

FINAL REPORT – Yukon Fish and Wildlife Enhancement Trust

Project title: Common Nighthawk (*Chordeiles minor*) habitat associations and activity patterns in the northern boreal forest

PROJECT ACTIVITIES

Background: Over the past three decades Common Nighthawks have experienced drastic, unexplained population declines and as a result the species has been listed as “Threatened” under the federal Species at Risk Act. Despite the northern boreal forest representing a significant portion of their breeding distribution, little is known about the populations in this habitat as this area has remained largely un-surveyed. As these populations are highly understudied there is currently insufficient data to effectively incorporate this species into management and land use planning efforts. The results of my research will help enhance future land use plans by enabling regulatory agencies to develop more comprehensive management strategies which integrate nighthawk conservation with future development.

Activities completed

Habitat associations: This summer I completed the last of two field seasons. I conducted 26, 9 km long Common Nighthawk surveys (along 12 survey routes) throughout the southern half of the Yukon. Survey locations were randomly selected across forests of different ages ranging from recently burned sites to stands greater than 200 years old. Routes were located as far South as Watson Lake and extended North to Pelly Crossing. Surveys were conducted nightly (weather permitting) between June 7 – August 8. Surveys began 30 minutes before sunset and consisted of 10 minute point counts (six minutes listening, four minutes playback), spaced 500 m apart. Surveying each transect multiple times per season ensured the highest probability of nighthawk detection in a given habitat. Habitat data were collected by conducting 40 vegetation assessments along each nighthawk survey route.

Activity patterns: I deployed five Autonomous Recording Units (ARUs) to study nighthawk activity patterns throughout the summer (May 21 – August 23). Units were programmed to actively record beginning one hour prior to sunset, until one hour following sunrise. Every three weeks batteries were exchanged and data were downloaded. Cornell’s Raven Pro software was used to analyze acoustic recordings to determine at what time of day and year nighthawks were most active. These ARUs were accompanied by temperature and light level loggers to help assess what factors, aside from seasonality, influence activity patterns in the North.

Contribution of activities to objectives

The overarching goal of my research is ensuring conservation through informed and effective management of Fish and Wildlife resources and their habitats.

The data I collected on habitat associations this summer helped us to begin understanding habitat associations of understudied nighthawk populations in the boreal forest (objective 1). We detected nighthawks on 11 out of 12 survey routes, with a surprisingly large variation in the number of individuals per route (1-43). Nighthawks were present in a diverse array of habitats ranging from recently burned sites (3 years) to old (> 200 years) both spruce and pine forests. Overall, we detected approx. 73% of nighthawks in younger forests, between 0-20 years since last fire. These forests have large areas of open ground which may provide an abundance of nest sites for these ground-nesting birds. This suggests that burned areas are an important habitat for nighthawks in the boreal and that, whenever possible, this should be taken into consideration in the context of fire management and suppression. As expected, nighthawk abundance was lower in areas where there was more shrub and canopy cover.

Through the identification of seasonal and daily periods of peak calling activity, I am able to make sampling time recommendations for nighthawk populations at northern latitudes (objective 2). Seasonally, I found that nighthawk calling activity increased during the first week of June and remained elevated until approx. the first week of July. In terms of daily activity, nighthawks appear to respond to the lengthened twilight period during early summer (June 7- July 11) by beginning to call prior to sunset and calling continuously through the night until sunrise. In late summer (July 25 – August 8), as nights grow darker, calling ceased during the darkest periods and was concentrated immediately around sunset and sunrise. Temperature did not influence calling activity, however, light did with calls increasing as light decreased. The *National Nightjar Survey Protocol* recommends surveying for nighthawks between June 15 – July 15, with surveys beginning ½ hr before sunset. My results suggest that future sampling efforts in the Yukon should follow these guidelines as the survey window reflects peak activity periods and thus will accurately sample nighthawk populations at northern latitudes.

Objective and work plan changes

Objectives remained unchanged between the first (2015) and second (2016) year of this project. To ensure data were comparable between years, survey and ARU data collection methods and work plan (as outline in the funding proposal) remained unchanged.

We did however conduct several days nest searching to assess the feasibility of future studies focusing on nest-site characteristics. We located five nests, each with two eggs. One nest failed (due to predation) but the remaining four were successful with two chicks each (July 12). After the chicks fledged (August 8) we returned to the nest sites to collect habitat data. Based on this experience, locating nighthawk nests in the Territory is challenging but feasible. Given the very limited information on the breeding biology of this species, collecting nesting/productivity data would be very valuable and contribute toward understanding what variables create source and sink habitats – essential information for a species at risk.

Contribution to protection of wildlife and habitat

My MSc thesis will identify (estimated completion date: April 15, 2017) which forest ages and vegetation cover variables nighthawks are most closely associated with in the North. In the future, this baseline information on critical habitat requirements can be integrated into species management plans and will help conserve breeding populations of nighthawks in the Yukon.

The data I collected on nighthawk activity patterns is currently being used to inform the timing of future sampling efforts for northern populations. My results strongly suggest that sampling efforts should follow the *National Nightjar Survey Protocol* (survey period: June 15 – July 15, start time: ½ hour before sunset) as the survey window corresponds closely with peak nighthawk calling periods. Following this protocol will allow for accurate nighthawk population monitoring at northern latitudes – an essential component of effective species management. These recommendations will be distributed to local wildlife management organizations to be implemented during the 2017 summer field season.

Things to do differently

If I were given the opportunity to re-do this project, I would place more emphasis on nest searching - as we found locating nighthawk nest sites to be feasible. Due to the large distances between sites, significant financial resources were allocated to travel between survey routes. Adding a nest-searching member to the team would have provided a great benefit to our understanding of basic nighthawk breeding biology without imparting significant additional financial costs. Identifying nest site characteristics, nest productivity and habitat requirements at multiple spatial scales are all

important factors that contribute to effective conservation efforts, particularly for a far ranging species such as the Common Nighthawk.

COMMUNICATIONS

Results sharing

Throughout the course of this project, I have regularly consulted and communicated with the local scientific community and wildlife management organizations to ensure that my findings will act as a platform for future research and have immediately practical applications which benefit Yukon nighthawk populations. This project has received valuable support and guidance from both the Canadian Wildlife Service (CWS) and the Wildlife Conservation Society (WCS) Whitehorse offices. Both of these organizations are regularly updated on the findings of my research. Other organizations that I have communicated my research with include: Yukon College, Department of Environment, Yukon Parks, Yukon Conservation Society, the Yukon Wildlife Preserve and First Nations governments. Upon full completion of my project, all findings will be distributed to these organizations as well be made available to interested members of the public free of charge.

Further, roadside survey and ARU data have been submitted to the national nighthawk database which is currently being compiled by a University of Alberta researcher. Thus any future management recommendations originating from this database should take northern nighthawk populations into consideration.

Enhancement trust recognition

During each presentation, I verbally acknowledge that this project was made possible through the support of the Yukon Fish and Wildlife Enhancement Trust. I further include the Fish and Wildlife Enhancement Trust name/logo on my slides, presentation materials and in the acknowledgement section of reports.

Communication strategies/materials (year: 2016/2017)

Over the past year, I have disseminated my research in the form of oral presentations (exit seminar, University of Regina (Dec 2016); guest lecture, University of Regina (Nov 2016); Cypress Hills Nighthawk symposium (Sept 2016)). I also attended the PUBS conference at the University of Saskatoon where I participated with a poster presenting “Activity Pattern” results (Feb 2017). I have made my nighthawk photographs and videos available to Yukon College to be used as lecture/teaching material. This past summer, I had several members of the public join me on nighthawk surveys – the best way to communicate and bring my project and nighthawk conservation to life.

Ultimately, citizen support is a central pillar to long-term, effective conservation. Thus, one of my primary goals was to communicate information about this unique species, and my research, to the public through various outreach activities including the establishment of a new Yukon-wide volunteer nighthawk survey program (branch of the BCs WildResearch program). The success of this initial year (summer 2016) of the program was due to volunteers who are engaged in nighthawk conservation but also, in large part, to the support of local naturalist and conservation organizations, with whom I have developed relationships through my MSc research. With the help of CWS and 14 volunteers, an impressive 24 nighthawk routes were surveyed throughout the territory. This is just the beginning of years of valuable data collection on northern nighthawk population trends and distributions by involved and engaged citizen scientists. My MSc research allowed me to develop the skills to bring nighthawks to the public and coordinate this program in the Yukon.



Conducting evening surveys for Common Nighthawks (by bike) to learn about habitat associations of breeding populations in the northern boreal.



The incredible camouflage of a female nighthawk incubating near Pelly Crossing.



Female nighthawk watching us from a safe distance



Common nighthawk nest near Little Salmon River at a recently burned site.
June 22, 2016.



Common nighthawk chicks near Little Salmon River. July 12, 2016.



Common nighthawk chick camouflage near Pelly Crossing – Can you find us?
July 12, 2016.