

MANAGEMENT OF THE AMERICAN OSPREY ON THE DESCHUTES NATIONAL FOREST, OREGON

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INTRODUCTION

Insufficient data are available to establish the nationwide population status of the American Osprey (*Pandion haliaetus carolinensis*). The Committee on Rare and Endangered Wildlife Species (1967) has directed attention to the Osprey by listing it as "status undetermined" in the "Redbook."

In Oregon, Newberry (1857) found ospreys in all parts of the State he visited, including the Cascade Range, the Klamath Lakes, the Willamette Valley, and the Columbia River. Osprey populations have declined since then. Gabrielson and Jewett (1940) considered the Osprey to be one of the rarer Oregon hawks. Marshall (1969) also classified it as rare. He reported 56 active nests in Oregon, plus an additional seven pairs that probably nested in the State. All but 12 of these nesting pairs were found on the Deschutes National Forest in Central Oregon; most of them at Crane Prairie Reservoir.

The Crane Prairie Reservoir Osprey colony, in existence less than 30 years, is an incidental result of past land management practices. Recognizing the uniqueness of this colony, which is the largest in the Pacific Northwest, the U. S. Forest Service and Oregon State Game Commission decided to intensively manage and protect the birds and their habitat. As data was unavailable on which to base management decisions, informal administrative studies were initiated by both agencies. The areas studied were nesting, in order to evaluate success of future years, and habitat, to determine the Osprey's requirements for survival. Oregon State Game Commission made the initial censuses in 1966 and 1967 in conjunction with waterfowl surveys, and the U. S. Forest Service made surveys of Osprey habitat and nesting success in 1968 and 1969.

ESTABLISHMENT OF A MANAGEMENT AREA

The Crane Prairie Reservoir Osprey Management Area was officially established by Memorandum of Agreement on October 10, 1969, by signatures of the Regional Forester, Pacific Northwest Region, U. S. Forest Service, and Director, Oregon State Game Commission. The Memorandum of Agreement was supplemented by

a formal management plan which spells out the responsibilities of both agencies in managing the Osprey and other wildlife on the 10,600-acre Management Area. Establishment of the area was under the authority of the Endangered Species Preservation Act of October 15, 1966, which authorizes the Secretary of Agriculture to protect species of native fish and wildlife that are threatened with extinction, and to preserve the habitat of such threatened species on lands under his jurisdiction.

The Management Area includes the 3,850-acre reservoir plus a 6,750-acre contiguous buffer strip, which together contain approximately 80 percent of the nesting ospreys on the Deschutes National Forest. Additional acreage will be added to the Management Area if new concentration areas warrant special management.

DESCRIPTION OF THE AREA

Crane Prairie Reservoir is located on the Bend Ranger District, 30 miles southwest of Bend, Oregon. It was created by a temporary dam on the upper Deschutes River by irrigation interests in 1922. The dam was replaced by a permanent earth and rock fill structure in 1939 by the Bureau of Reclamation.

The reservoir covers 3,850 acres and has 20 miles of shoreline when filled to the designed capacity of 55,000 acre feet. It was flooded without clearing the timber, leaving approximately 1,500 to 2,000 acres covered with lodgepole pine (*Pinus contorta*) and ponderosa pine (*Pinus ponderosa*) snags (dead trees). Some of these snags have fallen but many are still standing today; they can be expected to last for 10 to 20 years.

The reservoir was closed to fishing until 1949 to protect an egg-taking operation. By this time, there was an excellent population of rainbow trout (*Salmo gairdneri*) and brook trout (*Salvelinus fontinalis*). Tui chub (*Siphateles bicolor*), an undesirable species, was accidentally introduced into the reservoir around 1952, and was found in considerable numbers by 1955. These have increased to 87 percent of the total fish numbers (Campbell and Locke, 1967). The Osprey buildup apparently coincided with the increase of fish, as few were reported prior to the 1950's.

The combination of a high forage fish population and numerous nesting sites on the snags has created suitable habitat for at least 35 nesting pairs of birds. In nearby snag-free Wickiup Reservoir where the fish population is lower, no Osprey are known to nest.

METHODS OF MANAGEMENT

The primary objectives of the Crane Prairie Reservoir Osprey Management Area are to protect and enhance the Osprey habitat; to

protect the birds and their food supply; and to provide public enjoyment. Secondary objectives are to protect the endangered (in Oregon) northern Bald Eagle (*Haliaeetus leucocephalus alascanus*) and rare greater Sandhill Crane (*Grus canadensis tabida*) (Marshall, 1969), and their habitats; and to intensively manage the fish, waterfowl, shore birds, song birds, big game and other wild mammals of the area and their habitat.

Management of the Osprey habitat will be largely through preservation of the existing reservoir snags. Approximately 800 acres of snags have been cleared in the last 3 years to enhance recreation, grazing and waterfowl nesting. A buffer strip has been left around all Osprey nests. No additional clearing is planned except for fallen snags. These will be removed as they float onto the beaches.

The standing reservoir snags, which are now the key to successful Osprey nesting, are expected to fall within 20 years; therefore, shore nesting sites will be needed as replacements. The standing green timber around the reservoir is recognized as the key to future nesting success and will be reserved for this purpose. Cutting will not be permitted except for danger trees and road rights-of-way in a 200-foot-wide strip of timber, immediately adjacent to the reservoir. Beyond the 200-foot-wide strip, a 1,120-foot-wide "restricted cutting" strip has been established. Here, a minimum of two dominant trees per acre will be saved for potential nesting sites. No snags will be cut within any part of the timbered portion of the Management Area.

Regulations also restrict activities around Osprey and eagle nests found throughout the Deschutes National Forest. These include a 132-foot-wide "no cut" buffer zone around each nest and a "restricted activity" zone within 660 feet of a nest during the nesting season.

Osprey habitat improvement projects are planned. Nesting snags will be created, by killing the most suitable trees in the green buffer strip. Artificial nesting sites will be erected as needed to replace the toppled snags. Goose nesting structures will also be installed to alleviate the competition between the geese and ospreys.

Shooting, both deliberate and accidental, has been recognized as a hazard to ospreys at Crane Prairie Reservoir. To more fully protect the birds, the entire Management Area has been closed to hunting during the nesting season (April 1 to September 30). Most of the ospreys have migrated by the latter date, so chance of accidental shooting is slight. Waterfowl and big game hunting is permitted after September 30.

A nest harassment problem exists and will be investigated further. The critical sections of reservoir will be watched closely, and if disturbances continue, use of these areas may be restricted.

The present food supply apparently is adequate for all of the

fish-eating birds of the reservoir—Osprey, Bald Eagle, Great Blue Heron (*Ardea herodias*), Double Crested Cormorant (*Phalacrocorax auritus*), Belted Kingfisher (*Mergaceryle alcyon*), and Common Merganser (*Mergus merganser*). This is provided partly by the greater numbers of tui chub that infest the reservoir and compete with the trout and kokanee for food and space. The excessive numbers of tui chub have created a problem in that providing food for the birds is in conflict with management of a good cold water fishery. Reduction of these fish could have a detrimental effect on the welfare of the Osprey and the other fish eaters, including the river otter (*Lutra canadensis*). The U. S. Forest Service and Oregon State Game Commission have agreed that any tui chub control program will be preceded by thorough research and fully coordinated between the agencies. The Osprey will be given full consideration if such a program is needed.

There is mounting evidence that nesting failures of ospreys and other birds are tied directly to pollutants, the chlorinated hydrocarbons used in insect control work (Hickey, 1969). Use of these pesticides so far has not been a problem on the Forest. To assure that no problem does develop, these chemicals will not be used in Crane Prairie Reservoir and its watershed.

Crane Prairie Reservoir is a heavily used recreation complex on the Deschutes National Forest, noted for its trout and kokanee fishing and waterfowl hunting, and is also popular with bird watchers and photographers. Therefore, a large scale information and education program will be initiated. This will include placement of permanent signs explaining the ecology of the Osprey, and also the concern of the U. S. Forest Service and Oregon State Game Commission for this potentially endangered species. The message will also be carried to the public via a brochure and visual aids, such as movies and slide programs.

RESULTS OF STUDY

Osprey Numbers and Nesting Success

No official records were kept on Osprey numbers before 1966. Nelson (1970), however, provided invaluable information from his personal records for the years 1947 to 1967. Following are dates of observations and number of active nests that he saw:

Date	No. of Active Nests	Date	No. of Active Nests
April 1, 1947	16	April 1, 1958	22
May 30, 1948	16	May 31, 1959	24
May 29, 1949	19	May 29, 1960	21
May 28, 1950	23	May 28, 1961	24
April 3, 1951	18	May 27, 1962	25
April 1, 1952	20	April 2, 1963	22
May 31, 1953	22	May 31, 1964	25
May 30, 1954	23	May 30, 1965	25
May 29, 1955	23	April 30, 1966	26
May 27, 1956	20	April 29, 1967	25
May 26, 1957	22		

In August 1966, Oregon State Game Commission personnel counted 46 ospreys at Crane Prairie Reservoir. In August 1967, 56 birds were counted (Bright, 1967). No bird census was made in 1968, but Anderson (1968), an independent observer, reported 27 active nests.

In 1969, studies were expanded to include the entire Deschutes National Forest. Ground and water search was made for Osprey nests by U. S. Forest Service field personnel in conjunction with their other duties. Each site was numbered, located on aerial photos, and cataloged. Recorded were nest condition, size and species of snag or tree, habitat type, distance to other nests, distance to water, date of last known use, and 1969 nesting success.

The 1969 Osprey nesting search on the Forest showed:

Active nests, successful	25
Active nests, later abandoned (not including renests)	18
Active nests, success unknown	5
Total active Osprey nests	48
Nests built after 7/1/69	10
Renesting attempts using established nests	3
Total renesting attempts	13
Non-breeding pairs associated with established nests	7
Total nests used by Osprey in 1969	68
Number of young	35
Brood size	1.4

The known 1969 breeding population on the Deschutes National Forest was 48 pairs. Of these, 37 nested on or within 1 mile of Crane Prairie Reservoir. Nine additional pairs nested within 7 miles of the reservoir. The 2 remaining were found at distances up to 25 miles from the reservoir. Seven other pairs associated with established nest sites, but none of these gave the appearances of active nesting and

were assumed to be immature birds.

In 1969, ospreys were first noted on April 12 along the ice-free Deschutes River below the reservoir. The first Osprey was seen on Crane Prairie Reservoir on April 15. This is considered late, but probably resulted because 90 percent of the reservoir was covered by ice then.

Full-scale nesting did not begin until about the first week of May, when most of the birds had arrived. Six Osprey nests were already occupied by Canada geese (*Branta canadensis*). One of these nests fell apart and was abandoned by the geese, to be rebuilt by ospreys for a successful nesting attempt.

A total of 68 Osprey nests was used in 1969. Forty-eight of these showed evidence of incubation and were considered to be active nests. Based on 25 of these active nests where the outcome could be determined, production on the Deschutes National Forest was 35 young or 1.4 birds per brood. Single birds fledged from 16 nests, 2 from 8 nests, and 3 from 1 nest. Success was not determined on 5 nests.

The first fledgling left the nest approximately August 5, and most young were flying by August 20. The last bird fledged between September 5 and 10.

The south bound migration was triggered during early September. Approximately three-quarters of the birds had left Crane Prairie Reservoir by September 15, and the last bird was seen on October 1.

Osprey Nesting Habitat

Nesting was largely limited to lodgepole pine and ponderosa pine snags in the reservoir because there was little else to choose from. Most of these nests were built on stubs, broken off well below the original tree height. The lowest of these was only 10 feet above the water.

Adjacent to the reservoir and at higher elevations where many other trees and snags were present, ponderosa pine was the preferred species. One possible explanation is that the tops of overmature ponderosa pines characteristically flatten and form a natural basket in which ospreys prefer to build nests. When green trees were used, the majority had spike (dead) tops. All nests were located at or within a few feet of the top of a snag or live tree. Other tree species used for nesting were white fir (*Abies concolor*), Engelmann spruce (*Picea Engelmannii*), and Douglas-fir (*Pseudotsuga menziesii*); one of each species.

Of the Osprey nests under surveillance in 1969, data was obtained from 63 as to physical description of the individual nest trees. Table 1 shows the relationship of height to nesting activity.

Table 1. Description of 63 Osprey nest trees and snags by height classes, Deschutes National Forest, 1969.

Height Feet	Lodgepole Pine		Ponderosa Pine	
	No. Dead	No. Live	No. Dead	No. Live
20	8	0	0	0
30	4	0	0	0
40	17	0	1	0
50	3	0	1	0
60	0	0	4	0
70	2	0	1	0
80	0	1	3	0
90	0	0	1	1
100	0	0	6	8
110	0	0	0	2
Total	34	1	17	11

Nest heights appeared to be related directly to visibility both to and from the nest. Visibility was good through the reservoir snags and nest heights were lower than in the timbered areas. In the reservoir, nests in lodgepole pine snags averaged 40 feet high and ponderosa pine snags averaged 60 feet.

In timbered areas, greater visibility was obtained by constructing the nests above the average height of the tree canopy. These ponderosa pine snags and trees averaged 90 feet and 100 feet tall, respectively.

Lodgepole pine nesting snags and the single live tree averaged 15 inches diameter breast high, and ranged from 10 to 24 inches. Ponderosa pine snags and trees averaged 39 inches diameter breast high and ranged from 24 to 50 inches.

The Osprey's choice of a nesting site in relation to the proximity of water varied. Forty-two of the 68 used nests were located in the reservoir proper, with the majority surrounded by water during most of the nesting season. The remaining 26 were located on dry ground in green timber, and were usually not visible from any body of water. Their distance from water or potential food supply is shown in the following list:

Distance to Water	Number
Surrounded by water	42
Less than 1/8 mile (660 feet)	9
1/8-1/4 mile (1,320 feet)	1
1/4-1/2 mile (2,640 feet)	3
1/2-1 mile	4
1-2 miles	6
Over 2 miles	3
Total	68

The Osprey, being colonial, does not exhibit the extreme territorial instincts of the other hawks. To gain some insight into intraspecific tolerances of nesting ospreys, the distance was measured from each active nest to the nest of its nearest neighbor. These distances are listed:

Distance	Number
Less than 1/16 mile (330 feet)	2
1/16-1/8 mile (660 feet)	12
1/8-1/4 mile (1,320 feet)	12
1/4-1/2 mile (2,640 feet)	9
1/2-1 mile	6
1-2 miles	4
Over 2 miles	3
Total	48

These data indicate that most nesting birds prefer a minimum of 375 to 450 feet between their nesting trees. Two pairs, however, nested successfully within 150 feet of each other.

A Great Blue Heron rookery was found adjacent to the reservoir. This rookery was composed of a clump of five large ponderosa pine trees, containing 63 heron nests. A pair of ospreys nested at the top of one of these trees.

Mortality Factors

Some nest damage occurred during the moderately severe winter of 1968-69 from wind and an abnormally heavy snow load. Six nesting snags toppled. Nests also fell apart, but were quickly repaired; several of them within a week's time.

Eighteen of the 48 active nests were abandoned. Records for four of these are lacking, but 14 were abandoned between approximately July 10 and July 25. Four of these were lost because the nests fell apart. Why the others were deserted is not known, but six nests were located near the edge between the snags and open water where use by fishermen was heavy. Abandonment may have been caused by

unsuspecting fishermen anchoring their boats near nests, which forced the female to leave the nest for extended periods, allowing the eggs either to chill or to overheat from the sun.

During the period July 5 to August 15, 13 renesting attempts were noted. New nests were constructed by 10 pairs. The other 3 used established nests. Some of these were close to abandoned nests, suggesting that the pair moved only a minimum distance from the old nest. In one case, when a nest fell apart a few days prior to fledging, an adult bird was seen reconstructing the nest around the two young.

One crippled bird was found in 1969, but it could not be determined whether the bird survived. There is other circumstantial evidence of malicious shooting, but the extent of this practice is not known.

SUMMARY

The Deschutes National Forest is home for the Oargest Osprey colony in the Pacific Northwest. In 1969, there was a known breeding population of 48 pairs. Most of these nested in or closely adjacent to Crane Prairie Reservoir, where numerous snag nest sites and an abundant forage fish supply are found.

The U. S. Forest Service and Oregon State Game Commission have established the 10,600-acre Crane Prairie Reservoir Osprey Management Area to protect and enhance the Osprey habitat; to protect the birds; and to provide public enjoyment. Management measures now in effect include a "no hunting" ban during nesting season (April 1 to September 30); "no timber cutting" and "restricted timber cutting" zones around the reservoir; restriction on use of persistent pesticides; a "restricted activity" zone around nests; and an Osprey nest replacement program.

A 1969 survey showed 25 successful nests with a total production of 35 fledglings, or 1.4 young per successful nest. Eighteen nests were abandoned, and there were 10 renesting attempts. Most nests were in ponderosa pine and lodgepole pine snags, usually located in or very near water. The nesting birds usually preferred a buffer area between nests of 375 to 450 feet.

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