

A CITIZEN SCIENTIST'S GUIDE TO CONDUCTING RED-SHOULDERED HAWK AND SPRING WOODPECKER SURVEYS



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INTRODUCTION

This Citizen Scientist's Guide contains detailed instructions for conducting Red-shouldered Hawk and Spring Woodpecker Surveys. Please read this guide carefully. At least one week prior to conducting your survey, check to be sure you have all the necessary equipment (see checklist on page 4). Please contact the Red-shouldered Hawk and Spring Woodpecker Survey Coordinator if you have any questions:



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WHAT IS A CITIZEN SCIENTIST?

A Bird Studies Canada citizen scientist is a volunteer who dedicates their time and observations to scientific research projects supporting bird conservation. Citizen scientists' voluntary efforts are essential and contribute to the conservation and preservation of Canada's wild birds and their habitats. Thanks for being a citizen scientist!

BACKGROUND

Although once common throughout south-central Ontario, the Red-shouldered Hawk is now officially designated as Vulnerable in Ontario and in Canada. Red-shouldered Hawks require large tracts of mature forest in close proximity to wetlands. Habitat loss, degradation, and fragmentation have led to the decline of this woodland hawk, especially in southwestern Ontario.

The Red-shouldered Hawk Survey was initiated in 1991 as a long-term volunteer-based project to monitor Red-shouldered Hawk populations in Ontario. This survey is coordinated by Bird Studies Canada (BSC), as part of its Ontario Birds at Risk (OBAR) program, in cooperation with the Ontario Ministry of Natural Resources Wildlife Assessment Program. The main objective of this survey is to collect data that can be used to assess the impact of forest management practices on Red-shouldered Hawks and woodpeckers.

Starting in 1992, surveyors were also asked to record the number of Pileated Woodpeckers and Yellow-bellied Sapsuckers observed. Like the Red-shouldered Hawk, these woodpecker species are found in deciduous and mixed forests and are potentially affected by forest management practices. Furthermore, woodpeckers are easier to detect in late April and early May than in June, when other breeding bird surveys are conducted.

In 1994, the survey name was officially changed to the Red-shouldered Hawk and Spring Woodpecker Survey. Survey participants are now asked to record all hawks and woodpeckers that are seen or heard during the survey.



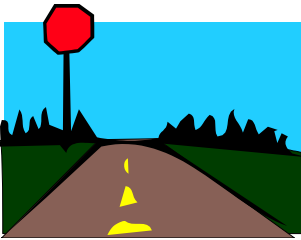


STUDY AREA

Because the Red-shouldered Hawk is the primary target species, the study area for this survey is restricted to its breeding range. The study area includes most of southern Ontario, south of the 47°N line of latitude. Breeding densities of Red-shouldered Hawks vary considerably across the study area. Availability of suitable habitat is a major constraint, particularly in agricultural areas. This woodland hawk is now rare in southwestern Ontario.

To monitor Red-shouldered Hawk population trends, areas of suitable habitat throughout its breeding range should be surveyed. However, the survey design (roadside survey consisting of 20 stops at 1 km intervals) is best suited to secondary roads passing through areas of extensive forest cover. Most survey routes are located in central Ontario, where forest management occurs on extensive tracts of Crown land. It is important to know how Red-shouldered Hawks are faring throughout their breeding range in Ontario. However, routes established in the fragmented woodlands of southwestern Ontario have proven ineffective.

GENERAL SURVEY METHODOLOGY



The Red-shouldered Hawk and Spring Woodpecker Survey protocol is similar to that of other roadside surveys using playback. A team of two volunteers drives a pre-determined route, stopping at fixed intervals along the roadside. At each stop, the assistant plays a tape or CD of Red-shouldered Hawk calls alternated with timed listening periods. The surveyor is responsible for identifying all hawks and woodpeckers heard or seen during the broadcast period and recording this information on the data forms provided.

Each survey route consists of 20 stations, spaced at 1 km intervals. Each route is surveyed once a year during the last 2 weeks of April or the first week of May (17 April-7 May). Surveys begin shortly after sunrise and take about 4 hours to complete (not including travel time). The playback tape/CD used for this survey is 7 minutes long and consists of six short sets of Red-shouldered Hawk calls, separated by 40-second listening periods, followed by a final two-minute listening period. No other hawk or woodpecker calls are broadcast during the survey.

SURVEY MATERIALS

New surveyors will receive a complete package containing the survey material listed below. Previous participants normally keep the training tape/CD, Citizen Scientist's Guide, and BSC broadcast unit from year-to-year but are sent new data forms and broadcast tapes each year. New broadcast tapes are sent to volunteers each year to reduce potential variation in hawk response due to tape degradation. Broadcast CDs are now available for use on the surveys. CDs will not be replaced annually, so be careful with your CD and hold on to it for use in future surveys.



☑ SURVEY MATERIALS CHECKLIST ☑

The following materials are included in the participant's kit:

- | | | |
|-----------------------------|--|---------------------|
| ☞ Citizen Scientist's guide | ☞ Scannable data forms | 🎵 Broadcast tape/CD |
| ☞ Stop description form | ☞ Application for tax relief | |
| ☞ Return envelope | ☞ Sign for dashboard of car (explains the purpose of the survey) | |

In addition, new participants will receive:

- 🎵 Survey Training tape/CD
- ☞ Route map

You will have to supply the following:

- | | |
|--|--|
| ☞ Reliable vehicle | ✎ Pencil/pen |
| ☞ Portable stereo (see below) | ☞ Clipboard |
| ✚ Compass | 🕒 Watch |
| ☞ Flashlight | 🔋 Fresh batteries (for flashlight or stereo) |
| ☞ Road map and/or topographic map showing survey route | |

The following items are optional but are recommended, if available:

- Towel (to place underneath broadcast unit to avoid scratching your vehicle)
- Geographic Positioning System (GPS) unit (see page 8)
- Thermos with hot beverage (hot chocolate is our favourite!)



Unfortunately, we are not able to reimburse volunteers for travel or other expenses. However, as a charitable organization, BSC can offer support for expenses volunteers incur while conducting fieldwork. We are happy to extend this benefit to participants in the Red-shouldered Hawk and Spring Woodpecker Survey. An application for voluntary support is included in each participant's kit.

⚠ Please contact the Survey Coordinator immediately if you are missing any of these materials! ⚠

BROADCAST EQUIPMENT

To standardize the broadcast and ensure that the volume meets the target level of 100 to 120 decibels, BSC purchased a number of broadcast units that were specially modified for this survey. Unfortunately, we no longer have enough units to meet demand (the survey has become quite large!). So, if BSC equipment is not available, surveyors should use their own broadcast equipment.





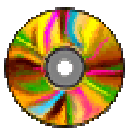
In the past, two general types of broadcast sets were supplied by BSC for this survey:

1. **Car stereo set.** Your broadcast set may consist of a YAMAHA YCR340 or YCR325 car cassette deck equipped with KOSS M60 bookshelf speakers, YAMAHA 6920 speakers, or a treble horn speaker. These units can only be powered with a car adapter.
2. **Portable cassette player.** Your broadcast set may consist of a SANYO CD/cassette player with a 5" horn speaker and 12-volt adapter cord. The adapter cord fits the cigarette lighter of a car and will power the broadcast set via the car battery. Please ensure that the speaker is mounted and wired to the set according to the assembly instructions included with the unit. These units can be powered with either the adapter or batteries.

If your unit is equipped with an adapter cord so that it can be plugged into your cigarette lighter, please use it if possible. Before heading out to do your survey, make sure that the car adapter is compatible with the vehicle you will be using. If you must use batteries to power the unit, then include the purchase receipt when applying for tax relief. Make sure the batteries are fresh. Do not store the batteries in the unit year-round. We will be tracking the equipment used by each surveyor on the data form.

Because we are unable to provide standardized broadcast equipment to all surveyors, we expect that a wide variety of equipment will be used. Differences in the volume and sound quality of the different tape and CD players will no doubt affect the number of hawks that respond. However, as long as the average volume and quality of the broadcast unit does not change over time, this will not interfere with the usefulness of this survey for monitoring long-term trends in Red-shouldered Hawk populations.

If you are using your own equipment, it should be as loud as possible. Although not as loud as the specially adapted units, car stereo systems (with external speakers) or large portable cassette players may be adequate for this survey. **Please test the volume of your broadcast equipment following the instructions below.** If at all possible, please indicate the output volume of your unit on the survey form. Most importantly, try to use the same equipment each year you conduct the survey.



We would also like you to conduct a simple test of your equipment (or BSC provided equipment) to see how far away you can clearly hear the calls on the broadcast tape/CD. This will provide us with some indication of how much variability there is in broadcast equipment. We have established 500 metres as the minimum distance at which you should be able to recognize the Red-shouldered Hawk calls when the broadcast tape is played at maximum volume without causing distortion. This guideline is well within the capability of many inexpensive tape or CD players. If your equipment does not meet this guideline, please locate another unit that does.





🔊 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 what will be encountered during the survey (i.e. little wind, no precipitation, minor background noise). Use two people for this test: a "surveyor" to listen and an assistant to run the tape player.

Find a quiet area where you can measure off distances of approximately 100, 250, and 500 metres either by pacing (100 metres is roughly 120 steps for most people) or driving (use car odometer). Using the broadcast tape/CD and portable stereo you will be using during the survey, have the surveyor stand 100 metres away from the broadcast unit while the assistant plays the broadcast tape/CD. The broadcast unit should be played at the same volume as for the survey (i.e. at the maximum volume without causing distortion). If your tape player has bass and treble settings, make sure they are set to the treble setting. The surveyor should listen to see if the Red-shouldered Hawk calls are audible and recognizable. Repeat this test for the 250 metre distance and, the 500 metre distance. The target broadcast volume is 100 to 120 db. This is very loud! Avoid standing in front of the unit while the calls are being broadcast. The results of this test should be entered on the first page of the survey form.

The purpose of this simple test is two-fold:

- 👂 To ensure that the tape player you will be using during the survey meets our guideline (i.e., the Red-shouldered Hawk call is audible and recognizable at 500 meters)
- 🔊 To give us a rough measure of the variability of the broadcast volume produced by different tape players

OPERATING INSTRUCTIONS

All equipment should be operated with the volume and treble set on **FULL**, and the bass turned **OFF**. Make sure the "BassXpander" (on SANYO units) is also set on "normal" position. Avoid standing in front of the unit while the calls are being broadcast as the broadcast is very loud. The equipment should be operated with the speaker facing the side of the road. At each stop, the speaker must be rotated 180° between each set of calls.

Surveyors occasionally report equipment problems during their survey. To minimize time spent fixing equipment in the field and avoid having to abort your survey:

1. Test the equipment prior to the survey. Note that the adapter cords are a tight fit but should fit standard cigarette lighters.
2. If the tape won't play, check the power supply. For adapters, the car must be ON (engine not running). Check for poor connections, especially the power cord connection on the back of Sanyo units.
3. Check that the volume is set to the maximum. On the SANYOs, check that the horn speaker has been properly connected to the back of the tape deck (see instructions in Appendix II). On the YAMAHA units, check that the speaker balance has not been accidentally changed (only one speaker is connected and the balance must be set to the correct side). The balance is adjusted by pushing in the volume knob and turning it all the way to left or right.



BROADCAST RECORDING

A new, double-sided broadcast tape or a compact disk is included in each survey kit. If you are using cassette tapes, please use the new tape for this year's survey, and discard (or file) any old broadcast tapes. New participants will also receive a copy of the training tape/CD with their participant's kit. If you are using a CD for your survey, please be careful with it and hold onto it for use in future survey, as these will NOT be replaced annually.

On each side of the broadcast tape, there is a series of six sets of Red-shouldered Hawk calls (pair of birds calling for approximately 20 seconds), interspersed with 40 seconds of silence. A 2-minute listening period, ending with a quiet beep follows the sixth set of calls. This beep marks the end of the observation period (and the tape) at that particular station. The CD is identical to the cassette tape.

As the broadcast tape is double-sided, it does not need rewinding. If your tape deck has auto-reverse feature (e.g. the YAMAHA car stereo units), just turn the unit off between stations. Otherwise, flip the tape and it is ready for the next stop. If you are using a CD, simply press play at each stop.

TRAINING TAPE/CD

Although we are primarily interested in collecting data on numbers of Red-shouldered Hawks, Pileated Woodpeckers, and Yellow-bellied Sapsuckers, we would like you to report all hawk and woodpecker species seen or heard on the survey. Because there is a wide range in the identification skills of survey participants, particularly as to their ability to identify drumming woodpeckers, surveyors are asked to indicate their skill level on the survey form. Don't worry - even if you can't identify all species by sound, you can still provide useful data.



To help less experienced surveyors, a training tape/CD is distributed to new participants. This 30-minute tape contains examples of hawk and woodpecker calls that you might hear during the survey. Examples of drumming by various woodpecker species are also included. The contents of the training tape/CD and descriptions of the various calls are included in Appendix I, and a general description of Ontario hawks and woodpeckers are provided in the Field Notes booklet. Everyone (new and old surveyors) should listen to the training tape/CD as it is a useful refresher. It is easy to forget bird calls during the long winter months. Please do not broadcast the training tape during the survey.

You also need to be able to identify any hawks you see during the survey and, if possible, distinguish between adult and immature birds, so it is a good idea to review the relevant section of your field guides prior to the survey. A Field Notes booklet with identification tips for all Ontario hawks and woodpeckers has been provided to surveyors. However, please keep in mind that only adult birds are shown in this booklet. It is also a good idea to spend a few hours hawk-watching at a suitable site. There are several excellent books available dealing specifically with hawk identification. Feel free to contact the Survey Coordinator for suggestions.



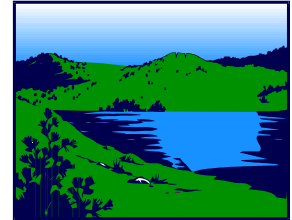
SURVEY ROUTES

Each surveyor is assigned a pre-selected route. Ideally, we prefer to have the same person run the same route for as many consecutive years as possible.

Route Selection

Survey routes have been pre-selected to pass through areas of suitable Red-shouldered Hawk breeding habitat. In most cases, Red-shouldered Hawks are known or suspected to have nested in the vicinity in the recent past. Across their Ontario breeding range, the density of Red-shouldered Hawks varies considerably.

In most years, the average number of Red-shouldered Hawks detected per survey route is around 4.0; however, the total number per route ranges from 0 to more than 20!



In order to detect population trends, it is essential that we monitor areas of sub-optimal and marginal Red-shouldered Hawk breeding habitat, as well as ideal habitat. All routes should pass through suitable Red-shouldered Hawk habitat. If yours does not, please let us know.

Route Configuration



Each survey route consists of 20 stops spaced at least 1 km apart. The total route length is therefore at least 19 km. The distance between stations is measured using a car odometer (1 km = 0.6 miles). However, some car odometers are not very accurate, so it is important to record stop locations on the route map, especially if you are using a different vehicle than in past years. To ensure that there is year-to-year consistency in stop locations and route length, new participants are asked to prepare stop descriptions. If you have a GPS unit (or are able to borrow one), please provide stop coordinates (see below).

If your route loops back on itself, then the station spacing should be increased to ensure that the minimum distance between stations is still 1 km (to avoid drawing in the same birds to more than one station). In areas with fragmented forest cover, routes consisting of two or three segments may be used to fit in 20 stops with suitable habitat.

ROUTE MAPS

If yours is a previously established route and you are a new surveyor, you will be sent a photocopy of the route with the start, end, and each stop location marked. If any of the information on the route map is incorrect, please mark the correct locations and return the map to us with your completed data forms. You will also receive a copy of the stop descriptions to ensure accuracy in determining each stop location.

If yours is a new route, we will provide you with a general route map, or will help you to develop an appropriate location for your route. Please do not initiate a new route without talking to the Survey Coordinator first. Please mark the start, end, and each stop location on your map and return it with your completed data forms and stop description form.



STOP DESCRIPTIONS AND LOCATIONS

Stop descriptions are very useful for re-locating stops in future years, particularly if a different vehicle is being used (each vehicle will give slightly different odometer settings). The general habitat information included in these descriptions will also provide some indication of habitat suitability along the route and may be used as an indicator of habitat change over time.

If you are developing a new route this year, we have included a stop description form with your survey forms. These descriptions can be completed when you scout your route, or by the assistant during the actual survey. Please return this form along with your data sheets.

It is very important that we know the location of the stops along your survey route. Most of you have been sent a copy of a topographic map showing your survey route. **If you haven't already done so, please mark your stop locations on the map and return it with your completed data sheets to Bird Studies Canada.** Having accurate stop locations is very important because it allows us to relate hawk and woodpecker locations to habitat characteristics. With this information, we can answer questions such as: Do Red-shouldered Hawks like old growth forests or young forests? Are Yellow-bellied Sapsuckers found mostly in small forests or in large?

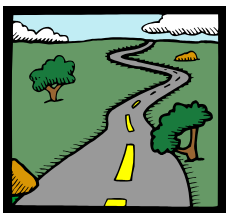
If you have access to a GPS unit (see below), please provide coordinates for each stop.

GEOGRAPHIC POSITIONING SYSTEM (GPS) UNIT

If you own or can borrow a Geographic Positioning System (GPS) unit, we recommend that you take it with you on your survey. Many Ontario Ministry of Natural Resources offices have GPS units that you may be able to borrow. You can run the GPS unit while you do your survey at each stop, so it should be possible to record the position of every stop without adding to the survey time. We would prefer that all positions be reported to the nearest 100 metres using the NAD83 reference system. Please indicate if the GPS you are using uses a different reference system (e.g. NAD27) or other units (e.g. longitude/latitude). Please record all 6 digits of the easting and all 7 digits of northing. These units can be accurate to about 2 meters, and the added precision is useful for relating hawk and woodpecker locations to habitat data.



MODIFYING AN ESTABLISHED ROUTE



and Data Form.

It is important that routes be run in a standardized manner from year-to-year. As much as possible, the location of the stops and the order in which they are surveyed should remain consistent. However, during the first year or two of running a new route, it may be necessary to modify the route configuration. Please confirm any planned changes with the Survey Coordinator prior to your survey. Also, be sure to indicate any route changes (including unplanned changes due to road conditions, etc.) on the route map

The most common reasons for shifting the location of one or more stops are safety concerns (i.e. busy road traffic), to avoid built-up areas (i.e. lots of houses or cottages), and to avoid areas where there is no Red-shouldered Hawk habitat within 500 m of the regularly spaced stop. If a particular stop is unsuitable, move farther down the road to the next suitable location.



Do not modify your route for other reasons (e.g. more hawks, more convenient order) without prior approval from the Survey Coordinator.

ABANDONING NON-PRODUCTIVE ROUTES

If most of your route was not suitable, then you should let us know and we will try to locate a new route for you. If your route passes through apparently suitable habitat but you found few or no Red-shouldered Hawks the first year you surveyed, we strongly recommend that you survey it again. Response rates can vary considerably from year-to-year and we need information from areas with few hawks in order to detect population trends.

If no Red-shouldered Hawks have been detected on a route in two or three consecutive surveys, then the route can be temporarily "abandoned" and the volunteer assigned a different route. Provided that the original route passes through suitable habitat, it should be surveyed again every five years. If the habitat is still not suitable, the route should be permanently abandoned.

TAKING ON A NEW ROUTE

If you are taking over a new route, please study the route map carefully before surveying your route. If you are unsure of where your route is located, please call the coordinator. We recommend that you scout your new route by driving it once or twice. As much as possible, please try to keep your stop locations in the same spot as the previous surveyor. However, stops should be moved if they are too dangerous or noisy. To help you remember where your stops are located in future years, we have provided you with a stop description form.




In the past few years we have established new routes in areas that we felt were under represented. These routes were selected randomly within appropriate habitat. If you would like to do another route, please contact the survey coordinator for a list of available routes. Please do not establish a new route without checking with the coordinator.

DETAILED SURVEY INSTRUCTIONS



Please read the following information carefully. Both the surveyor and assistant should be familiar with these instructions prior to conducting the survey.

Getting Ready




At least a week prior to conducting the survey, you should:

-  Read over the information in the Citizen Scientist's Guide to make sure that you are familiar with the survey methods and data forms.
-  Listen to the training tape. It contains examples of hawk and woodpecker calls you might hear during the survey. Examples of drumming by various woodpecker species are also included. Even if you are familiar with the calls of the target species, it is a useful refresher.
-  Make sure that you have all the necessary survey materials (see checklist on page 3), including blank data forms, maps, Red-shouldered Hawk broadcast tape and a working broadcast set.



-  Look over your route map to be sure you are familiar with the route.
-  Test your broadcast equipment and broadcast tape to be sure they are working. Purchase batteries if necessary.

We also recommend that you:

-  Find a partner to accompany you.
-  Scout your route in advance to check access and to complete stop descriptions.
-  Call the Survey Coordinator if you have any questions or problems!

When to Survey Your Route



Each survey route should be completed once, sometime within the last two weeks of April and the first week of May (i.e. between 17 April and 7 May). This survey window was selected to coincide with the pre-incubation period of the Red-shouldered Hawk breeding cycle when they are most likely to respond to the tape playback. Each survey should begin shortly after sunrise and should finish by 10 a.m. Check your local paper for sunrise time. The survey takes about 4 hours to complete (not including travel time to and from the route). The response rate of the Red-shouldered Hawks to the broadcast may decrease in the late morning, so please start your survey on time and move promptly from stop to stop.

Weather has a great influence on calling rates and detectability. Calm, sunny conditions are preferred. Wind, precipitation and fog significantly reduce the number of hawks and woodpeckers detected. Try to pick a day with little or no wind (Force 3 or less on the Beaufort Scale, see reverse of Survey Form), good visibility (at least 1.6 km) and no precipitation. There is little point in attempting or continuing a survey if the wind exceeds Force 3 or if there is persistent rain.



HOW TO SURVEY YOUR ROUTE



Although it is possible to run a route by yourself, we recommend that another person accompany you to operate the broadcast equipment (rotate speakers between calls), complete the stop descriptions, and pour the coffee! The surveyor is responsible for identifying all hawks and woodpeckers heard or seen during each listening period and recording this information on the data forms provided. Only the surveyor should identify hawks and woodpeckers; the assistant should simply record information as given by the surveyor.

Routes are to be surveyed according to the following guidelines, to ensure that all necessary tasks are carried out in a standardized manner.

**Before starting out:**

- Make sure that the weather conditions are suitable.
- Check the equipment list on page 3 to avoid forgetting necessary equipment.
- Record the odometer reading so that you can calculate the total number of kilometres travelled to, from, and during your survey in order to apply for Voluntary Support (see Application for Voluntary Support for details).

Drive to the starting location. This is Stop 1. Plan to arrive just about sunrise.

- Reset the trip odometer, if your vehicle has one. Mark “0 km” as the odometer reading for Stop 1.
- Fill out date, time, and weather information at the top of the data form.
- Make sure the starting point of your route agrees with the point labelled "Start" on your route map. If not, then mark the correct start on the map (use coloured pen).

The survey procedure at each stop consists of the following steps:

1. Record the odometer reading and time.
2. If it is not already filled in, complete the stop description and write down the GPS coordinate (if you have a GPS unit).
3. Place the broadcast set (or speaker) on a towel on top of the car. The speaker should face one side of the road. Set the treble high and bass low. Volume should be set to full. Make sure the broadcast tape/CD is ready.
4. Begin the survey by starting the broadcast tape/CD. Push the play button on the stereo and move about 20 metres away from your vehicle. This will reduce noise interference from the engine as it cools and prevent you from being deafened by the broadcast! The start of each broadcast is indicated by the first set of Red-shouldered Hawks calls. Between each set of calls, the assistant will have to rotate the speaker 180°, so it faces the opposite side of the road.
5. Fill out the information requested on the data form at each station (see below).
6. Before you leave each stop, make sure you have filled in all the necessary information including the odometer reading, start time and stop description. As the broadcast tape is double-sided, do not rewind it. If your tape player has an auto-reverse feature, simply change the play direction. Otherwise, flip the tape over and it will be ready for the next stop. If you are using a CD, simply press play at each stop.
7. Proceed immediately to the next station, 1.0 km along the road.



At the next station, repeat the above procedure. Continue until all 20 stations have been completed. If moving 1 kilometre puts the next station in an inappropriate location (such as adjacent to a house, dangerous curve or in unsuitable habitat) continue to the first suitable location. Be sure to indicate on the route map and data forms that this stop has been shifted.

At the end of the 20th stop, record the time and weather conditions. You're done!



Remember to record the final odometer reading when you return home. Please fill out the Comments section of the Survey Form immediately after completing this survey. If you had any interesting experiences on your survey route, please let us know. We love to hear your stories!

Also, if you take any photographs while on your survey, please send us a copy. You may be featured in one of our newsletters (with your permission of course)!

CAUTIONARY NOTE

Song broadcasts are effective in locating and studying some birds 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 bird. Enjoy the birding experience but please keep disturbance to a minimum. Remember that the health and welfare of each bird is our utmost priority.

If during the survey you notice that a Red-shouldered Hawk is becoming very agitated by the tape playback, it may be nesting nearby. If you feel that continuing to broadcast the full set of six calls will cause undue stress to this bird, then abort the playback at that station. Please report this in the Remarks column. Remember to advance or rewind the tape before the next station. It is rare to encounter more than one pair of hawks at any one station.

We are also concerned about your safety. Please choose safe places to pull over and be careful when standing on roadsides.

COMPLETING THE DATA FORMS

All surveyors must complete the data forms, and, if yours is a new route, the Stop Description Form. You are also invited to complete the Application for Voluntary Support.

How to Complete the Survey Form

The first page of the Survey Form can be completed before starting the survey. Detailed instructions for filling out the survey forms and an example of a completed form are included below.

Route name and number: To avoid confusion, use only the route name and number given by the coordinator (e.g. Norfolk #17).

Route status: Please indicate whether this is a previously established route, modified route (i.e. previously established but location or order of some or all stops changed from previous year), or entirely new route.



Route map: If you have not already done so, please attach a route map (e.g. a photocopy of a road or topographic map with the survey route and the start and end points clearly marked) to your completed survey forms. If you were previously sent a map of your route, please mark your stops on the map and return it with your data sheets.

Surveyor/assistant information: Provide the name, mailing address (where you want further correspondence directed), e-mail address, and phone number of both the surveyor and assistant.

Broadcast equipment: Indicate the general and specific type of equipment you are using to play the broadcast tape/CD.

Results of pre-survey equipment test: Please indicate the results of your pre-survey equipment test for each of the three distances.

Comments: Please complete this section immediately following each survey while the information is still fresh in your mind. Keep in mind the different components of the survey (e.g. instructions provided, format of the data form, survey procedure, equipment, etc.). Your comments are very important. We want to be sure this volunteer survey is feasible, enjoyable, and productive.

How to Complete the Data Form

The Data Form is to be completed in the field. Explanations of the various codes to be used in completing the Data Form are provided on the reverse side of the Survey Form. The data form is scannable, which means that it can be 'read' by the computer. This saves considerable time entering the survey data. However, the scanner is only efficient if the data sheets are legible. Please be careful to print clearly (see Scannable Forms – Helpful Hints below), and do not wrinkle or bend the data forms. If your data sheet is spoiled (e.g. you spill coffee on it), contact the Survey Coordinator for a new form.

Woodpecker Identification Skills: Please indicate which woodpecker species you can positively identify by sight, call, and drumming by placing a check mark in the appropriate box. Although we want to collect information about Pileated Woodpeckers and Yellow-bellied Sapsuckers, Red-shouldered Hawks remain the primary focus of the survey. Some observers may be uncertain about their ability to identify or fully record woodpeckers. This part of the form lets you tell us whether you feel that your woodpecker data should be used. Please check the appropriate response.

Date: To avoid any possible confusion of day and month, please fill in the date as month, day, and then year.

Start time: Record the time you started the broadcast tape at Stop 1.



Weather: Record the weather conditions at both the start and end of the survey in the space provided at the top of your data form.

‡ **Temperature:** estimate air temperature to the nearest whole degree (no decimals).

☁ **Wind/Cloud Cover/Precipitation:** Circle the appropriate weather code to indicate the wind, cloud cover and precipitation. Please select only **one code** for ‘**Wind**’ and ‘**Cloud Cover**’. Up to **two selections** can be made for ‘**Precipitation**’ (ie. If there was both rain *and* snow).

<u>WIND (Beaufort Scale)</u>	<u>CLOUD COVER</u>	<u>PRECIPITATION</u>
0. Calm, smoke rises vertically.	1. 0-25%	<i>Choices:</i>
1. Light air movement, smoke drifts.	2. 25-50%	• None
2. Slight breeze, wind felt on face.	3. 50-75%	• Trace
3. Gentle breeze, small twigs move.	4. 75-100%	• Rain
4. Moderate breeze, small branches move.	5. Fog	• Snow
5. Fresh breeze, small trees sway.		

Station data: The odometer reading and your arrival time should be recorded for each station in the left-hand column. This information is particularly important if there was a delay between stations or if a stop was shifted from the standard station spacing. Stop 1 should always be noted as 0 km.

Hawk data: Record each hawk species detected in the column immediately to the right of the stop number. Please use the four-letter abbreviation for each species, as provided on the reverse side of the Survey Form. Include any unidentified hawks, which could not be positively identified to species. The three columns to the right of the hawk species codes are used to indicate the number of birds in each of three age categories: adult, immature, and unknown age. For each hawk species detected on a single stop, indicate the number of adults, immature, or unknowns detected. Consult a good field guide for plumages and identification tips.

For each stop, up to three hawk species can be recorded on the lines provided. If more than three hawk species are observed at a stop, then they should be recorded in the spaces provided at the bottom of the page. Be sure to write in the stop number beside any additional species.

Woodpecker data: Record each woodpecker species in the column immediately to the right of the Hawk columns. Please use the four-letter abbreviation for each species, as provided on the reverse side of the Survey Form. Note the total number of individuals of each species of woodpecker detected (either visually, by call, or drumming) at each stop under the column marked “Total”. If any individuals within this “Total” were detected by drumming only (i.e. they were not seen and did not call), please note the number of “Drum Only” individuals in the column marked “Drum Only”. It is very important that you include “Drum Only” in the total. This information will allow us to compare data provided by observers of varying skill levels.

For both hawks and woodpeckers, only birds heard or seen between the start and end of the broadcast tape should be tallied. If you observe a bird only before or after this period, then make a note in the Comments column, but do not include this individual on the datasheet.



Traffic count: Indicate the number of vehicles that pass by during the broadcast period at each stop in the column provided. Your assistant can either mark a tally as each vehicle goes by or keep a mental count and enter the total at the end of the survey. If no vehicles pass by, then enter a 0. Please be sure to enter only the **total** number of vehicles on your datasheet. *Please do not tally vehicles on your form.*

Noise level: Rate the background noise level at each stop using the four-point scale described on the reverse side of the survey form. Describe the source of any elevated noise levels (above level 1) in the “Comments” section (e.g. airplane overhead, running water, etc.).

Comments: Use the Comments column to record any unusual circumstances that may affect the results at that station (e.g. excessive traffic or loud noises and their source). Other noteworthy species (e.g. those considered vulnerable, threatened, or endangered in Ontario) should also be noted in the Comments column. Additional information is also useful. For example, were the hawks seen or heard, did they appear to be responding to the broadcast, do you suspect any of the birds reported are "repeats" (i.e. do you think you heard the same Pileated Woodpecker at two consecutive stops?). The latter is particularly important and should be noted whenever suspected.

Conditions at the end of survey: Record the time you completed the last stop and the weather conditions at the end of the survey.

How to Complete the Stop Description Form

The purpose of the Stop Description Form is to allow you (or future surveyors) to re-locate each survey stop in future years.

Re-locating the starting point (Stop 1) is particularly important, so try and relate this point to something that is easily recognizable (e.g. 1.2 km west of junction with Highway 38, top of rise, west of bridge over Trout Creek).

In addition to the stop location information, any habitat information you can provide is useful (e.g. type of forest, proximity to water, etc.). We expect that the habitat along some routes will change due to forestry activities, natural disturbances, etc. One of the survey objectives is to determine if these changes affect Red-shouldered Hawk populations. Please include a general habitat description on the stop description form and report any recent habitat changes on the data forms.

Please also note any safety, noise, or traffic level problems associated with the route or a particular stop.



SCANNABLE FORMS – HELPFUL HINTS

USE PEN instead of a pencil or felt-tipped marker when filling in forms as they are easier for the computer to “read.”

PLEASE PRINT legibly using block letters as the scanning program cannot discern cursive writing (i.e. **R | S | H | A** not **R | s | h | a**). Please follow the example forms carefully when filling in your forms.

STAY BETWEEN THE LINES when filling out your datasheet. The scanning program cannot decipher lines that cross into multiple fields. If you need more room than what is provided, please use the Comments column or attach a separate page.

FILL IN THE BUBBLES completely when you are asked to make a choice using them (i.e. $\circ \rightarrow \bullet$).

MISTAKES HAPPEN! Try to limit errors, but if they occur, correct them as best you can. To reduce the number of mistakes, we have provided a rough datasheet to use on your survey. Please transcribe your data to the ‘good’ form and return that to BSC. If you really mess up, feel free to download a new form from the web site. As the scanning program responds the best to the original datasheet, please try your best to send us the original back in legible form.

RETURNING THE COMPLETED FORMS



After you've completed the survey, check over your forms to make sure all information is complete (and legible). Return the forms by 15 May 2002 to the RSHA Survey Coordinator at Bird Studies Canada, Box 160, Port Rowan, Ontario, N0E 1M0. If you are applying for voluntary support, include the completed application form and your cheque with your data forms. A pre-addressed return envelope is included with this participant's kit.



SAMPLE SURVEY FORM

Red-shouldered Hawk and Spring Woodpecker Survey - 2004

Joe Eaglesmith (ID# 12345)
 Hawk's Line (#123)
 67 Woodpecker Rd
 Birds Nest, ON N3Z9W2

Please contact Susan Debrececi (1-888-448-2473, sdebrececi@bsc-ecoc.org) if you have any questions or problems or are unable to complete this survey. Please return completed forms by 15 May 2004 in the envelope provided to: RSHA Survey, Bird Studies Canada, P.O. Box 160, Port Rowan, ON, N0E 1M0, Fax: 519-586-3532.

ROUTE NAME: Hawk's Line ROUTE #: 123

Route Status (circle one): Established route Modified route New route

Do you wish to participate next year? (check one) Yes No

SURVEYOR: Joe Eaglesmith ASSISTANT: Annie Eaglesmith

Address: 67 Woodpecker Rd Address: same as
Bird's Nest, ON N3Z9W2 surveyor

☎ Telephone (home): 705-292-5671 ☎ Telephone (home): same as surveyor

☎ Telephone (work): 705-876-6630 ☎ Telephone (work): 705-344-5901

✉ Email: joe.bay@hotmail.com ✉ Email: aleaglesmith@work.org

BROADCAST EQUIPMENT (as actually used in the survey)

Equipment supplied by BSC: SANYO portable tape deck with treble horn speaker
 YAMAHA car stereo unit with treble horn speaker
 BSC Stereo ID #: 5678

Personal Unit:
 Small, portable tape player with single speaker
 Luggable stereo with dual speakers
 Other (please describe)
 Make/Model (speaker output if known):

RESULTS OF PRE-SURVEY EQUIPMENT TEST

When you tested your portable stereo, could you hear the Red-shouldered Hawk call (when playing the broadcast tape at maximum volume without distortion) at:

100 meters? YES NO
 250 meters? YES NO
 500 meters? YES NO

COMMENTS: It was a wonderful morning to do a survey! More blue jays than RSHA, but saw and heard many woodpeckers. Can't wait to do next years survey!!



SAMPLE DATA FORM

Red-shouldered Hawk and Spring Woodpecker Survey

Route #
123

Woodpecker Identification Skills									
	PIWA	YBSA	DOWO	HAWO	NOFL	RBWO	RHWO	BBWO	TTWO
Sight:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Call:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Drumming:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Mon Day
04 20
2004

Weather	Wind	Cloud Cover	Precipitation	Temperature
Start of Survey: 0 1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	None Trace Rain Snow	+/- - 0.2 °C
End of Survey: 0 1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	None Trace Rain Snow	+/- + 0.5 °C

Stop #	Time (am)	Odometer (km)	HAWKS			WOODPECKERS			Traffic Count (# cars)	Noise Level (1-4)	Comments
			Species Code	Adult	Imm	Unk	Species Code	Total			
1	06:00	0.0				DOWO	2		0	1	Dawo ^s were chasing each other making a lot of noises
2	06:12	0.1				YBSA	1	1	1	1	Piwo flew in and we had great views!
3	06:24	0.2	BWHA						4	2	BWHA was soaring high overhead

SAMPLE STOP DESCRIPTION FORM

Stop Number	Description	Latitude	Longitude
1	Severn River	44.7939987	-79.3878708
2	Edge of cornfields on both sides. Woods behind fields.	44.7963142	-79.3765182
3	Before bridge.	44.7994804	-79.3617706
4	Steel roof barn. Pasture on both sides.	44.8016777	-79.3500824
5	Woodlot on right, farmhouse on left.	44.8062859	-79.3409424



APPENDIX I – ONTARIO HAWK AND WOODPECKER VOCALIZATIONS

Included in your kit is a training tape with vocalizations and/or drumming sounds of the hawk and woodpecker species you might encounter on your survey. We encourage you to listen to this tape to familiarize yourself with these vocalizations. Use this tape as a reference only. Do not use this tape for broadcasting during your survey.

SIDE A: HAWKS

Red-shouldered Hawk

The common call is a loud, rapidly repeated, 'kee-you, kee-you, kee-you' or 'kee-yah, kee-yah, kee-yah'. Sometimes the call is a drawn out 'keee-yah' similar to that of a Red-tailed Hawk but it is not as raspy or drawn out and is usually followed by more typical rapidly repeated 'kee-yah' calls.

Blue Jay imitating Red-shouldered Hawk

The next four sets of calls demonstrate the resemblance of a Blue Jay imitating the call of a red-shouldered Hawk. Sets one and three are Blue Jay vocalizations and sets two and four are those of an actual Red-shouldered Hawk. The difference may be remarkably slight; listen for the characteristic interspersed "jay" call that Blue Jays often give.

Red-tailed Hawk

The common call of the Red-tailed Hawk is a hoarse, rasping scream 'keeyarrh' with a hissing quality in the voice likened to escaping steam. The call starts high and slurs downward.

Comparison of Red-shouldered and Red-tailed Hawks

The next three sets of vocalizations compare the Red-shouldered Hawk and the Red-tailed Hawk. Calls one and three belong to the Red-shouldered Hawk while the second is of a Red-tailed Hawk. Note that the Red-shouldered can give a similar 'keeyar' call but it is not as raspy or drawn out as that of the Red-tailed Hawk and is usually followed with a rapid succession of the more typical 'keeyah' calls.

Broad-winged Hawk

The territorial call is a high-pitched, thin whistle given in two notes 'pi-tee' or 'pee-eeee'. The first note is generally quite short while the second is drawn out.

Blue Jay imitating Broad-winged Hawk

The next two sets of vocalizations give examples of a Blue Jay imitating a Broad-winged Hawk followed by an actual Broad-winged Hawk. When mimicking the Broad-winged Hawk, the call of the Blue Jay is not as high or drawn out as that of the Broad-winged Hawk. Again, listen for the interspersed "jay" calls.



Cooper's Hawk

The alarm call of a Cooper's Hawk can be heard when approaching the nest. It is a rapidly repeated, even-paced series of `cac-cac-cac' or `cuck-cuck-cuck' notes somewhat reminiscent of a Northern Flicker.

Northern Goshawk

The call of the female Goshawk can include a high plaintive `kee-ah'. The alarm call is similar to a Cooper's Hawk but is a harsher and more spaced-out series of `cac-cac-cac' notes.

American Kestrel

The common call when alarmed is a loud, shrill, rapid `klee-klee-klee' or `killy-killy-killy'. A variation also included on the tape sounds like a continuous whirring chatter.

Merlin

The alarm call of the Merlin is a harsh, cackling and accelerating series of `ki-ki-ki-kee' notes.

Peregrine Falcon

The common alarm call given at an intruder at the nest is a series of loud, harsh `cack-cack-cack' notes with an intense angry quality.

Northern Harrier

The alarm call of the male harrier is a rapid series of nasally sounding `kek-kek-kek' notes and that of the female is a higher `kee-kee-kee' delivered with the similar nasal quality. Also heard on the tape are vocalizations of a pair during courtship. These calls sound like a thin, wheezy `whee-a'.

Osprey

The alarm call of the osprey is a thin, high-pitched series of `kyew-kyew-kyew-kyew' notes.

Bald Eagle

The common call of the Bald Eagle is a harsh creaking cackle `kleek-kik-ik-ik-ik' or a lower `kak kak kak'.



SIDE B: WOODPECKERS

Yellow-bellied Sapsucker

Typical calls made by the Yellow-bellied Sapsucker are short, sharp, nasal mewling notes or a slurring, downward `cheerr'. Territorial drumming has an erratic "morse code" quality.

Pileated Woodpecker

The call is a loud, high, accelerating `kik-kikkik-kik-kik' with pitch rising and falling. Several examples of the loud resonating drumming are provided on the tape.

Northern Flicker

The common vocalization is a loud series of `wick-wick-wick' notes similar to the Pileated Woodpecker but lower in pitch and more even in cadence and pitch. Often, a perched pair will duet with softer, slower `wicka-wicka-wicka' notes. The call note is an emphatic `Kleeyer!'.

Downy Woodpecker

The call of the Downy Woodpecker is a high-pitched, harsh whinny accelerating at the end. The call note is a `pick' which is generally softer and higher pitched than that of the Hairy Woodpecker.

Hairy Woodpecker

The call of the Hairy Woodpecker is a slurred whinny usually even-pitched. This whinny can be drawn out to a long high-pitched rattle. The call note is a loud, sharp `peek'.

Comparison of Belted Kingfisher and Hairy Woodpecker calls

The first call is the `rattle' of the Belted Kingfisher followed by the `rattle' of the Hairy Woodpecker. Notice that the woodpecker call is higher-pitched and not as "dry" sounding as that of the kingfisher.

Red-headed Woodpecker

The call of the Red-headed Woodpecker is a series of raspy `queer' notes.

Red-bellied Woodpecker

The common call of the Red-bellied Woodpecker is a rolling series of nasal `chur, chur, chur' notes with a distinct trilled quality. Also heard is a barking `chiv-chiv' or `chaw-chaw' call.



Comparison of Yellow-bellied Sapsucker and Red-bellied Woodpecker calls and drumming

The down-slurred, nasal `cheerr' note of the sapsucker is clear and well spaced out. Its drumming is erratic in cadence, often likened to "morse code". The Red-bellied Woodpecker delivers a rapid series of short raspy `queer' notes that are slightly trilled. The drumming is a short, rapid, even-cadenced rap.

Black-backed Woodpecker

The call note of the Black-backed Woodpecker is a quiet `pic' or `krick' given singly or well spaced out.

Three-toed Woodpecker

Although unlikely to be encountered during this survey, this species is included for completeness.



APPENDIX II

Assembly Instructions for the SANYO Portable Cassette Player

1. Make sure you have been sent the following. Replacement parts are available from Radio Shack, but please contact us if you have any problems or questions.

CD/cassette player (SANYO MCD S750)

12-volt cigarette lighter cord (#270-1534)

One 5" Horn Speaker (#40-8434)

2. Mount the speaker to the white bracket on the side of the CD/cassette player using the nut and bolt provided. The speaker is meant to swivel on the bracket, and can face either the front or the back of the CD/cassette player.
3. Wire the speaker to the unit jacks using the wire provided. The white-striped wire should be connected to either red terminal. The other wire should be connected to the black terminal.
4. Each unit can be powered by hydro, 8 D batteries, or by using the 12-volt adapter cord for a car cigarette lighter. Please remove the adapter cord or batteries when not in use and store them with the unit.