Canadian Nightjar Survey Protocol 2018

This protocol is the product of a series of working group meetings held from November 2015 – April 2016. The protocol is adapted from the Nightjar Survey Network protocol from the Center for Conservation Biology.

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Photo credits: Anne C. Brigham (Common Nighthawk); Alan Burger (Common Poorwill); Nicholas Bertrand (Eastern Whip-poor-will).

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1. INTRODUCTION

Thank you for contributing to nightjar monitoring in Canada! Prior to surveying, please read this protocol in its entirety and familiarize yourself with the identification of nightjar species that may be found in your area. A one-page summary of the protocol can be found in Appendix A and used as quick reference in the field.

Conducting a Nightjar Survey is easy – anyone with good hearing and a vehicle can participate!

- Each route is a series of 12 road-side stops
- Each route needs to be surveyed once per year between June 15 and July 15
- Survey the route once starting at 30 minutes before sunset
- At each stop, you will listen quietly for nightjars for six minutes and record information about your survey

2. OBJECTIVES

The data you are helping to collect will be used to expand our understanding of Common Nighthawks, Common Poorwills, and Eastern Whip-poor-wills across the country. Due to their nocturnal habits, nightjars are understudied, but there is concern about their declining populations. Common Nighthawks and Eastern Whip-poor-wills are listed as Threatened under the federal *Species at Risk Act*. Common Poorwills were assessed as Data Deficient by the Committee on the Status of Endangered Species in Canada (COSEWIC) in 1993. Information on nightjar distribution, abundance, habitat associations, and population trends is critical for conservation and management efforts.

To increase our understanding of nightjar species in Canada, the Canadian Nightjar Survey Protocol is designed with four objectives in mind:

1. **Habitat associations and critical habitat mapping**: roadside citizen science data will cover a large geographic expanse and can be integrated with more locally-collected, non-roadside data to characterize nightjar habitat.
2. **Long-term population monitoring:** data collected will be compared to Breeding Bird Survey data after several years of data collection to determine whether the protocol increases the precision of population trend estimates.
3. **Distribution and abundance mapping**: data collected will help refine our understanding of the distribution and abundance of nightjars across Canada.
4. **Environmental assessment**: survey data could be used to inform environmental assessments by providing a baseline against which we can evaluate the potential impacts of development to nightjar species and their habitat

3. NIGHTJAR BIOLOGY & IDENTIFICATION

Nightjars are a family of cryptic birds that forage for flying insects at night. These beautiful birds have long, pointed wings for flight, and are highly camouflaged against the leaves and branches they roost upon during the day. Many of these species are highly migratory, spending their winters as far south as Argentina. During the summer, nightjars breed across Canada, generally laying two eggs directly on the ground with no nest.

Due to their nocturnal behaviour and cryptic appearance, nightjars are rarely seen, so it is most important to learn how to identify nightjars by sound!

3.1. Common Nighthawk (*Chordeiles minor*)

3.1.1. Biology

Common Nighthawks are found almost everywhere in Canada, except Newfoundland and the far north. These birds are one of last birds to arrive from migration, showing up across the country in late May and early June. Common Nighthawks are generally found in open-area habitat such as grasslands, clearcuts, sandy areas, peatlands, rocky bluffs, open forests, and even urban areas. Nighthawks use large areas of space – males are thought to defend territories for mating and nesting, but forage and roost outside those territories up to several kilometres away. Common Nighthawks are listed as Threatened due to steep population declines based on existing Breeding Bird Survey data.

3.1.2. Identification

Common Nighthawks are most likely to be seen during surveys because these birds are more crepuscular than other nightjar species, meaning they are most active at dawn and dusk. Common Nighthawks become active approximately 30 minutes before sunset, and remain active until 60 or 90 minutes after sunset. Nighthawks forage for insect prey during sustained-flight, much like swallows and swifts. Their bright white wing bars are a tell-tale way to identify this species in flight.

Common Nighthawks can be identified by two different sounds. The first is a vocal “peent” or “beerb” call that is frequently made while the birds are in flight. The second is mechanical wing-boom, made by wind rushing through the down-curved wing tips of the male at the bottom of a steep vertical dive. Wing-booms are thought to be for territorial defense and mate attraction, much like the songs of male songbirds.

3.2. Common Poorwill (*Phalaenoptilus nuttallii*)

3.2.1. Biology

Common Poorwills are found in the southern-most areas of central British Columbia, eastern Alberta, and western Saskatchewan. These birds arrive in Canada in late April to early May to breed in semi-arid open habitats such as rocky bunchgrass hillsides and open forests. Common Poorwill population trends in Canada are unknown. The species was assessed as Data Deficient by the Committee on the Status of Endangered Species in Canada (COSEWIC) in 1993 due to insufficient data. Common Poorwills are physiologically noteworthy in that they are one of the only bird species that can enter torpor (i.e., hibernation) for weeks at a time to conserve energy!

3.2.2. Identification

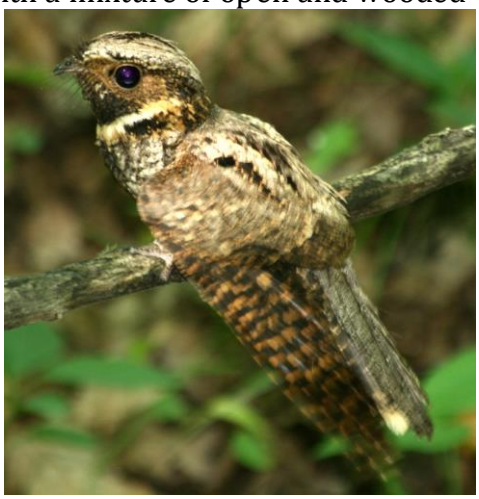

Alan Burger

Common Poorwills are rarely seen because they are truly nocturnal and remain on the ground or perched, taking flight only to sally up and catch insects from the air. True to its name, the Common Poorwill is most readily detected by its "poor-will" call. Common Poorwills begin calling about 30 minutes after sunset, and are most vocal during clear nights when the moon is at least half full.

3.3. Eastern Whip-poor-will (*Antrostomus vociferus*)

3.3.1. Biology

Eastern Whip-poor-wills are found from east-central Saskatchewan to Nova Scotia, with the majority of the population likely occurring in Ontario and Quebec. Eastern Whip-poor-wills arrive in Canada in early to mid May, and occupy areas with a mixture of open and wooded areas. They forage in open areas and use wooded areas for perching and nesting. Eastern Whip-poor-wills are listed as Threatened also due to steep population declines.



3.3.2. Identification

Eastern Whip-poor-wills are also rarely seen, but the species is distinguished by a white ring around the base of the neck and white spots on the outer tail feathers. Eastern Whip-poor-wills are most vocal during clear nights in June when the moon is at least half full, and can repeat their characteristic "whip-poor-will" call up to

100 times without stopping! They begin calling about 30 minutes after sunset, and call for about 90 minutes each night.

3.4. Other Species of Interest

Other nocturnal and crepuscular species of conservation interest that it may be useful to document, and that you might want to learn include:

- Owls
- Yellow Rail
- American Woodcock
- Chimney Swift

3.5. Identification Resources

To practice your nightjar and nocturnal bird species identification, we recommend the following resources:

3.5.1. Online – Before You Survey

- Dendroica: an interactive website designed to help learn bird identification. Listen to recordings and look at photos of potential species.
- Xeno-canto: an online database of recordings of birds from volunteers across the world.
    - Common Nighthawk (make sure to listen to some recordings with wing-booms)
    - Common Poorwill
    - Eastern Whip-poor-will
- The Cornell Lab of Ornithology's Macaulay Library is the world's largest collection of wildlife sounds and videos.

3.5.2. Apps – While You Survey

- iBird (nightjars are in the Pro, Canada, Ultimate, and Plus editions)
- Audubon Birds of North America (now free!)
- The Sibley eGuide to Birds

4. SURVEY OVERVIEW

4.1. Route

The Canadian Nightjar Survey Protocol uses unlimited radius point counts along permanent road-side survey routes so that survey data can be compared between years. The route framework is made up of permanent routes from several sources:

- Breeding Bird Survey routes (every second stop of first 23 stops)
- Routes in target habitat for Common Poorwills or Eastern Whip-poor-wills
- Existing routes from previously-established survey programs

To maintain volunteer interest, routes with no nightjars detected for two consecutive years will be removed from the pool of available routes and put back in the pool of available routes after five years of not being surveyed.

Please contact your Regional Coordinator if there are no nightjar survey routes available near your area. New routes will be designed by Breeding Bird Survey staff unless in an area where road length is insufficient to fit a full-length Breeding Bird Survey route or if a route is designed to target specific habitat.

4.2. Stops

Each route consists of **12 survey stops each spaced at least 1.6 km apart** (there are some routes that have 10 or 11 stops if there is not enough space for 12). The starting point of your route will be named Stop 1. Subsequent stops are sequentially numbered (i.e. 2, 3, 4 etc.). **It is critical that surveys be conducted at these same stops each year** so that data can be compared between years. Volunteers will be provided with a route map and the coordinates of their survey stops to ensure the same stop locations are surveyed each year.

4.2.1. New Routes

Some routes may never have been surveyed before, in which case the location of the stops is at your discretion, and will require extra scouting time. You will be provided with a map of your route including satellite imagery, and **you will be required to collect information on stop location** (see Section 5.4). Please choose your stop locations with the following in mind:

- Stops should ideally be 1.6 km apart. Use your car odometer to measure distance.
- If your survey route road has curves, try to place stops 1.6 km apart **straight-line distance.** Using a GPS will help determine straight-line distance.
- Your safety is of first priority during nightjar surveys, so please ensure that your stops include a safe place to pull over and park.
- Avoid stop locations with excessive noise (e.g. located beside running water, barking dogs, etc.)
- It is better to add distance between stops rather than placing stops less than 1.6 km apart so that you avoid counting the same birds twice.
- Not all of your stopping points need to be on the same road. Turning onto different roads may be necessary to find a safe place to park.
- We recommend scouting your route during daylight to become familiar with the stops.

4.3. Survey

At each survey stop, count all nightjars seen or heard for a period of **SIX minutes**. Counting birds and recording data should be done from a stationary position outside of your vehicle. Record birds as you hear them, rather than waiting for the end of the six-minute period to avoid data omission errors. Most importantly, be consistent. Use the same technique at each stop including how you focus your listening between nearby and distant birds. To ensure data are comparable between surveys by different volunteers, please:

- **DO NOT** use whistles, audio calls, or any method that coaxes birds to call or come closer
- **DO NOT** use a flashlight to search for reflections of bird eyes

See Section 5.3 for further details on how to record your nightjar observations.

4.4. Date

Surveys must be conducted during the nightjar breeding season between **June 15 and July 15**. **Each route needs to be surveyed once per year.**

If there is the potential for Common Poorwills or Eastern Whip-poor-wills in your area, survey within one week of the full moon (June 20 to July 6, 2018).

Excessive wind and rain will diminish the quality of surveys. **Do not complete surveys when wind speeds are Beaufort level 3 or greater, or if there is any precipitation.**. If you begin a survey route and conditions deteriorate for more than 3 survey stops, we advise you to abort the survey and attempt it on another night with better conditions.

4.5. Time

Surveys **begin 30 minutes before sunset**, the time when nightjars are most active. Only one route may be surveyed per night due to these timing requirements. Sunset is considered the beginning of official civil twilight for your survey route area and can be looked up online at:

http://www.nrc-cnrc.gc.ca/eng/services/sunrise/advanced.html.

To cover both the 6-minute nightjar survey and driving to your next survey stop, each stop will require about ten minutes to complete. The entire route will require a total time of approximately two hours.

5. DATA COLLECTION

A datasheet for data entry is available in Appendix B. Fill in each section of the datasheet according to the instructions in this section.

5.1. Survey Info

Fill in the route name, date, start time, and end time of the survey. Describe the general location and condition of the route including road condition and any safety concerns. Record the temperature at the beginning and end of your survey. Submit your name, mailing address, phone number, and email address for our records.

5.2. Stop Conditions

For each stop surveyed, **record the time the survey began**. We also ask that you record data on the conditions at each stop because factors such as wind and moon visibility can affect your chances of detecting a nightjar.

5.2.1. **Wind**

Record the wind speed using the Beaufort scale below. Do not conduct surveys during winds ≥ 3.

Code	Wind Speed	Description
0	< 1 km/h	Calm- Smoke rises vertically.
1	1-5 km/h	Light air - Smoke drifts, leaves and wind vanes are stationary.
2	6-11 km/h	Light breeze – Wind felt on exposed skin, leaves rustle, wind vanes begin to move.
3	12-19 km/h	Gentle breeze - Leaves and small twigs constantly moving.

5.2.2. Cloud Cover

Rate the amount of cloud cover in the sky at the time of your survey using the following codes:

Code	Sky	Description
0	0% cover	Clear, cloudless sky; can see stars and moon clearly.
1	< 25% cover	Mostly clear, with scattered clouds.
2	25-50% cover	Up to half the sky covered with clouds.
3	50-90% cover	Dense cloud cover, but some patches visible.
4	> 90% cover	Entire sky clouded over.

5.2.3. Moon

Enter "Y" for yes or "N" for no to indicate if the moon can be seen while surveying. This is particularly important to record in deep valleys where the moon is often obstructed by the surrounding hills or mountain ridges.

5.2.4. Noise

Record the level of background noise at each stop using the following codes:

Code	Noise	Description
0	None	No effect of background noise on your ability to hear nightjars.
1	Slight	Noise slightly affects your ability to hear nightjars (e.g. distant traffic, dogs barking)
2	Medium	Noise moderately affects your ability to hear nightjars (e.g. airplane, moderate traffic).
3	Excessive	Noise seriously affects your ability to hear nightjars (e.g. continuous traffic nearby, construction noise, frog chorus).

5.2.5. Cars

Count the number of cars that pass on the road during your survey.

5.3. Nightjar Detections

5.3.1. Nightjars

Each line on the data sheet represents an individual bird's detection history (see example on next page). Use a new line for each new bird detected at a stop. Do not record any nightjar detection data if no nightjars or owls were heard at any given stop. If you cannot

accurately count the number of individuals by sight or by concurrent calls, make a note in the "comments" column of your data sheet. Use the following nightjar codes:

- CONI = Common Nighthawk
- COPO = Common Poorwill
- EWPW = Eastern Whip-poor-will

5.3.2. Detection Type

The survey period is broken into **6 one-minute intervals** on the data sheet. **For each bird heard or seen during each one-minute interval, indicate the highest ranked type.**

1. **Wing-boom (W):** If the bird performed a territorial wing-boom in that one-minute interval (Common Nighthawks only).
2. **Call (C):** If you heard the bird call during that one-minute interval.
3. **Visual (V):** If you saw the bird, but did not hear it during that one-minute interval.
4. **Not detected (N):** If you did not detect the bird during that one-minute interval.

Sample data entry: The observer initially detected one Common Nighthawk calling during the first three minutes of survey at Stop 1, and performing wing-booms in minute 3. The observer then detected a second Common Nighthawk calling at Stop 1 during the third minute and fourth minute of the survey, so began a new row on the data sheet for this bird. This observer used the best judgment in deciding these were two individual Common Nighthawks, and not the same bird that moved after initial detection. At stop 2, the observer did not detect any birds until the survey ended, so they did not record any data. At Stop 3, the observer detected one Common Nighthawk calling and performing several wing-booms per minute for the entire six minutes several hundred metres to the northeast. A Common Poorwill was also heard calling in minutes 2-4 less than 100 metres to the south. At Stop 4, the observer saw two Common Nighthawks fly over in minute 2, one of which made a "peent".

Stop (1-12)	Species	Time Interval						Distance (circle)	Cardinal Direction
		1	2	3	4	5	6		
1	CONI	C	C	W	N	N	N	< 100 m > 100 m	
1	CONI	N	N	C	C	N	N	< 100 m > 100 m	
3	CONI	W	W	W	W	W	W	< 100 m (> 100 m)	NE
3	COPO	N	C	C	C	C	N	(< 100 m) > 100 m	S
4	CONI	N	C	N	N	N	N	< 100 m > 100 m	
4	CONI	N	V	N	N	N	N	< 100 m > 100 m	

5.3.3. Distance and Direction

Recording the location of particular observations may help us learn more about the specifics of nightjar habitat requirements. Please estimate the distance and direction to your first detection of:

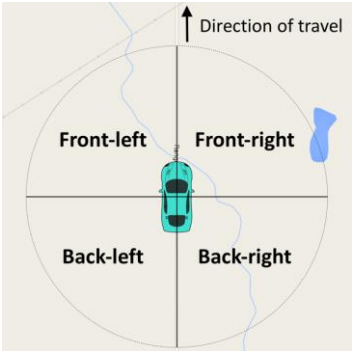
- Common Poorwills
- Eastern Whip-poor-wills
- Common Nighthawks performing repeated wing-booming in the same location (≥ 3 wing-booms).

You do not need to estimate distance and direction for Common Nighthawks that are not performing repeated wing-booming.

Estimate distance as one of the following:

- near (< 100 m)
- far (> 100 m)

Estimate direction using cardinal direction (i.e., north, east, south, west). If you are unsure of cardinal direction, you may describe direction relative to your vehicle and the road:



5.4. Stop Locations

This section of the datasheet should **only be filled out if your route has never been surveyed before or if you wish to recommend a stop location amendment.**

Stop coordinates must be recorded and submitted for routes to be surveyed at the same stops in subsequent years. Ideally, location coordinates should be submitted as latitude and longitude in **decimal degrees** (NOT degrees minutes seconds) to six digits (e.g., 49.884128 N, 119.496301 W). There are several ways to obtain the coordinates for your new stop locations:

1. Use a handheld GPS and take waypoints at each of your stops.
2. There are many excellent GPS apps available for smartphones. If you have an iPhone, Android, or BlackBerry, you can turn it into a handheld GPS. Here are a few app options:
   - MotionX-GPS for iPhone ($1.99)
   - Free GPS for iPhone (Free)
   - GPS Test for Android (Free)
   - GPS Maps Location Finder for BlackBerry (Free)
3. Locate coordinates after survey completion in Google Earth. If you choose this option, we recommend marking stops on a printed map as you survey and using your car's odometer to keep track of how far apart your stops are.

6. EQUIPMENT

6.1. Essential

- Vehicle
- Protocol
- Datasheets (blank)
- Flashlight (ideally headlamp type)
- Watch or other device with a timer (e.g., phone)
- Several pencils/pens

6.2. Recommended

- An assistant/driver
- Map of route and stops
- GPS and/or phone with GPS app
- Thermometer for recording temperature at the beginning and end of your survey
- Road map for getting to your route
- Compass (for determining cardinal direction to birds)
- Clipboard
- Spare batteries (for flashlight or GPS)
- Insect repellent and/or mosquito-repellent clothing
- Safety vest or other reflective clothing.

7. SAFETY

Your safety is most important, so please ensure that you are conscious of your safety when conducting a survey. Please take the follow points into consideration:

- Consider conducting surveys in a team of two
- If surveying alone, make sure someone knows where your survey route is and what time you will return
- Park your vehicle well off the road during survey stops
- Stand off the road surface when conducting surveys
- Leave parking lights on throughout the duration of a count
- Wear a reflective vest or use a headlamp so that other drivers are aware of your location
- Conduct the survey near the road to avoid trespassing on private property
- Check your clothing and skin for ticks when you get home to prevent the transmission of Lyme disease and other tick-borne illnesses

8. WILDRESEARCH LIABILITY

We encourage all WildResearch Nightjar Survey volunteers to become annual WildResearch members in order to ensure full liability coverage and help us cover the costs of running the program. Learn more about membership and join us here.

For volunteers that do not wish to become annual WildResearch members, please complete a Day Membership form online through Better Impact (http://bttr.im/v06kg) to ensure you are covered under liability insurance during your survey.

1. Pick the dates you plan on completing your survey. Make sure you choose at least one back-up date in case of bad weather. The online form allows you to choose up to 10 dates; please email nightajrs@wildresearch.ca if you require more than 10 dates. Please keep in mind that WildResearch incurs a financial cost for each date.

2. Sign-in to Better Impact here. First-time users will need to create an account using your email address.
3. Fill in the Day Membership form with your selected survey dates.

9. WILDRESEARCH DATA SUBMISSION

Enter your data using your account on the WildResearch Nightjar Atlas!

1. Login using your username and password
2. Go to "Enter My Survey Data"
3. Enter your Survey Info and submit
4. Click on Stop 1 to enter your Stop Conditions data for Stop 1 and submit
5. Enter any nightjar observations for Stop 1
6. Repeat steps 4 and 5 for each subsequent stop.

If you are unable to enter your data online, you can also submit your data using one of the following options:

- Scan/photograph your data sheets and email to nightjars@wildresearch.ca.
- Mail your data sheets to:

WildResearch Nightjar Survey
c/o Elly Knight
9624 77 Ave NW
Edmonton, Alberta T6C 0M5

APPENDIX A: QUICK-REFERENCE PROTOCOL SUMMARY

Quick-Reference Protocol Summary

The Protocol Summary is intended as a quick reference for in the field. Please use the summary once you have read and are familiar with the full survey protocol.

Survey: Listen quietly for a period of six minutes.

Route: Each route consists of 10 to 12 survey stops spaced at least 1.6 km apart and numbered consecutively.

Date: Survey once between June 15 and July 15. Survey between June 15 and June 27 if you may have Common Poorwills or Eastern Whip-poor-wills in your area. Do not survey when winds are Beaufort level 3 or greater, or rain is stronger than a light drizzle.

Time: Begin at 30 minutes before sunset (civil twilight for your area). It will take about 10 mins to survey one stop and travel to the next, for a total survey time of 2 hours.

Data collection – Stop Conditions: At each survey, record the time your survey began, wind strength, cloud cover, whether the moon is visible, the level of background noise, and the number of cars that pass.

Data collection – Nightjar Detections: Each line on the data sheet represents an individual bird's detection history.

- You do not need to fill this in if you did not detect any nightjars at your stop.
- The survey period is broken into six one-minute intervals on the data sheet.
- For each bird detected in each one-minute interval, record the code for the highest ranked detection type you observed:
    1. W (Wing-boom; Common Nighthawks only)
    2. C (Call)
    3. V (Visual)
    4. N (Not detected)
- Record the distance (< 100 m or > 100 m) and direction to your first detection of
    - Common Poorwills
    - Eastern Whip-poor-wills
    - Repeat wing-booms of Common Nighthawk(i.e., ≥ 3 wing-booms in the same location)

Data collection – Stop Locations: Record stop coordinates as latitude and longitude in decimal degrees if your route has no pre-established stop locations or if you wish to suggest an amendment to your route.

Essential Equipment Checklist:

- Data sheets
- Survey protocol
- Route map
- Flashlight
- Stopwatch/timer
- Pens/pencils
- GPS or map of route to mark new stops on (new routes only)
- Location of stops (previously surveyed routes only)

APPENDIX B: CANADIAN NIGHTJAR SURVEY DATASHEET

1. SURVEY INFO: Fill this out before you start. Don't forget to fill in "End Temperature" when you're done your survey!

Observer Name:	**Co-Observer Name:**	
Address:	**Email:**	**Phone:**
Route Name:	**Date:**	

Comments: _____

2. STOP CONDITIONS: Record the conditions at each survey stop.

Start Temperature: _____

Stop	Start Time (24 hr)	Wind (circle)	Cloud (circle)	Moon (circle)	Noise (circle)	# Cars	Comments
1		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
2		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
3		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
4		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
5		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
6		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
7		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
8		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
9		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
10		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
11		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		
12		0 1 2 3	0 1 2 3 4	Y N	0 1 2 3		

End Temperature: _____

Code	Wind Description	Cloud Description	Noise Description
0	Calm- Smoke rises vertically	No clouds	None
1	Light air - Smoke drifts, leaves and wind vanes are stopped	< 25% cover	Slight (e.g., distant traffic)
2	Light breeze – Wind felt on exposed skin, leaves rustle, wind vanes begin to move	25-50% cover	Moderate (e.g., airplane, moderate traffic)
3	Gentle breeze - Leaves and small twigs constantly moving, light flags extended	50-90% cover	Excessive (e.g., construction, frog chorus)
4	Do not survey	> 90% cover	N/A

3. NIGHTJAR OBSERVATIONS: At each stop, listen for 6 minutes and fill out one line for each individual heard. Record the code for the highest ranked detection type you observed in each one-minute time interval: 1. W (Wing-boom), 2. C (Call), 3. V (Visual), 4. N (Not detected). Only record distance and direction for COPO, EWPW, and repeat wing-booming CONI.

Stop (1-12)	Species	Time Interval						Distance (circle)	Cardinal Direction	Comments
		1	2	3	4	5	6			
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		

3. NIGHTJAR OBSERVATIONS: At each stop, listen for 6 minutes and fill out one line for each individual heard. Record the code for the top-ranked detection type you observed in each one-minute time interval: 1. W (Wing-boom), 2. C (Call), 3. V (Visual), 4. N (Not detected). Only record distance and direction for COPO, EWPW, and repeat wing-booming CONI.

Stop (1-12)	Species	Time Interval						Distance (circle)	Cardinal Direction	Comments
		1	2	3	4	5	6			
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
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								< 100 m > 100 m		
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								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		
								< 100 m > 100 m		

4. STOP LOCATIONS: This section of the datasheet should **only be filled out if your route has never been surveyed before or if you wish to recommend a stop location amendment.**

Stop	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Comments
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			