

NOVA SCOTIA NOCTURNAL OWL SURVEY

Guide for Volunteers

Revised March 2019



Birds Canada - Atlantic Region

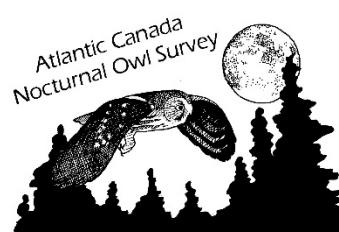
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NOVA SCOTIA NOCTURNAL OWL SURVEY

Birds Canada welcomes you to the mainland Nova Scotia Nocturnal Owl Survey!

Thanks for committing your time to the survey.

Please read this instruction booklet carefully. The NS protocol follows the *Guidelines for Nocturnal Owl Monitoring in North America*, published by the Beaverhill Bird Observatory and Birds Canada, and available (in English) online at www.bsc-eoc.org/volunteer/atowls. The survey is meant to be an annual event and will continue as long as possible. Owl surveys have been ongoing on Cape Breton Island since 2001.

WHY A NOVA SCOTIA NOCTURNAL OWL SURVEY?

Owls are excellent indicators of environmental health, as they are high on the food chain and are thus vulnerable to many environmental disturbances such as toxic chemicals and habitat loss. Some owl species have specialized habitat requirements, such as the Barred Owl, which depends upon cavities in large trees (mostly hardwood) for nesting. The Barred Owl is therefore susceptible to changes in abundance of large cavity trees as a result of forest management activities. Monitoring the Barred Owl in NS is therefore of considerable importance to wildlife and forest managers and conservationists as a means of assessing long term forest health.

To this end, Birds Canada is working with naturalist groups, forestry companies, and many keen volunteers to manage the NS Nocturnal Owl Survey. Monitoring owls is not an easy task. They are secretive, primarily nocturnal and roost in concealed locations during the day. Consequently, Nova Scotia's owl populations are not adequately monitored through existing monitoring programs (e.g. Breeding Bird Survey, Christmas Bird Counts). Playback of recorded songs is used to census a variety of bird species, and is particularly useful for owls (especially Barred Owls). Due to their territorial behaviour, songs broadcast within an owl's territory may elicit a vocal or visual response by the resident owl in an attempt to defend its territory against an intruder.

In Canada, volunteer owl surveys have been established in Ontario, Manitoba, Alberta, Saskatchewan, British Columbia, Prince Edward Island, New Brunswick, Newfoundland and Nova Scotia. Bird Studies Canada coordinates the owl surveys in Ontario, British Columbia, New Brunswick, Newfoundland, mainland Nova Scotia and Prince Edward Island, and has been heavily involved in the development of the North American guidelines.

The goals of the NS Nocturnal Owl Survey are:

1. To estimate population trends of owls over at least a 10-year period;
2. To gather location information on rare or little-known owl species (especially Boreal, Long-eared, and possibly Northern Hawk owls) in Atlantic Canada; and
3. To involve volunteer birders from across the region in wildlife monitoring.

The NS playback protocol consists of Boreal and Barred owl calls interspersed with silent listening periods. Northern Saw-whet Owls will respond to the calls of Boreal Owls, and in fact will likely be detected in much higher numbers than Boreal Owls in NS. All other owl species that are encountered will also be monitored. These include Great Horned, Long-eared, Short-eared, and possibly, Northern Hawk, Eastern Screech, and Great Grey owls. You can expect to encounter Great Horned, Northern Saw-whet and Barred owls most often on your survey.

GENERAL SURVEY METHODOLOGY

It's simple! A team of two (or more) volunteers drives a pre-determined, randomly chosen route, stopping at 10 fixed intervals every 1.6 km along the road. At each stop, volunteers play a CD or MP3 file with calls of Boreal and Barred owls alternating with timed listening periods. Volunteers identify and record all owls heard or seen during each listening period.

Surveys begin one half hour after sunset and take approximately 2.5 hours to complete (not including travel time to and from the survey route). Surveyors are asked to run each route once, anytime in the designed survey period (see letter accompanying survey kit, or data sheets, for dates). **We do, however, encourage those of you in southern NS to run your route within the first two weeks of the survey period to avoid problems with frogs (e.g. loud choruses drowning out owl calls) and/or spring runoff or melt water problems.**

It is important that the same volunteer survey the same route from year to year as much as possible.

GETTING READY

Before you can get started on your owl survey, you need to:

1. Read these instructions and become familiar with the methods and data forms.
2. Learn your owls! Listen to the training CD/MP3 to be sure you can identify any owl calls you might hear. Go out in your local neighbourhood in the evening to listen for owls and practice your ID skills (but try to avoid using playback unnecessarily; see Cautionary Note on p. 12). Go owling with an experienced birder who can teach you the different calls you might hear on your route. Try to be as familiar as possible with the calls of the three most commonly encountered species: Barred, Great Horned, and Saw-whet owls. The training CD/MP3 also contains sounds of two other nocturnal birds you might encounter (Common Snipe and American Woodcock) which are monitored using the survey as well as two species of frogs that begin calling first in the spring (Spring Peeper and Wood Frog).
3. Scout your assigned route during daylight hours. If you wish, distribute flyers to local residents to let them know that you'll be conducting the survey near their homes in the coming weeks. Some local residents are puzzled by the owl sounds which often make their dogs bark.
4. If you are using your own CD or MP3 player, check to be sure that it is working and that it is loud enough by carrying out the test outlined in the box on page 5. If you do not own a CD player,

notify the survey coordinator who can arrange for you to borrow one. Reserve the CD player for 1-3 nights during the time period when you think you'll be surveying your route.

Your assigned route

Your kit includes a map of your survey route and a description of each stop along the route. All survey routes were chosen randomly using a map of all roads that should be driveable in April. Birds Canada's National Council, consisting of leading ornithologists from across the country, is promoting random route selection for any new owl surveys being developed in Canada, as this is the best way to achieve statistically sound results. It will take some patience and some help from you, but we believe it can be done.

If you own or can borrow a Geographic Positioning System (GPS), we *strongly* recommend that you take it with you on your scouting expedition or actual survey. At a minimum, we would like to know the latitude and longitude of the first and last stops on your route. We would prefer that all positions are reported using the NAD83 reference system; please indicate if your GPS uses a different system (e.g. NAD27). Coordinates should be recorded in degree decimal format (e.g. 45.56783° N, 67.10332° S). If the GPS you are using is not set to give coordinates in this format see your unit's manual about how to change the display settings.

Along each route, stops should be located every 1.6 km as much as possible. However, stops should be moved if they are dangerous (e.g. on a curve) or too noisy (e.g. near a house with a loud dog, beside a loud river or creek, etc.). Also, if a stop falls in an open area (e.g. an agricultural field, or in the middle of a town), please move it to the nearest available forested location. Forest on only one side of the road is fine; you will simply direct your playback to that side of the road. If you need to adjust the station spacing, please ensure that the stations are *at least* 1.6 km apart; you may lengthen the distance between stops, but please do not shorten it. Also, please keep in mind the following general requirements:

1. The route should pass through mostly-forested habitat. If the route is on a road that is heavily settled with many houses or farms, it may not be suitable. Dogs often respond to the owl playback and make it difficult to hear any owls that might be calling back. If your route falls on a road that has a lot of homes (e.g. several per kilometre on average), it is probably not suitable.
2. The road(s) followed on the route should be permanent roads, which will likely be available for surveying in future years. Roads should be accessible in April. If you're not sure if a road is accessible in April (it might be too muddy or wet, and you may require a 4WD vehicle), ask someone who lives nearby!
3. The route should follow secondary roads with little traffic and sufficient safe points for stopping. Generally, a road that has constant traffic is not suitable for the owl survey, as it is neither safe nor easy to hear owls when cars and trucks are constantly passing.

If you find that your route does not fit one or more of the above requirements, please contact the survey coordinator who will choose a new route for you. Any knowledge you could provide on the suitability of roads in the area would help us to pick a better route.

SURVEY MATERIALS

The following materials may be included in your participant's kit:

- Instruction booklet
- training CD or MP3 file
- broadcast CD or MP3 file
- survey and data forms (2 copies)
- route map and stop description form
- application for voluntary support
- Envelope for returning the completed forms

You will have to supply the following:

- CD player or MP3 player and speakers - either your own, or a CD player borrowed from Birds Canada
- Towel (to place underneath tape player to avoid scratching your vehicle)
- Flashlight
- Spare batteries for flashlight and CD/MP3 player (* **VERY IMPORTANT***)
- Watch
- Pencil/pen
- Clipboard
- Compass
- Reliable vehicle

Handy but optional equipment:

- Headlamp-type flashlight
- Geographic Positioning System (GPS)
- Cell phone (in case of emergency)

We are not able to reimburse volunteers for travel or other expenses. However, as a charitable organization, Birds Canada can offer tax relief for expenses volunteers incur while conducting field work. We are happy to extend this benefit to participants in the NS Nocturnal Owl Survey. An application for voluntary support is included in each participant's kit.

Broadcast Equipment

We are attempting to provide standardized broadcast equipment to surveyors by making CD players available for borrowing through Birds Canada. However, if you own a loud portable CD player or MP3 player and speakers, you may use it for the survey provided it passes the simple test outlined on the following page. We have established **400 metres** as the minimum distance at which you should be able to recognize the Barred Owl calls when the broadcast CD/MP3 is played at maximum volume without causing undue distortion (under ideal conditions: in an open area with no wind or precipitation). If your own equipment does not meet this guideline, please make arrangements to borrow a CD player from Birds Canada.

Differences in the volume and sound quality of different CD players and MP3 speakers will no doubt affect the number of owls that respond. However, as long as the average volume and quality of the CD

player/MP3 speakers used by an individual volunteer on a specific route does not change over time, the survey should be able to monitor long-term trends in owl populations. **In other words, please attempt to use the same CD player or MP3 player and speakers each year you conduct the survey!**

**If you are using your own CD player or MP3 player and speakers....
INSTRUCTIONS FOR TESTING YOUR BROADCAST EQUIPMENT**

This test takes about 20 minutes to complete and can be done anytime before the survey. It should be carried out under weather and noise conditions similar to those which will likely be encountered during the survey (i.e. little or no wind, no precipitation, minor background noise). Use two people for this test: one to listen and one to run the CD/MP3 player.

Find a quiet, open area where you can measure off distances of approximately 400 and 500 metres either by pacing (100 metres is roughly 120 steps for most people) or driving (use car odometer). One volunteer should stand 400, and then 500 metres away from the CD/MP3 player while the other volunteer plays the broadcast CD/MP3. The CD/MP3 player should be played at the maximum volume possible without causing distortion. If your CD/MP3 player has bass and treble settings, make sure they are set to the "normal" setting. Listen to see if the Barred Owl calls are audible and recognizable at both 400 and 500 m. The results of this test should be entered on the first page of the survey form.

DETAILED INSTRUCTIONS

When to Survey Your Route

Survey Window

Please run your route once per year, on any evening during the designated survey period. If you're in southern NS, we strongly encourage you to run your route in the first two weeks of the survey window to avoid competing frog choruses or messy roads due to snowmelt. Noise from running streams is also a problem later in the season.

Timing

The survey should begin one half hour after sunset and finish no later than midnight. Please check your local paper for sunset time. The time required to complete a survey, not including travel time to and from the route, ranges from 2.5 hours to 4.5 hours.



Weather Conditions

Weather has a great influence on our ability to hear owls. Calm conditions are without a doubt the best. Wind and precipitation significantly reduce calling rates and detectability, while cloud cover is less important. Because some owl calls do not carry very far, wind is a critical limiting factor. Try to conduct surveys with little or no wind (3 or less on the Beaufort Scale; see data forms for details). Extremely cold temperatures have an adverse effect. For optimum response, try to select a night that is clear, calm and not too cold (e.g. warmer than -15°C). Do not attempt a survey if the wind exceeds force 3 or if there is persistent snow or rain. If conditions deteriorate over the course of an evening, use your judgement as to whether or not the route should be completed, or run it again on another evening. Generally, light snow or drizzle starting in the middle of a survey shouldn't prevent you from completing your route, but strong winds are a much more serious problem.

How to Survey Your Route

Drive to the starting location. Plan to arrive at least half an hour after sunset. Reset your trip odometer. This is Stop 1. Fill out date and weather information at the top of the data form. Put the broadcast CD in your CD player, or cue up the MP3 on your player and turn on your speakers. **Be careful not to play the training CD/MP3 instead of the broadcast CD/MP3!**

At each stop, push the play button on the CD/MP3 player and move at least 20 metres away. Although all participants should listen and watch for owls, one person should act as the surveyor and be responsible for identifying and counting owls and completing the survey forms. **Please use the forms provided for recording data in the field, following the instructions on pages 7-9.**

IMPORTANT

There are two copies of the data form (a good copy and a rough copy). The “good” copy (which is stapled to the survey form) will be scanned at Birds Canada and therefore needs to be legible. We have provided the rough copy so that you can use it on your survey without worrying about wrinkling or staining the good copy. When you complete the survey, please transcribe your data on to the good datasheet. If you decide to use the good copy on your route, please be careful with it!

The broadcast CD/MP3 lasts approximately 9.5 minutes. It starts with a beep to indicate the start of the first **silent listening period**, which lasts **one minute**. Record all owls heard or seen. Another beep marks the end of the first silent listening minute. This is followed by a **second silent listening minute**. Record any **new** owls heard or seen during this second minute, as well as any owls from the first period that continue to call. Owls heard during these first two silent minutes are calling voluntarily, rather than in response to the playback.

Then, the **Boreal Owl** broadcast will begin (20 seconds long), followed by another **one-minute silent listening period**. Record all owls heard and seen during this period separately. Keep track of whether the owls heard in the first 2 minutes continue to call and mark down any new owls, which start to call. Remember that both Boreal and Northern Saw-whet owls can be expected to respond to the Boreal Owl call.

The **Boreal Owl** broadcast is repeated, followed by another **one-minute silent listening period**. Continue to record all owls heard and seen during this period separately.

Then the **Barred Owl** broadcast will play for 20 seconds. This will be followed by a **two-minute silent listening period**. Then the **Barred Owl** broadcast will be repeated, followed by another **two-minute silent listening period**. A **beep** marks the end of the broadcast after the final two-minute listening period.

Estimate the distance and direction to each owl when it first began to call, following the instructions on page 9. We realize that these particular measurements can be difficult to make; please do your best. These data can be used for gross-scale habitat modelling and to adjust for some variation in detection rates using sampling methods.

Before you leave each stop, make sure you have noted the odometer reading, time of day, traffic count and the background noise levels. It is important to keep track of the noise level on your route, because noise can affect the detectability of owls. For example, if the average noise level on a route increases with time, then the number of owls *detected* might decrease, even though the actual number of owls calling was not decreasing.

Proceed immediately to the next station, and repeat the above procedure at all 10 stops. At the end of the last stop, record the time and weather conditions. Add up the total number of owls of each species and fill out the Comments section.

How to Complete the Survey Form and Data Form

The first page of the survey form can be completed before starting the survey. The reverse side of the survey form has a summary of the key survey instructions and definitions for the various codes to be used in completing the data forms. Detailed instructions for filling out the forms, as well as an example of a completed data form are included below. **Please study the sample data form carefully to ensure that data are collected accurately.** Codes to be used in completing the data forms are also reproduced below (on p. 10).

Broadcast equipment: If you are using your own CD/MP3 player, indicate the type of equipment you are using. Also indicate the results of the equipment test described on page 5. If you are using a CD player borrowed through Birds Canada, please indicate the Birds Canada ID# given on the unit.

Date: Please note the month (in numerals) followed by the day, e.g. 04-08.

Weather: Record the weather conditions at both the start and end of the survey. Estimate the air temperature. Circle the appropriate code (as listed on the reverse side of the survey form) to indicate the wind, cloud cover and precipitation.

Odometer reading: This information is particularly important if a stop has to be shifted from the standard station spacing of 1.6 km due to noise interference (from running water, frogs, hydro generator, barking dogs) or unsuitable habitat (open fields, homes). As much as possible, please try to follow stop descriptions and coordinates provided. There is likely to be variability within odometers between vehicles, so you may have to rely on a combination of both the odometer reading as well as the stop description to locate each stop.

Time at each stop: Record the time of day using the 24-hour clock (e.g. 1900h) at the start of each new stop.

Owl Information: We are primarily interested in knowing how many owls of each species you hear, when you first heard each owl (i.e. during which silent minute, or after which playback call?), and whether it continued to call in subsequent listening periods. We would also like you to note any owls that were seen but not heard, individuals you think are "repeats" (the same bird you heard at previous station), and possible pairs. **If you think you are hearing the same bird as at a previous station, then record it as usual but put "Y" into the section of the data form that says, "Repeat?"** At each stop, record each owl detected in the column immediately to the right of the stop number by writing in the appropriate 4-letter species code, as provided on the reverse side of the survey form. For each stop, up to 4 different owls can be recorded on the lines provided. If more than four owls are detected at a stop, then these additional birds can be recorded in the spaces provided at the end of the form, being careful to write in the stop number beside them. Record *each* individual owl on a separate line even if they are the same species.

The seven columns to the right of the species codes are used to indicate which of the seven listening periods a particular owl was heard calling in. When an owl is heard, record the species code as noted above, then place an "X" in the column(s) corresponding to when that owl was heard (e.g. if an owl is heard calling during the second silent listening period, place an "X" in the column titled, "2nd minute". If the owl is heard during every listening period, place an "X" in every column). Leave the relevant column blank if a particular owl was not heard during that listening period. **Follow the sample form carefully!**

You may be wondering why we require such precise information about *when* owls are detected during playback. First, it is extremely important that we note whether the owls were heard before or after the playback (i.e. during the first two silent minutes, or after the Boreal or Barred Owl calls), so that we can determine the effect of playback on calling behavior. In addition, the first two minutes of silent listening are standardized in owl surveys across the country based on the National Guidelines. Therefore, if we

want NS data to be used in any Canada-wide analyses, it is important that we keep track of owls heard separately before and after playback. By further noting exactly which period the owl called in, we can also analyze the effectiveness of multiple playback periods. For example, we can determine the proportion of Boreal or Saw-whet owls that called after 1 set of calls, as opposed to two sets. If we find that 95% of owls are detected after only 1 set of calls, we may decide, in future years, that the second set of calls is not necessary.

If the owl is seen but not heard, put an "S" in the appropriate column. If the owl was both seen and heard, use "XS". **Please do not use "XX" to denote two owls heard calling during the same listening period! Use a separate line for each individual owl.** Also, we are not interested in how many times an owl calls during a particular listening period. Use only one X to denote that an owl called, regardless of whether it called once, or 20 times.

Only owls detected between the start and end of the broadcast CD/MP3 should be tallied. If you detect an owl before or after this period, make a note in the Remarks column, but do not include this individual when you add up the total number of owls on the route.

Distance to owl: For each owl heard calling, estimate its distance from you *at the point when it first began to call* by checking off the appropriate distance category (<200m, 200-500m, 500-1000m, and >1000m).

Direction to owl: For each owl heard calling, estimate the direction it is calling from *at the point when it first began to call* using a compass. Stand on the road facing forward (i.e. the direction you are traveling in). Use the compass to determine which way is North and estimate which compass direction most closely matches the direction the owl is calling from (e.g. N, NE, E, SE, S, SW, W, NW).

Traffic count: Indicate the number of vehicles which pass by during the broadcast period at each stop in the column provided.

Noise level: Rate the background noise level at each stop using the four-point scale described on the reverse side of the survey form. **Please do not give a range of possibilities for noise level; give only one code per stop (e.g. Noise Level = 1).** Describe the source of any elevated noise levels (above level 1) in the Remarks section (e.g. frogs calling, airplane overhead, running water, etc.).

Other Species: If you are confident in the identification of American Woodcock, Ruffed Grouse and Common Snipe, please record the number detected at each stop. If you detect none please enter a 0 so that we know you were listening for them. If you are not confident in identifying these additional species please put an X in the boxes. The characteristic sounds made by woodcock and snipe are found on your training CD/MP3. Male Ruffed Grouse can be identified by their deep drumming sound that increases rapidly in tempo.

Comments: Note any additional wildlife detected, interesting habitat characteristics as well as any other interesting observations made during that stop.

General Remarks: Please complete the General Remarks section of the cover sheet immediately following the survey while the experience is still fresh in your mind. Your comments are very

important. We want to be sure we design this volunteer survey so that it is feasible, enjoyable and productive.

WEATHER CODES		
WIND (Beaufort Scale) 0. Calm, smoke rises vertically. 1. Light air movement, smoke drifts. 2. Slight breeze, wind felt on face. 3. Gentle breeze, small twigs move. 4. Moderate breeze, small branches move. 5. Fresh breeze, small trees sway.	CLOUD COVER: 1. 0-25% 2. 25-50% 3. 50-75% 4. 75-100% 5. Fog	PRECIPITATION: (circle one) None Trace Rain Snow
NOISE LEVEL CODES		
1. None or slight, relatively quiet, little interference. 2. Moderate, some interference with broadcast and/or listening. 3. High, substantial interference with broadcast and/or listening. 4. Excessive noise, extreme interference with broadcast and/or listening.		
OWL SPECIES CODES		
BARR = Barred Owl BOOW = Boreal Owl GHOW = Great Horned Owl	NSWO = Northern Saw-whet Owl EASO = Eastern Screech Owl LEOW = Long-eared Owl	SEOW = Short-eared Owl NHOW = Northern Hawk Owl UNOW = Unknown Owl



ATLANTIC CANADA NOCTURNAL OWL SURVEY - NOVA SCOTIA

Route # NS 2,2

Weather Conditions: Snow Cover (%) 100 Max Depth (cm) 10 Min Depth (cm) 5

(Please circle one)

Start of Survey: 0 1 2 3 4 5 Wind 1 2 3 4 5 Cloud Cover 2 3 4 5

End of Survey: 1 2 3 4 5 1 2 3 4 5

Mon Day 04/12

2005

Precipitation: Trace Trace Rain Rain

Temperature: 0.7 °C 1.0 °C

Stop	Time (24hr and Odometer(km))	Species Code	1st Min	2nd Min	After 1st BOOW	After 2nd BOOW	After 1st BARR	After 2nd BARR	Repeat?	Direction to Owl	Distance to each owl (m)	Traffic Count (# cars)	Noise Level (1-4)	Amer. Wood-cock	Ruffed Grouse	Snipe
1	2,0:3,1 0,0.0	N, S, W, O	X	X				X		N, W		0	1		1	
2	2,0:4,7 2,0	B, A, R, R			X			X		S, E		0	1	1		
		N, S, W, O	X	X					Y	N						
3	2,1:0,4 4.0	N, S, W, O			X					N		0	1			
		N, S, W, O			X			X		S, W						
		U, N, O, W			X	X	X			S						
4	2,1:2,1 6.0	B, O, O, W			X					N, W		3	2			
5	2,1:3,8 8.0	B, A, R, R						S, X, S		E		1	4			

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SAMPLE

Note Regarding Coordinates

For routes with pre-established coordinates they are provided in degree decimal format which is also the preferred format for you to submit new coordinates. This format is easy to use and by far the easiest in terms of data entry and management. The NS provincial road atlas includes latitude and longitude in degree decimal format on the top and left hand side of each page.

Rare Owls

If you're lucky enough to see or hear one of Nova Scotia's rare owl species (Boreal Owl, Long-eared Owl, Short-eared Owl, Northern Hawk Owl, Eastern Screech Owl, Great Grey Owl), please contact the survey coordinator RIGHT AWAY (i.e. the very next morning!). We will follow up on your reports of rare species (perhaps by visiting your route again) to further verify these important records. If you believe you have heard a Boreal Owl, please refer to the Boreal Owl Identification Sheet and complete for each Boreal Owl detected.

Returning the Completed Forms

Online:

If you are comfortable with online forms, we enthusiastically encourage you to submit your data via our NatureCounts website (www.birdscanada.org/birdmon/atowls/main.jsp). When you type your data into the online form and push submit, it goes directly into the main Atlantic Nocturnal Owl Survey database, so it is the quickest and most efficient option. All you have to do is register (first time you use it) or log in using the link given above. If you are not sure whether you have an account, can't remember your password, or have any other questions, please contact us!

By Mail or Fax or Email:

After you've completed the survey, check over your forms (survey form, data form) to make sure all information is complete (and legible). If you have access to a photocopier or scanner, make a copy of your data forms for your records (and in case the originals get lost in the mail!) Mail your data sheets to the address below OR email the scanned sheet to rtorrenta@birdscanada.org OR fax your data sheets to (506) 364-5062. Please return the forms by **31 May**.

Rémi Torrenta
Owl Survey Coordinator
Birds Canada - Atlantic Region
P.O. Box 6227, Sackville, NS, E4L 1G6
phone: (506) 364-5045 fax: (506) 364-5062
email: rtorrenta@birdscanada.org

If you are applying for voluntary support, please include the completed application form and your cheque with your data forms. A pre-addressed envelope is included with the participant's kit.

CAUTIONARY NOTE

Song broadcasts are effective in locating and studying owls but should not be used indiscriminately. Responding birds may continue to vocalize for some time after the playback ends, and therefore may be more easily located by predators. In addition, frequent and persistent playback may affect the normal activities of the owl. Enjoy the birding experience but please keep disturbance to a minimum. If you wish to use playback outside of the actual survey, please do so sparingly; do not use it to continually attract one or two pairs of owls which happen to be in a convenient location. Remember that the health and welfare of each bird is our utmost priority.

We are also concerned about your safety. Dress warmly. Please be careful when standing on roadsides at night and while driving on wintry roads.

**THANK YOU, ONCE AGAIN, FOR YOUR PARTICIPATION IN THE
NOVA SCOTIA NOCTURNAL OWL SURVEY!**

APPENDIX A

IDENTIFICATION OF NOVA SCOTIA OWL CALLS

Please read the following descriptions of owl calls and listen to your training CD/MP3. Go out owling with an experienced birder before conducting your survey. Most information taken from:

<http://www.owlpages.com/>

Commonly encountered in NS

Barred Owl

Highly vocal, giving a loud and resounding "hoo, hoo, too-HOO; hoo, hoo, too-HOO, ooo" often phrased as "Who, cooks, for-you? Who, cooks, for-you, all?" The last syllable drops off noticeably. Will call in the day and at night. Other calls include "hoo-hoo, hoo-WAAHH" and "hoo-WAAHHH" used in courtship. Mates will duet (as on training CD/MP3). Other vocalisations range from a short yelp or bark to a frenzied monkey-like squall.

Great Horned Owl

Large repertoire of sounds, from deep booming hoots to shrill shrieks. The male's resonant territorial call "hoo-hoo hoooooo hoo-hoo" is often phrased as "Who's awake? Me, too". Gives a growling "krrooo-oo" or screaming note when attacking intruders. Other sounds include a "whaaa whaaaaa-a-a-aarrk" from disturbed birds, a catlike "MEEE-OWww", barks, hair-raising shrieks, coos, and beak snapping.

Northern Saw-whet Owl

Primary courtship call is a monotonous, whistled "hoop, hoop, hoop, hoop...", given at a rate of about 1½ notes per second. Territorial calls are series of short clear notes. The Saw-whet Owl's name comes from the "skiew" call that is made when alarmed. This sound resembles the whetting of a saw. When the male flies to the nest with food it gives a rapid staccato burst of toots, and the female responds with a soft "swEE".

Long-eared Owl

Main call is a low "hoo, hoo, hoo, hoo,", repeated 10 to 200 times, with one note every 2 to 3 seconds. The female responds with a raspy buzz call, and often duets with the male. When alarmed, Long-eared Owls bark "whek-WHEK-whek" or shriek like a cat. Both males and females hiss during exchange of prey or when alarmed.

Rarely encountered in NS**Boreal Owl**

A rapid, high-pitched, “to-to-to”, like the sound of dropping water or a series of musical, cooing notes. Similar to the sound made by Common Snipe tail feathers during display flight (also included on training CD/MP3). Please see also the Boreal Owl Identification Sheet included with the survey kit.

Short-eared Owl

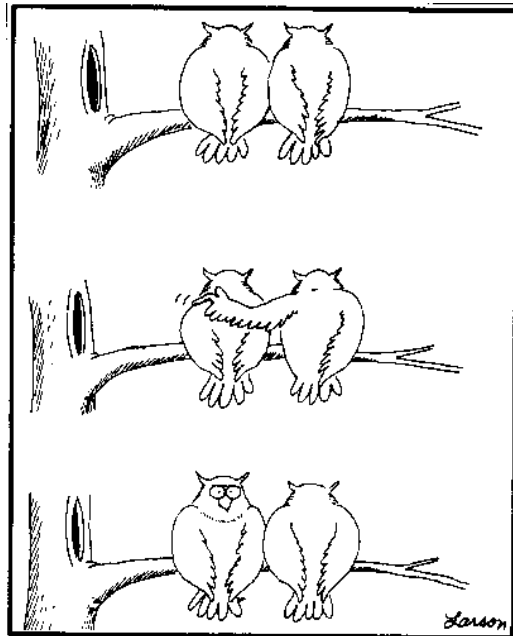
Unlikely to be detected on the NS survey, because they are diurnal (active during the day), and prefer open habitat to forest. The male's territorial song is a pulsing “voo-hoo-hoo”, resembling an old steam engine. This song is given mainly during flight displays and the female responds with a barking “kee-ow”. When excited near the nest, both sexes squawk, bark, hiss and squeal.

Northern Hawk Owl

Very unlikely to be encountered on NS survey because of diurnal habits; not on training CD/MP3. Gives a whistle-like call, “Ululululululu...” lasting approximately 10 seconds per turn.

Eastern Screech Owl

Unlikely to be encountered in NB because of their more southern range. Most common call is an eerie, mellow, muted trill given during the mating and nesting seasons. Each call lasts 2 to 3 seconds with about 35 notes given. When in the nest with young, adults give a descending whinny call, instead of the normal call. Females tend to bark or hoot when defending the nest.



APPENDIX B
INFORMATION ON NOVA SCOTIA'S OWLS

Species descriptions can be found in the *Second Atlas of the Breeding Birds of the Maritime Provinces*, which is available online at: www.mba-aom.ca/jsp/toc.jsp?lang=en

Great Horned Owl
Barred Owl
Northern Saw-whet Owl
Long-eared Owl
Short-eared Owl
Boreal Owl