# MANAGEMENT GUIDELINES FOR THE PROTECTION OF HERONRIES IN ONTARIO

## ONTARIO MINISTRY OF NATURAL RESOURCES

**Prepared by Irene Bowman**
**and Joanne Siderius**

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# MANAGEMENT GUIDELINES FOR THE PROTECTION OF HERONRIES IN ONTARIO

## 1.0 Introduction

The maintenance of established heronries and associated feeding areas is essential to ensure the stability of breeding populations of herons and egrets (Family: *Ardeidae*). These colonial nesters are especially vulnerable to human disturbance and habitat destruction during the breeding season when large numbers of birds are concentrated in a relatively confined area. Colonial birds tend to desert nests and entire colonies if disturbed during the periods of pair-formation, nest construction or early egg laying (Blaker, 1969; Jenni, 1969; Buckley and Buckley, 1978; Tremblay and Ellison, 1980).

Established heronries, and in particular large established heronries consisting of hundreds of nesting pairs, are a valuable biological resource. They may be occupied for decades or even centuries because of habitat conditions that are conducive to reproductive success (Bent, 1963; Hagey, n.d.). If forced to relocate, alternative habitats may be of a poorer quality (Vermeer, pers. comm., 1978). Other consequences of disturbance include fragmentation of breeding populations, total reproductive failure in colonies that have relocated, or reduced numbers of nesting pairs and reduced reproductive output per pair in relocated colonies (Buckley and Buckley, 1978). Desertion of large colonies that are responsible for the major portion of a population's reproductive output can affect the stability of the entire regional population of herons, even if the desertion is followed by relocation.

## 1.1 Herons and Egrets in Ontario

The following communally nesting heron or egret species have been recorded as breeding in Ontario: great blue heron (*Ardea herodias*), black-crowned night heron (*Nycticorax nycticorax*), green-backed heron (*Butorides striatus*), great egret (*Casmerodius albus*), and cattle egret (*Bubulcus ibis*). Green-backed herons usually nest singly, but are included here because they sometimes occur in small colonies of ten or fewer nests (ONRS*). The guidelines apply to green backed herons only when they are present in colonies.

In Ontario, large mixed-species heronries are found mainly in the extreme southwestern corner of the province where the breeding ranges of all five species mentioned above coincide. Black-crowned night herons, cattle egrets, and great egrets usually nest in colonies containing other heron species.

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*Ontario Nest Record Scheme

Cattle egrets have not been reported as nesting in Ontario since 1978 (ONRS) but since this species is at the edge of its range (Fig. 1), it could presumably nest here again. Cattle egrets have been reported nesting in mixed-species heronries situated on some islands in the western arm of Lake Erie, and have nested as far north as Wellington County. Great egrets have been reported nesting in western Lake Erie and also on the mainland south of Amherstburg.

The black-crowned night heron is the second most numerous colonially nesting heron species in Ontario, and breeds along the shores of the Great Lakes eastward to Northumberland and Frontenac Counties (ONRS), and as far north as Manitoulin District.

The great blue heron is the most numerous and widely distributed heron in Ontario (Dunn et al., 1981) breeding as far north as latitude 54°12' (Gray, 1978) (Fig. 1). Data from a two-year (2) census, conducted in 1980 and 1981 as part of the Ontario Heronry Inventory (OHI), gave a conservative estimate of 13,022 breeding pairs of great blue herons in Ontario (Dunn et al., 1981). The Ontario population appeared to be larger and denser than populations censused in other inland areas (Dunn et al., 1981). Great blue heron colonies located on the Canadian Shield in Ontario (eg., those colonies north of latitude 45°N, approximately) are smaller and more numerous than colonies south of the Shield (Dunn et al., 1981). It also appears that a large proportion of the province's breeding pairs of great blue herons are concentrated in relatively few colonies located in the Ontario Heronry Inventory's Southern Sample Area: "The herons nesting in the Southern Sample Area which made up an estimated 24% of the province's total are more vulnerable than elsewhere as a result of being concentrated into larger and more dispersed colonies" (Dunn et al., 1981).

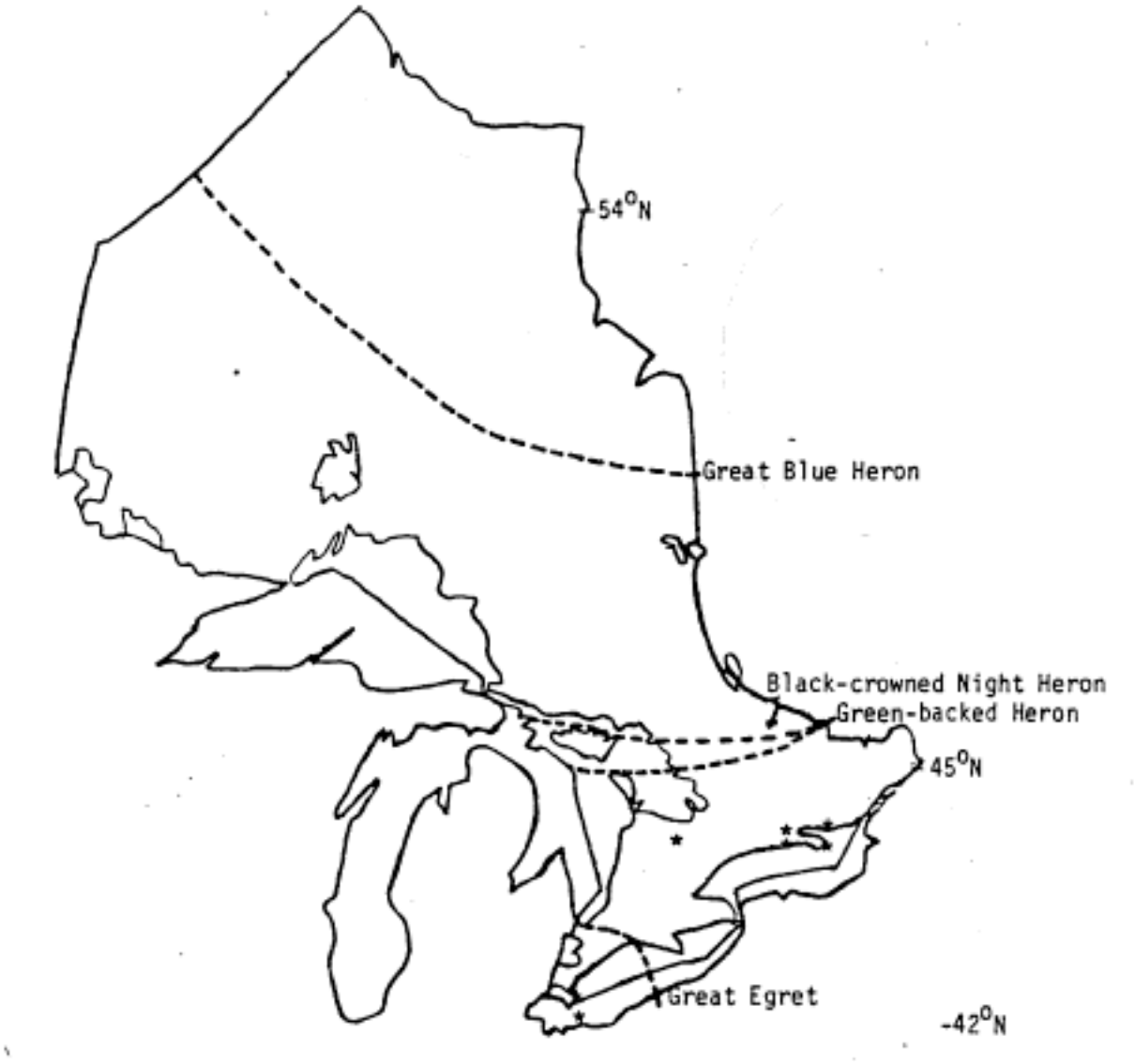


**Figure 1:** Nesting Distribution of Colonial Herons in Ontario as of 1981

(Great Blue Heron, Black-crowned Night Heron, Great Egret, Cattle Egret[+] and Green-backed Heron) (from ONRS, OHI[#] and Godfrey, 1966).

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*indicates past nesting localities

[+] not known to have nested in Ontario since 1978.

[#] Ontario Heronry Inventory

## 1.2 Response to Disturbance

Herons of all species are unpredictable in their response to the disruption of a colony. The severity of the response does not always correspond to the magnitude of the disturbance, since even seemingly "innocuous" activities can produce serious results.

The effects of human disturbance very in response to a number of factors, including stage of the nesting cycle, degree of habituation to disturbance, size of the colony, species of heron present, type of habitat surrounding the colony, region within the species' range, and the nature of the disturbance. Perhaps the most important factors to be considered are the timing of the disturbance in relation to critical periods of the nesting season, and the degree to which the birds are able to adjust to human activities in or near nesting areas.

Heronries are frequently situated in areas isolated from human disturbance, for example, in swamps, marshes or beaver ponds, in woodlots adjacent to water bodies, or on islands (Adams et al., 1973; OHI). Herons have, in rare instances, tolerated human settlement and activities near their breeding areas; some herons have even selected colony locations near areas of human disturbance (Kelsall, pers. comm.; OHI), presumably because of excellent feeding opportunities. However, disturbances cannot be imposed arbitrarily on any heronry. Herons inhabiting remote island or woodland locations that have experienced few past disturbances are unlikely to tolerate human activities near their colonies. Some colonies have been deserted or relocated after the destruction or alteration of their habitat during the **non-nesting** season (Bjorklund, 1975).

Birds nesting in large colonies and those accustomed to a certain amount of disturbance are less likely to desert the colony, although some nests may be deserted (Bjorklund, 1975; Werschkul et al., 1976, Kelsall, pers. comm.), and nestings may be delayed.

The density of vegetation in and surrounding the colony may also influence the impact of disturbance. Removal of trees or shrubbery in or near a colony would facilitate intrusion by humans or predators, and in some instances would result in fluctuating water levels in the colony. The exposure of an increased number of nests would also be undesirable. Maintenance of trees and shrubs around the colony, on the other hand, would provide a buffer against disturbance and provide alternate nest sites.

The frequency of colony relocation is influenced by geographic location. Colonies in northern Ontario, for example, are smaller and more numerous than more southerly colonies (Dunn et al., 1981), and appear to change location more frequently (OHI).

As a rule, disturbances in colonies initiate instabilities that can lead to loss of habitat and/or decreased reproduction. Some of the major disturbance-related factors that have a negative impact on reproduction are as follows:

### 1.2.1 Abandonment of the Colony or Individual Nests

Abandonment is most likely to occur in the pre-nesting (courtship) period and up to hatching time. Adult herons do not develop a strong attachment to the nest until young are present (Adams et al., 1973).

### 1.2.2 Increased Predation on Eggs and Young

Disturbances causing even the temporary absence of adults from the nest may result in a significant increase in predation on eggs and young (Bent, 1963; Teal, 1965; Wolford, 1966; Wolford and Boag, 1971). Predators such as crows, ravens, gulls and racoons may become accustomed to this source of food if adults are often kept from the nest (Simpson and Kelsall, 1978).

### 1.2.3 Mortality Due to Exposure

Disturbances which prevent adults from attending the nest contribute to mortality of embryos and young due to exposure (Teal, 1965; Wolford, 1966; Pratt, 1970; Adams et al., 1973; Tremblay and Ellison, 1976).

### 1.2.4 Loss of Food

Disturbances cause interruptions in the feeding routine, which result in the loss of food by the young. In addition, the young tend to regurgitate meals when frightened (Cottrille and Cottrille, 1958; Bent, 1963; Teal, 1965; McVaugh, 1972).

### 1.2.5 Mortality Resulting from Alarming Young

Alarming older young causes them to leave the nest and many fall to their deaths or become entangled in branches while scrambling through the vegetation (Bent, 1963; Teal, 1965; Wolford, 1966, Wiese and Smith-Kenneally, 1977). Young that stray from their own nests may also be attacked by other herons whose territories they may venture into (Blaker, 1969). In addition, adults do not normally feed young that have fallen to the ground.

## 2.0 Management Objectives

**2.1** To prevent the loss of colonial nesting sites, feeding areas and any other sites important to the reproductive success of herons and egrets in Ontario.

**2.2** To provide information that will enable the Ministry of Natural Resources, as well as other ministries, agencies, developers, landowners, naturalists and recreationalists to minimize disturbances to heronries and to recognize the habitat and breeding requirements of herons.

**2.3** To encourage continuing cooperation between the Ontario Ministry of Natural Resources, the Canadian Wildlife Service, scientific researchers and naturalists, in order to maintain current information on the status of Ontario's heron populations, and to use that information as a basis for protecting colonies and making appropriate management decisions.

**2.4** To emphasize the need for land use plans that protect heronries by recognizing the habitat/breeding requirements of herons.

**2.5** To encourage educational programs to promote the appreciation of herons and to inform the general public, especially landowners and recreationalists, about the sensitivity of herons to disturbance.

## 3.0 Management Guidelines

### 3.1 Inventory of Heronries

#### 3.1.1 Ontario Heronry Inventory

The Ontario Heronry Inventory (a project supported by the Ministry of Natural Resources, the Canadian Wildlife Service and Long Point Bird Observatory) maintains an inventory of heronry sites; copies of the inventory are located at main office, in the Wildlife Branch, and in Regional Offices of the Ministry. Information is contributed by Ministry personnel, federal and municipal government staff, naturalists, recreationalists, private landowners, and other members of the public. Information recorded for each colony includes: location, size and ownership of the colony site, and a description of the habitat. Information from a 1980 and 1981 Ontario-wide census of great blue heron colonies is included in the inventory.

### 3.1.2 Ministry Reports of Heronries

The locations of heronries reported by Ministry staff have been mapped and indexed by the Wildlife Branch. Sites are marked on 1:50,000 and 1:250,000 topographical maps and a cross-referenced card index of colonies is maintained for each map scale. Available information on numbers of nests in colonies, egg laying and hatching dates is recorded on the 1:50,000 scale index cards.

Records of new sites and updated information on previously mapped sites are to be reported to head office by district staff.

If colonies are censused, the guidelines in Section 3.6.4 are to be followed to prevent disturbances. Ground censuses are to follow the methodology outlined in Appendix 4.1, Census Instructions for Heronries. All census results should be recorded on the field sheet and summarized on the record sheet. Sample sheets are included in Appendix 4.2. Site locations are to be mapped on 1:50,000 maps.

One copy of the census record sheet and the map for each site should be kept by the district. Data on the census report forms should be summarized by the district and forwarded to the region.

### 3.1.3 Encouragement of Site Reporting

District field staff should encourage landowners, naturalists, hunters, trappers, fishermen, and recreationalists to notify the Ministry of Natural Resources about the locations of heronries they may know of. Educational or interpretive materials could be used to inform members of the public about the value of heronries, their vulnerability to disturbance and to encourage people to report any colonies encountered (Sec. 3.7).

### 3.1.4 Confidentiality of Colony Locations

Information on colony locations should have a restricted distribution. Research proposals requesting information on colony locations should be reviewed by Ministry biologists (Section 3.6). Researchers whose proposals are approved should understand that the information on colony locations is given in confidence and is not to be circulated.

## 3.2 Protection/Management Relative to Size of a Heronry and Other Factors

All colonies which contribute significantly to regional populations of heron species should be given full protection, and managed, if necessary, to ensure their continuance, and to minimize disturbances.

Larger, denser colonies tend to supply more young to the population than do smaller, less dense colonies. Dunn et al (1981) found 44 colonies with more than 50 active nests in Ontario, and these colonies contained 37% of the province's total estimated population of great blue herons.

A colony of any size isolated by a large radius from other colonies should be afforded protection. The colony may occupy the only suitable breeding habitat in the area, and may represent the only source of breeding birds within the area.

The size of a colony, however, is not the only factor that should be looked at in evaluating its regional significance. In northern Ontario, virtually all great blue heron colonies are small in size because of marginal habitat conditions. The significance of these colonies should, therefore, not be assessed by making comparisons with much larger colonies found in southern Ontario.

## 3.3 Habitat Conservation for Heronries

The habitat requirements of herons require consideration in land-use planning, and when considering proposals concerning development, resource use, and the recreational use of Crown lands. The following initiatives on the part of fish and wildlife managers will help to ensure protection and conservation of this valuable wildlife resource.

### 3.3.1 Inform Property Owners or Developers

An effort should be made to inform the landowner about the special requirements of heron species as soon as the location of a heronry on private land is known. Contact should be made with any public or private agency involved in a proposed development before the activity threatens an existing heronry.

### 3.3.2 Provide Input Early

Fish and wildlife managers should be aware of the appropriate time for providing input into resource use plans that could threaten heronries. Habitat concerns should be identified during the early stages of this process, since they are much more likely to receive serious consideration if

identified before detailed resource-use plans are developed. In the case of major activities or developments proposed for previously unsurveyed areas,* provisions should be made to protect heronries that are discovered during inventories.

It is not possible to discus in detail the steps for each type of development which could threaten a heronry. However, the development of forest management plans, and a discussion at the appropriate time for providing input, is included in Appendix 4.3.

## 3.4 Buffer Zones

Written specifications for the establishment of buffer zones shielding heronries from habitat destruction or disturbance should be required in all permits for activities or developments that pose a potential threat to those heronries.

Buffer zones should be established around each active heronry that is vulnerable to human disturbances during the sensitive breeding season. This season is roughly as follows in the sections of the province indicated:

| | | |
|---|---|---|
| Southern Ontario | (lat.42°N - 44°N) | March 15 - August 1 |
| Central & Northern Ontario | (lat.44°01' - 54°N) | April 1 - August 15 |

Arrival dates in the province and the timing of egg laying can vary greatly, according to latitude. Werschkul et al. (1977) noted that larger heronries tended to have earlier arrival dates on the Oregon coast.

In view of the varying sensitivity of herons in different colonies, it is not possible to set a precise distance that will serve as a buffer zone in all cases. Response to disturbance varies with factors already discussed, including geographical location, degree of habituation to disturbance, size of colony, species present, and so on. As a general rule, it should be remembered that the majority of herons are extremely sensitive to disturbance, and that the widest buffer zone possible should be established around colonies.

For the purposes of these guidelines, the following zones represent the minimum level of protection that should be provided for heronries. Information on the buffering distances recommended by various colonial bird authorities is provided in Appendix 4.4

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*Environmental impact studies would be required under the Environmental Assessment Act for most major developments (subdivisions excepted).

### 3.4.1 Heavy Development Buffer Zone

#### 3.4.1.1 Size

During the sensitive breeding season, a heavy development buffer zone of one (1) kilometre should be established, extending from the peripheral nests of the colony.

#### 3.4.1.2 Prohibited Activities

Activities having a high disturbance factor, such as road construction, logging, forest site-preparation, pipeline construction, blasting and dredging should be prohibited in the heavy development buffer zone during the nesting season.

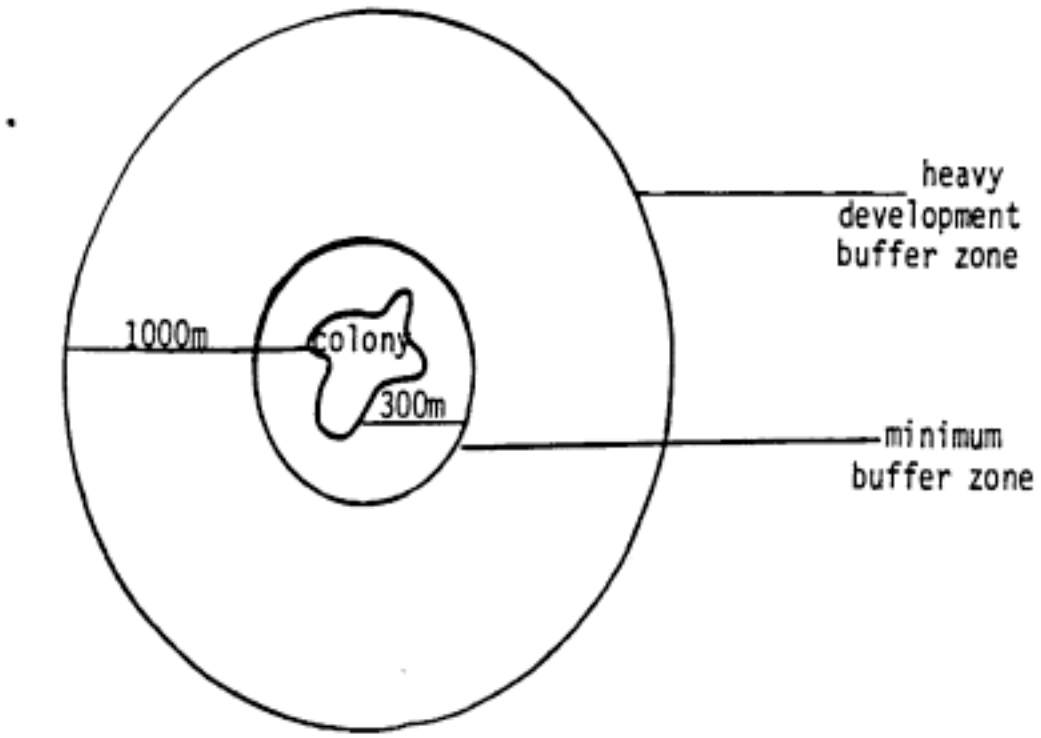


**Figure 2** Recommended Buffer Zone

### 3.4.2 Minimum Buffer Zone

3.4.2.1 Size

During the sensitive breeding season, a minimum buffer zone of 300 metres (1000 feet) should be established, extending from the peripheral nests of the colony (Fig. 2).

3.4.2.2 Specifications for Entry

The minimum buffer zone and colony proper should be entered during the least sensitive parts of the breeding season (Figs. 3 and 4), and only by the following:

i Staff of the Ontario Ministry of Natural Resources or Canadian Wildlife Service who are conducting the yearly census, or other studies;

ii Persons conducting research approved by the Ontario Ministry of Natural Resources (see Section 3.6.1).

3.4.2.3 Activities Prohibited in Minimum Buffer Zone at All Times

Activities that would necessitate the removal or disturbance of trees or ground vegetation in the minimum buffer zone and in the colony proper should be **prohibited at all times**. The vegetation should remain intact to serve as a deterrent to man and predators (see Section 3.6.3). Trees in the buffer zone are also needed as nesting sites, should the colony increase in size, and to shield existing nests from the elements.

The use of all-terrain vehicles and snowmobiles is prohibited since these activities create trails through the vegetation making access to the colony easier, and they may also initiate erosion.

3.4.2.4 Activities Prohibited in Minimum Buffer Zone During Breeding Season

All of the following activities or types of intrusion should be prohibited in the minimum buffer zone and colony proper during the sensitive breeding season:

i Pedestrian foot traffic.

ii Off-road vehicles (all-terrain vehicles, swamp buggies, trail bikes, etc.).

iii Recreational activities, including camping, hunting, bird watching, and photography.

iv Pets or livestock.

v All development, forest management and wildlife habitat management activities.

3.4.2.5 Activities Permitted in Minimum Buffer Zone and Colony During Non-nesting Season

Activities that could be permitted (unless otherwise prohibited) in the minimum buffer zone and colony proper during the non-nesting season are as follows:

i Habitat management to enhance the colony site.

ii Wildlife management activities that do not interfere with the nesting habitat (eg., erecting wood duck boxes in areas outside of colony proper).

iii Recreational activities such as hiking, camping, and hunting.

### 3.4.3 Aquatic Buffer Zone

During the sensitive breeding season, an aquatic buffer zone of at least 300 metres (1000 feet) should be established to protect heronries situated on the shores of islands, lakes or rivers. If posting of the aquatic buffer is not possible, landing on the shore near the colony should be prohibited.

In the case of heronries situated on water bodies which are being opened up to boat traffic, it may be advisable to post signs in the water notifying recreationalists of the establishment of aquatic buffer zones.

## 3.5 Habitat Management

### 3.5.1 Feasibility

The feasibility of undertaking habitat management in any colony should be carefully examined. Management may be desirable in some cases to maintain the vegetation in the colony proper and minimum buffer zone, or to improve the quality of aquatic feeding areas. Since factors influencing nest site selection are poorly understood, the habitat must not be altered in ways that could result in rejection of the site by the birds.

For most Ontario heronries, the major management requirement is colony protection. Habitat acquisition should be considered in order to provide long-term protection for important colonies.

### 3.5.2 When to be Undertaken

Habitat management should be undertaken in the colony proper and minimum buffer zone only in the non-breeding season (eg., the period following the dispersal of the birds from the heronry and surrounding area, and ending before the arrival of the adults in spring. (see Figs. 3 and 4).

### 3.5.3 Management of Colony Site and Buffer Zone

3.5.3.1 Techniques Not to be Used

No trees or shrubs, living or dead, should be removed from the colony proper or from the minimum buffer zone of the colony.

3.5.3.2 Suggested Techniques

The following management techniques could be useful, if improvement of habitat is desirable:

i Manage for dense ground vegetation, which helps to shield colonies from human intrusions and ground predator disturbance. Install artificial nest baskets (Markham and Brechtel, 1978) to replace nesting sites that have been lost. This effort should be coupled with long-term management for preferred nesting trees and shrubs. Artificial nests may keep colonies active, but cannot be relied upon to maintain populations.

ii Obtain help from a plant pathologist to determine if diseased nesting trees in a colony can be saved.

iii Manage for tree or shrub species preferred as nesting sites.

iv Manipulate water levels through cooperation with the appropriate water-control agencies, to prevent inundation of the floor of the colony. Flooding could result in the death of trees or ground cover.

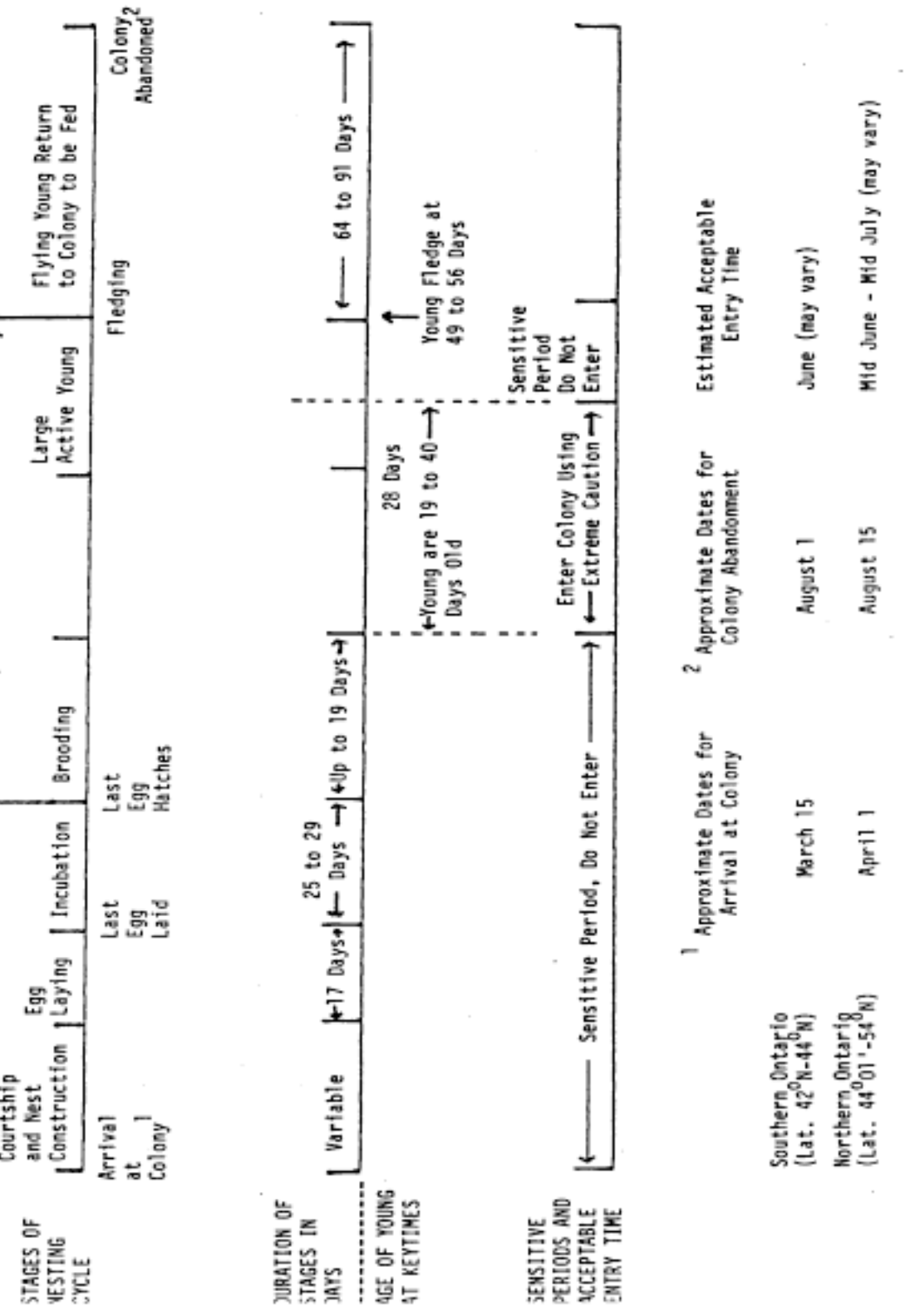


**Figure 3** Sensitive Periods in the Nesting Cycle of Great Blue Herons

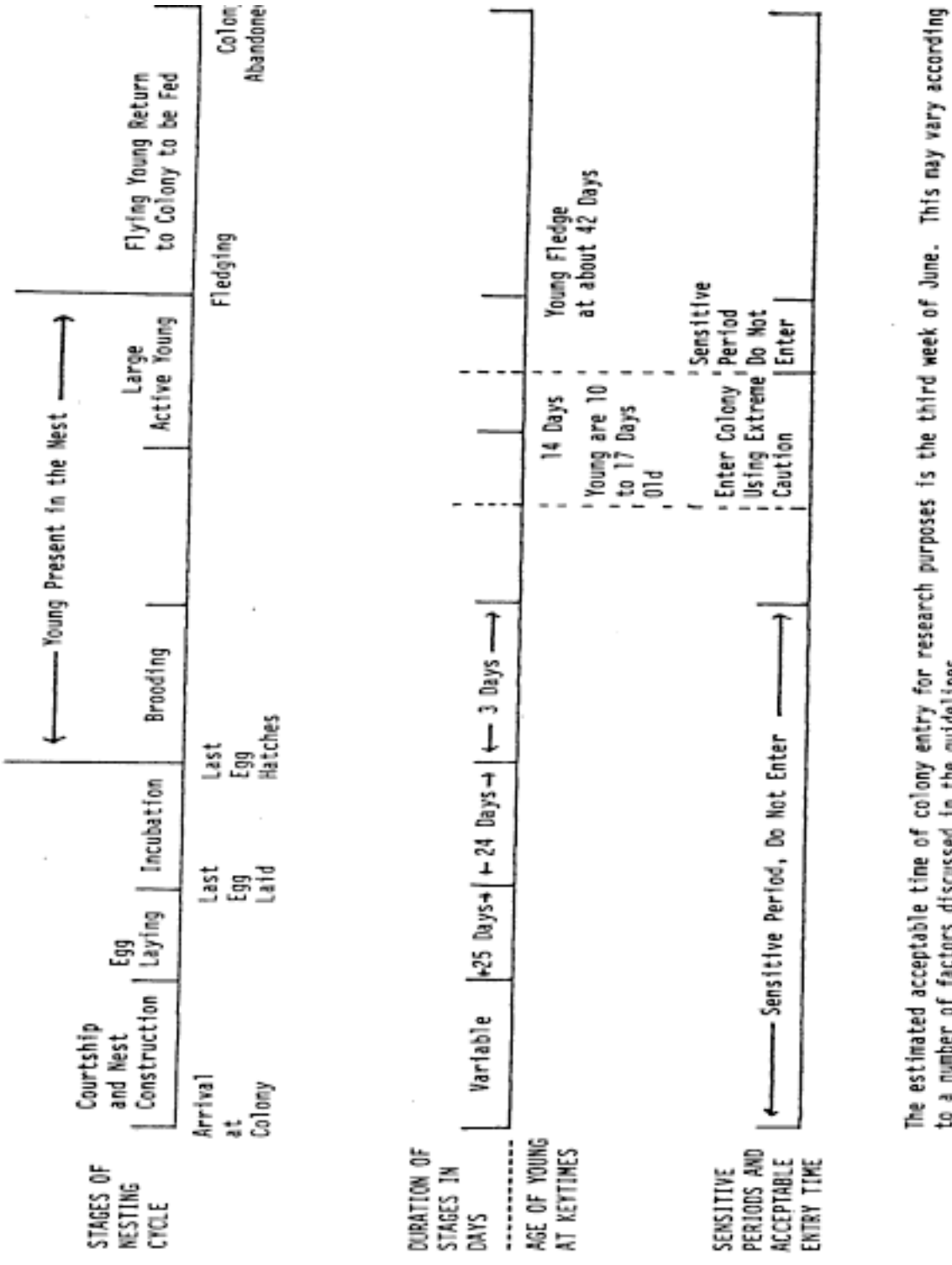


**Figure 4** Sensitive Periods in the Nesting Cycle of Black-crowned Night Herons

3.5.3.3 Management of Feeding Areas

Cooperation with water-control agencies may be necessary to maintain water quality, levels, and flow at key heron feeding areas, thereby ensuring optimum production of prey species.

3.5.3.4 Fencing or Posting of Colonies

Fencing or posting may not be required or even desirable in colonies that are not subject to disturbance, or in which ground vegetation is dense enough to discourage visitors, since signs and fences may focus attention on that colony.

Buckley and Buckley (1978) recommend posting of all colonies vulnerable to human disturbances with educational/admonitory signs. If greater protection is required, they recommend "symbolic" twine fencing, but never wire.

3.5.3.5 Protection of Sites Associated with Heronries

In addition to the colony site, a number of other sites used by herons and egrets during the breeding season may require special protection - for example, feeding and loafing areas. These "associated" sites have not been identified for the majority of heronries. However, if an important site **is** known, the level of protection to be provided should be decided by the district concerned.

## 3.6 Research in Colonies

### 3.6.1 Conditions of Approval for Research Proposals

3.6.1.1 All research proposals for work in heronries will be reviewed and evaluated by the Wildlife Branch. Proposals should be rejected:

i if the birds would be severely disturbed because of the nature of the research;

ii if disturbances would be caused in the sensitive periods of the breeding season (Figs. 3 and 4);

iii if there is evidence that precautions to avoid disturbances are inadequate.

3.6.1.2 Persons in charge of approved work in colonies will be responsible for the actions of members of their work teams.

Persons conducting approved work in colonies will be asked to assess and recommend ways to minimize disturbances caused by their visits.

3.6.1.3 The Ministry shall release colony locations to legitimate researchers on the condition that such information is treated confidentially.

### 3.6.2 Use of Standard Survey and Census Techniques

Where applicable, standard survey and census techniques and terminology (Appendices 4.1 and 4.2) should be used by researchers and by Ministry workers, so that present and future status and long-term trends of heron populations will be comparable within Ontario.

### 3.6.3 Aerial Surveys and Censuses

Aerial surveys and censuses of heronries can frequently be combined with other work in the districts. Although aerial censuses are not as accurate as ground censuses, they are an effective means of monitoring colonies over a wide area. If more accurate data are needed, ground censuses should be conducted.

Kushlan (1979) suggests the following precautions to minimize colony disturbance when censusing from the air:

The colony should be approached gradually by first circling it at a distance either latitudinally or horizontally, and then moving closer for the count. The aircraft should fly around the periphery of the colony. Helicopters should fly slowly but not hover over the colony. Continual attention should be paid to signs of drastic disturbance during the census.

Aerial census should not be conducted during the most sensitive stages of the nesting season (Figs. 3 and 4).

### 3.6.4 Guidelines for Persons Entering Heronries

Extreme caution must be exercised in entering an occupied heronry. Persons entering heronries during the breeding season for research or for other approved activities will avoid all undue disturbances to both adult birds and young by following these guidelines:

3.6.4.1 Heronries should not be entered during the periods of courtship, pair formation, nest building or egg laying, because of the danger of nest or colony abandonment.

3.6.4.2 Heronries should not be entered while the adults are incubating eggs or brooding young because embryos and young can die as a result of exposure or predation while adults are absent from the nest.

3.6.4.3 Heronries should not be entered while the unfledged young are capable of scrambling from the nest. Young may become lost, or fall to the ground in an attempt to escape observers.

3.6.4.4 Heronries should not be entered on very hot or very cold days, or during rain, to avoid unnecessary exposure of the young to inclement weather conditions.

3.6.4.5 When research is planned in a colony, the sequence of courtship and incubating behaviour should be observed from a distance in order to determine the best time to enter the colony. An effort should be made to obtain the advice of experts involved in colonial bird research before colonies are entered. Figures 3 and 4 depict sensitive times of the breeding season (eg., courtship, nesting building, egg laying, incubation, brooding and presence of older young) for great blue herons and black-crowned night herons.

3.6.4.6 The routine to be followed in the heronry should be established well in advance to minimize the duration of the disturbance. The layout of the colony should be determined before entry (from air photos) to allow the organized movement of researchers.

Heronries should be entered slowly, by one researcher, or by a very small number of researchers, to avoid alarming the birds. Observer teams should not split up over a wide area once inside

the colony. The same route should be followed when entering or leaving the colony. All movements should appear unhurried and there should be a minimum of conversation. No attempt should be made to hide since "the sudden appearance of anyone invariably creates panic." (McVaugh, 1972).

3.6.4.7 Heronries should be entered approximately three hours after the early morning or late afternoon feedings to minimize regurgitation of food by the young. Entry time in a particular colony should be determined by observing the feeding routine at a distance.

3.6.4.8 Only one visit should be made per heronry in the least sensitive period of the nesting season, and no visits should take place during the sensitive times (Figs. 3 and 4). If additional trips are absolutely necessary, they should be infrequent and of short duration to minimize predation while adults are absent from the nest, and to prevent predators from following scent trails into the colony.

3.6.4.9 If extended studies are to be conducted, heronries should be entered over a period of hours, or days if possible, to accustom the birds to the presence of humans (McVaugh, 1972).

3.6.4.10 If heronries are entered while the young are too small to defend themselves against avian predators, special care must be taken to avoid times when large numbers of crows, ravens or gulls are in the vicinity.

3.6.4.11 If crows, ravens, gulls or other predators begin to enter a colony when researchers are present, the researchers should leave immediately.

3.6.4.12 If young do leave the nest, **no attempt should be made to replace them**. Eggs and young must not be touched or disturbed in any way. Buckley and Buckley (1978) include these actions and also the chasing of young (eg., to count them) under the title "*Prohibited Behaviour*".

3.6.4.13 No person conducting research in a heronry, nor any person entering or working in the buffer zone shall construct a foot trail, snowmobile trail, or other access route that will facilitate accessibility to a heronry or increase its vulnerability in any way.

## 3.7 Education and Interpretation

An effective education strategy aimed at informing people about colonial birds and their special requirements is essential to ensure the protection of Ontario's heronries. "Much of the enforcement called for now could be discarded if the human users of these areas were educated to the needs and sensitivities of the animals." (Buckley and Buckley, 1978)

### 3.7.1 Messages

The following messages should be incorporated in all interpretive materials or programs:

1) Heronries should not be disturbed.

2) Heronries on private and public lands should be conserved.

3) Locations of any heronries found should be reported to the Ministry of Natural Resources. (Locations should not, however, be published in educational or interpretive materials made available to the general public.)

### 3.7.2 Interpretive Tools

The interpretive tools described in this section are suggested as examples only of materials or program activities that might be implemented to promote the messages outlined above.

#### 3.7.2.1 Signs

The benefits of posting educational or warning signs must be weighed against the disadvantages. Signs would be respected by some individuals, but they would not deter vandals. In fact, signs, which are visible from a distance, could draw attention to a colony.

In order to make signs more effective, they should include a warning and an explanation of why trespassing is prohibited. Buckley and Buckley (1978) suggest two tiers of signs, an informational sign to be erected some distance from the colony, and a warning sign closer to the colony.

3.7.2.2 Pamphlets

An illustrated pamphlet could be developed for distribution by the districts. This pamphlet could provide general information on the biology and distribution of herons and egrets, conservation goals, the sensitivity of colonial birds to disturbances.

3.7.2.3 News Releases and Advertisements

News releases or advertisements could be circulated to newspapers and to publications of major naturalist, outdoor recreation or sportsmen's groups prior to the breeding season. This would be a good way of informing the public about the sensitivity of nesting herons and other colonial nesters.

3.7.2.4 Educational Viewing Programs

The assistance of a scientific authority on colonial birds is an essential prerequisite in evaluating and selecting any site to be used for educational viewing purposes, and in determining precise distances for boardwalks or viewing stations.

Educational programs can be developed that make use of certain colonies for educational viewing purposes. Colonies selected should be those in which the birds are habituated to the presence of humans. Viewing should take place only during the least sensitive times of the breeding season (Figs. 3 and 4). Guidelines concerning buffer zones should be strictly observed, and boardwalks or fenced nature trails should be constructed at distances well beyond the minimum buffer zone of 300 metres to control viewer traffic. Viewing points should be established beyond the buffer, in natural clearings or on small rises. **Trees or shrubs should not be removed or thinned to facilitate viewing.**

Groups using the boardwalks or trails should be accompanied by a guide whose job it would be to give an interpretive talk and to ensure that visitors remained well away from the nesting birds.

3.7.2.5 A/V Shows and Exhibits

An audio-visual presentation and exhibits describing the biology of herons and egrets, conservation goals, the sensitivity of colonial birds, etc., could be developed as interpretive-educational tools to be used at wildlife viewing weekends and in provincial parks.

3.7.2.6 Local Interest Groups

Naturalists, hunters and other recreationalists can effectively promote conservation interests in the community. If concern exists about disturbances in a particular colony (or group of colonies) these individuals should be notified, and an effort made to obtain their assistance in policing the colony(ies) and initiating protective measures. Contact with members of the community may alert Ministry staff to potential problems.

# 4.0 Appendices

## 4.1 Census Instructions for Heronries

### 4.1.1 Terms Defining Status of Nests

Active Nests: those nests which are being used by breeding birds, and which are distinguished by the presence of one or more of the following:

- adults on the nest
- eggs or young in the nest
- "white-washing" (excrement) on the nest, tree branches or branches, or or ground below the nest (see also definition for nests of unknown status)
- large blue egg shells, dead chicks, or food items on the ground.

Inactive Nests: those nests that lack any of the characteristics defining active nests.

Nests of Unknown Status: those nests whose status is difficult to determine because of visual barriers, or the presence of whitewash that could be attributable to an active nest higher up on the same tree.

### 4.1.2 Censusing of Great Blue Heron Colonies in Woodlots and Swamps

The Ontario Heronry Inventory method used for censusing great blue heron colonies in woodlots and swamps is as follows:

i Each tree in the colony is marked with surveyor's tape after the number of active nests, inactive nests or nests of unknown status have been noted on the field sheet.

ii Binoculars should be used to determine the status of nests.

Nest status should not be judged on the basis of size considerations, since new nests can be extremely flimsy.

iii Censusers should leave the colony immediately if young fall fall from the nest or if predators such as crows, ravens or gulls begin disrupting the colony.

iv A check is made to ensure that all nest trees are marked and that all field sheets are complete.

v The surveyor's tape is removed and the censusers leave the colony.

### 4.1.3 Great Blue Heron Colonies in Deep Beaver Ponds

This procedure should be used if nest trees cannot be approached owing to deep water, and if nests are visible from points along the "shore". It should not be used if a view of the nests is obscured by dense foliage.

i The colony should be divided into groups of nests using visual reference points agreeable to the two individuals who will perform the census.

ii The number of nests in each grouping should be counted and recounted by the two observers until both arrive at the same number.

iii The occupancy status of nests in each section should be agreed upon (eg., active, inactive, or unknown).

iv The above procedure should be repeated, using different vantage points, if possible.

### 4.1.4 Colonies With Species Nesting Close to Ground

Caution must be used when censusing colonies in which the birds are nesting close to the ground (eg., in low shrubs), since the potential for disturbance is greater. The procedure described for woodlots and swamps could be used by experienced personnel in small colonies. Ground transect sampling or aerial censusing should be considered in large colonies to avoid disturbing the birds for long periods of time.

## 4.2 Ontario Heronry Inventory Census Field Sheets and Record Sheets

Colony Number _____

ONTARIO HERONRY INVENTORY

GREAT BLUE HERON CENSUS: **FIELD SHEET**

Date of Census: _____ Time of Day: _____ to _____
(month, day, year) (start) (end)

Name(s) of censuser(s): _____

_____

Colony name or location _____

_____

Record the number of nests in each tree in the appropriate column: eg., 5 nests total; 3 active, 2 inactive. There should be a few "unknowns". If you cannot complete the count, at least try to get as accurate an estimate as possible of the total number of nests present.

| Total nests in tree | No. of active nests (adults, eggs or young present, whitewashing visible) | No. of inactive nests (No adults, eggs, young or whitewashing) | No. nests of unknown status |
|---|---|---|---|
| | | | |

Please complete back of sheet before leaving colony

| Total nests in tree | No. of active nests | No. of inactive nests | No. of nests of unknown status |
|---|---|---|---|
| | | | |

Indicate type of supporting trees: deciduous _____ coniferous _____mixed _____

alive _____ dead _____ mixed _____ species (if known) _____

Estimated average height of nests from ground: _____

Wet _____ or dry _____ under nest trees (check one).

General conditions during census (approximate temperature, precipitation):

_____

_____

Colony Number _____

ONTARIO HERONRY INVENTORY

GREAT BLUE HERON CENSUS: **RECORD SHEET**

Complete as soon as possible after your census, and mail by July 15, 1981 to: OHI, Long Point Bird Observatory, P. O. Box 160, Port Rowan, ON NOE 1MO

1. Name and address of chief censuser:_____

_____

2. Colony name and location: (include military grid if possible) _____

_____

3. Date of Census: _____ Time of day: _____ to _____
(month, day, year) (start) (end)

4. Weather conditions during census (approximate temperature, amount of precipitation):

_____

5. Census results:

| | Active nests | Inactive nests | Status Unknown | Total |
|---|---|---|---|---|
| No. of nests: | | | | |

Are the above totals actual counts _____ or an estimate _____ (check one).

If the count was incomplete, give the reason below:

_____

_____

If more than one census was done, record the most reliable here, and give the results of other censuses on the back of this sheet.

Was it easy _____ or difficult _____ to get a complete count of the nests in this colony? (check one) If difficult, give reasons:

_____

6. Total no. nest trees: _____

7. Tree type supporting nests (check one): deciduous _____ coniferous _____ both _____

8. Status of nest trees (check one): alive _____ dead _____ both _____

9. Species of nest trees (if known): _____

10. Estimated average height of nests above ground: _____

11. Condition of heronry terrain (check appropriate space for each):

    Easy _____ or difficult _____ to find heronry and way home.

    Easy _____ or difficult _____ to walk through heronry.

    Wet _____ or dry _____ under nest trees..

12. Were the directions provided adequate for you to find the colony? If not, explain why and forward amended sketch map and/or written instructions, (including military grid coordinates if possible) for future censusers.

    _____

    _____

13. Was there any evidence during your census visit of threats to the future of this heronry? (give details): _____

    _____

14. Please comment on the census methods and instructions, for the benefit of future censusers. Were the instructions and record sheets clear and straightforward?

    Yes _____ No _____ Please describe specific difficulties and make suggestions or changes.

THANK YOU FOR YOUR HELP!

## 4.3 Forest Management Plans

A general knowledge of planning procedures is required if resource managers are to ensure that fish and wildlife habitat requirements are considered in proposals for various activities or developments. This section provides, as an example, a description of the planning process for one activity - timber harvesting.

In order to effectively identify fish and wildlife concerns at the planning stage of forest management units, Fish and Wildlife mangers must first be aware of the various steps in the planning process. The steps outlined below are summarized from pages two (2) and three (3) of "*Standards and Guidelines for Moose Habitat Management in Ontario*" by the Ontario Moose Council.

The first planning step for all forestry management units entails the preparation of a Management Plan Report. These reports are prepared either by the licenced holder of an area large enough for "sustained yield management" or by the Ministry of Natural Resources, in the case of all other units. Plans must be prepared in accordance with specifications outlined in the *"Manual of Management Plan Requirements for the Province of Ontario*" (January, 1976).

The specifications in the "Manual" provide for the identification of fish and wildlife habitat requirements in Management Plan Reports. Section B(12) entitled "Other Forest Uses", in Part 1 of the "Manual" states:

The requirements for forest uses other than timber production, such as fish and wildlife production, recreation, wilderness, research and others are stated in this section and are based on the capability of the area to provide them and the feasibility of making them available.

Where plans for other uses on the area have been developed, a summary of each shall be shown in this section; the original document shall be filed with the management unit or may be appended to the plan.

In each particular case, a statement shall be made in this section as to how the objectives for the other uses will be attained, by what means and with whose cooperation. The agreed upon objectives shall be stated in Section 7 and shall also form an integral part of the prescriptions made for silvicultural systems in Section 9. Details of the requirement treatment shall be shown in the operating plan.

Concerns with respect to heronries must be identified in Management Plan Reports. This ensures their consideration at the next stage of the planning process - The Operating Plan.

The Operating Plan is worked out for a five (5) or ten (10) year period and outlines specifications for actual work to be done in the management unit, such as cutting, planting, etc. Any work to be undertaken must meet the standards described in the Management Plan Report. The details of fish and wildlife habitat requirements must be identified at this stage. In the case of heronries, buffer zone requirements, etc., would be identified.

Annual plans, as the name suggests, are prepared annually, and describe work to be undertaken in any given management unit over a period of only twelve (12) months. These plans further refine the work specifications outlined in the Operating Plan and provide the last opportunity for change before final approval is given.

## 4.4 Buffer Zones Recommended by Colonial Bird Authorities

The recommendations of several colonial bird authorities on the buffer zone requirements of heronries are presented as follows:

i Buckley and Buckley (1978:28) in "*Guidelines for the Protection and Management of Colonially Nesting Waterbirds*" advise that a 300 metre (1000 foot) buffer is suitable for most ground-nesting colonial birds, but recommend "...an exceptionally wide buffer zone around the base of tall-tree colonies, as the greater visibility from these heights renders them disturbable at greater distances."

ii Vermeer (letter dated September 17, 1977) recommends a no-boating buffer zone of one kilometre (3,278.9 feet) for colonies situated on lake islands or lakeshores.

iii McVaugh (letter dated September 26, 1977) recommends "a minimum zone of one-half mile (805 metres) radius... around all heronries."

The Fish and Wildlife Division of Alberta's Department of Recreation, Parks and Wildlife has recently developed a draft "Colonial Waterbird Management Plan" for white pelicans (*Pelecanus erythrorhynchos*), double-crested cormorants (*Phalacrocorax auritus*) and great blue herons (*Ardea herodius*). The "Plan" proposes that on Alberta Crown lands, all active great blue heron colonies and a half (0.5) kilometre buffer strip should be designated as "Wildlife Protection Areas" under the Wildlife Act. The acquisition of private lands supporting well-established heronries is also recommended. In each case, the property to be acquired would include the colony site and a minimum half (0.5) kilometre (1640.5 foot) buffer zone; ideally, the quarter (.25) section in which the colony is situated would be purchased. If a landowner is unwilling to sell, an attempt will be made to negotiate an agreement for the protection of the colony and the habitat in a minimum half (0.5) kilometre buffer zone.

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