

WildResearch Nightjar Survey 2016 Annual Report



Report prepared by
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The WildResearch Nightjar Survey is a program under non-profit organization,
WildResearch.

WildResearch's mission is to build, train, and educate a community that contributes to
conservation science.



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Friends of the Environment Foundation, the Canada Summer Jobs program, and the Nature
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**TD Friends of the
Environment
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organizations across Canada.



**BIRD STUDIES
ÉTUDES D'OISEAUX CANADA**



Community Mapping Network

The WildResearch Nightjar Survey is made possible by the dedicated Citizen Scientists who generously donate their time to survey for and report on these cryptic birds.

Thank you to all WildResearch Nightjar Survey volunteers!

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Executive Summary

The WildResearch Nightjar Survey is a volunteer-run citizen science program that conducts nocturnal roadside surveys for three highly understudied species of conservation concern: the Common Nighthawk, the Common Poorwill, and the Eastern Whip-poor-will. All three species belong to the nightjar family, which is a group of cryptic migratory birds that forage for flying insects at night. All three species are understudied because their nocturnal habits preclude their detection during other survey programs like the Breeding Bird Survey. Data that are available for nightjars indicate that their populations are in decline. The Common Nighthawk and Eastern Whip-poor-will are both listed as Threatened under Canada's *Species at Risk Act* due to these perceived declines. The Common Poorwill has been assessed as Data Deficient by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) because sufficient surveys have not been completed. Citizen science surveys are an ideal way to study nightjars and contribute to their conservation because they can efficiently collect reliable data over a large geographic extent.

The 2016 focus of the WildResearch Nightjar Survey, previously named the BC Nightjar Survey, was a large program expansion to five new provinces and territories across Canada. Thanks to the efforts of regional coordinators and citizen scientists, nightjar surveys were conducted in British Columbia, Alberta, Saskatchewan, the Yukon, the Northwest Territories, and New Brunswick in 2016. In 2016, 270 citizen scientists surveyed and submitted data for 2,066 survey stations along 192 routes. Volunteers reported observations of 1,142 Common Nighthawks and 45 Common Poorwills. No Eastern Whip-poor-wills were reported in 2016. Volunteers conducted surveys using the new standardized Canadian Nightjar Survey Protocol, which WildResearch helped to draft during several working group meetings with a host of other non-profit, academic, and governmental institutions. The 2016 survey season was greatly facilitated by the launch of the new Nightjar Atlas on the Community Mapping Network.

In addition to the 2016 program expansion, we continued our commitment to education and research. Over 50 volunteers attended one of six orientation sessions across Canada to learn about the new survey protocol and nightjar conservation. Two undergraduate students at the University of Alberta started independent research projects using WildResearch Nightjar Survey data. The first student completed an analysis of nightjar detectability, including our final year of our acoustic recording data from roadside and off-road locations. The second student is working on a habitat and population modelling project for British Columbia's grasslands. We are preparing our 2016 data for upload to the Nature Counts data portal for public access, and are pleased to contribute the entire dataset to a national Common Nighthawk database for conservation and recovery planning purposes.

Looking to 2017, we plan to continue surveying at all six of our regions. Survey routes in British Columbia will be reassessed and routes that have been surveyed for three years without a nightjar detection will be removed from the regular list of available survey routes. We will also continue working to improve the Nightjar Atlas, particularly the data entry portal, so that we can continue to increase the capacity of the program and our volunteers.

1. BACKGROUND

1.1. Family Caprimulgidae: Nightjars

Nightjars are a family of cryptic birds that forage for flying insects at night. Due to their feeding habits, nightjars belong to a larger guild of birds called the aerial insectivores. Many of these species are highly migratory, spending their winters as far south as Argentina. These beautiful birds have long pointed wings for flight, and are highly camouflaged because they roost during the day and nest on the ground. In Canada, there are three species of nightjars: the Common Nighthawk (*Chordeiles minor*), the Common Poorwill (*Phalaenoptilus nuttallii*), and the Eastern Whip-poor-will (*Caprimulgus vociferus*).



A Common Nighthawk roosts on a rocky bluff. Photo credit: Dwayne Gaschermann.

1.2. Why Survey Nightjars?

Relatively little is known about the population trends of nightjars due to their nocturnal habits and cryptic nature; however, steep population declines of other aerial insectivore species have been detected across North America. Although nightjar species are often missed by other bird survey programs, available data indicate that many nightjar populations in Canada are also in decline. The Common Nighthawk and Eastern Whip-poor-will are federally listed as Threatened under Canada's *Species at Risk Act* due to these perceived declines. The Common Poorwill has been assessed as Data Deficient by COSEWIC because sufficient surveys have not been completed.

Nocturnal roadside citizen science surveys are an ideal method to study nightjars in Canada and contribute to conservation. The nocturnal nature of these birds requires that survey stations must be accessible for surveyor safety. Travelling by car allows surveyors to travel

quickly between stations that are far enough apart to ensure that birds are not counted twice. Citizen science surveyors allow for survey coverage of large geographic areas, which is important because nightjars are found across Canada. Data collected by citizen scientists during nocturnal roadside surveys will allow for analyses of habitat associations, long-term population monitoring, distribution and abundance mapping, and environmental assessment of these cryptic birds. Lastly, citizen scientists contribute invaluable local knowledge to the project including incidental nightjar reports and information about route accessibility and local habitat.



A Common Poorwill roosts at night. Photo credit: Alan Burger.

1.3. Program Objectives

The goal of the WildResearch Nightjar survey is to contribute to the conservation and recovery of nightjars in Canada. To achieve this goal, the program has several multi-species objectives and one single-species objective per species.

1.3.1. Multi-species Objectives

- Collect baseline inventory data on nightjar populations in Canada.
- Determine best survey methods for nightjars in Canada and compare to other existing monitoring programs.
- Raise awareness on nightjar conservation and biology in Canada.

1.3.2. Single-species Objectives

- **Common Nighthawk:** investigate habitat associations in Canada.
- **Common Poorwill:** determine the extent of the species range in British Columbia, Alberta, and Saskatchewan.
- **Eastern Whip-poor-will:** survey the historic range in Saskatchewan to confirm a range contraction.

1.4. Program Background

The WildResearch Nightjar Survey began in south central British Columbia in 2010 and expanded to the rest of the province in 2014. The first four years of the program were conducted in the Okanagan region to target an area where Common Nighthawk and Common Poorwill are abundant. Surveys collected from 2010 to 2013 followed a standardized survey protocol designed by the Nightjar Survey Network in the United States. In 2014, the program was expanded to survey for the Common Nighthawk across their range in British Columbia. Also in 2014, the BC Nightjar Survey protocol was revised to create separate protocols reflecting the two species varying ranges and life histories. Surveys across British Columbia continued in 2015, with several trial surveys also conducted in Alberta and Saskatchewan.

1.5. 2016 Expansion

2016 saw a major expansion of the WildResearch Nightjar Survey. New chapters were launched in Alberta, Saskatchewan, New Brunswick, the Yukon, and the Northwest Territories under the expert supervision of six Regional Coordinators. The expansion was also made possible by two major accomplishments. First, the Nightjar Atlas hosted by the Community Mapping Network allowed for automated route sign-up to ease the work load of volunteer coordination. Second, a new standardized Canada Nightjar Survey Protocol ensured that all citizen science nightjar surveyors across the country would follow the same survey methods.

2. WILDRESEARCH NIGHTJAR SURVEY METHODS

2.1. Survey Protocol

Roadside surveys, beginning at dusk, are used to survey Canada's three nightjar species. Each survey route is a series of 12 survey stations along a public road, which are spaced at least 1.6 km apart. At each survey station, a six-minute passive point count is conducted with an unlimited radius. In other words, the citizen scientist listens quietly for six minutes and records each nightjar detected. Information on wind speed, cloud cover, cars passing, and moon visibility is also collected at each survey station. Each route is sampled once a year between June 15 and July 15. In areas where Common Poorwills or Eastern Whip-poor-wills occur, volunteers are encouraged to survey within one week of the full moon when these birds call most frequently. Surveys start at 30 minutes before sunset and require approximately 2 hours to complete.

For further details, please visit the WildResearch website for copies of the Canadian Nightjar Survey Protocol:

<http://wildresearch.ca/resources/nightjar-survey/>

2.2. Survey Locations

Per the Canadian Nightjar Survey Protocol, the WildResearch Nightjar Survey uses Breeding Bird Survey (BBS) routes because these routes are randomly selected and will allow us to compare the Canadian Nightjar Survey Protocol to the BBS for long-term trend monitoring. The WildResearch Nightjar Survey also incorporates survey routes from other previous nightjar surveys, randomly selected routes in British Columbia that were selected earlier in the program's history, some subjectively placed routes based on the occurrence of nightjars, and some routes in locations where Eastern Whip-poor-will have been historically detected.

3. SUMMARY OF 2016

The WildResearch Nightjar Survey saw some big changes in 2016, with an expansion to five new provinces and territories in Canada! We welcomed new volunteers and Regional Coordinators to the program in Alberta, Saskatchewan, the Yukon, Northwest Territories, and New Brunswick. The program also saw the launch of the new Nightjar Atlas, where we had some successes and some lessons learned for upcoming years. Finally, the many lessons learned about survey methods from the previous years of the BC Nightjar Survey were used to inform the development of a new, standardized Canadian Nightjar Survey Protocol, which volunteers followed in 2016.

3.1. Volunteer Effort

In 2016, citizen scientists surveyed and submitted data for 192 routes (Table 1, Figure 1). Surveys were completed by 139 volunteers and 131 assistants, for a total of 270 volunteers in 2016! In total, volunteers contributed over 384 survey hours in addition to time required to reconnaissance routes and complete data entry for a total of over 1000 volunteer hours.

Table 1. Number of WildResearch Nightjar Survey routes, stations and observers per year since 2010.

	2010	2011	2012	2013	2014	2015	2016	Total
Routes surveyed	3	3	16	29	141	154	192	538
Stations surveyed	19	33	156	301	1,716	1,837	2,066	6,128
Observers	2	2	10	20	73	99	139	345

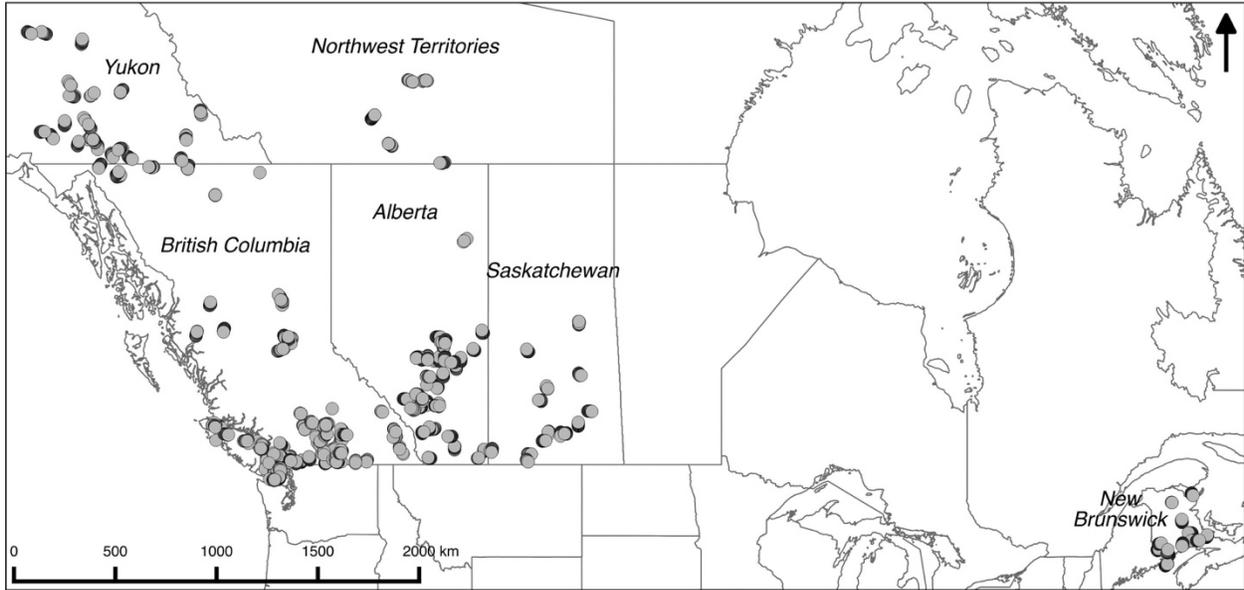


Figure 1. Nightjar Survey stations surveyed in 2016.

The number of routes surveyed in 2016 was higher than in any other year due to the expansion of the program. Across Canada, there were 38 surveys conducted in Alberta, 96 in British Columbia, 15 in Saskatchewan, 24 in the Yukon, 6 in the Northwest Territories, and 13 in New Brunswick.

3.2. Common Nighthawk

Common Nighthawks were detected at 127 of the 192 routes surveyed (66%), and at 546 of the 2,066 stations surveyed (26%). In total, 1,142 Common Nighthawks were detected in 2016. The mean number of Common Nighthawks per station was 0.5 across all stations, and 2.1 at stations where they were detected (Figure 2).

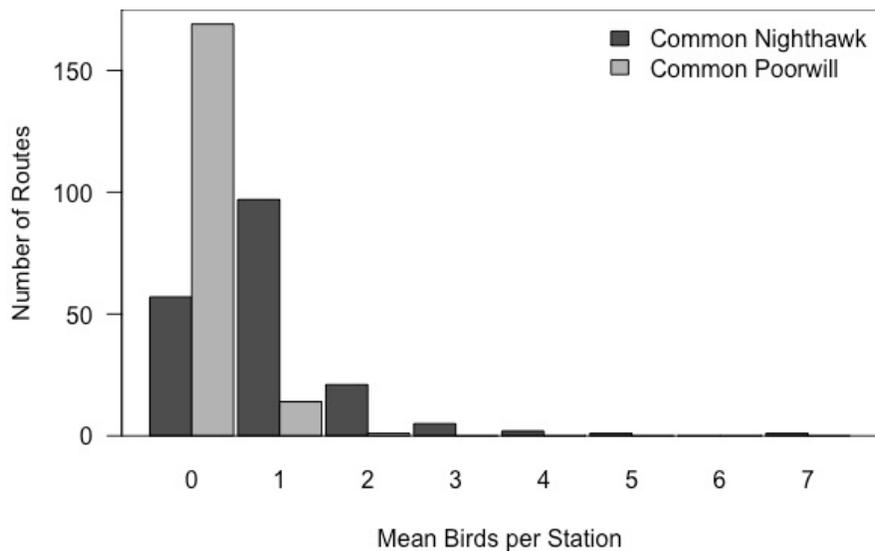


Figure 2. Frequency of mean number of nightjars detected per survey route in 2016.

Common nighthawks were detected across all regions surveyed in 2016 (Figure 3). The highest number of nighthawks per station and route were 11 and 81, respectively, both in north eastern Alberta. Relatively high abundances were also detected along routes in southern and central British Columbia, southern Saskatchewan, and the Yukon.

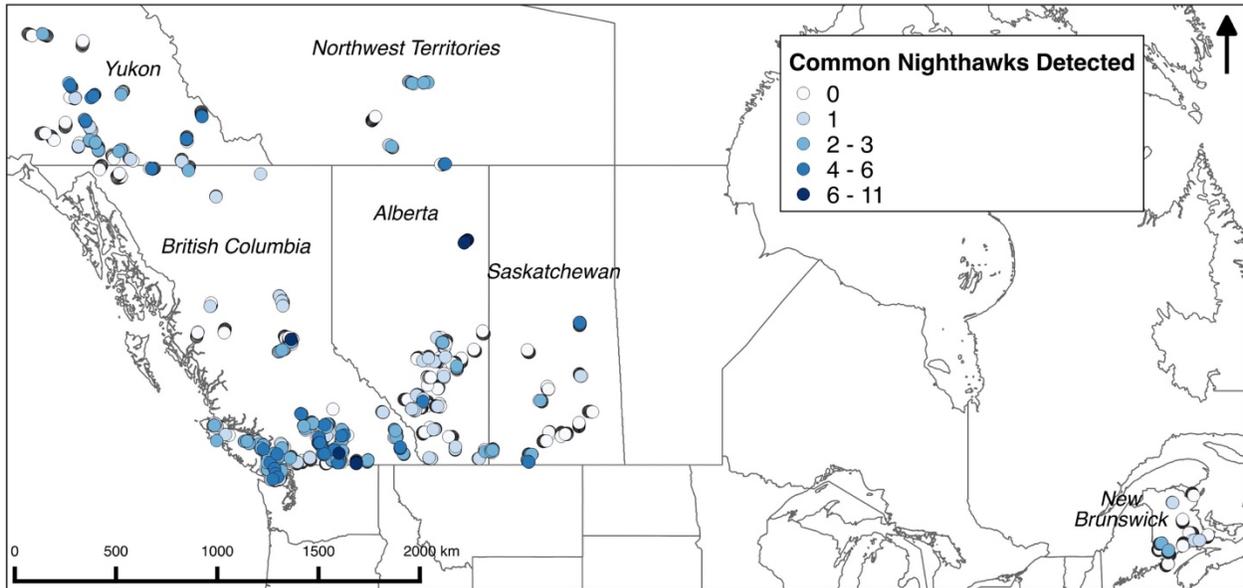


Figure 2. Abundance of Common Nighthawks detected at stations surveyed in 2016.

3.3. Common Poorwill

In total, 45 Common Poorwills were detected in 2016. The mean number of Common Poorwills per station was 1.6 at stations where they were detected (Figure 2). The maximum number of Common Poorwills detected at a station was 6 along the Fraser River in central British Columbia (Figure 5).

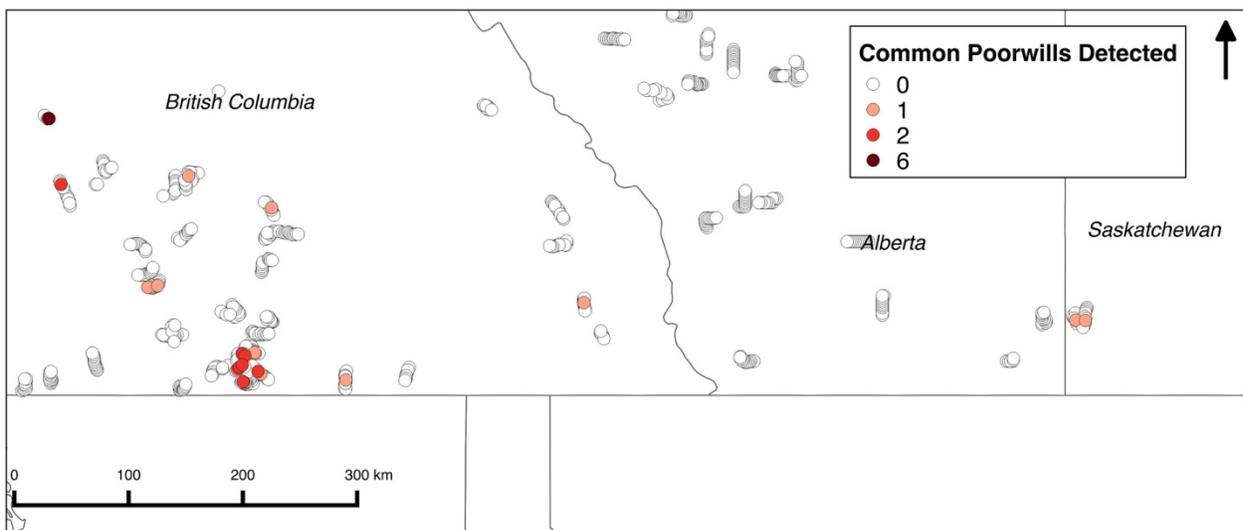


Figure 5. Abundance of Common Poorwills detected on routes surveyed in 2016.

True to their range, Common Poorwills were detected only central British Columbia and south eastern Saskatchewan (Figure 5). No Common Poorwills were detected in Alberta in 2016. As in previous years, citizen scientists recorded particularly high abundances in the southern most area of central British Columbia (Okanagan Valley).

3.4. Eastern Whip-poor-will

No Eastern Whip-poor-wills were detected during the 2016 WildResearch Nightjar Survey; however, there was only one route surveyed within the area where Eastern Whip-poor-wills might occur.

3.5. Regional Updates

3.5.1. British Columbia

By Paul Preston, British Columbia Regional Coordinator

Another successful year for the WildResearch Nightjar Survey in British Columbia! We had 91 routes covered this year all across the province from Atlin to Oliver and (almost) everywhere in between. We had excellent coverage in Southwestern British Columbia including outstanding volunteer participation on Vancouver Island. Also as per usual we had a good amount of coverage in the Thompson-Okanagan region. Of the 91 routes that were surveyed this year, 73 of them picked up either Common Nighthawks or Common Poorwills during the survey which is an excellent detection rate.

Volunteers were very helpful and patient this year in helping us with our transition from 6-station routes to 12-station routes as well in picking up routes that were newly added or modified for 2016. Thank you to all our volunteers this year for being excellent citizen-scientists!



Citizen scientists at the 2016 orientation in Oliver, British Columbia

3.5.2. Alberta

By Elly Knight, Alberta Regional Coordinator

Following a year of Alberta trial surveys in 2015, the WildResearch Nightjar Survey exploded onto the scene in 2016, thanks entirely to the citizen science community in Alberta. We hosted two orientations in 2016: one in Edmonton and one in Calgary. Both orientations were a great time, well-attended, and we even saw several Common Nighthawks booming at close range at the Edmonton orientation!

Volunteers completed 38 surveys in Alberta this year! Most of the surveys were completed from Edmonton south to the international border, with particular volunteer effort in and around Edmonton and Calgary. Common Nighthawks were detected at 18 of the 38 routes surveyed, for a total of 145 nighthawks in all. No Common Poorwills were detected in Alberta this year, despite two surveys in areas where the species has been detected in the past. This year, Alberta held the record for most nightjars detected, with 81 birds along a route through an old forest fire north of Fort McMurray!

In addition to the immense survey effort, we were honoured by a warm welcome from the citizen science and naturalist community in Alberta this year. The survey season in Alberta would not have been possible without far-and-wide advertisement of the new program by many organizations including the Edmonton Nature Club, Nature Alberta, the Boreal Centre for Bird Conservation, Beaverhill Bird Observatory, the Alberta Society of Professional Biologists, Prairie Birder, and more. Special thanks as well to the TD Friends of the Environment Foundation for providing funding for the launch of the WildResearch Nightjar Survey in Alberta. And finally, a huge thanks to our 2016 Nightjar Biologist Alessandra Hood, who coordinated the Alberta volunteers, led the orientations, put together a new orientation video, and generally kept things running this summer.



Citizen scientists spot a booming Common Nighthawk at the 2016 Edmonton orientation.

3.5.3. Saskatchewan

By Gabriel Foley, Saskatchewan Regional Coordinator

The expansion of WildResearch's nightjar surveys into Saskatchewan has started off well! Fifteen routes were surveyed in Saskatchewan in 2016 by fourteen volunteers. Of the routes

surveyed, half had nightjars detected on them. Routes had an average of 3.3 nightjars detected per survey and a total of 47 Common Nighthawks and 2 Common Poorwills detected. Across Canada, 1,078 nighthawks and 48 poorwills were found. This means Saskatchewan had 4% of both the Common Nighthawks and the Common Poorwills found across Canada using these surveys. The northernmost location surveyed in Saskatchewan, Jayjay Lake (175 km northeast of Prince Albert), had the maximum nightjar detections with 14 nighthawks, while Pleasantdale, near Saskatoon, had the minimum with a single Common Nighthawk detected. The four south western-most routes had 31 Common Nightjars, and not surprisingly this includes both of the province's Common Poorwill detections. Many thanks to the volunteers who collected these data!

3.5.4. Yukon

By Andrea Sidler, Yukon Regional Coordinator

The Yukon's first WildResearch survey season was a great success. 14 surveyors braved a blustery summer and traveled to the far reaches of the territory to survey a total of 23 nighthawk survey routes. Common Nighthawks (the Yukon's only nightjar) were detected on 17/23 routes with a total of 158 observed throughout the survey season. The highest count was the Little Salmon River route with 29 Common Nighthawks detected – wow! Volunteers also provided valuable help with modifying routes by scouting new survey stops and collecting waypoints to establish safe and accessible routes for upcoming years.



Sunset near Simpson Lake. YT



Female nighthawk performing a predator distraction display to protect her young chicks by Little Salmon

Despite the Yukon's limited road network, surveyors covered a huge amount of ground. Routes began just South of Watson Lake and reached North to Dawson City, with some even nearing the Alaskan border. Common Nighthawk populations on the routes near Dawson City, which straddles the northern extent of their range, will be particularly interesting to observe as the climate changes over the coming years. Overall, we surveyed a broad variety of habitats ranging from the charred landscape of the recent Little Salmon burn to deciduous aspen stands and old growth forests.

The long-lasting sunsets of the North treated surveyors to many spectacular displays of reds and shimmering golds

descending over mountain tops, colors reflecting off still lakes. In addition to the aerial shows

put on by Common Nighthawks, the waddling-walk of the North American Porcupine was a common, and always welcome, sight on surveys. One volunteer was even fortunate enough to witness two young bull moose practicing their adult skills in a play-wrestling match!!

I was lucky to have met with most of the Yukon's volunteers in person this summer and feel very fortunate to be working with such an enthusiastic and knowledgeable group of people. *Thank you all for making the 2016 season such a success!*



Brandon getting up close to a nighthawk

A big thank you also goes out to the Whitehorse Canadian Wildlife Service office for contributing their data to this project. As well, to the Yukon Bird Club, the Yukon Conservation Society and the Yukon Wildlife Preserve for their support with spreading the word about this program.

3.5.5. New Brunswick

By Virginia & Alex Noble-Dalton, New Brunswick Regional Coordinators

We are thrilled with the successes of the inaugural season of the WildResearch Nightjar Survey in New Brunswick. This past year, an orientation session was held in Hampton, New Brunswick on Saturday, June 11th. There was a small group of attendees but a high amount of enthusiasm for the nightjar survey program. During the orientation, at one practice survey station, 10 Common Nighthawks were visually identified flying overhead, four of which were actively calling.

Overall, a total of 13 survey routes were surveyed in New Brunswick in 2016 (with interest in an additional 6 routes) – the majority being in the southern half of the province with the exception of routes near Shippagan and Mount Carleton Provincial Park, NB. During the surveys, a total of 10 Common Nighthawks were observed, 4 of which were recorded to be wing booming. The highest occurrences of Common Nighthawks were on the McDougall Lake and Nepisiguit routes, each with three individuals. The surveys also recorded occurrences of Chimney Swifts and Wilson's Snipes. Anecdotally, there were also two different reports of Eastern Whip-Poor-



The train station in McAdam, New Brunswick where Chimney Swifts were recorded

Wills in the province and 8 more reports of Common Nighthawk occurrences. We look forward to building on the groundwork and momentum laid during the 2016 survey season for next year's WildResearch Nightjar Survey. In particular, we are hoping to have the survey instructions translated to French, which should aid in targeting the largely francophone population of Northern New Brunswick. Finally, a big thank you goes out to the New

Brunswick Naturalist clubs and all who helped us advertise our new program. In particular, we would like to thank the Saint John Naturalists Club, Fredericton Nature Club, Club de Naturalistes de la Peninsula Acadienne and CBC Radio's Shift.

3.6.Route Spotlight

By Alessandra Hood, 2016 WildResearch Nightjar Survey Biologist

Working as the 2016 WildResearch Nightjar Survey Biologist was an amazing experience and great introduction to field work. I was excited and nervous to do field work for the first time in places I have never been and with weather that could get up to 40°C. My nerves quickly subsided while working with Paul Preston, the British Columbia Regional Coordinator, who was a great mix of easy going and hard-working! During our time in the field we attempted many survey routes around Lillooet, Lynott, Ashcroft, and Okanagan Falls. While most surveys were unsuccessful due to wind, the few we completed were amazing!



Weyerhauser route where Paul and Alessandra detected nightjars

It's hard to pick one favorite route or experience from this summer. All the locations were places I have never been and each had its own good moments! The Edmonton, AB Orientation in Bruderheim was the first survey I had ever done and my first time seeing a Common Nighthawk in person. After hearing many recording of nighthawks, it was an exciting and memorable moment finally hearing one in person! The Oliver survey was also very memorable. The survey started off slow but ended in my first up-close encounter with a Common Poorwill feeding on moths, as well as multiple calling in the distance! The first time I witnessed a wing boom up close occurred during a failed attempt at a survey near Okanagan Falls. At the first station we encountered a nighthawk flying in circles performing multiple wing booms with other nighthawks a bit in the distance! Unfortunately, the road became too



White Lake route, a hotspot for Common Poorwills

unstable and we were not able to continue the survey. My favorite route would have to be the Lillooet-Lynott route. The route followed a cliffside through a forested area with a beautiful view for most of the stations. We saw lots of wildlife including deer and frogs along the route, and at many stations had bats feeding directly above us! This route also had an abundance of both nightjars, with Common Poorwills and Nighthawks heard at almost all the stations! Overall we didn't have to endure any extreme heat and were able to explore many different places covering a huge range of ecosystems!

3.7.Citizen Scientist Spotlight:

By David Wilde, WildResearch Nightjar Survey Citizen Scientist

I had the most serendipitous meeting with Dr. Mark Brigham early last summer as he was conducting Common Nighthawk research at the Okanagan Falls Campground. For a week his small team sampled & released Common Nighthawks captured in the mist nets set across the river each night, as well doing invaluable public outreach, inviting the public to come learn & participate in the fun. After deeply enjoying an intimate experience with a female nighthawk who decided that the warmth and comfort of my hand was far more desirable than following the hand release protocol and taking flight, I was nicknamed "The Nighthawk Whisperer". I was hooked!

I assisted every night that week, mesmerized at the witnessing of this incredibly unusual and high-numbered (~400) nighthawk feeding event for the duration of the survey. Dr. Brigham suggested I contact Paul Preston if I was interested in participating in a nightjar survey for WildResearch as a citizen volunteer. I was so excited to volunteer in scientific conservation work, that I immediately went to the local public library to gather as much Common Nighthawk and Common Poor-will information & call recordings as I could, and then signed up for 2 surveys online, before even returning home to Lake Country from my camping trip! I printed off the data sheets & protocols, then raced up to Canadian Tire in Penticton for a good headlamp, grabbed my compass & altimeter, and prayed that an experienced birding friend might have a GPS unit I could borrow. A trip to the local dollar store bought a thermometer, log books, clipboard, & all the supplies I would need for the journey. It was a very long 3 day wait as the orientation was still being organized by the British Columbia Coordinator, Paul Preston, for the Oliver-Osooyos area.



Paul Preston (centre right) with nightjar survey citizen scientists in BC.

I met Paul and several other volunteers for the orientation and we made a few stops on a local route to become familiar with the nightjar sampling protocol. I was quite familiar with Common Nighthawk after my previous week long experience, but had never seen and/or

heard a confirmed call from a Common Poorwill before. Paul cocked his ears while we were stopped at a known COPO area and indicated its call and direction. He was able to hear it at ~100 meters. I was unable to hear it until it was about 50 meters away, and noticed this experience of hearing ability was also shared by the older members in the group. So I decided I would use my cellphone & audio record all my survey stops, re-examining the recordings with the aid of computer software at a later date, in order to double check and confirm my call data.

The first survey I chose was a route that I was quite familiar with from having traveled it many times at night as an amateur astronomer attending an annual summer star party there over the years. The survey up Mount Kobau proved to be as exciting as it was exhausting! Trying to organize and fold my large frame into and out of a very small sports car that I am far too large for, with an extremely bad back, plug the cellphone back into the cigarette lighter to keep it charged so I could follow my



Sunset over Mount Kobau.

small pre-saved kml route with Google Maps on it, watch the speedometer to coordinate with the 1.6 km count at the same time, keep an eye on the road as I race like the devil- with only 4 inches of clearance in the car- up the mountain avoiding rocks & cliff-like drop-offs with the light of day quickly fading - in only 4 minutes - really tested my skill-set! But there is absolutely nothing that compares with the experience of being all alone, high up on a wilderness mountain at 6000 ft., in the dusky light of near darkness, breathing in the cool pine, fir, and sage scented air of the interior desert- then hearing the haunting lonely calls of an occasional owl - while listening intently for the 'peents', the 'booms', and the 'poor-will-oh' of our lively nocturnal nightjar friends.

This is definitely a 2-person endeavor- but don't let that stop you. Feeling more confident after completing my 2nd survey, and confirming my observational & data taking abilities by playing back the survey recordings from my cellphone through my car stereo at full volume, I decided to book 3 more survey routes, and GPS in a new 6th route I knew from past observations had many nighthawks on it, I called on my experienced birding friend Judy to come and be my assistant for a 2-survey adventure. I am a beginning birder, so it was nice to have an experienced friend along to help out.

Our first survey together took us up to a 6200 ft plateau surrounded by not to distant peaks in the utter wilderness close to 80km from the nearest paved road! We only heard one nighthawk call on this survey (off survey time, of course), but it was a great learning experience observing the mixed burn areas & various stages of forest regrowth, as well as what little avian life was up there considering the insect populations. It was such a fantastic and stimulating learning experience doing citizen



Judy McGee making us dinner before our survey began in the Cascades at 6200 ft

science, in the name of conservation, that the rest of my entire summer was quite focused on observing and photographing nighthawks! Along with enjoying the zen of photographing many birds, insects, butterflies, mushrooms and wildflowers in my outdoor journeys, I also discovered a nighthawk nest with eggs and was very privileged to observe some rare and super exciting inter-species behavior! You can find more pictures & the stories describing my experiences in much more detail on my blog at <https://wildebynature.com>.

Here's to hoping we all have a great year of nightjar surveying & birding this year, I can hardly wait!

4. ROADSIDE BIAS IN COMMON NIGHTHAWK DETECTABILITY

In 2015 and 2016, WildResearch deployed autonomous recording units (ARUs) at roadside locations and off-road locations to study whether citizen science nighthawk detections are affected by the location of the surveys at roadsides. The project was made possible with funding from TD Friends of the Environment Foundation, the Pacific Conservation Assistance Fund, and the Nature Trust of British Columbia, with ARU data collection completed by Virginia Noble, Azim Shariff, Paul Preston, and Alessandra Hood. Acoustic recordings produced by the ARUs were processed and the data was analyzed by undergraduate students at the University of Alberta as independent research projects. Below is a report from one of those students on the preliminary results of the project.

By Dhakshayini Boopalan, University of Alberta

Roadside disturbances such as collisions, traffic noise, light and pollution may influence Common Nighthawk behavior, thereby affecting the number of nightjars detected by roadside surveys. Since roadside surveys are quite invaluable in monitoring Common

Data were analyzed using Songscope software (Wildlife Acoustics Inc.). In Songscope, a recognizer was created and used to detect Common Nighthawk calls (“peents”). These outputs were visually validated by a trained observer to differentiate between true positives from false positives (i.e., peents from other similar noises). The number of vehicles per recording was assessed using bioacoustics software, Audacity.

Within each 10-minute recording, Common Nighthawk activity was measured by two parameters: presence and calling rate. Presence was defined as the detection of a single peent. Calling rate was defined as the number of “peents” per recording. We analyzed the effect of station type (on or off road), time relative to sunset (“sunset time”), and the number of cars per recording on presence and calling rate using generalized linear mixed models (GLMM) in R 3.3.2 (R core team 2016). Four main models were created - global control models, on road and off road comparison models, cars effect models and interaction models between cars and station type. The global control models looked at the effects of sunset time on Common Nighthawk presence and calling rate at both station types. On-road and off-road comparison models looked at how station type affected Common Nighthawk activity. The car effects model looked at the effect of cars on Common Nighthawk presence and calling rate at the on-road stations. The interaction models tested the interaction between station type and number of cars. Each model included station as a random effect to account for any variation due to sampling location.

4.2.Results

Altogether we observed Common Nighthawk presence in 13.8% of the total recordings. The highest Common Nighthawk calling rate was 270 peents per recording. The highest number of cars was 44 per recording.

GLMM control model results indicated that sunset time had a significant effect on Common Nighthawk presence and calling rate ($P = 0.04$). When cars were excluded, station type (on/off road) was found to have no significant effect on Common Nighthawk presence and calling rate. There was a significant interaction effect between the number of cars and station type on Common Nighthawk calling rate but not presence. Looking at the effect of cars at on-road stations only, we found that the number of cars had a significant negative effect on Common Nighthawk calling rate ($P = 0.004$), but not presence (Figure 2). There was no relationship between the number of cars and Common Nighthawk calling rate or presence at off-road stations (Figure 2).

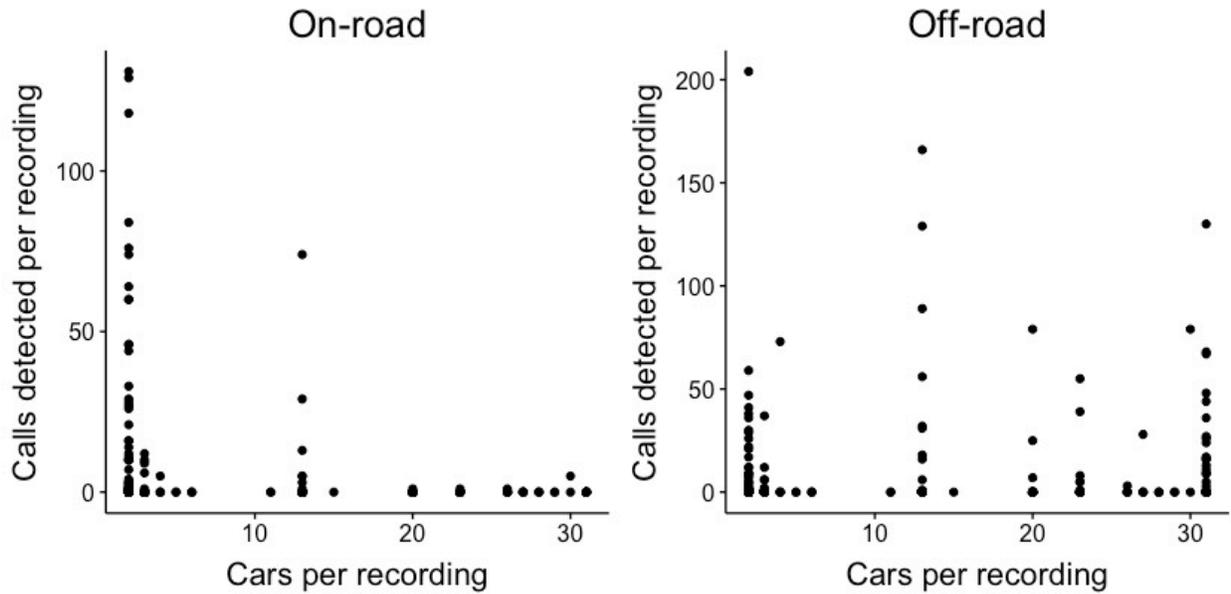


Figure 2. The number of Common Nighthawk calls detected relative to cars per ten-minute ARU recording.

4.3. Discussion

Both station types (on vs off road) and time relative to sunset had a strong effect on Common Nighthawk activity. This was expected since Common Nighthawks are crepuscular species. Our findings showed a correlation between Common Nighthawk activity and hours after sunset, suggesting that sunset is an important variable to consider when monitoring Common Nighthawk activity. No difference in Common Nighthawk activity was seen between the paired stations when cars were excluded from the models. The off-road stations were selected by keeping habitat type similar to the on-road station, so in the absence of cars, we expected Common Nighthawk activity to be similar at both stations if Common Nighthawks were not avoiding or drawn to the presence of the road itself. When the effect of cars was added to the models, the lower calling rate detected at on-road stations is likely attributed to avoidance of these locations due to road traffic disturbance. Another possible explanation is that Common Nighthawk were in fact present but were not detected by the computer recognizer due to sound masking by traffic.

Road disturbance encompasses several factors such as traffic volume, traffic noise, traffic mortality, pollution, and light disturbance. Any of these factors could attribute to a negative effect of roads on Common Nighthawk detections. Now that we know that roads have an effect on Common Nighthawk activity, it is important to find the exact cause and effect in order to have a better understanding of their population and habitat preferences, and to take appropriate precautions while conducting roadside surveys.

5. OTHER ACCOMPLISHMENTS IN 2016

The 2016 year was a huge leap for the WildResearch Nightjar Survey. In addition to the program expansion to five new regions in Canada, the program had many other successes.

5.1. Nightjar Atlas

In 2016, we launched the WildResearch Nightjar Atlas, thanks to funding for capacity building from MEC and hosting by the Community Mapping Network. The goals of the atlas were to 1) help automate the route sign-up process to ease the work load of our coordinators and reduce human sign-up error, and 2) provide an online data entry portal. The atlas is also intended as a portal for users to access their data, although editing capabilities are yet to be built in. Based on feedback and a survey completed by volunteers at the end of the season, the atlas met goal #1 of reducing the route sign-up process. Nearly all 192 routes surveyed in 2016 were signed up through the atlas, with relative ease! The data entry portal is undergoing some edits for the 2017 survey season, however, as many volunteers had trouble with the format and bugs of the data entry forms. Several other aspects will receive a bit of a face lift for the 2017 season as well. Overall, we are happy with the increase in capacity the Atlas has provided our coordinators, and grateful for the patience of our citizen scientists as we work through these growing pains – thank you!



Common Nighthawk in flight. Credit: Anne C. Brigham

5.2. Canadian Nightjar Survey Protocol

Over the winter of 2015-2016, WildResearch participated in a series of working group meetings with other non-profit organizations and Environment Canada to draft a new standardized Canadian Nightjar Survey Protocol to facilitate national conservation efforts for species recovery. The existing WildResearch data from 2010 – 2015 was greatly

informative in the development of the new protocol. The agreement upon and development of such a national protocol means that all citizen science nightjar surveys collected in Canada will be collected using the same methods and can be integrated for conservation analyses. All 2016 WildResearch Nightjar Surveys were conducted using the Canadian Nightjar Survey Protocol.

5.3.Revisiting Program Objectives

Following the adoption of the Canadian Nightjar Survey Protocol, we revisited and updated the WildResearch Nightjar Survey project objectives to ensure they are in line with the new protocol objectives. We summarized the existing objectives and developed several new objectives, for a total of three multi-species objectives and one single-species objective for each nightjar species in Canada. The new objectives go beyond benefits of the nightjar dataset to include raising awareness on nightjar biology and conservation. We also created a new Eastern Whip-poor-will objective, as this is the first year we've conducted surveys within the whip-poor-will range.

5.4.Autonomous Recording Unit (ARU) Surveys

Thanks to funding from the Nature Trust of British Columbia, WildResearch was able to complete collection of autonomous recording unit (ARU) data across central British Columbia to answer questions about nightjar detectability. ARUs collect acoustic data on a pre-determined schedule and can be used to study wildlife via their acoustic behaviour over longer periods of time than using human observers. ARUs were deployed at WildResearch Nightjar Survey stations at the side of the road and in paired habitat approximately 300 m away to study whether there is a bias in the number of nightjars detected by roadside surveys. Following the survey season, the data were analyzed by undergraduate students at the University of Alberta (see Section 4 for a summary of analyses).

5.5. Common Nighthawks in British Columbia's Grasslands

Undergraduate student and former 2016 Nightjar Biologist, Alessandra Hood, is currently using 2014 – 2016 WildResearch Nightjar Survey data from central British Columbia to study Common Nighthawk habitat associations in British Columbia's grasslands. For her undergraduate thesis, Alessandra is using the territorial wingboom of the nighthawk to study the local and landscape characteristics that explain where nighthawks are and how many there are. The final goal for the project will be to estimate the Common Nighthawk population for British Columbia's grassland areas, as part of a project funding by the Brink/McLean Grassland Conservation Fund. We look forward to sharing Alessandra's results in the 2017 Annual Report!

5.6. Appreciation Project

To let all our 2016 citizen scientists know how much we value their contributions, we made a variety of nightjar buttons and sent one to each volunteer with a thank-you note. Thanks again for all your contributions!



Nightjar buttons to say thanks to our 2016 volunteers!

6. FUTURE PLANS

In the long-term, we will continue working towards our multi-species and single-species objectives. We will continue to encourage the use of our data by students and researchers across Canada, and continue to work towards publishing our findings in scientific journals to share our knowledge with stakeholders and the public.

6.1. Route Assessment

Beginning in 2017, survey routes will be reassessed to transition the program from habitat objectives to long-term monitoring objectives. Routes that have been surveyed for three years without a nightjar detection will be removed from the regular list of available routes to a “zero” route list. These zero routes will be surveyed once every five years to ensure monitoring is capable of documenting range expansions. Reassessment of survey routes for British Columbia will begin in 2017, and in 2019 for other regions.

6.2. Data Sharing

We are pleased to share that the entire WildResearch Nightjar Survey dataset will be integrated with other survey data across Canada into a national Common Nighthawk dataset for Species at Risk conservation planning.

6.3. Survey Method Comparison

After several years of additional data collection, we plan to compare the WildResearch Nightjar Survey dataset to the Breeding Bird Survey (BBS) dataset to assess the value of the program for long-term trend monitoring. The adoption of the BBS route framework will allow for a paired comparison of the crepuscular nightjar survey to the dawn BBS.

