Nesting Success Trend Assessment of Common Nighthawks in Chadburn Lake Park

For the Fish and Wildlife Enhancement Trust

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Executive Summary

Common Nighthawk (Chordeiles minor) was listed as a Threatened species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2007. In 2016 the Recovery Strategy for Common Nighthawk (Chordeiles minor) in Canada was completed indicating a need for increased research and understanding of the species. In 2017 the Fish and Wildlife Enhancement Trust funded the study “Anthropogenic Effects on Common Nighthawks (Chordeiles minor) in Chadburn Lake Park” The study did show a higher rate of detection in the Long Lake Recreational Area. It also suggests that the significance of trail density might have less to do with breeding habits then the habitat itself. In 2018 the Fish and Wildlife Enhancement Trust funded the study Habitat Selection of Common Nighthawks During Breeding Season in Long Lake Recreation site. Four nesting sites were found, two were found within proximity to each other. Three of the nesting sites were successful, one failed due to predation. Nesting habitat was assessed to determine correlations between habitat and nest success. In 2018 COSEWIC reassessed the nighthawk as Special Concern. Its status under the Species at Risk Act will possibly be updated to reflect that in the future. In 2019 a Nesting Success Trend Assessment of Common Nighthawks in Chadburn Lake Park was funded by the Fish and Wildlife Enhancement Trust. Understanding why nighthawks select specific localities to nest over others in important to the management and conservation of the species. Determining if a trend exists and inform the development and establish critical habitat. The four established nesting sites were visited from 2018, only one site was revisited by a nighthawk pair, the nest was successful. Nighthawk and other breeding bird activity was lower during the survey period. Heavy smoke and a colder spring were possible contributors to lower detection rate. Overall detection and breeding activity decreased by 75% in the Long Lake Recreation Site.

Project Activities

Common Nighthawk Surveys

The survey followed the guidelines and protocols set out in the Saskatchewan Ministry of Environment. 2015, Common Nighthawk Survey Protocol. Which is aligned with the Government of Alberta. 2013, Sensitive Species Guidelines for Common Nighthawk (Chordeiles minor). These were also the survey methods used in the 2017 Anthropogenic Effects on Common Nighthawks in a High Use Recreation Area as well as the Habitat study. One survey transect was completed in the focus area of the Long Lake Recreation Site. The transect started before the recreation site and ended after to ensure the areas that had bird detections in the previous study were included. Observer stopped at predetermined locations evenly spaced across the study area to complete Point Counts with Call Playback surveys. During each survey observer records all Common Nighthawks seen and heard within survey location. The locations and activity were documented. Once surveys were complete researches returned to area and completed nest searches to locate the habitat the nighthawks were utilizing.

Additional Common Nighthawk Surveys

Extra surveys were added in 2019 when the decrease in nighthawk activity was observed in the Long Lake Recreation area. The original survey transects from 2017, that included Grey Mountain and Chadburn Lake were surveyed during breeding season. These additional surveys were completed to have a greater understanding if the decrease was isolated to Long Lake or general location was having less activity. Additional survey showed a decrease in nighthawk activity as well as songbird activity. The increased hours investigating surrounding areas increased data to determine if the decrease activity was localized.

2019 Nest Searches

Once nighthawks were detected during surveys the location was recorded, and the survey was completed. Upon completion of the transect line the researchers returned to the detection location and searched forested area using the visual and vocal presence of the nighthawks to narrow down the nest location. This is labor intensive and requires a great deal of care as to not disturb the possible nest site. Once the nest location was determined the site was recorded using GPS and broad site descriptions were competed. Any possible nest location was revisited multiple times to determine if a nest was present. If the presence of a nest was confirmed the nest site was revisited multiple times to observe and monitor nest and success.

Common Nighthawk Nest Locations 2018

The four nest sites that were located and monitored in 2018 were visited by researchers. These nesting sites were visited as well as the surrounding area to determine if the site itself as well as the encompassing areas was revisited by the nighthawk pair. Only one site was revisited by a nesting pair in close proximity to last years nesting site. This pair established a nest near the Long Lake shore. The three other sites and the surrounding area did not have activity in 2019. The overall nighthawk activity in the area was drastically reduced in 2019 with visual, wing booms and pneets significantly lower than previous years of study.

Habitat Data Standards

Habitat descriptions were completed for the nesting location in later summer once the nighthawks had vacated the area to reduce risk of disturbance. The habitat data was completed using a smaller scale site description created by Yukon Energy Mines and Resources. The plots were a five-meter radius with the nesting site at the center of the plot and tallied: tree species, saplings, understory vegetation, course woody debris, fine woody debris, forest floor, soil disturbance, slope and crown closure. A micro nest assessment was also completed to document what substrate and vegetation were used at the nest site to use for comparison between sites and determine patterns. The habitat information collected will assist in current critical habitat discussions within Department of Environment and the Kwanlin Dun First Nation Eco mapping project.

Results

Common Nighthawk Detection Data

Breeding bird surveys were conducted from June 5th until July 20th, 2019 during the known Common Nighthawk breeding period. The same transect that was completed in 2018 was surveyed again with eight sample stations starting before the Long Lake Recreation Area and ending after. These sites were visited on 9 different survey nights during the breeding season. Total of 6 Common Nighthawk detections were recorded over the study period in the Long Lake Recreation site. The surveys were extended past the last two years survey dates to confirm the absence of breeding activity.

Extra survey transects were added to the 2019 study. These included the original survey transects from 2017 on Grey Mountain and Chadburn Lake. These sites were visited to assess if the decrease in activity was across Chadburn Lake Park or isolated in the Long Lake Recreation area. It was determined that activity had decreased across the entire park.

In 2018 the surveys were delayed due to cooler dips in temperatures that went below the standard protocol. This did not pose a problem in 2019. Surveys were able to start closer

to the 2017 start dates and were carried on beyond both years to confirm presence/absence.

All surveys were completed an hour before sunset and were completed no later than thirty minutes after. 82% percent of the detections occurred in the hour before sunset. This detection rate throughout the study period has fluctuated from 75% to 91%. Some factors that might contribute to these differences could be the availably of insects in that study year.

Nest Search Activity

The presence of nighthawks was recorded and then nest searches were carried out in order to determine if they were nesting in the area. The overall nighthawk activity was significantly lower than previous years studied. In addition, songbird activity was noticeably less active during the surveys. Fewer detections were recorded at all stops for all bird species. After extra surveys were completed in the study area as well as original broader study area. It was determined that activity across the entire original survey area had decreased in 2019. All sites showed a decrease of nighthawk activity compared to previous years within Chadburn Lake Park. Additional searches were conducted to determine if the lack of detection was due to the cryptic nature of the bird or the decreased presence in the 2019 breeding season.

Due to few detections and lower activity of nighthawks only one nest was located during the nest searches. This was the only mating pair located this year at the study site. The nest was in close proximity to the 2018 lake site (spruce lichen-grass). The nest was located on a 20% slope and was 625 meters from the road in the spruce old growth forest surrounding Long Lake. The nest was situated at the base of an uprooted spruce in the root cover. The nest was monitored, and two hatchlings were observed in the later season. This nest was deemed successful after observing it through the 2019 season. The four nest sites from the previous year were also monitored throughout the breeding season to determine if nighthawks returned to the sites. None of the four sites were revisited. The lake site from 2018 did have more disturbance around it with a fallen tree that made people walk closer to the nest site the in previous year.

Habitat Descriptions for Nesting Areas

The nest located in 2019 was located up slope from the Long Lake shore was more specifically classified as White spruce-lichen-grass community. This forest type covers approximately 329 ha (CLBR 2016) of Chadburn Lake Park. As described the most dominant tree species is White Spruce with a few Lodgepole Pine recorded. This site would be classified as PSw26, in the Vegetation Association Classification guide. The

habitat plot had less Soapberry (Shepherdia canadensis) and more fine woody debris then last years nest site. The nest micro site also showed less leaf litter and more exposed soil as it was located under a downed tree root bed. The nest site was protected from disturbance and predation due to its location.

Trend Assessment of Nighthawk Activity

The data from the 2018 and 2019 Common Nighthawk studies was compared in the Long Lake Recreation area. It showed an overall decline in all activity that has been observed. The overall detection has drastically reduced in 2019 which has directly affected the number of established nests and hatchlings. This is significant due to status of this species with Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as special concern. The population of nighthawks has declined in southern Canada 68% since 1970. The cause of the declines is not well known but could be linked to aerial insects which they feed on. COSEWIC has highlighted the increasing frequency of severe and extreme weather as likely impacting the nighthawk. These events can reduce productivity and increase mortality.

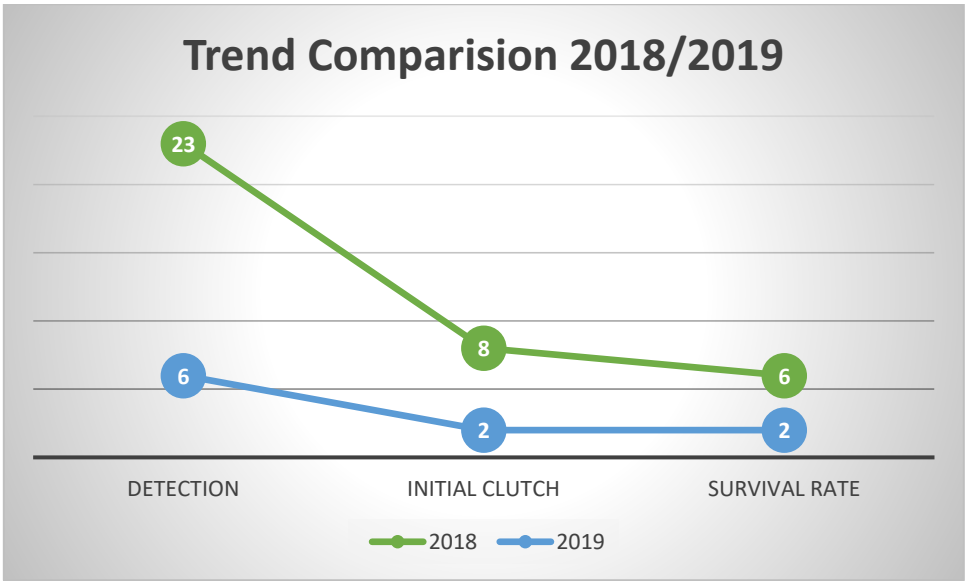

Figure 1: Trend Comparison for 2018/2019 of Common Nighthawk activity

Investigation of Trending Decline in Detection and Nesting Activity

Temperature

Different factors were considered to understand the decline the Common Nighthawk activity 2019. A review of the temperature was completed, and it was determined that the average range among the three survey years were similar and likely not a limiting factor. In 2018 some cooler dips in temperature were recorded which delayed some surveys to meet the protocol but the overall average between the years was similar. Although the cooler dips in temperature did mean later observations of breeding activity, the birds were successful in breeding and having viable nests. It was determined that temperature was likely not the limiting factor for breeding and nesting of the nighthawks in the region.

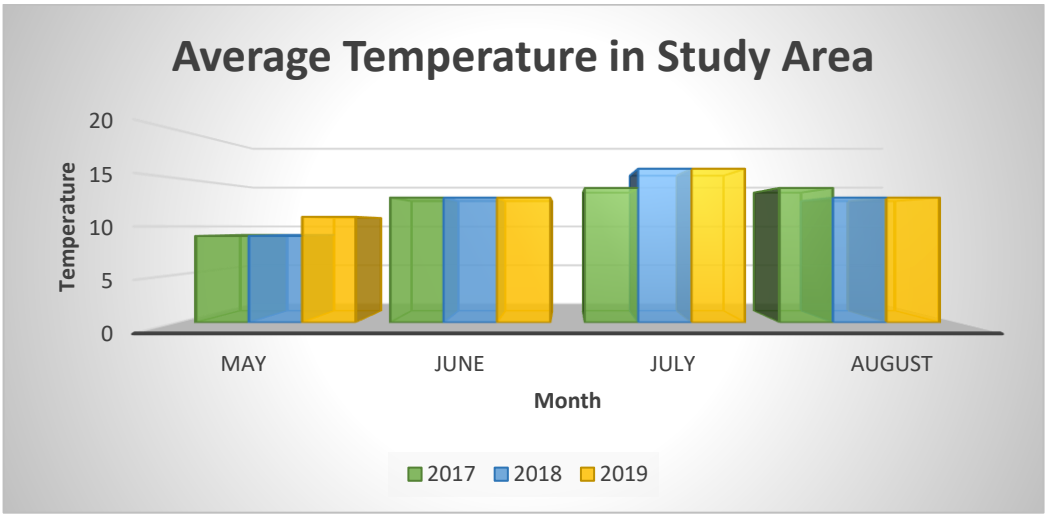

Figure 2: Average Temperature for the Long Lake Study area for 2017, 2018, 2019

Forest Fires

Forest fire activity and smoke were assessed for 2019. During the breeding season there were a significant amount of fires in the Yukon and Alaska. This contributed to lower visibility and air quality. The increased smoke might be a contributing factor to the lower detections of nighthawks. The image below is from June 2019 Canada's Fire Smoke website. This imagine captures the concentration on fire activity and subsequent smoke in the Yukon and Alaska regions during June. This is a critical period for nighthawks arriving and breeding in the Yukon.

Figure 3: Map showing concentration of fire and smoke activity in June 2019

In 2019 there were four fires within the City of Whitehorse between May and July. These contributed to local smoke in the study area during breeding season in addition to the smoke from Alaska.

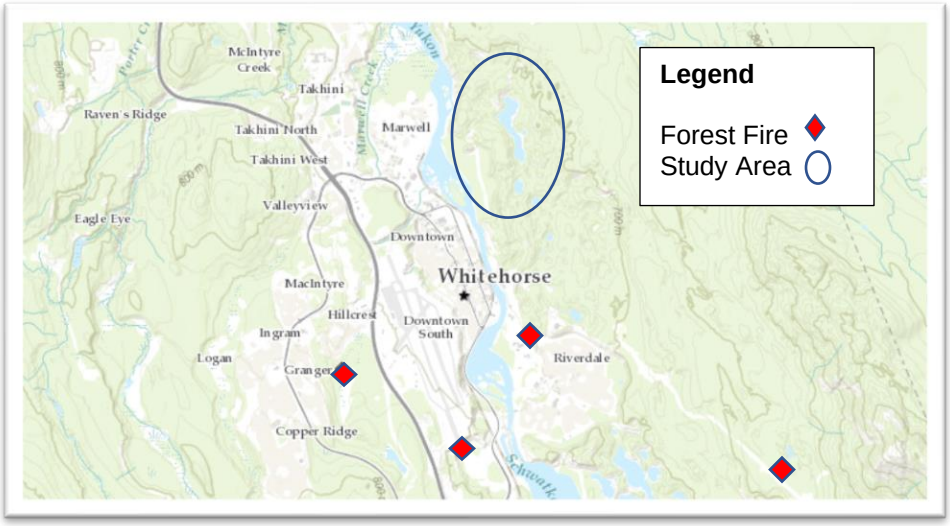

Figure 4: Forest fires within the City of Whitehorse between May 1, 2019 and July 9th, 2019.

Forest Fires and Bird Health

Birds are more susceptible to the toxic effects of smoke due to their respiratory systems. Their respiratory system is more efficient then many mammals so they can absorb more oxygen in order to fly. Birds have a one-way air flow through their respiratory track which is different then mammals which travels in and then back out. Birds breath goes into abdominal air sacs, then through the lungs, once they inhale again that air goes into their thoracic air sacs and then out on the next exhalation. It is a much more complicated system. Birds also have a higher volume of air per breath and a higher respiratory rate. Toxins and particulates can deposit easier which can lead to irritation and infections. This could contribute to birds avoiding an area of dense smoke and might explain the decrease in activity observed in the 2019 study.

Protection and Enhancement

The 2019 survey showed a significant decrease in Common Nighthawk activity in the Long Lake Recreation area. There was 75% decrease in nest establishment and only two viable hatchlings recorded in the study area in 2019. There were very few repeated wing booms which is an indication of breeding males as well as visual observation and peents. Comparing the three years show a downward trend in overall nighthawk activity.

Committee on the Status of Endangered Wildlife in Canada has stated concerns over the effects of human activities and changing climates in reducing food and nest-site availability. The increasing frequency of severe or extreme weather events is also deemed likely to impact this species by reducing its productivity and increasing mortality. These concerns over extreme weather and potential impacts were observed in the 2019 breeding season in Long Lake. The overall decrease in nighthawk activity showed a possible link to less nesting activity and fewer eggs laid and hatchlings being born. The increased fire activity, high winds and dry forest conditions were likely factors in the overall decrease. In 2019 both the Yukon Government and the City of Whitehorse declared a climate change emergency. This means that future decisions on development should be looking through the climate change lens and take extra precautions for development and protection. These will hopefully benefit the nighthawks breeding areas.

Monitoring breeding and nesting activity in this area is valuable in the protection of this species and its future in this region. This increased understanding of how this population is surviving and what its reproductive success in the region adds to the population information within the Yukon and across Canada. It also can be used by current research projects in the region. Kwanlin Dun First Nations are working on Heritage and Ecosystem Conservation project. Adding data regarding critical habitat for nighthawks allows land planners and land designations to be informed. Understanding habitat use, success and risks can be added to the broader mapping work being completed. Mapping critical habitat for a species at risk can help nighthawks throughout the territory. Once critical habitat is established it can be used as a tool to protect areas that fit the same criteria. These criteria can be looked at in areas of development across the Yukon.

The increasing population in the Yukon and increased mining and exploration means understanding habitat use and impacts in essential to recovery of this species. Development is taking place and established critical habitat is essential to protection of vulnerable species. The links between use of critical habitat and development protect nighthawks beyond the Long Lake Recreation Area.

Future Considerations

Continuing to monitor Common Nighthawk breeding and nesting success would offer increased protection for the nighthawks in the southern Yukon. The established route and current data set will benefit from continuous monitoring. The decline that was observed in 2019 is concerning as activity since 2017 was very high and nest establishment and success in such a small area was overserved. The established site and crew increase efficiencies which has overall savings in data collection. A robust dataset showing critical habitat makes a compelling case to show repeated use and need for protection of a species at risk.

Establishing connections with habitat use and critical habitat can greatly increase the protection of the species across the Yukon. By collecting yearly data, land planners and regulatory agencies can use data to establish requirements from developers with similar habitat markers. This is how protection of the species is promoted in Alberta and Saskatchewan. Proponents must survey areas prior to development if habitat fits the criteria that has been established as nighthawk habitat.

Data sharing with the Conservation Data set with Yukon Government, City of Whitehorse and the Kwanlin Dun First Nations helps inform and protect the species. Increasing the greater awareness of the breeding population in the area is also important to decrease possible detrimental impacts. Public education initiatives can also be established once data shows a predictable pattern of activity. These have a track record of success in the Yukon in creating support for lesser known species that need conservation protection and stewardship. The Yukon government had success doing this with the Little Brown Bat (*Myostis lucifugus*) population in the Chadburn Lake recreation site which is currently listed as endangered.

In the Chadburn Lake Management Plan 2017, the Long Lake area is designated for improvements to the parking area, as well as the recreation area surrounding the lake. After presenting the findings of 2017 nighthawk research, the City of Whitehorse has taken precautionary steps by supporting a Species at Risk Mitigation and Management Report 2018 to help mitigate any negatives impacts to the nighthawk population. This will help the City develop the area in the least impactful way. These initiatives taken by the City of Whitehorse would most likely not have happened if this research was not funded by the Enhancement Trust and presented to the City of Whitehorse staff. The city staff was not aware of Common Nighthawks breeding in the park until these surveys were completed.

Communications

This project was funded by the Fish and Wildlife Enhancement Trust with the Yukon Department of Environment. The project was also supported by the Kwanlin Dun First Nation and The City of Whitehorse.

The information collected has been shared with the Biodiversity Biologist that also sitting member of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for the Yukon Government.

The information will be added to the Yukon Conservation Data Centre within the Yukon Government, which is a member of a network of data centers from around the world. This database maintains and distributes information on Yukon species and maps the known localities of those that are of conservation concern. Environment Yukon will be encouraged to use these results in their management planning, environmental assessments, and public outreach programs relevant to nighthawk conservation.

The City of Whitehorse staff will again be offered a presentation on this year's study results. There will be suggested mitigations that can be taken as park development commences in the study area. The findings from the 2017 and 2018 studies was used to inform the Species at Risk Mitigation and Management Report created for the City of Whitehorse.

The Kwanlin Dun First Nation Lands and Resources Section will receive an update on the results from 2019 study. This information will assist in their managing of the nighthawk on their traditional territory and can be used in their broader eco land mapping projects they are working on.

The Fish and Wildlife Enhancement Trust will be acknowledged as the main supporter of the project and the logo and name will be included on all presented materials associated with this study, findings and information shared.