MANAGEMENT GUIDELINES AND RECOMMENDATIONS FOR OSPREY IN ONTARIO

ONTARIO MINISTRY OF NATURAL RESOURCES

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The author would like readers to note that The Raptor Management Information System (RMIS) developed by the United States Department of the Interior, offers a variety of papers and reports related to raptor management and human impacts on raptors and their habitats (see section 2.5.1.5 and Appendix 4).

In addition, current information on Osprey research on a worldwide scope can be obtained from a bulletin published by the International Osprey Foundation (see Appendix 4).

1.0 Introduction

1.1 General Biology

Osprey (*Pandion haliaetus*) are raptorial, fish eating birds belonging to the Order Falconiformes (Brown and Amadon 1968). They are the only species belonging to the family *Pandionidae* in North America (Brown and Amadon 1968; Evans 1982). In Ontario, the Osprey has generally been documented as breeding north of a line between Napanee and Collingwood and usually winters in an area ranging from the southern USA to South America (Mansell et al. 1976). Generally, these birds of prey are usually associated with water, often found nesting close to lakes and coastal area (Henny 1977; Evans 1982) throughout their range.

The Ontario Nest Record Card Scheme (ONRS - see section 2.5.1.3) (Peck and James 1983), documents breeding Osprey in: bogs, flooded areas, swamps, marshes, as well as on islands, or on the shores of lakes or rivers. Preferred nesting trees are coniferous or deciduous. Sometimes nesting was reported in deserted or active heronries.

Osprey, also known as "fish hawks" (Gray 1978) are characterized by long wings, which are brown in colour on their upper surface. The wing span ranges from thirty-seven (37) to 183 cm (fifty-four [54] to seventy-two [72] inches), with females being larger than the males (Godfrey 1966). The head is white and marked by a broad dark patch through the eye and a dark crown (Van Tyne and Berger 1959). The feathers on the head give the appearance of a slight crest (Godfrey 1966).

The breast is white, with some dark spotting, the tail is barred (Van Tyne and Berger 1959) and the soles of the feet are covered in many spiny processes known as spicules (Godfrey 1966) which aid in holding prey (Jackman and Scott 1975).

In flight, the Osprey takes on an "M" or bow-shaped profile. White underparts and dark patches at the bend of the wing or the wrist are visible from the underside (*Peterson 1980*).

Once the ice is out, Osprey are seen building large stick nests which are typically placed in dead or open-topped trees (Evans 1982). However, this species is also very adaptable to other nesting structures, including utility poles, cliffs, stumps, duck blinds, channel markers, as well as artificial nesting platforms (Godfrey 1966, Jackman and Scott 1975; Olendorff et al. 1980; Evans 1982).

Osprey of the eastern United States nest colonially, although in Canada, no such high-density colonies are known (Freemark 1978).

Breeding age is usually reached when Osprey are three (3) years old (Ogden 1977). Two (2) to four (4) eggs are laid and are incubated for about thirty-eight (38) days by both sexes (Garber and Koplin 1972). The young fledge at forty-four (44) to fifty-nine (59) days of age (Stotts and Henny 1975; Stinson 1977) and may continue to be dependent on the parents for six (6) weeks or more (Henny and Van Velzen 1972).

Young of the year banded by Henny (1977) did not return from their wintering grounds until two (2) years of age. About fifty-four (54) percent of all the two (2) year old birds returned to their natal area.

1.2 Population Changes

Significant declines in the Osprey population on the Eastern Seaboard were noted as early as the 1950s and continued into the 1970s (Spitzer and Poole 1980). The presence of environmental pollutants such as Dieldrin, DDE and PCB were thought to be one of the major factors affecting the reproductive success of Osprey in this area, particularly in Connecticut (Wiemeyer et al. 1975). High positive correlations were found between eggshell thinning and DDE concentration throughout North America (Spitzer et al. 1977). High levels of PCB's and heavy metals (mercury and lead) have been linked with increased embryonic mortality in other species (Wiemeyer et al. 1975).

Postupalski (1977) reported that during the years from 1967 to 1971, forty-five (45) percent of Osprey nestings in the Lake Nipigon area of Ontario produced at least one (1) developed young, based on a sample of fifty-eight (58) nests. Although Postupalski did not consider this sufficient to maintain a stable population, he noted that this figure may not have been representative of the Province as a whole.

Mansell et al. (1976) reported that it would be difficult to determine if population declines comparable to those experienced in the New England States also took place in Ontario. According to Freemark (1978) the population declines observed in the eastern United States were generally not evident in Canada. However, between 1969 and 1972 an analysis of organo-chlorine residues in various bird species and their eggs, indicated that eggs of Osprey from Ontario contained high levels of both DDE and PCB (Gilbertson and Reynolds 1972). Evans (1982) noted that the Great Lakes Region experienced population declines similar to those in the North Atlantic Region during the 1950s and 1960s.

Two additional factors that were thought to play important roles in the decline of the Osprey in North America were: habitat destruction (Kahl 1971; 1972; Prevost et al. 1978).

In Ontario in 1976, Osprey were considered as uncommon summer residents in the north and rare in the south by James et al. (1976). In the same year, Fyfe (1976) reported Osprey to be low to medium in abundance, in comparison to other birds of prey in the Province.

By the late 1970s and early 1980s the gradual increases in many Osprey populations across North America were thought to be a direct result of the restrictions and/or bans placed on the use of DDT and related chlorinated hydrocarbons (Henny 1977). In 1978 Evans declared that the reproductive rates in the Great Lakes Region appeared normal and stabilized.

This overall improved population status was documented in 1982 by Tate and Tate. It was the first time in ten years that Osprey had not been formally placed on American Bird's Blue List.

In 1982, it was estimated that at least sixty (60) Osprey nest sites were located in the direct vicinity of Lake of the Woods (Chambers pers. comm.). Other locations containing significant Osprey populations are the Trent-Severn Waterway, the Rideau Canal System and several areas close to other water bodies throughout the Province.

1.3 Need for Implementing Guidelines

Despite such encouraging population trends, the monitoring of nesting populations should be continued and management guidelines must be implemented for several important reasons, which are discussed as follows:

1.3.1 Persistent Pesticides

Osprey may accumulate chlorinated hydrocarbons if they overwinter in Central or South America where the use of such pesticides is not restricted (*Evans 1982*). Therefore, populations must be thoroughly monitored during the breeding season in order to implement appropriate management practices and ensure stable productivity levels.

1.3.2 Habitat Destruction

Habitat destruction has threatened raptor populations consistently (Scott 1981) and according to Henny (1977), such losses preclude the return of pre-DDT abundance.

Habitat destruction may be the result of one (1) or more of the following activities including: logging, road and pipeline construction, hydro development, peat extraction and mining activity.

1.3.3 Problems Related to Power Lines

Power line construction may cause both the destruction of raptor habitat and the disturbance of adults during the breeding season, which may in turn result in unsuccessful nesting (Olendorff et al. 1980). Although seventy (70) to ninety (90) percent of all raptor mortalities along electric distribution lines are eagles. Osprey may also be electrocuted when they perch on power poles (Van Daele 1980). Management techniques designed to mitigate such problems are discussed in Section 2.4.2.3.i.

1.3.4 Acid Rain and Reduction of Food Supply

A relatively new problem - acid rain (detailed in Section 2.4.2.4 iii) may have an indirect, yet detrimental effect on Osprey populations, by reducing the fisheries and hence the necessary food source (Evans 1982).

1.3.5 Disturbances Related to Recreational Activities

The effects of disturbance on the productivity rates of Osprey are not conclusive (Ames and Mersereau 1964, Dunstan 1968; MacCarter 1972; Reese 1977). However, with the increased use of prime Osprey habitat by humans for recreational purposes (Evans 1982), this may become an important limiting factor for the species. *A review of the effects of disturbance on Osprey is detailed in Section 1.3.6.

Osprey often nest close to human activity (Poole 1981). Nevertheless, results from research conducted in Idaho found that birds nesting more than 1500 metres from human disturbance were significantly more productive than those whose nests were situated closer to the disturbance (Van Daele and Van Daele 1982).

Swenson (1979) noted that the actual effects of human presence on Osprey productivity reported in the literature are variable (Ames and Mersereau 1964; Dunstan 1968; MacCarter 1972; Reese 1977). He suggested that the degree of Osprey habituation to humans and the timing of the activity might explain such differences. Increased tolerance is usually present in birds initiating nesting activities in an area where humans are already present, as opposed to those initiating nesting when humans are absent. Swenson (1979) also reported that Osprey exposed to human activity throughout all of the nesting cycle usually are less likely to flush than those in remote locations which are subjected to occasional or sporadic influxes of people. Similar observations of Osprey behaviour were recorded in Idaho by Van Daele and Van Daele (1982).

*The author notes that in some unusual cases, Osprey in Ontario have habituated to disturbance and nest successfully in areas utilized extensively for human recreation.

In Ontario, sudden disturbances may occur in May, especially on the Victoria Day weekend, when vacationers suddenly arrive to reopen their cottages. At this time Osprey are already at the nest-building or egg-laying stage.

1.3.6 Researcher Disturbance

Generally, Poole (1981) found that visits of short duration had negligible impact on Osprey reproductive success, provided that they did not take place at sensitive periods in the nesting cycle. Visits to the nest site or climbing of the nest tree should be avoided near fledgling time (young fledge at approximately fifty [50] days of age) (Garber 1972). Climbing of the nest tree close to fledgling time may cause young that are not ready to leave the nest to fledge prematurely. As a consequence, this may reduce the survival of young by causing injury or making them more vulnerable to predators.

Climbing the nest-tree may be a direct stimulus for racoon predation (Poole 1981), as racoons will track human scent. A comparatively lower predation rate results if a ladder is used to reach nests. Poole (1981) suggested that for the purpose of scientific study (banding or trapping) nests should be reached using a ladder. In addition, metal predator guards should be installed around trees or paradichlorobenzene should be sprinkled around the base of the nest tree.

Mosher (pers. comm. 1980) believes that mammalian predators are usually able to spot large raptor nests from the ground; hence attempts to cover human scent by scattering paradichlorobenzene around the base of the nest tree may not serve any useful purpose. Where possible, nest productivity information should be collected by viewing the nest from the ground with the aid of a spotting scope or binoculars.

Cochrane District of the Ministry of Natural Resources has reported significant aircraft disturbance, particularly that of helicopters, near Osprey nests. Aircraft in that district are used for: recreation, development and nest inspection. The former two activities may be difficult to control, particularly in heavily forested areas where the locations of all nest sites are not known. However, when two (2) flight aerial surveys are conducted to determine reproductive parameters of large raptors, a specific schedule should be followed to ensure the accuracy of estimates (Frazer et al. 1983). By limiting the number of survey flights, disturbance would also be minimised (see section 2.5.1.6 for details).

2.0 Management Guidelines

The following guidelines are based on the recommendations made by Jackman and Scott (1975), Grier (1976), Mansell et al. (1976), McKeating (1977), Gray (1978), Coleman (1981) and Evans (1982), as well as the suggestions submitted by Ministry of Natural Resources staff in various regions.

2.1 Protective Legislation

Osprey and other birds of prey are protected under the *Game and Fish Act R.S.O., 1980, c. 182*. This Act prohibits the chasing, molesting, taking, destroying or shooting of such birds, with one exception; Section 2 - (1) (b) permits a landowner to take or destroy raptors, **other than those designated as an endangered species**, "...in his own land where he finds such an animal damaging or destroying his property or, on reasonable grounds, he believes such an animal is about to damage or destroy his property."

2.2 Protective Measures Relating to Pesticide Control

Protective measures relating to pesticide control were established by Mansell et al. (1976) and by Gray (1978). These recommended measures are outlined below with some modifications and additions.

2.2.1 Pesticide Control

Organochlorines have been linked to population declines of Osprey in the United States (Ames and Mersereau 1964; Anderson and Hickey 1972; Henny 1972; Wiemeyer et al. 1975; Grier et al. 1977; Spitzer et al. 1977). Controls on the use of pesticides should continue to be supported.

2.2.2 Organochlorines in Watersheds

Organochlorine pesticides should not be used on lands that drain into watersheds occupied by Osprey (or other birds of prey). Existing pesticide levels in such areas should be monitored on a regular basis.

2.2.3 Non -persistent Pesticides and Biological Controls

If a pesticide or herbicide must be utilized in close proximity to nesting Osprey or other wildlife, a non-persistent type should be selected, in consultation with the Ministry of the Environment. The use of *Bacillus thuringiensis* in Osprey buffer zones has been recommended by Cochrane District of the Ministry of Natural Resources. This is a chemical insecticide of microbial nature that has been used effectively against lepidopterous larvae, but has little toxicity to other forms of life (McEwen and Stephenson 1979).

2.3 General Management Guidelines for the Establishment of Buffer Zones

(Northern and Southern Ontario)

Disturbance at the nest site may cause long absences from the nest by incubating or brooding adults (Jackman and Scott 1975). This may result in the chilling and possible death of embryos or chicks.

Management guidelines pertaining to buffer zones should be implemented as long as any nest site is deemed "active". An active nest site is one where the evidence of fresh nesting material, white-wash, feathers, eggs, young, incubating or brooding adults has been confirmed.

2.3.1 Absolute Buffer Zone

An absolute buffer zone with a minimum radius extending 200 metres from the nest (in all directions) should be established around osprey nests in both forest and water sites (Figure 1), throughout the year, in both northern and southern Ontario.

The absolute buffer zone is the zone in which no activity shall take place with the exception of the authorized collection of scientific data, the removal of hazardous trees close to roadways or campgrounds, and the improvement of nesting habitat. Improvements shall include maintenance of the nest site and the preservation of snags.[1]

2.3.2 Heavy Development Buffer Zone

2.3.2.1 Northern Ontario[2]

The size of the heavy development buffer zone in Northern Ontario will be the same as that for Southern Ontario. However, in the North this buffer zone will be put in operation at a later date (April 15 to September 1 inclusive), to correspond with the delay in nesting associated with higher latitudes.

2.3.2.2 Southern Ontario[3]

A heavy development buffer zone with a minimum radius extending 800 metres from the nest, **or** 600 metres from the periphery of the absolute buffer zone should be established during the nesting season (March 1 to September 1 inclusive).

2.3.2.3 Prohibited Activities

Activities to be prohibited in the heavy development buffer zone at all times include the following: road and pipeline construction, logging, forest site preparation for planting, peat extraction, mining and activities of a similar nature having a high disturbance factor.

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[1] A snag is "a standing dead tree from which the leaves and most of the branches have fallen, or a standing section of the stem of a tree broken off at a height of twenty (20) feet or more. If less than twenty (20) feet, properly termed a stub." (Society of America Foresters, 1958.)

[2] Northern Ontario includes that area of the Province north of the French and Mattawa Rivers.

[3] Southern Ontario includes that area of the Province south of the French and Mattawa Rivers.

2.3.2.4 Allowable Activities

At times **other than during the nesting season** (i.e., September 2 – February 28, For Southern Ontario and September 2 – April 14, for Northern Ontario), certain specified activities will be allowed inside the heavy development buffer, as follows: selective tree harvesting, tree planting, wildlife habitat management/development, the use of off-road recreation vehicles, and other recreational activities such as camping, hiking, waterskiing, and the discharge of firearms.

If selective harvesting[4] occurs within the 600 m buffer zone, provision will be made for the preservation of at least five (5) snags and at least five (5) clumps[5] of tall trees.

A special effort should be made to preserve those trees (dead or alive) which are isolated from other trees, as these are often chosen by Osprey for nesting (Godfrey 1966).

Shoreline reserves should be established for a distance of seventy (70) metres from water. This shall include the preservation of five (5) snags and five (5) clumps of tall trees.

[4] Selective harvesting includes "The silviculture practice of partially harvesting a stand, on a tree by tree basis, to increase growth and recover the value of the mature timber." (*Franzese et al, 1978*).
[5] A clump of trees will be defined as six (6) to ten (10) trees and their associated habitat, where the two farthest trees (as measured from their bases) are no greater than twenty-five (25) metres apart.

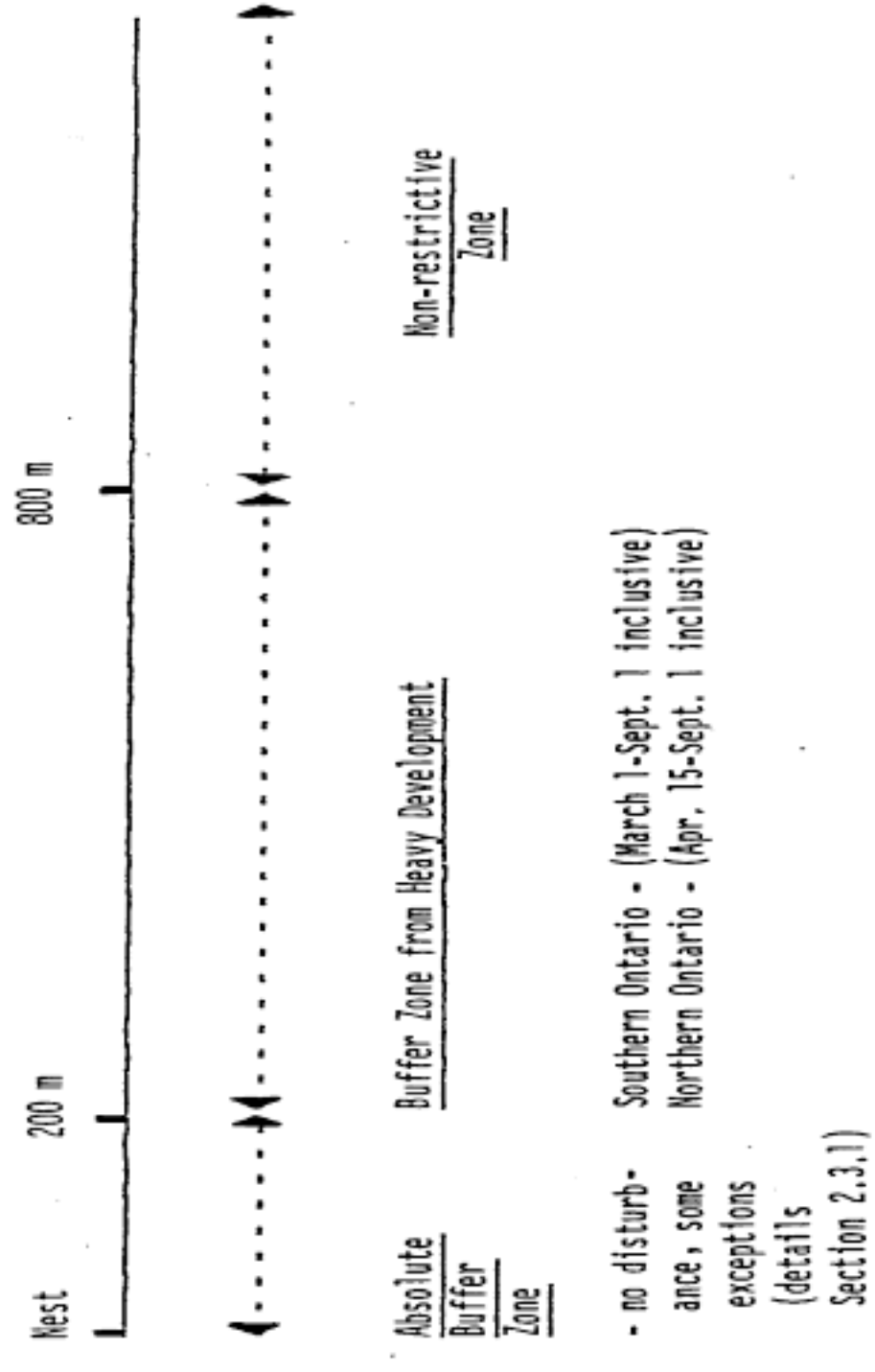

Figure 1 Buffer Zones Around Osprey Nests

(Adapted from Mansell et al, 1976**)**

2.4 Habitat and Nest Site Improvement and Preservation

2.4.1 Northern Ontario

2.4.1.1 Location and Documentation of Nests and Estimation of Productivity

The vast amount of land area in Northern Ontario and the sporadic distribution of nesting Osprey often make it difficult to locate all Osprey nest sites. McGregor (pers. comm. 1982) has noted that the lack of nest sites or suitable nesting habitat does not appear to be a limiting factor for the species in Northern Ontario.

Therefore, it is recommended that to the extent feasible, Osprey nests should be located and recorded, and estimations of productivity should be made. In order to obtain such information, Ministry staff should consult sensitive area files, various naturalist groups, conservation authorities and coordinators of the *Ontario Breeding Bird Atlas*. (see Section 2.5 and Appendix 4 for more details.) This will allow long-term monitoring of Osprey population in the North.

2.4.1.2 Protection of Osprey Habitat

Areas with high concentration of Osprey should be highlighted for special consideration and protection in accordance with Nongame Program objectives to protect significant nongame habitats, and to ensure the continuance of stable populations of nongame species. Mechanisms which may be used to protect these areas include, but are not limited to, the following:

i Landowner agreements

ii Identification of areas in Management Plan Reports prepared for Forestry Management Units; specifications relating to buffer zones and any other relevant information should be included in Operating Plans, Annual Plans, and Work Permits.

iii Land acquisition (e.g., through a joint effort of the

Ministry of Natural Resources and the Nature Conservancy of Canada).

2.4.1.3 Protection of Individual Nests

Individual Osprey nests should be considered for protection. Mechanisms, which may be used to protect these areas, are described in Section 2.4.1.2 (i and ii).

2.4.2 Southern Ontario

In addition to those guidelines established for Northern Ontario, the following recommendations should apply to Southern Ontario:

2.4.2.1 Annual Inspection and Maintenance of Nest Sites

An annual inspection of existing Osprey nests and habitat should be conducted in the fall, after migration, or in the early spring before the return of the birds to identify the need for habitat or nest site improvements. Any maintenance work required should be implemented before the birds' return to the breeding territory. According to James et al. (1976) the earliest annual arrival date for Osprey in the Province is March 23. Arrival dates will vary with latitude (Peck and Long, pers. comm.).

General maintenance measures may include the reinforcement of nests (natural or artificial) using guy wires or braces. In addition, since Osprey require a good view of the foraging area (Austin-Smith, pers. comm. 1982), branches in trees around nest sites may be trimmed.

2.4.2.2 Artificial Nesting Structures

Nesting platforms have become a very important tool for Osprey (Reese 1970; Rhodes 1972; Stackpole 1974; Stahlecker 1979). In districts lacking nest sites, but in which suitable foraging habitat exists, artificial nest sites should be created. Various designs for such structures (tripod and pole designs) are illustrated in Figure 2. Nest sites may also be created by removing the tops of selected trees above a whorl of limbs capable of supporting a nest.

Coleman (1981) has suggested several locations in Lindsay District – the Nonquon River, Omemee Pond, and a Lake Ontario marsh – for the placement of artificial nesting structures. Regular sightings of Osprey were reported for those areas during the breeding season in the mid-1970's (Tozer and Richards 1974).

2.4.2.3 Nest Relocation

i Nests on Hydro Poles or Towers

In Districts where Osprey have nested on hydro poles or towers, the Ministry of Natural Resources and Ontario Hydro should continue their co-operative efforts to relocate such nests in alternate sites, if they are creating significant problems.

ii Nests Subject to Adverse Influences

Ministry personnel should also consider relocating those Osprey nests that may be subject to predation, flooding or other disturbances having a negative impact on productivity. This would apply to (for example) nests on low stumps such as those commonly used by Osprey in the northwestern part of Lindsay District (Postupalsky pers. comm. 1982). Ideally, alternate nest sites should be chosen in locations near the original nest.

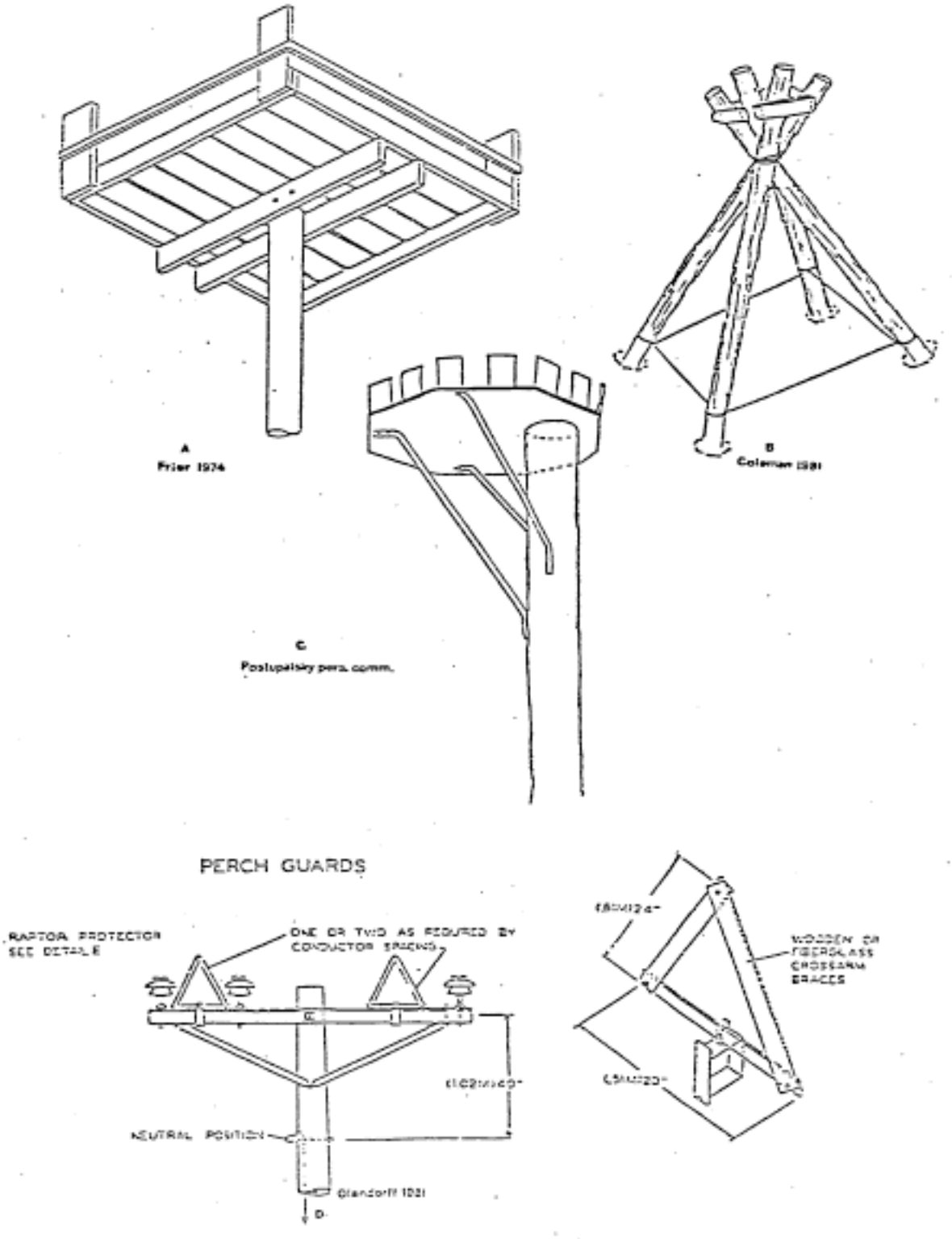

Figure 2 Artificial Nesting Structures

2.4.2.4 Enhancement of Water Systems for Prey Species

The management of water systems in the vicinity of Osprey nesting areas to enhance fish populations on which these birds depend for food is a valid management option. In Idaho, controlled water levels and management for shallow water fisheries have been associated with increased productivity for this species (Van Daele and Van Daele 1982). The creation of reservoirs in the western United States has also helped to extend the breeding range for Osprey (Roberts and Lind 1975; Henny et al. 1978).

The following management options should be considered, where feasible:

i Manipulation of Water Levels

Osprey generally take fish that swim near the surface of the water (Jackman and Scott 1975). Maintenance of low water levels in controlled-level systems may enhance fishing success.

ii Pollution Control

Factors such as pollutants or dense algal growth, which are responsible for water turbidity, should be controlled in areas supporting Osprey populations. Turbidity reduces prey visibility and may be responsible for decreased hunting success.

iii Neutralization of Lakes

A reduction in fish populations through the effects of acid rain would have severe consequences for Osprey abundance (Evans 1982). The acidity of lakes (especially those where Osprey and other fish-eating raptors are found) should be monitored on a regular basis. The experimental neutralization and fish re-stocking programs for “acid” lakes which are soon to be implemented by the Ministry of Natural Resources

(Donna Wales pers. comm. 1982) may offer a short-term solution to the problem.

2.5 Monitoring of Productivity and Documentation of Nests

2.5.1 Data Recording

2.5.1.1 Standard Inventory Data Sheets

As part of the identification and assessment of significant populations of nongame species, standard inventory data sheets (Appendix 1) should be completed by district field staff. This inventory sheet provides a standardized format for field observers to follow when collecting and recording annual productivity information as well as nest sites and habitat characteristics. These data should be stored in a nongame data file at the district and regional offices and transferred to a computerized data storage and retrieval system, when such a system is developed (2.5.1.5). These data could be utilized to conduct future studies on the factors affecting productivity.

2.5.1.2 Topographical Maps

Osprey nest sites, buffer zones, reserves and any other protected areas should be identified on 1:50,000 (and 1:250,000) topographical maps and a cross-referenced card index maintained for each map scale.

2.5.1.3 Ontario Nest Records Scheme (O.N.R.S.)

Ontario nest record cards (Appendix 2) should be completed for all known Osprey nests and sent to the Royal Ontario Museum.

2.5.1.4 Ontario Breeding Bird Atlas

District personnel should report any evidence of nesting Osprey to the coordinators of the Ontario Breeding Bird Atlas (details in Appendix 4). A sample data card is provided in Appendix 3. This project is coordinated by the Federation of Ontario Naturalists (F.O.N.) and has received funding from M.N.R. and other agencies.

2.5.1.5 Computerized Data Storage and Retrieval in Ontario

Regions and districts able to collect significant data on Osprey populations should consider developing a computerized data storage and retrieval system if facilities are available.

2.5.1.6 Raptor Management Literature Available on Computer

The United States Department of the Interior Bureau of Land Management (see Appendix 4) has developed a Raptor Management Information System (RMIS) which consists of published and unpublished papers, reports and other research related to raptor management and human impacts on raptors and their habitats. In the early part of 1983 RMIS was comprised of abut 2,500 original papers, 160 keyworded notecard decks composed of 15,000 key paragraphs from the original papers, and a computer program to retrieve partially annotated bibliographies by species, by keyword or by any combination of keywords and/or species. New papers are added to the system as they are received and a geographical index is under development.

2.5.1.7 Estimation of the Breeding Population

The estimated size of Osprey breeding populations may be best obtained by two consecutive surveys. Swenson (1982) conducted his initial survey during the incubation period. Aerial censuses were conducted using high-winged aircraft or helicopter. A subsequent survey was conducted either from land or by plane or boat to confirm observations made during the first survey.

Fraser et al. (1983) noted that if two (2) sets of observations are made from a fixed-wing aircraft, the activity flight (first flight conducted early in season to count pairs of birds and number of pairs with eggs) should take place after the last clutch has been started. The productivity flight (the second flight flown later in the nesting season, to count fledglings) should take place before the young start to leave the nest.

Fraser et al. (1983) suggested that before surveys are conducted as part of long-term studies on Bald Eagles or Osprey reproduction, short-term studies should take place in order to estimate optimal survey dates. In the Province of Ontario this date will vary with latitude. Information in order to determine optimal survey dates may be available at the District Offices of the Ministry of Natural Resources or by contacting other sources such as coordinators of: the *Ontario Breeding Bird Atlas*, the Ontario Nest Record Card Scheme of the Royal Ontario Museum or local naturalist clubs.

2.5.1.8 Banding and Colour Marking Programs

A banding and colour marking program would assist in providing long-term information on survival and mortality rates, and nest site fidelity. This program could utilize colour leg bands or other markers (i.e., patagial markers, streamers, etc.) and metal U.S. Fish and Wildlife Service bands. Applications for banding permits to Ministry staff could be forwarded to the Canadian Bird Banding Office of the Canadian Wildlife Service at the following address: Ottawa, Ontario, K1A 0E7. Young Osprey can be banded at the nest at approximately three (3) weeks of age. Poole (1981) should be consulted for all banding and trapping techniques.

2.6 Public Awareness

Public education efforts to encourage the maintenance of Osprey nest sites on public and private lands may take several forms, which are described as follows:

2.6.1 Discussion with Members of the Public

Direct discussion of the subject by Ministry personnel and interested members of the public is as important as the provisions of educational materials. If funds for education materials are lacking, the rapport established by Ministry staff and members of the public may be the chief mechanism for ensuring the cooperation of private landowners.

Ministry personnel should encourage individuals associated with accredited academic institutions, who are conducting scientific research on raptors or other avian species to undertake studies on Osprey in Ontario.

2.6.2 Educational Materials

Educational materials could be developed by districts with large Osprey populations, in cooperation with main office. These materials could be provided to school groups, wildlife conservation clubs, and private fish hatcheries (which may engage in Osprey control). The various materials which could be developed include information brochures, films of management activities, and slide shows (assuming that slides have been taken of activities such as the construction of artificial nesting platforms). Field trips could also be organized in Osprey nesting areas **at non-critical times of the breeding season**.

2.6.3 News Releases

Members of the public should be encouraged to participate in efforts to identify Osprey nest site locations. News releases should be issued in early spring, encouraging members of the public to report sightings of Osprey, or locations of Osprey nests. Reported sightings should be verified by Ministry personnel.

2.6.4 Summary of Recommendations for Future Study

The following management activities for Osprey could be implemented by field staff:

1) collection of habitat and nest site characteristics

2) compilation of productivity data

3) estimation of the breeding population (e.g., by serial census methods)

4) the establishment of a banding and colour marking program for adult and young Osprey, in conjunction with an accredited academic institution

5) the development of a computerized storage and retrieval system.

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Appendix 1 Standard Inventory Data Sheet for Nesting Osprey

(Please fill in the blanks or circle the appropriate response on both sides.)

Observer(s) _____

MNR Region_____ MNR District _____

County_____ Township _____

Lot and Concession _____

Longitude and Latitude _____

Year_____ Method of Survey: Foot_____ Fixed-Wing Aircraft_____

Helicopter_____ Automobile_____ Boat _____

Nest tree species_____ Dead Tree: Yes_____ No _____

Artificial nest structure Yes_____ No_____

Height of tree or artificial nest structure: _____m

Height of nest in tree or structure: _____m

General habitat description:

Distances to structures, features or disturbances

(Note: all the following measurements are taken from the nest to the given structure, feature or disturbance.)

Distance to nearest lake	0-200m	200-800m	800m	
Distance to nearest river	0-200m	200-800m	800m	
Distance to nearest osprey nest	0-200m	200-800m	800m	unknown
Distance to nearest paved road	0-200m	200-800m	800m	
Distance to nearest unpaved road	0-200m	200-800m	800m	
Distance to nearest footpath	0-200m	200-800m	800m	

Distance to closest building	0-200m	200-800m	800m	
Distance to timber cutting	0-200m	200-800m	800m	no cutting
Distance to tree planting	0-200m	200-800m	800m	no planting
Distance to mining	0-200m	200-800m	800m	no mining
Distance to sport fishing	0-200m	200-800m	800m	no fishing
Distance to hunting activity	0-200m	200-800m	800m	no hunting
Number of inhabited buildings within 800m of nest	1-5	5-10	>10	

What percentage of buildings are inhabited seasonally? _____

What percentage of buildings are inhabited year round?_____

Is there any aerial disturbance in the nest vicinity? No _____ Yes _____

If yes, specify nature of disturbance. Airplanes _____ Helicopters _____

Nest Observations (at one nest)						
Date	Closest Distance (m) Nest Approached	Time Spent Observing	# Eggs	# Young	Incubating	Brooding

Was nest active at time most of data was collected Yes _____ No _____

Were (adult) birds observed near nest Yes _____ No _____

If Yes, # _____ Date _____

Did new nest-building occur? Yes _____ No _____

Was an old nest repaired? Yes _____ No _____

Was nesting successful? Yes_____ No_____ Unknown_____

Failure due to: weather____ predation____ disease____ human activities____ unknown____

Appendix 2 Ontario Nest Record Card

Appendix 3 Ontario Breeding Bird Atlas Card

Appendix 4 Osprey Research and Management Contacts

Ontario Breeding Bird Atlas
Coordinator
FON Conservation Centre
355 Lesmill Road
Don Mill, Ontario
M3B 2W8

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Marine Biological Lab
Woods Hole, Massachusetts 02543
U.S.A.

Telephone: (617) 548-3705 extension 538

Royal Ontario Museum
Ornithology Department
Ontario Nest Record Card Scheme
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