expand the breeding population of a species within a local area. Utility companies are beginning to cooperate in accepting the use of similar platforms on steel towers (Nelson and Nelson 1977).

Requirements to implement a basic raptor management program of this type are few. The following information should first be secured: (a) population history of target species and its competitors; (b) evaluation of feasibility and methods; (c) habitat and nesting requirements of the species; (d) whether the prey base will support additional populations of raptors; (e) determination that the introduction of nest structures will not displace or affect threatened and endangered species.

Acknowledgments

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Literature Cited

Anderson, W. C., and T. M. Follett. 1978. Nest-site management techniques for increasing productivity of grassland raptors. Abstract proceedings of the 1978 annual Raptor Research Foundation Inc. Conference, Allentown, Penn.

Bohm, R. T. 1977. Artificial nest platforms for raptors. *Raptor Research* 11(4):97–99.

Dunstan, T. C., and Borth, M. 1970. Successful reconstruction of active Bald Eagle nest. *Wilson Bull.* 82:326–327.

Fyfe, R. W., and H. I. Armbruster. 1977. Raptor management in Canada. Pages 282–293 in R. D. Chancellor, ed., World Conference on Birds of Prey, Vienna, 1975, ICBP.

Nelson, M. W. and P. Nelson. 1977. Power lines and birds of prey. Pages 228–242 in R. D. Chancellor, ed., World Conference on Birds of Prey, Vienna, 1975, ICBP.

Olendorff, R. R., and J. W. Stoddart. 1974. The potential for management of raptor populations in western grasslands. Pages 47–88 in F. N. Hamerstrom et al., eds., *Management of Raptors,* Raptor Research Report No. 2, Ft. Collins, CO, 1973.

Postupalsky, S., and S. M. Stackpole. 1974. Artificial nesting platforms for Osprey in Michigan. Pages 105–117 in F. N. Hamerstrom et al. eds., *Management of Raptors,* Raptor Research Report No. 2, Ft. Collins, CO, 1973.

Reese, J. G. 1970. Reproduction in a Chesapeake Bay Osprey population. *Auk* 87(4):747–759.

U.S. Department of Interior. 1979. Snake River birds of prey special research report. Prepared by Bureau of Land Management, Boise District 142 pp.

Addendum

In the spring of 1980, the nest structures were resurveyed for occupancy and productivity. During the first week in May, three were occupied by Ferruginous Hawks while no Ravens were found nesting in the structures. The structures were checked in late May. Of 24 surveyed, three supported 10 nestlings ($\bar{x} = 3.3$).

Two pair of Ferruginous Hawks utilized unshaded structures. One pair utilized a shaded structure and produced three young. We suspect this was the same pair that utilized an unshaded structure in 1978 and 1979 at this site. During the winter of 1979, this structure fell over. When the birds returned in 1980, they built their nest in the shaded structure. Its evident by our results that a shaded structure of this design is not desirable for nesting raptors. They were utilized only once in five years.

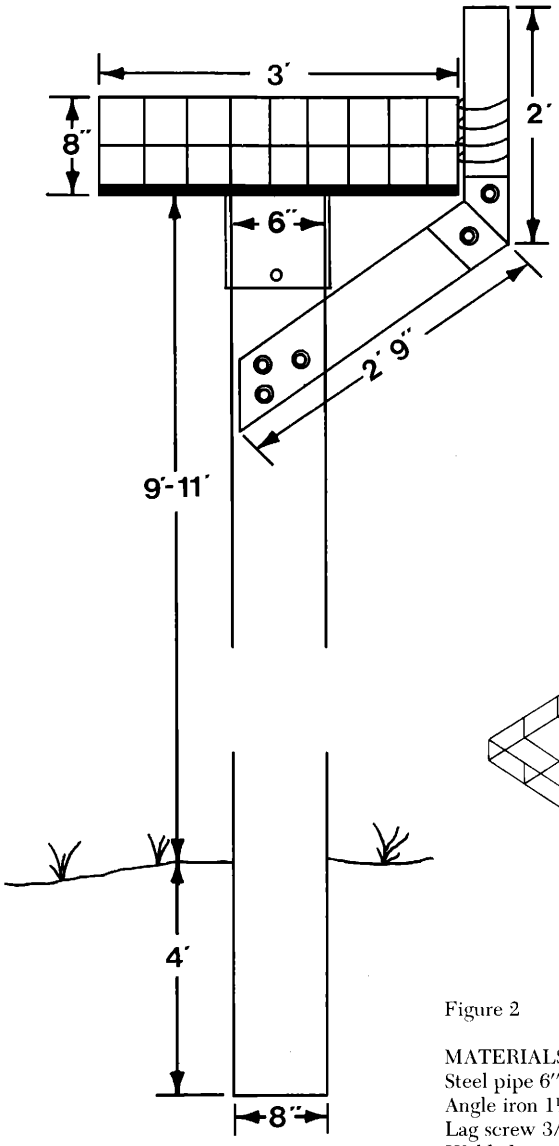

Figure 1

BUTEO NEST PLATFORM

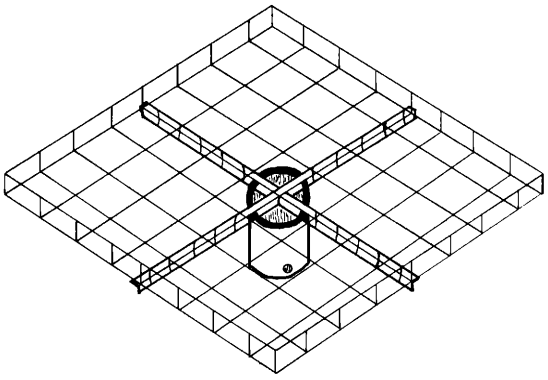

Figure 2

MATERIALS
Steel pipe 6″ inside diameter x 9″ long
Angle iron 1¼″ x 1¼″ x 36″ long
Lag screw 3/8″ x 4″, five lag bolts with washers and nuts
Welded wire basket, mesh size 4″ x 4″, basket size 36″ x 36″
1–4′ board 2″ x 6″ for perch
1-utility pole 13′–15′ long
Note: Wire into basket about two dozen sage brush sticks.
Sticks should be dead—without leafy branches and 15″–25″ long.