

ONTARIO NEST RECORDS SCHEME HANDBOOK



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Cover photos by George Peck. Front: Cedar Waxwing with young; Back: Semipalmated Plover nest with eggs.

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ONTARIO NEST RECORDS SCHEME HANDBOOK

Welcome to the Ontario Nest Records Scheme	2
How You Can Participate	4
Your Questions Answered	4
When to look for nests	4
How many times to visit the nest	5
Where are nest records wanted.....	5
Nest boxes and colonies	6
Rare species.....	6
Historical records	7
Nest Recorder's Code of Conduct	8
Hints for Finding Nests	11
Reference Materials	12
Completing the Nest Record Card	14
Scannable cards.....	14
General guidelines for completing cards.....	14
Sending in your cards	16
Completing the front of the card	16
Completing the back of the card	21
Recording Nests in Colonies	24
Status Codes Explained	25
Habitat Codes Explained	27

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based partly on material from the BTO Nest Record Scheme Handbook

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WELCOME TO THE ONTARIO NEST RECORDS SCHEME

The **Ontario Nest Records Scheme** (ONRS) is, essentially, a collection of record cards, each detailing one or more visits to an occupied bird's nest, a nest under active construction, or an active nesting colony in Ontario. The majority of cards are submitted by field volunteers who find nests and record the relevant data on nest cards.

These data, especially from nests that have been visited multiple times, have tremendous potential for monitoring the health of bird populations in Ontario and the impact of human activities on birds. Some of the ways these data can be used include:

- monitoring clutch size, hatching success, fledging success, predation rates, and other factors over time, to determine whether sufficient young are being produced to maintain healthy populations.
- providing information on egg laying dates to help identify safe periods for management activities such as harvesting hay or timber.
- documenting the effects of climate change on breeding birds (e.g., changes in nesting dates, nesting success or distribution).
- evaluating the impact of Brown-headed Cowbirds and various predators on nesting success of songbirds.
- documenting basic breeding biology such as nesting habitat, nest site selection, incubation period, renesting, additional broods, etc.
- documenting the breeding distribution of each species in Ontario.

The **Ontario Nest Records Scheme** (ONRS) needs your help to achieve these goals. Simply by sending in Nest Record Cards you can help the ONRS to understand better the breeding biology and population health of Ontario's birds.

Since 1956, the ONRS has accumulated a collection of more than 120,000 nest record cards. Why the need for more? Each year's intake of cards increases the precision with which the ONRS can detect changes in the distribution, productivity, numbers and breeding biology of the province's breeding birds. Cards are needed for as many species as possible, each year, to monitor changes over time.

In many respects, the past century has been witness to the development of an increasingly hostile environment. The fortunes of our nesting birds provide valuable indicators of the quality of the space that both birds and humans enjoy or endure.

The files of the ONRS contain not only current nest card submissions, but also all available historical nest records, both published and unpublished. Published records have been transferred to nest cards from books, journals, newspapers, naturalist club newsletters; unpublished sources include the field logs of many amateur and professional naturalists, both living and deceased, and various government reports and censuses. Thus, the ONRS has become the most comprehensive source of provincial breeding bird data in Ontario.

This huge database has been summarized and published in a two-volume work entitled *Breeding Birds of Ontario: Nidology and Distribution, Volume 1: Nonpasserines; Volume 2: Passerines*. These books have been updated by published revisions and appendices to keep

the information current. Summaries from the Scheme have been cited in many ornithological text and papers.

Because birds are an important indicator of the state of the environment, the files of the ONRS have been used by environmental consultant firms, national and provincial government agencies, university researchers, students, authors of natural science and regional bird books, and many other individuals and agencies.

The ONRS files have detailed the drastic declines of the breeding populations of the Bald Eagle and the Peregrine Falcon in the 1960s and 1970s, and also have recorded the heartening increase in the current breeding numbers of both of these species.

Decreases in nesting numbers of Loggerhead Shrike, Wood Thrush and many wood warblers, as well as the rapid increase in House Finch populations have also been chronicled. Changes in the breeding distribution of many species, resulting, in part, from agricultural development, are apparent from the database. Such documentation is vital to our efforts to protect our environment and its biodiversity.

Recently, efforts have begun to transfer all of these data into a computerized format to enhance their accessibility and value. Images of the cards are being scanned, indexed, and stored on CD-ROM for safekeeping and for easier distribution. Computer programs are being set up so that staff and volunteers can start coding and entering all the details on each card into databases where they can be readily analysed.

As part of this process, we have redesigned the Ontario Nest Records Card so that new data can be quickly and easily captured on computer. The

new card still asks for essentially the same information as before, but in a more standardized way, using a carefully selected set of codes. These new cards are designed so that much of the information can be scanned and interpreted by computer, thus greatly speeding up the process. For even greater accuracy and efficiency, we are also developing web pages where participants can enter their data directly over the Internet, without the need for any interpretation at our end. These web pages will also be used to provide contributors with feedback on how their data are being used and summaries of results from the Scheme.

The strength of the ONRS comes from welcoming contributions from both specialist and occasional nest finder alike. The bulk of contributors, who form the backbone of the Scheme, find just a handful of nests each year. Others build up their nest finding into an absorbing hobby, that involves spending many hours in the field annually. All agree that there is no better way of understanding how a species "ticks." Nest studies provide marvellous insights into the private lives of birds that we need to unravel in order to conserve them.

By sending cards to the ONRS, the combined efforts of amateur birders and professional ornithologists allow the Scheme to monitor how our birds are coping with the modern environment in a way that no single observer could ever accomplish.

We hope you will join us.

HOW YOU CAN PARTICIPATE

Taking part in the ONRS is simple:

1. Cards are available **free** from the ONRS for use within the Scheme.
2. Please complete one card per nesting attempt.
3. Follow the **instructions** for filling in the cards and refer to the handy pocket-sized "**Coding Card**" as a reminder of the codes required. Please write neatly so that we, and the computer, can read your data correctly.
4. Take proper care when observing nests. Read the **Nest Recorder's Code of Conduct** (see below) and follow it at all times. It is important to put the bird's interests first and not to endanger the nest. If the Code is adhered to, then there is no need to worry that the nest might suffer, and you can be sure that the information gained will be of benefit to conservation and science.
5. Be very careful when recording the contents of nests in precarious positions, especially in trees and on cliffs or quarries. **The ONRS cannot accept responsibility for any accident that occurs while nest recording.**
6. Please send in cards for **all** recorded nests. It is very important that contributors **do not** just send in those records that "seem interesting" or just those which are successful: **the ONRS needs all records of nests whether successful or not.** We cannot calculate the success rates of nests if we do not know how many failed.

Remember that there is **no minimum contribution** of cards each year: the ONRS is grateful for **every** card that has been completed as fully as possible.

YOUR QUESTIONS ANSWERED

1. DO I RECORD ANY NEST?

No. The ONRS needs records of "**actively used**" nests, i.e. nests that contain eggs or nestlings, or nests under active construction. Where a nest was abandoned or destroyed some time before being found by the observer, it is impossible to estimate accurately when construction or egg-laying began, or how many eggs the nest originally contained.

2. WHEN SHOULD I START LOOKING FOR NESTS?

You should **keep your eyes open throughout the year** as birds like Rock Doves, certain finches and House Sparrows have extended nesting periods. Some species like Great Horned Owls start nesting in **February**, and several species start to nest in **March** or **April**. The greatest nesting activity will be in **May, June** and **July**. It is always tempting to reduce one's searching effort after **July**, but some species continue to nest until **September** or even later, though their song output will have dwindled. Some species have **second** and even **third** broods before winter sets in. They often nest in previous nests or very close to them. Because clutch size, parasitism rates and nesting success may be quite different for late nests, it is important for the ONRS to receive records of such nests every year. So please do try to **see the season through!**

3. HOW MANY VISITS SHOULD I MAKE?

Preferably **more than one** visit to each nest, because two checks, even just a day apart, provide so much more useful information than a single visit. From two visits it is possible to **calculate a survival rate** for the nest or contents (for example: the nest survived 5 days; two out of three nestlings in another nest survived 4 days, etc.). Enough visits to record the date of the last egg laid and the beginning of hatching, in most cases provide an **incubation period**. Multiple visits are usually needed to determine the completed clutch size and to estimate the laying date. It is precisely this sort of information that the ONRS needs in order to monitor the success rates of nests each year and obtain breeding biology information. So, cards with **two or more visits are particularly valuable** to the Scheme. However, even if you are only able to visit the nest once, cards with a single visit can provide useful information on distribution and habitat, especially for poorly known species.

Moving to the other extreme, it is neither necessary nor desirable to inspect nests daily or more than once per day. **A few well-planned visits can provide all the information required.** Ideally these would be:

- a. **Laying period:** two afternoon visits to show date of first egg and rate of laying.
- b. **Incubation period:** two or more visits to show completed clutch size and later to check that no egg-losses occur.
- c. **Hatching period:** one or two visits at or just after hatching time to give the incubation period and the number of eggs hatched. Care

is needed, because parent birds are often sensitive to disturbance during hatching.

- d. **Nestling period:** a visit when young are half-grown to show how they are surviving, and another at three-quarters grown to give the number which are likely to fly.
- e. **Fledging period:** one or two visits at this time help confirm nest success or failure and furnish an exact fledging period for nidicolous young. Care is needed to avoid causing premature fledging.
- f. **Post-fledging period:** it is worth checking some time after fledging for dead eggs and young, and also because the parents may re-nest in the same nest, or close by.

Most nests are found after the clutch is complete, so a visit every three days ensures that at least the approximate hatching date can be obtained. The spacing of visits should match the breeding cycle of each species and adhere to the Nest Recorder's Code of Conduct.

Of course, it is often impossible to keep to such a schedule, but it is described here to show the optimum routine for most species. Just remember that **any active nest that has been visited more than once provides a valuable record** for the ONRS.

4. DOES THE ONRS WANT RECORDS OF BIRDS IN MY GARDEN?

Yes! The ONRS needs Nest Record Cards from **all habitats**. We are especially keen to receive records from natural areas, but we need good numbers from towns and suburbia as well. Nest Records are needed from anywhere birds nest, from shores to hilltops!

5. WHAT ABOUT NEST-BOXES?

Yes! We want nest-box records too - they are often the easiest way to obtain accurate records of the nesting activities of some species (e.g. Eastern Bluebird, Tree Swallow, Purple Martin, House Wren). Not only are nest-boxes becoming increasingly important for these species (and others like Wood Duck, American Kestrel, Prothonotary Warbler), but also the ONRS can compare nesting success between birds using nest-boxes and those using natural sites.

6. WHAT ABOUT COLONIES?

Although we welcome information on colonies, it is important to remember that, unless extreme care is taken, **human intrusion can lead to possibly damaging disturbance** at colonies of any species. Waterbirds such as cormorants, herons, pelicans, gulls, and terns are especially vulnerable, as disturbance can lead to predation by gulls and crows, or young getting lost from their nests. Please avoid entering these colonies if possible – if you must, stick to the periphery of the colony as much as possible, and make each visit brief. When possible, try to view the nests from a distance.

If you are able to visit a colony multiple times and keep track of individual nests, we would like you to complete a card for each nest, or to make a table detailing the contents of each nest on each visit. We do not have a special card for this, but we would welcome the information in any form. You can use a standard card to record the details of location and habitat. If you are only able to visit a colony once, or if you cannot keep track of individual nests, you can provide a summary of the total number of nests in the colony and the contents of any you were able to inspect at each visit (e.g. 150 nests of which 34

inspected; 20 nests with 3 eggs, 10 nests with 2 eggs, 4 nests with 2 eggs and 1 young). You can write this information in one of the comments sections of the card, or on a separate paper.

7. WHAT ABOUT RARE SPECIES?

Recording the nests of rare species demands judgement and particular caution. If the species is being monitored and protected it may be necessary to obtain permission to examine its nest. Detailed information from the nests of rare species, if carefully and prudently obtained, can be of special significance, and may contribute to the species' protection. All records of rare species are kept separately and will be treated in confidence, following the guidelines of the Natural Heritage Information Centre. If you are concerned about reporting a particular nest, please feel free to contact us to discuss it.

8. WHICH SPECIES AND REGIONS ARE OF PARTICULAR INTEREST?

The ONRS would like to monitor the annual breeding performance of all of Ontario's breeding birds, so the records of any species, anywhere in the province, are valuable, especially if the record has multiple visits. Like the canary in the mine shaft, changes in the nesting success of even common species such as American Robin, Chipping Sparrow or Tree Swallow can serve as early warning of pending environmental problems. Of course, not all species will respond the same way, so we are keen to monitor as many species as possible. For this reason, we are particularly keen to receive records of uncommon species, species whose nests are infrequently reported, or species whose breeding ranges are restricted. Tables of the numbers of nests reported from each species throughout the province and from each region

each year are given in the ONRS annual report, These highlight the species and regions for which we particularly would like more data.

9. DOES THE ONRS WANT HISTORICAL RECORDS?

Yes! All records of nests are valuable to the ONRS. Historical nest records serve to point out changes in breeding populations and distributions, when compared with current records.

10. HOW DOES THE ONRS USE NEST RECORD CARDS?

The ONRS uses the cards to **monitor breeding biology, distributional changes, and nesting success** of Ontario birds in different habitats and regions and through time. Records are made available to those engaged in serious ornithological studies, both professional and amateur. The data will be entered into computer databases to ensure that they can be used as effectively and efficiently as possible.



Figure 1. Nest records for rare species, such as this Acadian Flycatcher, provide valuable information for developing conservation and management plans, such as identifying habitat where nesting success is high. Records of such species are treated confidentially for their protection. Take extra care when examining nests of rare species not to disturb the birds (photo by George K. Peck).

NEST RECORDER'S CODE OF CONDUCT

It is essential to minimize disturbance at nests for both ethical and scientific reasons. The basic principle is that observations should not jeopardize the safety of the nest. If due care is taken by an observer, the chance of accidental damage can be virtually eliminated. Each observer must exercise his or her responsibility, always putting the bird's interests first if a visit might endanger the nest. This applies with redoubled force where rare species are involved. There are two potential risks to the nest that must be eliminated during nest recording:

- a. Accidental damage to the nest
- b. Causing desertion.

Desertion may arise through natural causes, such as adverse weather, food shortage or the death of a parent, as well as from human disturbance. Sometimes too, for one of several reasons, a whole clutch fails to hatch despite being incubated well beyond the normal period and eventually the nest is abandoned.

With many species, a large number of nesting failures are due to predators such as crows, jays, weasels, squirrels, skunks, raccoons, snakes, small rodents, and cats.

Observers often fear that increased predation may result from the observer leaving a track or scent-trail to nests. However, a two-year investigation of this possibility by the British Trust for Ornithology Nest Record Scheme showed that nests visited frequently in bushes, hedges and thick undergrowth had similar success rates to others left undisturbed between laying and fledging. This finding has been

supported by the consistency of the results obtained from different observers' records, and is also supported by the records and findings of the ONRS and many other North American nest research projects.

That heavy predation constantly occurs in the absence of human involvement has also been demonstrated by searches of a completely undisturbed area late in the season. Far more nests were found which showed obvious signs of failure, than those which showed signs of successful rearing. Such findings are consistent with the normal high annual mortality of passerine breeding species. However, you should still do your best to minimize unnecessary disturbance of the nest.

PLANNING

Intelligent planning of observations makes daily visits unnecessary. The nest location should be noted accurately to avoid long searches on subsequent visits. To keep each visit brief, any equipment likely to be wanted at the nest (e.g. cards, notebook, camera, GPS unit) should be made ready beforehand. A sturdy stick is well worth carrying, being useful for:

- a. parting foliage to view a nest more clearly;
- b. leaning on, to inspect a nest without disturbing the immediate surroundings;
- c. attaching a mirror to the end, enabling inspection without close approach, or examining nests above eye level;
- d. rustling foliage to give advanced warning of your approach.

CAREFUL SEARCHING

Avoiding damage to known nests depends largely on common sense, but remember that

nests as yet undiscovered may be highly vulnerable. Therefore take care not to dislodge any nests when pushing through dense foliage. In water bird colonies the risk of treading on nests or downy young is obvious, but there is similar danger when searching for other ground nests, such as those of Killdeer, Horned Lark and Song Sparrow.

APPROACHING AND LEAVING NESTS

Tracks and signs (e.g. droppings) may assist some natural predators to find nests. So it is a basic rule as far as possible to avoid making tracks in the first place, as well as to cover up any traces after making a visit (the stick may help here).

Damaged or trampled vegetation could expose a well-sheltered nest to rain and wind. If possible, tracks should not be made through dew-soaked grass. On approaching a known nest, pick a route that disturbs as little vegetation as possible, stepping over or gently parting clumps of undergrowth.

A common danger is that once a parent is flushed it may not return immediately, so the nest remains exposed to searching predators. This applies particularly to large nests with conspicuous eggs (e.g. herons, ducks and colonial waterbirds) which are thus vulnerable to gulls and crows. In these circumstances visits must be kept to a minimum. Grebes and ducks normally cover their eggs with nesting material when they leave; make sure you do likewise.

It is good practice to approach nests casually, as if by chance, rather than directly and deliberately. Birds are then likely to regard you as harmless (much as they would a passing cow), and not as a predator intent on robbing the

nest. A sitting bird should never be given a sudden fright as this might cause it to desert. Also, if you startle the bird, it may accidentally knock out some of the eggs or young when it flies off. Some species such as Mourning Dove build very fragile nests, and are especially prone to knocking out eggs if they are startled.

Therefore, as you approach, try to see if a parent is sitting; a bird crouching low on a nest above eye-level can very easily be missed. Nest-boxes should be tapped first, then tapped again with the lid raised to allow the parent to slip away before you stare directly into the box.

Whether or not a sitting bird should be flushed depends on a variety of factors. A good many species leave their nest unattended while feeding; this provides the ideal opportunity for an inspection. In general, it is best **not** to flush birds in failing evening light, but for **owls** late afternoon and evening may be the best time for visits. Birds should also **not** be flushed during the egg-laying period, and as little as possible during the early stages of incubation. If the bird is to be flushed, give it ample time to slip off quietly by tapping branches during your approach. A sitting bird may take the opportunity to leave before you look in – if it does not, do not disturb it. Sitting adults should not be picked up, particularly during the egg stage. Should one be accidentally handled (e.g. in mistake for a well-grown nestling) it has been found better to release it a good distance away; this is apparently enough to make it "forget" the circumstances of its capture.

Certain species are more prone to desertion than others. Opinions vary about which species are "bad risks", but special care is at least sometimes necessary with the following: ducks, Northern Harrier, Red-tailed Hawk, Ruffed

Grouse, Wild Turkey, Gray Catbird, Northern Cardinal, and Eastern Meadowlark.

Some species tend to be rather sensitive to disturbance at certain periods when they should be treated with extra care:

- a. at the start and finish of their breeding season;
- b. in the early stages of each nesting attempt;
- c. to a lesser extent, about the time of hatching;
- d. in adverse weather such as cold, heavy rain, or extreme heat;
- e. at times of food shortage (often caused by adverse weather).

Young inexperienced breeders are, as a rule more sensitive than mature established pairs, though birds as individuals vary greatly in the degree to which they will tolerate nest inspection.

AT THE NEST

To avoid needless disturbance, remain at the nest for as short a period as is necessary to make the observations.

When a nest is out on a springy branch, a sudden jerk or release of the branch should be avoided, or the contents may catapult out.

Try not to handle the young or eggs if you can possibly avoid it. Small eggs and young are very delicate, and can be easily cracked, chilled or injured. If you do need to move the nest contents (e.g. to count them accurately) please do so with extreme care, and make sure you replace them exactly as you found them. Small nestlings are remarkably helpless and may not be able to crawl back into the nest cup if displaced, even in a nest box.

When partially feathered, the young of many species instinctively scatter from the nest on the close approach of a predator (often described as "exploding"). This gives a chance of survival for at least part of the brood, but once out of the nest the survivors are vulnerable to chill and to ground predators. In small birds, this fear of intruders often develops when about 6 mm of primary feather has emerged from the quill sheaths—a stage many species of passerines reach at about **9 days of age**. The young of cavity-nesters do not tend to "explode" until somewhat older.

If an "explosion" is inadvertently provoked, the young should be quickly gathered and kept together (in the dark if possible) and replaced gently but firmly in the nest cup, the smallest on top, and covered with a hand or handkerchief. The cover should be withdrawn smoothly after giving time for the nestlings to settle. This is most successful if it can be done with the observer out of the line of sight. Should they leave again despite this, more harm than good is done by staying; the more the parents "scold" the more determinedly will the fledglings scatter, and perhaps get lost. In this case, it is best to allow the parents to round-up the young. Some fledgling ground-nesters (e.g. Northern Harrier, Short-eared Owl) leave the nest well before they can fly, but are adapted to survive.

COLONIAL SPECIES

Special care is needed when studying the nests of colonial species, especially colonial waterbirds. Adult gulls and terns respond to man as they would a predator, leaving the nest at the slightest disturbance and relying on the camouflage of the chicks and defensive behaviour of the adults to protect the brood. Neither is entirely effective with such predators

as American Crow and Herring Gull, which often use the opportunity created by human visitors to snatch eggs and chicks.

In gull and tern colonies the young often run instead of crouching, particularly if they have been picked up and handled. Such young often wander far from their territories and are then severely pecked by strange adults after the disturbance is over. It seems that this effect increases with the length of the disturbance. It is much reduced, however, just before the young are able to fly, possibly owing to their greater size and mobility.

Because of the potential harm it might do, observers should avoid walking through colonies for nest recording purposes. If nests are to be monitored, this should be done from a distance so that adult birds and young are not stressed by your presence. If you do need to enter the colony, try to restrict your activities to the edge of the colony, and limit your visits to 5 to 10 minutes at a time, to minimize egg and chick loss.

ACCESS TO PRIVATE LAND

Taking part in the ONRS does not give you the right to enter private property. If you wish to search private land as part of your nest recording, you must first gain permission from the landowner. Remember that you are asking a favour, and explain your purpose. Many landowners will probably be interested and keen to know about what you are doing. It is very important to treat the owners and their property with the utmost respect and keep to any special requests they make. If really necessary, we can provide you with a letter of introduction, which contains information on the ONRS and names you as a bona fide participant in the Scheme.

HINTS FOR FINDING NESTS

Searching for bird's nests is one of the most interesting, challenging and rewarding aspects of ornithology. Some nests are easy to find – just about everybody has probably found the nests of Barn Swallows on the sides of buildings or American Robins in trees in their garden. Others can be much more difficult. Following the drab female of a Black-throated Blue Warbler as she skulks her way back to the nest with a beak full of food requires all of the skills of a good birder plus that little bit extra. Nest finding requires knowledge, determination, patience, skill and often, a little bit of luck. But the rewards are well worth it: a glimpse into each species' private life, and a better understanding of its ecology.

If you are new to nest finding, you might start with common species. Many nests can be found by simply searching in likely places—if you live in a suburban or rural area, the bushes and trees in your garden are a good place to start. As you get more experienced, you will want to find the nests of particular species. To do this, it is essential to gather some background knowledge on the species you are interested in. Do they nest on the ground, in bushes or in trees? There is no point looking for woodland, ground-nesting species in the middle of an alder swamp. Bird species tend to nest in specific habitats and specific areas within those habitats. Knowing where to look and what time of year to search for nests increases your chances of success dramatically. It can also help to determine the role males and females have in nesting duties. If only the female feeds the young, you will not find the nest by following the male!

REFERENCE MATERIALS

There are several books and websites that can provide you with photographs and descriptions of habitats, nests and eggs for all the species in Ontario. Some of the most useful are:

Breeding Birds of Ontario Nidology and Distribution. Volume 1: Nonpasserines & Volume 2: Passerines. G. K. Peck and R. D. James. – based on data from the ONRS (available through the ONRS).

A Field Guide to Birds' Nests. Hal H. Harrison. Peterson Field Guide Series, No. 21. Houghton Mifflin Company. A great pocket-sized guide with photographs of nests.

A Guide to the Nests, Eggs, and Nestlings of North American Birds. P. J. Baicich and C. J. O. Harrison. Academic Press. Includes all species in North America.

Life Histories of North American Birds. Bulletins of the U.S. National Museum. New York, Dover Publications. 1919 – 1968. A. C. Bent – 23 Volumes. Crammed full of nesting information. This is also available on the web at: <http://www.birdzilla.com/index.html>

The Birds of North America. 1992 onwards. Individual species accounts similar to Bent's Life Histories, but more recent.

Descriptions and photographs of habitats and nest sites for Ontario are also available on Environment Canada's Wildspace website: <http://www.on.ec.gc.ca/wildlife/wildspace>

Once you know where to look, careful observation of the birds you are after should

lead you to the nest. Birds carrying nesting material, food or fecal sacs can sometimes be followed directly back to the nest. Some species make specific calls as they approach the nest or even sing from the nest (some vireos and grosbeaks). Other species show certain behaviours (agitation displays, males following females closely) when they are near the nest. It is important to remember though, that each species behaves differently. A method that works for one species may not work for another. Once you have determined a general area where you believe the nest to be, don't be afraid to get a little dirty. For many species that nest on the ground or in bushes, getting on your hands and knees for a "bird's eye view" of the world will make locating the nest that much easier. Remember—always use extreme caution if you think you are near a nest to avoid causing damage to the nest site or the surrounding vegetation.

Once you have found a nest, there are a few pieces of equipment that you may find useful. For tree nesting species it is very helpful to bring along a mirror and a golf ball retriever pole. The extendable pole was originally designed to retrieve golf balls from ponds and creeks and should be available in many golf shops. Combined, these two items will allow you to check nest contents 5m up in a tree without ever leaving the ground. Tape the mirror into the ball basket and then bend the basket to a 75-degree angle. To check nest contents simply extend the pole above the nest and then look in the mirror. Another possibility for checking nests is to fasten a bicycle mirror, which comes with mounts, onto a wooden pole or branch.

Checking nests in cavities requires a dental mirror and a small penlight. Attach the penlight to a piece of string, turn it on and then lower it

into the cavity. By placing the mirror into the top of the cavity you will be able to see the contents of the nest easily.

Another useful tool is a Global Positioning System (GPS). The price of these units has been dropping and their accuracy increasing steadily over time. At present (2001), a unit for about \$200-\$250 can usually indicate your position anywhere on earth to within a few metres. (Check the Birds Ontario web site for details.) This is great to have if you are a hiker, boater or cottager. GPS units allow you to obtain an accurate location of the nest site thus enhancing

the value of the record. Equally important, they can help you relocate the nest so you can follow its fate – remember a nest with **multiple visits** is of much greater value for the Scheme. Of course, you should also take notes on how to find the nest relative to conspicuous landmarks. If you need to mark the location, you might tie a piece of numbered flagging tape at least 5-10 m away from the nest, and then write down the distance and direction from the tape to the nest (remember to pick up the flagging tape on your final visit).

Good luck, and have fun!



Figure 2. Brown-headed Cowbirds are obligate nest parasites, invariably laying their eggs in the nests of other bird species, such as this Golden-winged Warbler nest. The eggs (and young) usually differ in size, colour, or shape from those of the host. Be careful to recognize them! Nest records are a valuable way to assess the impact of cowbirds – please do not remove cowbird eggs. Young of both host and parasite are often able to fledge successfully. Fill out the number of eggs or young in the correct column for host or parasite (in this case, 3 host eggs, 1 cowbird egg).

COMPLETING THE NEST RECORD CARD

This **Handbook** outlines the procedures for completing the new **scannable nest card** which has been printed and distributed in 2001. If you wish, you may still use older cards, while stock lasts, but we would prefer if you switch to the new cards, because they can be computerized much more quickly and efficiently, thus ensuring your data will be used as effectively as possible for research and conservation.

The new design of the nest record card has been developed with three main aims in mind:

1. To ensure that your hard-earned data are as useful as possible.
2. To increase the speed and efficiency with which the ONRS can enter the data on the computer for analysis.
3. To help reduce the amount of writing required from you.

To achieve these aims the current Nest Record Card has several important features.

1. **SCANNABLE DATA FIELDS.**

The new card has been designed so that it can be scanned and most of the fields read automatically by computer. Provided you **write neatly, within the proper boxes**, the computer program can correctly interpret data in all of the fields except names, comments and additional information, which still need to be read or typed by hand.

2. **STANDARDISED CODES.**

A standardised coding scheme provides you

with simple options to describe the status of the nest and the habitat(s) surrounding the nest. This means that all cards are easily compared and that you do not have to decide which information might be most important – it is all laid out for you on the handy **Coding Card**. It also means that most of the information can be entered in computer readable fields. This ensures that we can enter and make use of your data as quickly as possible, without having to spend a lot of time interpreting comments. In many cases, you will find that you can cover all the options with the codes, and you do not need to use the comments section. However, if you do have additional information to provide (e.g., on particular plant species, or on a known predator), you should use the appropriate comment spaces.

3. **CHOICE FIELDS.**

The nest-site section of the Nest Record Card provides you with a series of choices for which you just need to fill in the 'bubble' beside the most appropriate choice(s). These can be filled in quickly and easily, and ensure that the codes are standardized.

Efficient coding of the data is important so that the ONRS and its partners (Canadian Wildlife Service, Royal Ontario Museum, Bird Studies Canada) can use your hard-won data quickly and cost-effectively to produce up-to-date results on the state of Ontario's birds to help ensure their effective conservation.

GENERAL GUIDELINES FOR COMPLETING CARDS

1. **PLEASE COMPLETE ALL CARDS NEATLY.** The cards are designed to be scanned and read by computer. Computers

are still not as good at reading as humans, so it is especially important that you write neatly (this also helps for the humans checking your data!). **Please use a dark pencil or pen, and fill out all fields using block capitals with one letter or number per box** (except in the 'modification' codes for habitat, which can accept 1 or 2 characters). If you make any mistakes, please erase them cleanly, or use liquid paper to cover the mistakes. The fields for species, observer and place names, comments and details will not be interpreted by computer, but should still be printed neatly so we can read them! Please take care not to obscure any of the pre-printed numbers or the cornerstone boxes, as they are required by the scanning software to read the card correctly.

2. **USE A NEW CARD FOR EACH NESTING ATTEMPT.** If you make more visits than can be fitted on to one card then you can continue on a second card. Please mark the second card by putting the 6-digit number from the **top left-hand corner** of the first card in the space marked 'Continued from' at the **bottom left-hand corner** of the second card. Please clip both cards together to help us check them. You only need to record nest location, nest site details, habitat, and nest outcome on the first card.
3. **IF A NEST IS USED TWICE** in the same season **by the same pair of birds**, use separate cards for each attempt, but clearly mark on the cards that they refer to the same nest and clip them together. In such cases, it would be very helpful if you could duplicate the nest site information on the back of each card for each new nesting attempt.
4. **JOINING CARDS TOGETHER.** If you used more than one card for a nest, or if you have data on multiple nesting attempts by the same pair, please clip the cards together with a paper clip, if possible. This is easier than staples, which we need to remove in order to scan the cards. If you do have to staple them, please staple in the **top right corner** in such a way that you do not obscure any details on the card.
5. **BROWN-HEADED COWBIRD.** If you find a nest with a cowbird egg or young, it is no longer necessary to fill out separate cards for the host and the cowbird, because the computer will allow us to cross-reference records easily. Instead, write the information in the appropriate columns of the card. If you find any other instance of two species having eggs or young in the same nest, record information for the second species in the Cowbird columns, and indicate the species code (see below for details).
6. **BREEDING RECORDS.** When concrete evidence of breeding is observed, even though no nest was found (e.g. ducks with flightless young), the information may still be submitted on a nest card, but it should be indicated on the card (in Other Comments) that this is a **breeding record**, not a nest record. Such records are useful but are filed separately from nest records.
7. **DOUBTFUL RECORDS.** If you are unsure of the identification of the bird species, **please do not send in the record.**
8. **UNUSUAL OBSERVATIONS.** Please make a special note to emphasize that the entries are correct (for instance when you have recorded an abnormally long

incubation period, or a very early laying date), so that we will know these were not recorded in error. Such unusual contributions can then be incorporated into the **Annual Report**, and possibly into journal notes and papers.

9. **RARE SPECIES DOCUMENTATION.**

If you find a nest of a poorly known species, a species outside its normal range, or the first record for a species in a particular region, good photographic evidence of the nest, adult, or both is encouraged! If you are unsure of the importance of a record, contact the Scheme, preferably while the nest is still active.

SENDING IN YOUR CARDS

1. Please check each card carefully for mistakes and omissions.
2. Please arrange your cards in the order of species shown on the **Coding Card**. (This greatly assists us in counting and filing incoming cards.)
3. Please bind the cards with rubber bands. Ordinary envelopes are not strong enough to take more than about 20 cards. For larger batches, send them in a padded envelope or cardboard box with a boldly marked address. A few cards are tragically lost in the mail each year because of flimsy packaging—please don't let this fate befall your hard-won cards.
4. Please send them to the ONRS/Ornithology, CBCB, Royal Ontario Museum, 100 Queen's Park, Toronto, ON M5S 2C6 **as soon as possible after the end of the breeding season** and no later than 31

January of the following year. Late cards are still welcome and will be incorporated into the database, but can not be included in the current Annual Report.

5. Please make sure that your registration information (name and address) is correct and up-to-date, so we can send you an Annual Report. If there are any changes, please let us know with an address form, over the web, or in a letter.
6. If you prefer, you may enter your data electronically: www.birdsontario.org

COMPLETING THE FRONT OF THE CARD

The front of the card is where all the basic information about the observer and nest location is written, along with details on each visit to the nest. As noted above, when completing the card **please use a dark pencil or pen (preferably black) and write neatly using block capitals so that the letters do not touch the sides of the box or each other.**

SPECIES CODE: Enter the four-letter species code with one character in each box. The accepted list of species codes is provided on the **Coding Card**. You should also write in the species name in the space provided. This will not be scanned, but will be used by ONRS staff to check the 4-letter code.

OBSERVER NUMBER: All observers are being assigned a number, so that we can easily keep track of who you are, and so that you can quickly and easily fill out the form. If you are participating in the Ontario Breeding Bird Atlas, or any Bird Studies Canada projects (e.g., Project FeederWatch, or the Canadian Lakes

Loon Survey) you will have the same number for all programs. Please check your mailing address or registration form for your number. If you are unsure of your number please contact the Scheme. You can also register over the web page. Registration is also important to ensure that we have your correct current address, so we can send you an Annual Report. Fill in your name as a double check. Names (and numbers, if available) of additional observers may be written in the Other Comments on the back of the card.

YEAR: Please fill in the complete 4-digit year.

LOCATION: Whenever possible, please give the exact coordinates of the nest site, in UTM or latitude/longitude, as that is the most accurate way to pinpoint the location of the nest. If you do not provide these, we will have to look them up based on the place name, but this is time consuming, and tends to be much less accurate, as you know better than we do, where you were.

Ontario Nest Records Scheme											
Royal Ontario Museum, Canadian Wildlife Service, Bird Studies Canada											
No.123456											
Species Code	Species Name	Observer Number				Observer Name	Year				
HETH	Hermit Thrush	1	2	3	4	5	J. Smith	2	0	0	1
Location (Place Name)		County/Region	Enter coordinates in UTM or lat/long		UTM Zone	UTM Easting	UTM Northing				
S. Shore of Westward Lake		NIP	NAD: <input type="radio"/> 27 <input type="radio"/> 83								
Algonquin P.P.			<input type="radio"/> GPS <input checked="" type="radio"/> Map		Latitude (deg. min. sec.)		Longitude (deg. min. sec.)				
					45	29	10	78	47	15	
Day	Month	Time (24h)	Host Eggs	Live Young	Dead Young	Cowbird [†] Eggs	Live Young	D. Yg	Visit Status Codes*	Comments	
28	5	9:00							NLAB		
2	6	14:00	3						CO		
6	6	10:30	?						FN		
10	6	13:00	4			1			FV		
14	6	7:30	1	3		1					
20	6	11:00		3	1	1					
24	6	14:00			1	1			AV		
Continued from card No. <input type="text"/>											
† Species if not cowbird <input type="text"/>											
Nest Outcome <input type="text"/> VAJD											
* See coding card for status and nest outcome codes.											
3946359807											

Figure 3. Front of sample nest record card for a (fictitious) Hermit Thrush nest in Algonquin Park, Nipissing Region. Coordinates were determined from a map, in latitude and longitude. The nest was visited 7 times, starting when the adults were nearly finished building. On 6 June, the female was on the nest (code FN), and was not disturbed, so the contents were not known. One cowbird egg was laid, but never hatched. One of the 4 host eggs hatched late, and the nestling later died. The nest outcome was partially successful, based on adult activity near the nest (code VA; suggesting fledged young were nearby), but was known to be partially unsuccessful based on the dead nestling (code JD).

Table 1. Current (2001) regions and their codes for counties, districts, and regional municipalities in Ontario. *The recently combined counties of Leeds/Grenville, Prescott/Russell, and Stormont/Dundas/Glengarry will continue to be considered separately for ease of coding and nest location. The region of Greater Sudbury should still be indicated under the district of Sudbury.

<i>Code</i>	<i>Region</i>	<i>Code</i>	<i>Region</i>	<i>Code</i>	<i>Region</i>
ALGO	Algoma	HAST	Hastings	PEEL	Peel
BRAN	Brant	HURO	Huron	PERT	Perth
BRUC	Bruce	KAWA	Kawartha Lakes	PETE	Peterborough
CHAT	Chatham-Kent	KENO	Kenora	PRES	Prescott*
COCH	Cochrane	LAMB	Lambton	PRIN	Prince Edward
DUFF	Dufferin	LANA	Lanark	RAIN	Rainy River
DUND	Dundas *	LEED	Leeds*	RENF	Renfrew
DURH	Durham	LENN	Lennox & Addington	RUSS	Russell*
ELGI	Elgin	MANI	Manitoulin	SIMC	Simcoe
ESSE	Essex	MIDD	Middlesex	STOR	Stormont*
FRON	Frontenac	MUSK	Muskoka	SUDB	Sudbury
GLEN	Glengarry*	NIAG	Niagara	THUN	Thunder Bay
GREN	Grenville*	NIPI	Nipissing	TIMI	Timiskaming
GREY	Grey	NORF	Norfolk	TORO	Toronto
HALD	Haldimand	NORT	Northumberland	WATE	Waterloo
HALI	Haliburton	OTTA	Ottawa	WELL	Wellington
HALT	Halton	OXFO	Oxford	YORK	York
HAMI	Hamilton	PARR	Parry Sound		

PLACE NAME: This is most important if you cannot provide coordinates, but it is also useful as a crosscheck if you can indicate the nearest village, town, or lake, etc. If accurate coordinates are not available, please give distance and direction from the **centre of town** or from another well defined location (e.g. "5 km NNW of Thornbury, near Georgian Bay"). If possible, try to avoid using sideroads and concessions in your locality description, as these are no longer being named on topographic maps, so it is hard for us to find them when we are trying to look up the coordinates.

COUNTY/REGION: Please indicate the District or Region using the appropriate 4-letter

codes (see Table 1 or Table 2). Because the names and boundaries change occasionally, please use the region names and associated codes appropriate for **the year in which you found the nest**. The codes for the current counties are given in Table 1. Codes for older region names (if they differ) are provided in Table 2, together with the year in which they last changed. Only use these older codes if you are reporting historical nests (e.g. Lincoln County [LINX] for a pre-1975 Niagara nest, or Hamilton-Wentworth [HAWX] for a pre-2001 Hamilton nest).

COORDINATES: Accurate coordinates are essential for distributional studies and are

needed for computerizing and analysing the data. If you do not provide them, we have to try to work them out based on your location description before we can enter the record. This is time consuming and prone to errors, so we strongly encourage you to provide the coordinates yourself. These can be read off a standard contour map, or you can use a Global Positioning System (GPS). A GPS is generally the most accurate, especially if you are working in remote areas with few landmarks. Small hand-held GPS units are now available from many different sources for only a couple of hundred dollars (these can be an invaluable aid to navigating in the backcountry, and are a good safety idea as well). The card has been designed to allow for coordinates in either the Universal Transverse Mercator (UTM) grid or latitude/longitude. Participants in the Ontario Breeding Bird Atlas are likely most familiar with the UTM grid, and if you are using GPS, we would prefer if you set it to UTM, because the result is more precise. **For UTM, please be sure to enter the full 6-digit Easting and 7-digit Northing as well as the zone.** There are two different projections of UTM commonly in use in Ontario, the older NAD 27 (North American Datum 1927) and the newer NAD 83. All of the maps provided for the 2nd Ontario Breeding Bird Atlas, and all newer contour maps use NAD 83, and we encourage you to set your GPS to this projection. However, if you are using older maps, you may enter coordinates in NAD 27. In either case, please be sure to mark the appropriate bubble – the coordinates for both systems are very similar, but differ by about 200m in most parts of Ontario. If you prefer, you may use latitude and longitude, but please record them precisely as degrees, minutes and seconds (do not use decimals). Please also mark the appropriate bubble to indicate whether you worked out the coordinates from a map or GPS.

Table 2. Names and codes for regions that changed prior to 2001.

<i>Code</i>	<i>Region</i>
CARX	Carleton (pre-1975)
DURX	Durham (pre-1975)
HADX	Haldimand (pre-1975)
HANX	Haldimand-Norfolk (pre-2001)
HATX	Halton (pre-1975)
HAWX	Hamilton-Wentworth (pre-2001)
KENX	Kent (pre-2001)
LINX	Lincoln (pre-1975)
MUSX	Muskoka (pre-1975)
NORX	Norfolk (pre-1975)
ONTX	Ontario (pre-1975)
OTCX	Ottawa-Carleton (pre-2001)
PEEX	Peel (pre-1975)
VICX	Victoria (pre-2001)
WATX	Waterloo (pre-1975)
WELX	Welland (pre-1975)
WENX	Wentworth (pre-1975)
YORX	York (pre-1975)

DAY/MONTH: Please write the day and month as numbers in the appropriate columns – note that day comes before month. You may, but do not need to write the leading 0 for 1 digit days or months (e.g., you can write either '6' or '06' for June). For one digit numbers, it also does not matter whether you write them in the right or left of the box, but please do not write over the tick mark in the middle!

TIME: Please use a 24-hour clock, e.g. 05:45 for 5:45am, 18:00 for 6:00pm. You may round off the time to the nearest 10 or 15 minutes, or even the nearest hour, as you prefer. This field can be especially helpful for evaluating changes in clutch size and laying times of birds. If you did not record the time, leave this field blank.

NUMBER OF EGGS OR YOUNG: Write the number of eggs, live young and/or dead young in the relevant columns under **Host** for *each* visit. Please do not guess at the numbers – if you were unable to see the contents (e.g. an adult was sitting on the nest) put in a question mark ('?'). Be sure to use the appropriate status code to indicate why the contents were unknown. If you can only see part of the contents, put in a '?' with the number (e.g. '3?'). If you know there were at least 3 eggs, you should put '3+'. Do not use any other symbols.

COWBIRDS: Brown-headed Cowbirds are obligate nest parasites that invariably lay their eggs in other birds' nests. If you find a cowbird egg or chick in the nest (make sure you can recognize them – they usually differ from the host in colour, size or shape), please fill in the appropriate columns at each visit. Please **do not remove** cowbird eggs or young from the nest. Your data are much more valuable if you do not interfere with the fate of the nest. Your data can help us to monitor the impact of cowbirds and other predators on nests. If nests reported to the scheme are manipulated, they do not give us a true picture of what is happening to Ontario's bird populations. If, for any reason you do manipulate the nest in any way, accidentally or otherwise, please mark the 'Manipulation' bubble on the back of the card, and provide details under **Other Comments**.

OTHER SPECIES: In some cases, you may find eggs or young of two different species (other than cowbirds) in a single nest. For example, Redheads often lay eggs in nests of other duck species; Wood Ducks and Hooded Mergansers sometimes both lay in the same nest box; Tree Swallows and Bluebirds may both use the same box (perhaps because one species has taken over from the other). In these cases, the

Host should be considered the species that is incubating the eggs and/or feeding the young. Details for eggs or young of the second species should be entered in the columns under 'Cowbird', but the correct species code must be written at the bottom of the card in the field labelled 'Species if not cowbird'. In the rare case that you find a nest with two different species raising the young (possibly hybrids) please write all the details under **Other Comments** on the back of the card.

VISIT STATUS CODES: These two-letter codes provide an easy way to describe the stage of development of the nest, eggs and young on each visit, as well as the observed activities of the parent birds. **Please use only the Visit Status Codes on the Coding card and ensure they always comprise two characters.** There is space for up to 3 codes on each visit – if more are needed, write them in the Comments. A full list of status codes is printed on the **Coding Card**, which should be taken into the field with you to act as a memory jogger. Details and explanations for some of these codes are given in the section **Status Codes Explained**.

OUTCOME CODES: These should be used to provide your best evidence for the success or failure of the nest. If even one young fledged, the nest is considered successful. See the section **Status Codes Explained** for details.

COMMENTS: Most of the usual comments should be covered by one or more of the Status Codes. However, if you have any additional notes about the behaviour of the parents or young, or the condition of the nest on a particular visit, that you feel are important, you can write them here. For birds of prey, it is useful to record if any prey remains are in or near the nest.

COMPLETING THE BACK OF THE CARD

NEST SITE: This section describes the position of the nest. You should select the codes that best describe the location of the nest, and put them in the appropriate box. For example, if the nest is in a bush, under a bridge, you would write a 'B'

in the 'In' box, and an 'O' in the 'Under' box. As before, please print neatly, with only one letter in each box. Please give details such as plant species in the appropriate section of the **Extra Comments**.

<p>Nest Site: Select only one code in each box to describe nest location</p> <table style="width: 100%; text-align: center;"> <tr> <td style="width: 33%; border: 1px solid black; padding: 5px;">In H</td> <td style="width: 33%; border: 1px solid black; padding: 5px;">On </td> <td style="width: 33%; border: 1px solid black; padding: 5px;">Under A</td> </tr> </table> <p>A - live tree I - dead veg. Q - earth B - bush/shrub J - floating veg. R - sand C - snag/stub/dead tree K - hedgerow S - gravel D - vines L - ditch T - stones/rock E - reeds M - post/pole/tower U - cliff F - herbs N - building V - other G - grass O - bridge H - lichen/moss P - other human artifact</p> <hr/> <p>Nest Site Type: <input checked="" type="radio"/> Unenclosed <input type="radio"/> Hole or Crevice <input type="radio"/> Ledge <input type="radio"/> Nest Box <input type="radio"/> Other bird/mammal nest</p> <hr/> <p>Other Details: <input type="radio"/> Raft/Islet <input type="radio"/> Island <input type="radio"/> Over Water</p> <hr/> <p>Manipulation: <input type="radio"/> Predator Protection <input type="radio"/> Other Manipulation (give details in comments)</p> <hr/> <p>Exposure: <input checked="" type="radio"/> Well Hidden <input type="radio"/> Partially Hidden <input type="radio"/> Exposed</p> <hr/> <p>Slope: <input type="radio"/> Vertical <input type="radio"/> Steep <input type="radio"/> Gentle <input checked="" type="radio"/> Flat</p> <p>Direction of Slope (Aspect): <input type="radio"/> N <input type="radio"/> NE <input type="radio"/> E <input type="radio"/> SE <input type="radio"/> S <input type="radio"/> SW <input type="radio"/> W <input type="radio"/> NW</p> <hr/> <p>Nest Hole Direction: <input type="radio"/> N <input type="radio"/> NE <input type="radio"/> E <input type="radio"/> SE <input type="radio"/> S <input type="radio"/> SW <input type="radio"/> W <input type="radio"/> NW</p> <hr/> <p>Nest Height above ground/water: 0 m</p>	In H	On 	Under A	<p>Habitat: Describe 1st habitat (containing nest), and 2nd major habitat within 100m (if appropriate). Select habitat class and subclass, and up to 4 codes each for structure and modification (see coding card).</p> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr> <th style="border: none;"></th> <th style="border: none;">Class</th> <th style="border: none;">Sub.</th> <th style="border: none;">Structure</th> <th style="border: none;">Modification</th> </tr> </thead> <tbody> <tr> <td style="border: none;">1st</td> <td style="border: 1px solid black; padding: 2px;">A</td> <td style="border: 1px solid black; padding: 2px;">2</td> <td style="border: 1px solid black; padding: 2px;">C</td> <td style="border: 1px solid black; padding: 2px;">1</td> </tr> <tr> <td style="border: none;">2nd</td> <td style="border: 1px solid black; padding: 2px;">E</td> <td style="border: 1px solid black; padding: 2px;">4</td> <td style="border: 1px solid black; padding: 2px;">F H I</td> <td style="border: 1px solid black; padding: 2px;">1</td> </tr> </tbody> </table> <p>Distance from nest to nearest edge of 1st habitat: <input checked="" type="radio"/> 0-15m <input type="radio"/> 15-50m <input type="radio"/> 50-100m <input type="radio"/> >100m</p> <p>Details of plant species and any extra comments:</p> <p>Nest Site: <u>UNDER 1.3 m WHITE SPRUCE</u></p> <p>First Habitat: </p> <p>Second Habitat: </p> <p>Other Comments: <u>2ND Observer: J. Black (#45678)</u></p> <hr/> <p>Please return by 31 January to: ONRS - CBCB, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6</p> <p>For more information visit: www.birdsontario.org 8955359802</p>		Class	Sub.	Structure	Modification	1st	A	2	C	1	2nd	E	4	F H I	1
In H	On 	Under A																	
	Class	Sub.	Structure	Modification															
1st	A	2	C	1															
2nd	E	4	F H I	1															

Figure 4. Example of the back of the card for the same nest as Figure 3. The nest was in moss (code H), under a small tree (A). It was not enclosed by any structure, and well-hidden on flat ground (0 m high). The habitat containing the nest was coniferous forest (A2) of mixed-age, with no human disturbance(1). The other main habitat nearby was a bog (vegetated wetland with moss = E4, bog =F) with scattered small deciduous (H) and coniferous (I) shrubs and no human disturbance (1). The nest was less than 15m from the edge. The comments give details on the tree species where the nest was found, and the name and number of a second observer. Further details on the habitats could have been provided if available (e.g., tree species), but are not required. The codes cover the most important information.

NEST SITE TYPE: You should completely fill the "bubbles" beside any relevant fields to describe the nest site. If you make any mistakes, please erase them completely, or use "liquid paper" or correction fluid. In this section, "Unenclosed" refers to any nest that is not enclosed within a cavity or nestbox. A Cliff Swallow's nest on the side of a building is therefore "Unenclosed". If the bird uses another bird or mammal's nest then please give details of the species, if known, under Other Comments at the bottom of the card. In a few cases, it may be appropriate to mark more than one field (e.g., if the bird is using a nest of another species of bird in a hole or crevice).

OTHER DETAILS: "Raft/Islet" includes man-made rafts or artificial nesting islands for terns or geese, etc. If the nest is on an **island** the **Habitat** and **Nest site** information should be indicated as usual.

MANIPULATION: If you have installed predator guards on nest boxes, or if you are working in an area where predators have been controlled to protect nesting birds, please mark the code for 'Predator Protection'.

If you have done any manipulation of the nest as part of a scientific research study, we still welcome your cards, but please mark the appropriate bubble, so that we can consider your nests separately when calculating nesting success. Manipulations could include supplemental feeding of the parents (e.g., to test effects on clutch size or fledging success), manipulation of clutch size, removal of eggs or young, etc. Please give details under Other Comments. It is not necessary to mark this bubble if the only manipulation was weighing or banding the adults or young (although if you captured the adults for banding near the nest,

please remember to mark the appropriate Visit Status Code on the relevant date).

EXPOSURE: This is to provide an idea of how well you think the nest is hidden from predators. It is rather a subjective measure, but it is unlikely that one person's "Well Hidden" will be another's "Exposed." An observer's opinion will also depend on the species: for example, an "exposed" Yellow Warbler nest is likely to be much better hidden than an "exposed" American Robin nest. This section can be used to look at relations between degree of exposure and predation rates and seasonality of predation.

SLOPE: Fill in bubble indicating incline of slope.

DIRECTION OF SLOPE (ASPECT): Fill in the bubble indicating the direction the slope faces, if the ground is sloped.

NEST HOLE DIRECTION: Fill in the bubble indicating the direction the entrance faces for a natural cavity or nest-box.

NEST HEIGHT ABOVE GROUND/WATER: Please record nest height to the nearest 0.1 m if below one metre, and as accurately as possible if above one metre. Please give figures to one decimal place rather than using fractions, e.g. 2.5m, **NOT** 2 ½ m, as the latter will not be read correctly. If the nest is on the ground on a sloping bank or in a ditch, then give the height as 0m (zero). In cases where the nest is in a bush in a ditch, give the height to the base of the bush and not to the bottom of the ditch. If the nest is that of a ground nesting species, please always write a zero rather than leave a blank space.

HABITAT: Although this appears a bit complicated, once you start to learn the codes, you will find it is reasonably straightforward.

What is the habitat? This is the area in which the bird is nesting and foraging. In the case of birds that forage over a wide area (e.g., raptors) this refers only to the area where they are nesting. As a general guideline, you should only consider habitats within about 100m of the nest. However, for species with very small territories, a smaller area may be appropriate – you should use your discretion and knowledge of each species to define the area that seems most relevant.

Habitat mixtures. Habitats in Ontario sometimes are a mixture of different types that occur close together. The card provides space to enter details of two habitats ("1st" and "2nd" Habitats on the card). Usually the 1st Habitat is that which contains the nest, while the 2nd Habitat is an adjacent habitat used for foraging, song posts, etc. However, this is not a hard and fast rule. If the nesting area spans more than two major habitats, put further codes into the Other Comments section below.

Habitat codes. These are filled out in the same way for the 1st and 2nd Habitat:

- a. Using the Coding Card as reference, write a letter, from A to H, to show the major habitat class (e.g. **A** for Woodland, **D** for Human Sites).
- b. Next choose **one number** for **Sub-class** of the habitat type you have selected (e.g., under A, 1 = deciduous woodland; under D, 1 = rural human site, etc.)
- c. Then select all relevant letter codes (up to 4)

for **Structure**, and number codes for **Modification** (up to 4). For structure, please write one number or letter per box. For modification, write one code in each box, but these may be one or two digits (some of the categories require two digits). If there are more than 4 relevant codes, you should try to choose the most important ones, or you can write additional codes in the relevant section of extra comments, below.

DISTANCE FROM NEST TO HABITAT EDGE: Fill in the circle indicating the distance in metres from the nest to the nearest edge of the 1st Habitat.

EXTRA AND OTHER COMMENTS: This area is for writing any further details about habitat or nest site. Put the name of the plant species supporting the nest and extra details on nest site beside **Nest Site**. You can put the dominant plant species in each habitat, if known, beside **First Habitat** and **Second Habitat** respectively. The **Other Comments** space can be used to write any additional information, such as details of another nest that is utilised (e.g. Long-eared Owl using old nest of American Crow), assistants who were working with you (please indicate their observer number, if they have one), details of habitat management (e.g. years since logging), history of the nest site (e.g. if used by the same, or different species, in previous years), your own nest numbers or nest box numbers, if appropriate; and extra detail on behaviour (e.g. evidence of more than two birds involved with incubation or feeding young). Please **do not repeat information** that can be adequately explained using the status codes, as the comments need to be typed by hand.

RECORDING NESTS IN COLONIES

Although we welcome information on nesting colonies, **great care is required when visiting colonies of many species**, especially some of the waterbirds – please read the cautions in the 'Code of Conduct' above.

Some colonies, such as those of swallows, can be safely entered and the nests inspected, but in general, you should **avoid entering the colonies of most waterbirds** such as cormorants, herons, pelicans, gulls, and terns. Your presence in the colony can lead to predation by gulls and crows, or young getting lost from their nests.

If you find a colony of waterbirds, whenever possible, try to view the nests from a distance. If you do need to enter the colony stick to the periphery as much as possible, and endeavour to make each visit reasonably brief.

We do not currently have a special card for colonial species, but there are several types of information that would be valuable to us.

For most sensitive species, we would be quite happy to receive details of the location and habitat of the colony, along with a count or estimate (please indicate which) of the number of active nests. For species such as herons or swallows, we would appreciate information on the total number of nests, both occupied and unoccupied. This can be helpful for estimating occupancy rates in cases when only total nests can be estimated. If you can not see into the nests, active nests can be identified by watching for activity of the adults, or by looking for signs such as droppings on the tree under the nest.

You can provide this information on a standard nest card, by filling in the location and habitat details, then writing the number of nests in the comments box.

If you are able to see the contents of any of the nests, that would be even better (but again, please do not disturb the colony unnecessarily). You should provide a summary of the total number of nests in the colony and the contents of any you were able to inspect at each visit (e.g. 150 nests of which 34 were inspected; 20 nests with 3 eggs, 10 nests with 2 eggs, 4 nests with 2 eggs and 1 young). If you cannot fit this in one of the comments spaces, please attach a separate piece of paper. For atlassers, this information could be written in the comments section of the Colonial Species data form.

Ideally, if you can do so without disturbing the nests, it would be great if you could visit the colony multiple times and keep track of individual nests so we can monitor their success. If you are watching the colony from a distance, you should sketch a map of the nests and number them on the map – it is not necessary to track all the nests in a colony – a sample will do. But do let us know where they are – nesting success may differ from the centre to the edge of the colony. If there are only a few nests, you should complete a card for each nest. Alternatively, you could make a table on a separate piece of paper, detailing the contents of each nest on each visit. We do not have a special card for this, but we would welcome the information in any form. You might use a standard card to record the location and habitat for the colony, then tabulate contents on a separate piece of paper.

STATUS CODES EXPLAINED

All of the **Visit Status Codes** and **Outcome Codes** are listed on the pocket-sized **Coding Card**. This section gives additional details and explanation for some of these codes.

VISIT STATUS CODES

These are codes to describe the status of the nest on each visit. If some, but not all, of the eggs or nestlings are missing from a nest on a particular visit, you may, if appropriate, use some of the **Nest Outcome Codes** in the Visit Codes boxes to indicate the probable fate of those eggs or young. However, in most cases it will be sufficient to restrict those codes to the Nest Outcome boxes.

NEST BUILDING STAGE

NL: Some species, when they have finished building, line their nest with softer material than the rest of the nest (e.g., feathers, fine rootlets, etc.). Some birds of prey line their nests with green leafy material.

EGGS

CO/WA: Eggs Cold/Warm: If the eggs can be easily reached (do not take risks that might damage them), very carefully feel them to see if they are cold or warm. This will tell us whether or not the adult was recently sitting.

UN/CV: Eggs Uncovered/Covered with material. Some species cover their eggs with nest material (e.g., vegetation, down) while they are away from the nest. **Only record UN/CV for those species that normally**

cover their eggs, e.g. grebes, ducks.

FR/DE: Eggs Fresh/Developing Embryo present: Freshness of eggs or the presence of a developing embryo can be assessed using the Water Test or by candling. In most cases, **it is not necessary to check for this**, but if you would like more information, contact the ONRS for details.

PE: Pipping egg: some chicks call from within the egg for 1 to 2 days before hatching. Before the chick has broken through the shell, "starring" of the shell occurs where the chick has cracked the shell from within.

YOUNG

Recording the state of growth of the young, using the appropriate codes, can be very **valuable for estimating egg dates and/or the hatching date**, especially if the nest was found at the nestling stage. Please use the most precise codes possible.

Recording growth of species whose young hatch asynchronously. The broods of some species (e.g. owls) normally have young at various stages of growth. In these cases, please use status codes to describe the age of the **oldest** chick only. Codes to describe the growth of younger birds may be recorded in the Comments section.

TO: Egg Tooth present. The egg tooth is a horny bump on the upper side of the beak that is used by nestlings to break through the shell and out of the egg. It drops off after a few days.

IP: Primary feathers In Pin: Primary feathers (the large flight feathers that form the outer

half of the wing) which are completely enclosed within a shiny sheath are called "in pin" (because of their pointed shape).

FS/FM/FL: Once the feathers have broken out of their pins (and look like a brush), use the code that indicates the length of the primary feathers relative to their final (adult) size (small <1/3, medium 1/3 – 2/3, large >2/3).

RF: Ready to Fledge. When the nestlings are well feathered and look ready to leave the nest (whether they can fly or not), please do not disturb them and record this code.

SY: Some young fledged; other live young still in nest. The count of young should include only young **still in the nest**.

YB: If you are a bander, and have banded the young, please use this code on the visit you put the bands on. Make sure you band the young before they are likely to "explode."

AY: Audible Young in nest: Use this when food-begging or hunger calls of the young are heard in the nest, but you are unable to see into the nest.

ADULT ACTIVITY

Recording the activity of adult birds at or near the nest can help determine the stage of the nest, particularly when the contents cannot be seen (as in the case of a species nesting high in a tree). For example, an adult sitting tight on the nest implies that the nest contains eggs and/or small young; adults regularly going to/from the nest with food implies that young are present.

The adult activity codes "AN" (Adult on/at nest) and "FN" (Female on/at nest) are probably the

most useful, but there are other codes to use if an adult is found dead, feeding young, or in the vicinity of the nest – see the coding card for a full list of codes. The status codes AV, MV, FV and PV should only be used if the adult(s) is visibly anxious (e.g. giving alarm calls) or carrying food in the vicinity of the nest **before the young have fledged**. If the nest is empty and the young have fledged already, instead of using these Visit Codes, complete the **Nest Outcome** boxes with an appropriate code to indicate the probable success or failure of the nest (see below).

NEST OUTCOME CODES

A nest is considered successful if at least one young fledges. You should indicate with the Outcome Codes, the best evidence you have that at least some young left the nest successfully, even if you are not sure whether they all made it.

You may sometimes have evidence that some young fledged but others definitely did not (e.g. if some were dead in the nest). In this case you should put both a success and a failure code. If the nest contained both Cowbird and host young, use Comments to indicate which fledged.

Young that leave the nest shortly after hatching (nidifugous species like shorebirds, ducks and gamebirds) cannot usually be followed after they leave. Other species naturally leave after a period in the nest, but before they can fly (e.g. Northern Harriers, Short-eared Owls). For these species, outcome refers to whether the young left the nest successfully or not.

In exceptional circumstances, it may be possible to follow the progress of such nestlings after they leave the nest. In that case further observations would be valuable, **if you are sure**

of the identity of the nestlings. However, even in this case, for consistency, the outcome should refer to whether the young successfully left the nest, not their fate after leaving the nest (e.g., if a brood of ducklings successfully hatched and left the nest, the nest would be considered successful, even if the ducklings are eaten by predators during their first week or two out of the nest).

OUTCOME: SUCCESS

Use these if at least one young **successfully** left the nest (i.e. it was old enough to survive outside the nest when it left). For nidicolous species (those with young that hatch naked, blind and helpless, such as the typical songbird nestling) this usually means the young can fly, though not necessarily very well. The young of nidifugous species, such as ducks, shorebirds and gamebirds, hatch covered with down and are able to leave the nest quickly. For this group, you may use the code **NN** if the young were seen near the nest, even if they cannot yet fly.

EX: Young "Exploded" from nest: Older nestlings may "explode" from or leave their nest in direct response to being approached by a nest recorder (see Code of Conduct). Survival chances may be lessened if this occurs, depending on how close they were to fledging naturally, but the nestlings will still be cared for by their parents.

NE: Although this means "Nest empty, undisturbed and well-trodden lining, containing feather scale and/or droppings", it may also be used in cases of partial success, for example, when a dead chick or egg is found trampled at the bottom of a nest after the rest of the brood has fledged.

OUTCOME: FAILURE

Multiple codes can be used, if necessary, to indicate the fate of various eggs or young. If more than two codes are possible, select the most appropriate, or write additional codes under Other Comments.

OUTCOME: UNKNOWN = OU

Use this if you were unable to follow the nest to fledging, or if your last visit was so long after the expected fledging date that you can no longer tell what happened. Remember, even if you are not sure of the outcome your data are still valuable to us, especially if you visited the nest more than once!

HABITAT CODES EXPLAINED

The complete list of habitat codes is given on the **Coding Card**. Here we provide further explanation for a selection of codes.

Human disturbance is included in a number of habitat categories under Modification, and refers to human activity that might affect birds at their nest area (e.g. hiking, fishing, boating). Light to moderate = less than once a day, Heavy = daily or more frequent.

A.WOODLAND: Trees generally greater than 5m tall and dominating the landscape (excludes isolated clumps of trees in a field).

Mixed: > 10% each of deciduous and coniferous trees.

Wet/standing water present. Includes temporary pools, as well as wet woodlands or swamps.

Closed canopy: > 70% canopy cover.

Open canopy: < 70% canopy cover.

Parkland: trees spaced widely across grassland (< 30% canopy cover).

No understory: few or no woody or non-woody plants under trees.

Shrub layer: Woody plants, either true shrubs or saplings, as a distinct layer under canopy.

Recent burning: within the last 10 years.

CLASS B. GRASSLAND, SHRUBLAND, AND AGRICULTURE

Grassland: primarily native grasses, though potentially mixed with some weeds.

Tame (planted) grass: includes pastures and grassy hayfields (lawns or golf courses are covered under "human sites").

Tilled land: land that has been ploughed and/or planted in the current year.

Overgrown/old field: a mixture of grasses, other herbaceous plants, and small shrubs (<2m tall).

Orchard: more than 10 trees.

Isolated group of trees: within a predominantly grassy/scrubby area.

Fallow: ploughed and left unplanted for one or more seasons.

Burned: within the last year.

Power line corridor: within 100m of nest site.

CLASS C. TUNDRA/ALPINE

(Note: alpine habitat does not occur in Ontario).

Polygonal Tundra: an intersecting network of shallow polygons 3 to 30 metres in diameter. Vegetative growth is usually restricted to the edges of the polygons. Uncommon in Ontario.

CLASS D. HUMAN SITES

Urban: includes suburban (use structure and modification codes to give details).

Rural: farms and small communities.

CLASS E. WETLANDS DOMINATED BY VEGETATION

Sedge/grass: dominant plants in marsh are sedges and grasses (low vegetation).

Reeds/cattail: includes other tall marsh plants such as *Phragmites*.

Bog/muskeg: Bogs are peatlands, fed by rain, poor in minerals and water-flow; are quite acidic and poor in plant species. *Sphagnum* mosses are dominant. The term 'muskeg' refers to northern peatlands (Subclass would be 4. Moss).

Fen: Fens receive surface and groundwater and range from somewhat acidic to basic. May be dominated by sedges, trees, or shrubs, and typically are rich in plant species.

Margin damaged: refers to roads, dams, landfill sites or other development along the edges.

CLASS F. WETLANDS WITH MAINLY OPEN WATER

Canals: intended for transport of water or boats.

Ditches: intended mainly for drainage.

CLASS G. SALTWATER COASTAL SITES

Estuarine shore: Shoreline where a river's mouth meets the sea.

Brackish lagoon: a large partially enclosed area of mixed salt/fresh water.

CLASS H. ROCK

Cliff: can be used for either inland or coastal habitats.

And finally...

Multiple visits: Please try to return to each nest you find, because multiple visits to a nest give so **much more information** than a single visit, not only on nest survival, but on laying dates, hatching dates, completed clutch size, etc. And remember to report **every active nest** – we need information on failures just as much as successes.

See the season through: The nesting season for many birds is considerably longer than many birdwatchers appreciate. For example, Rock Dove and Great Horned Owl may have young as early as February, Mourning Dove and Cedar Waxwing as late as October. American Robin may rear three, and Rock Dove and Mourning Dove may rear four broods, in one calendar year. Please try to see the season through.

Spreading the word: The ONRS is keen to recruit new contributors to the Nest Record Scheme. We will happily send an introductory "starter pack" to any enthusiastic and competent nest finder and recorder that you may recommend.

Extra materials or advice: If at any point during the nesting season queries arise or you need extra nest record cards, registration forms, handbooks or coding cards, we will be happy to help. Contact George Peck, Coordinator or Mark Peck at the address on the back of this booklet.

Check the Birds Ontario website for updates to the ONRS, summaries of results, information on nest finding and identification, on-line data entry and to download copies of the manual or coding card:

<http://www.birdsontario.org>

ENJOYABLE NEST FINDING TO ALL CONTRIBUTORS



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