

Pacific Gopher Snake Survey 2025



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Introduction

The Pacific Gopher Snake (*Pituophis catenifer catenifer*) is a species of snake native to the western coast of North America. It typically inhabits somewhat dry, grassy areas with open woodland and an abundance of cover. These snakes are currently considered to be extirpated in British Columbia, with the coast mountain range separating their historic habitat from that of their close relative, the Great Basin Gopher Snake (*Pituophis catenifer deserticola*). Last confirmed to be in the province in 1957 on Galiano Island, there have been no verified records of it since. The closest thing to a legitimate record came from an iNaturalist observation from 2019 of a large tan and brown snake crossing the road near potential Pacific Gopher Snake habitat. This report details a small-scale effort in the late summer of 2025 to locate an individual near where the reported sighting took place.

Goals and Objectives

There are two main objectives

- 1) Locate evidence of a surviving population of Pacific Gopher Snakes on the island
- 2) Observe the habitat near the 2019 sighting to see if it is suitable for a surviving population

Both main objectives had their own set of goals.

Gopher Snake Location Goals:

1. Gather as much information about the habits and habitat as possible before setting out
2. Speak with locals while on site to gain more information
3. Search the habitat on foot for evidence of snake usage
4. Drive nearby roads around dusk to search for snakes moving across them

Habitat observation goals:

- (1) Record tracks in search area
- (2) Take points at habitat features of interest
- (3) Gain a better understanding of the habitat requirements of the species
- (4) Compare to the habitat of Great Basin Gopher Snakes for clues about habitat usage

Methods

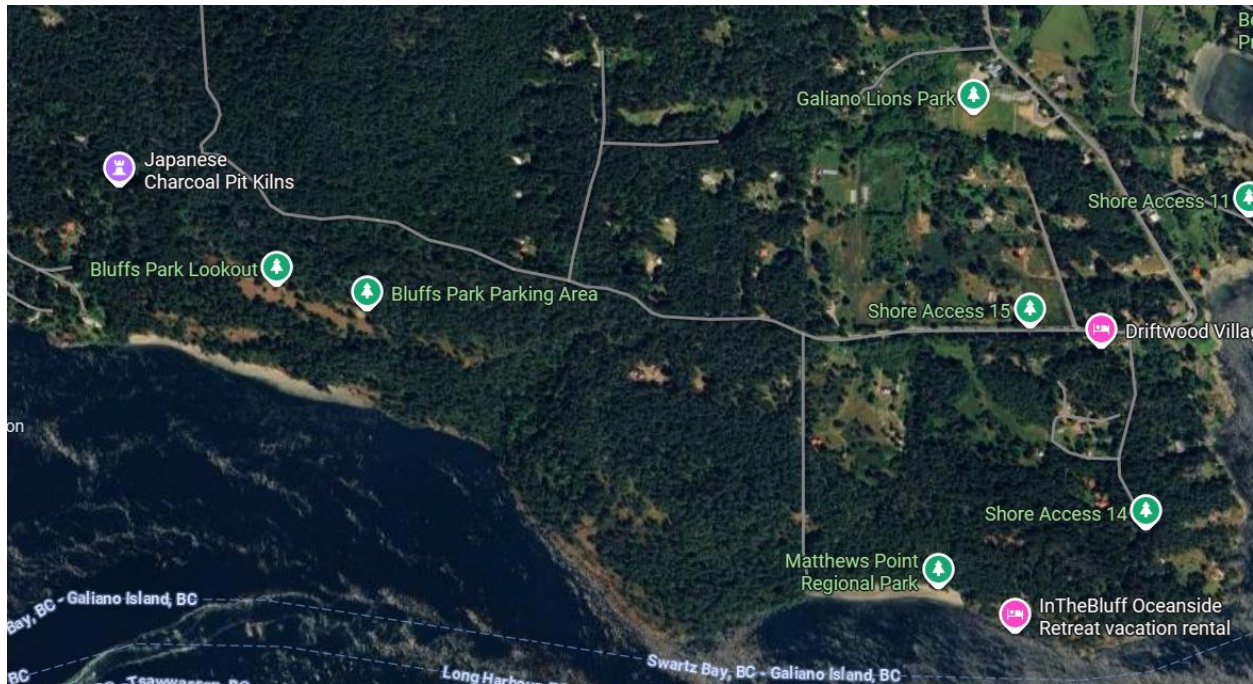


Figure 1: The section of Galiano Island where surveys took place.

Surveying on foot

On foot surveying was within the boundaries of Bluffs Park and Matthews Point. Surveys took place from September 2nd to September 5th. The survey on the 2nd took place between 1:15 pm and 4:00 pm. The other surveys began around 10:00 am and typically went until around 1:30 pm. The timing of the surveys was intended to capture the period of day where the ground would be warm enough for snakes to be moving while not yet being so warm that they would stay hidden.

Each survey would begin at the Bluffs Park Parking Area. From there the exact route taken differed each day. Surveys did not go further west than the Japanese Charcoal Pit and did not go further east than the shore access at Matthews Point. The general path of the trail was followed, though efforts were largely concentrated off path to properly investigate promising habitat features.

The primary target for these surveys was woody debris within the grassy woodland habitat present within a few hundred meters of the cliffside. Generally, surveys did not enter the more coniferous dominated areas with heavier groundcover. Within the survey area woody debris was turned over with an emphasis on care for the habitat. Logs that were too decomposed were generally ignored in favor of large pieces of intact bark and wood (figure 2). All debris was returned to its original location after being flipped. While moving through the landscape

surveyors moved slowly while scanning the ground as the possibility of snake movement was there. Sunny spots within the survey area were also checked as they represented potential basking sites. Very promising locations were checked multiple times over the survey period and points were taken using the arc Field Maps application.



Figure 2: An example of ideal cover near the trail. This location was checked multiple times

Driving Surveys

Each evening the roads near Bluffs Park were driven in an attempt to catch gopher snakes as they moved or used the open space to warm up. The surveys began at the turn off onto Georgeson Bay road from Montague Road and continued onto Bluffs Road until the turn off to Shore Access 14. The first two surveys took place from roughly 7:45 pm to 9:00 pm while the second two surveys were done between 7:00 pm and 8:15 pm. These times were chosen in order to catch the period before and after sundown as the roads would still be holding heat and snakes might be on the move as it is thought that Pacific Gopher Snakes are at least partially crepuscular.

The roads were driven slowly with headlights on in order to scan the ground effectively. Each directional pass took roughly 15-20 minutes to complete. The full length of the route (roughly 4.5 kilometers) was driven four times per night. Twice heading southeast towards Shore Access 14 and twice heading northwest towards Montague Road. The short section of road leading to the Bluffs Park parking area was driven up and down once per night. After completing one pass, an interval of 10-15 minutes was given before driving it again to allow time for wildlife to emerge.

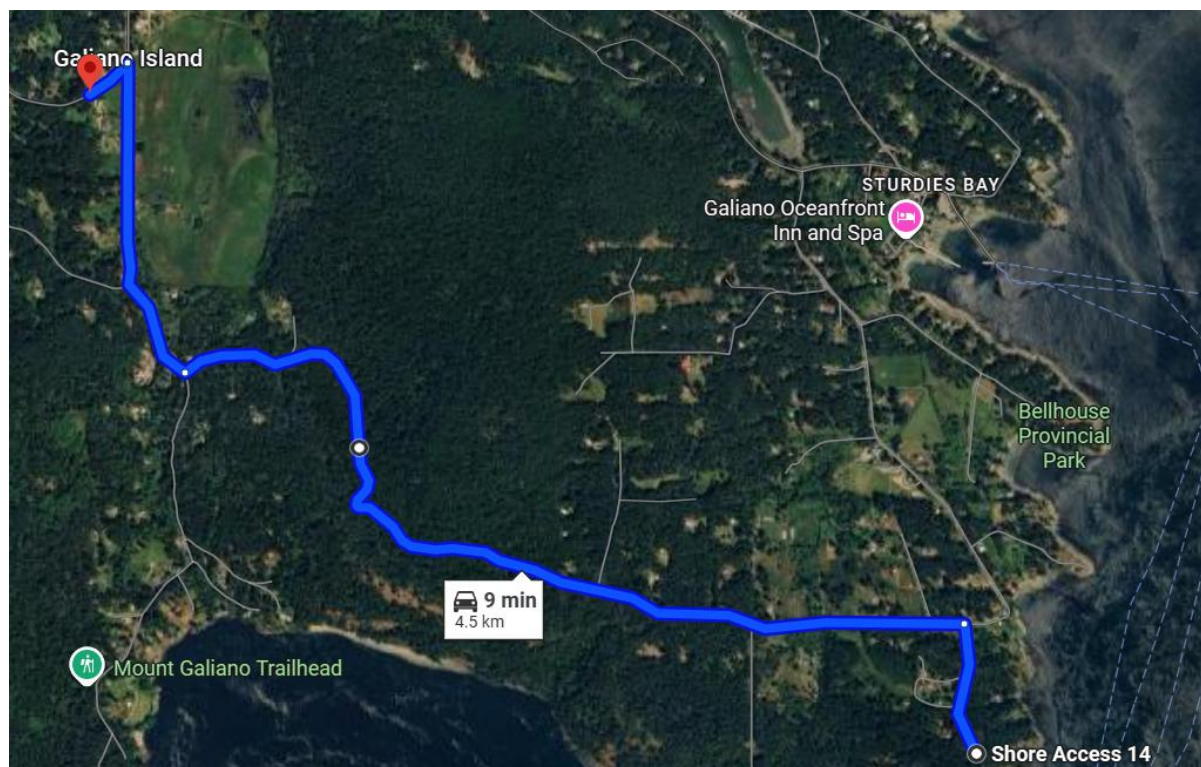


Figure 3: The route taken during driving surveys each night.

Results

Walking surveys

No Pacific Gopher Snakes were located during the course of the surveys, nor was any evidence found of their presence. However, the chance to observe the habitat was of value and locations with promising habitat features were noted (figure 6). Potential den sites (figure 4), suitable cover objects, basking spots and shed sites were all found within the landscape. Potential food sources were abundant, particularly small birds, though a small number of rodents were found underneath cover objects and elsewhere. The overall habitat appeared to be suitable when compared to Great Basin Gopher Snake habitat from the interior of B.C (figure 5).

Other species of reptiles and amphibians were largely absent from the surveys as well, with only a single adult Northwestern Garter Snake (*Thamnophis ordinoides*) being located. This individual was found on the move near a large pile of woody debris. Pacific Chorus Frog (*Pseudacris regilla*) calls were commonly heard, though no frogs or salamanders were seen. Northern Alligator Lizards (*Elgaria coerulia*) were another absent species.

The time spent on the landscape was recorded as best as possible, though issues with the functionality of the gps unit used prevented full tracks from being recorded. The approximate routes shown in figure 7 below are a mix of actual tracks and guesswork and do not represent the entire area covered.



Figure 4: An example of a promising looking overwintering location. This was visually similar to dens used by Great Basin Gopher Snakes in B.C's interior.



Figure 5: Suitable looking habitat along the trail at Matthews Point.

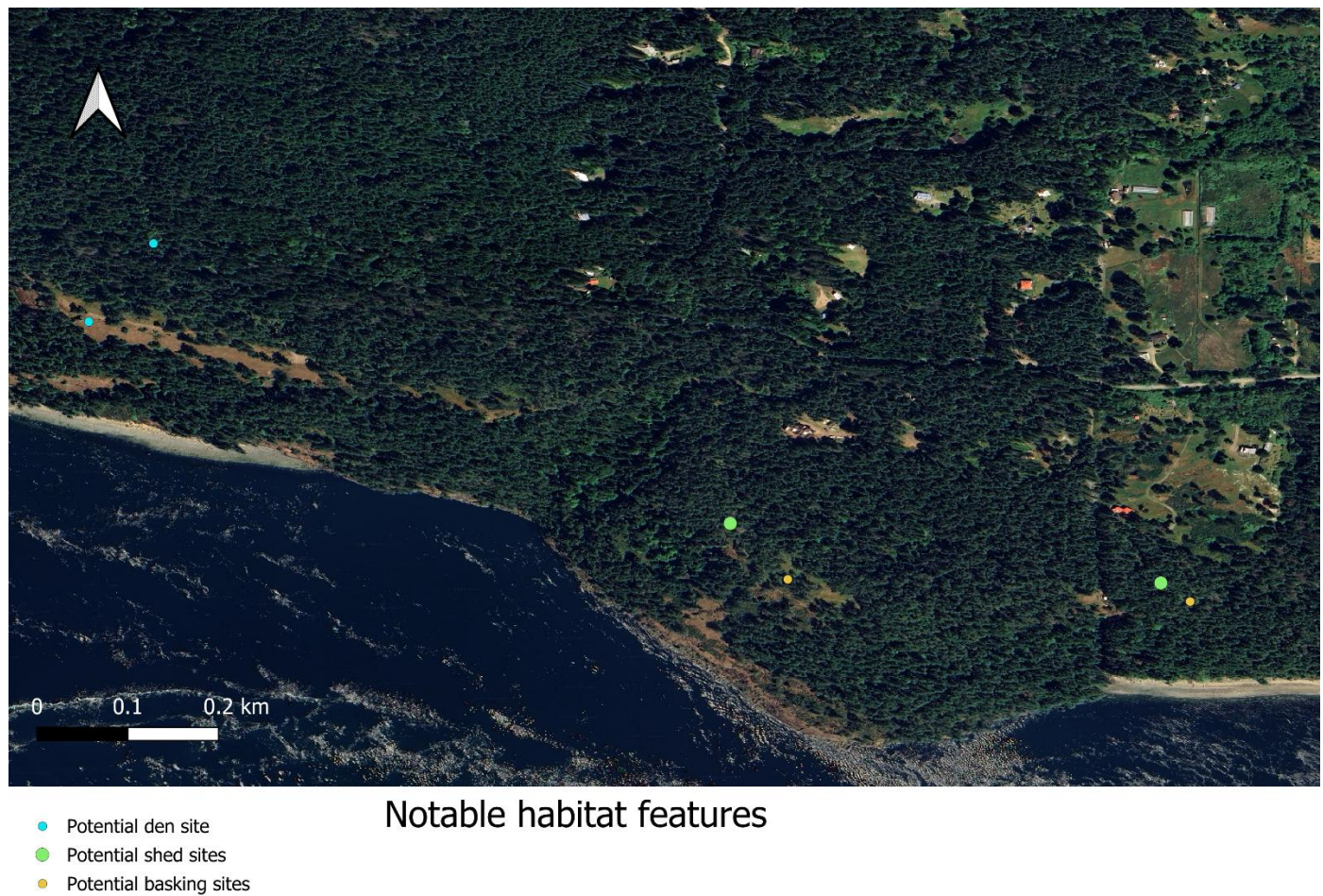


Figure 6: Points taken at promising looking habitat features. Note that these were examples and not an exhaustive list.

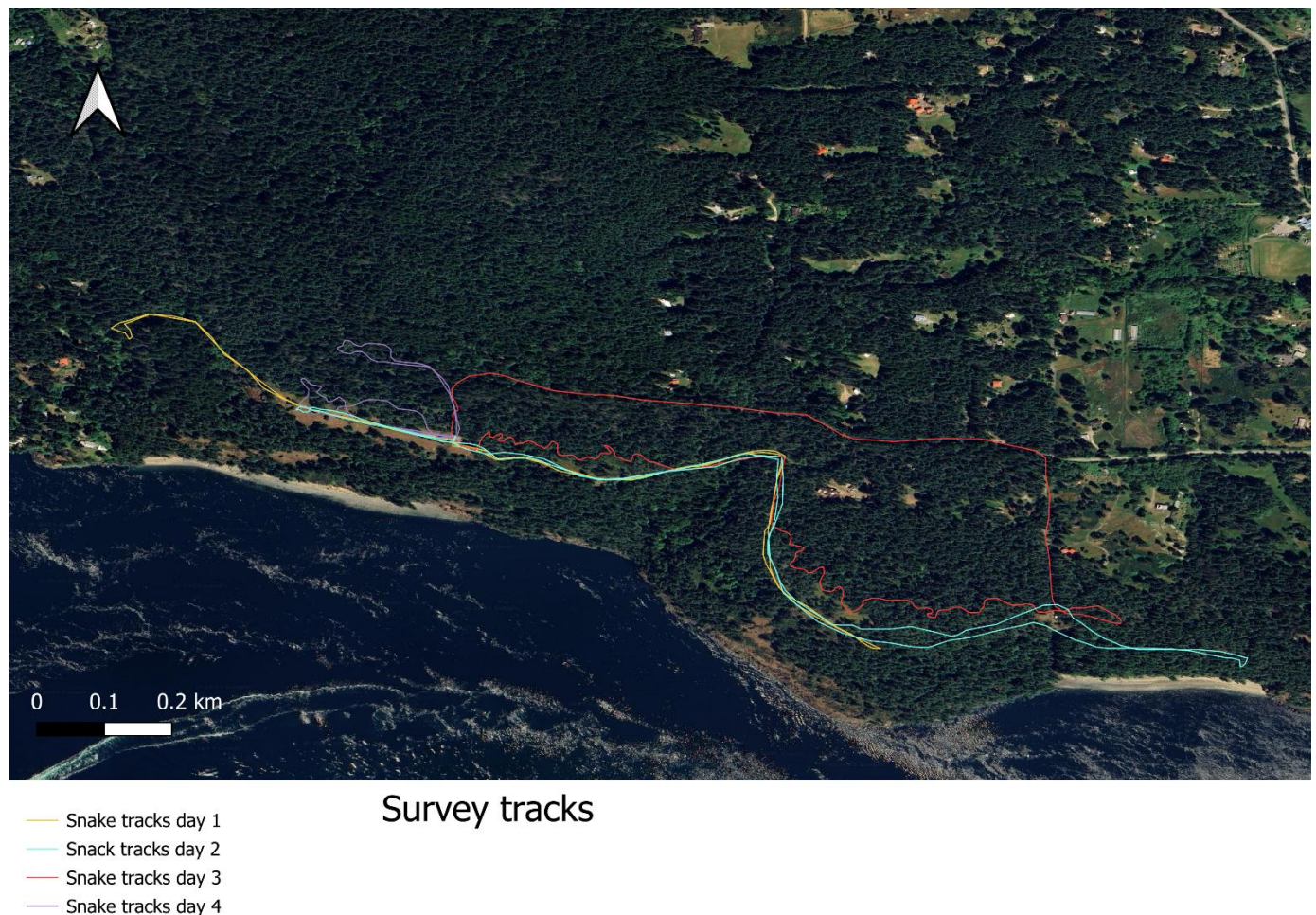


Figure 7: The approximate routes taken during each day of surveys. Note that these are not exact tracks.

Driving Surveys

No Pacific Gopher Snakes or evidence of their presence was found during driving surveys. A single Juvenile Northwestern Garter Snake was found around sunset on the warmest night. There appeared to be adequate habitat along much of Bluffs Road, though much of it was privately owned and developed to some degree which made further investigation impossible.

Discussion and Recommendations

Driving Survey Challenges

Several challenges presented themselves when it came to detection of snakes. First among these was the presence of other vehicles on the road. Other vehicles often drove far faster than was useful for surveying and having people behind and in front of the survey car impacted the

speed at which a pass was completed. This is in addition to the unknown impact of heavier traffic on wildlife movement patterns.

Another significant challenge was the gravel section of Bluffs Road. When the sun had set and the main source of light was from car headlights, the numerous small divots, holes and bumps on the road created shadows that looked remarkably similar to a snake's silhouette. This caused many false positives and potentially false negatives during the course of the survey. Small branches on the roads added to this issue.

Though walking surveys of the road is a more reliable method for snake detection, driving surveys are a useful tool. If these type of surveys are to be repeated in the future there are several recommendations to improve both data collection and detection chance. A second person should be present as a passenger/walking partner to improve detection as a driver cannot properly focus on searching and driving such a bumpy winding road. Secondly, environmental data should be recorded including air temperature, ground temperature, humidity, survey start time and survey end time. Any herps found along the road should also be recorded along with their location and the ground temperature where they were seen. Adding these types of information allows for a more comprehensive idea of the habitat quality as well as increased consistency of the surveys.

Walking Survey Challenges

The biggest challenge of the walking surveys was limited manpower. Three out of the four survey days only had one person walking the landscape in search of snakes. The fourth day had two surveyors on site. Because the area in question is not overly large, it was still possible to cover much of the promising looking habitat, though the effectiveness of the surveys is questionable. Even with an experienced set of eyes looking for snakes, it is difficult to locate animals at the best of times. The fact that most surveys were done by someone unfamiliar with the landscape of the island, and the cryptic nature of snakes as a group means that clues could have been missed. A larger group of people, led by experienced surveyors would allow for a more comprehensive search of the landscape.

Scale of habitat

The selected survey area was chosen based on local knowledge and the most recent potential sighting of the species. After seeing the scale and quality of the habitat, it is difficult to say whether there is enough space to support a largely unseen population of snakes. With a high amount of foot and vehicle traffic passing through Bluffs Park and Matthews Point during the active season, it seems likely that gopher snakes would have been spotted more often in such a small area if they were present. This begs the question of whether or not the remaining habitat is large enough to support a population that seemingly avoids the trail and road

network. Information on the movement of other gopher snake subspecies could give clues about whether or not there is enough habitat remaining.

Habitat usage could also be different than expected. Because the grassy open woodland that Pacific Gopher Snakes are adapted to is so scarce, could a surviving population be adapted to living in the more coniferous forest nearby? With the nearest extant population several hundred kilometers south of Galiano Island, it is hard to make assumptions based on Pacific Gopher Snakes from the United States. Snakes on Galiano could be adapted to a more fossorial lifestyle, hardly emerging from rodent tunnels. Or they could have become more arboreal to take advantage of abundant forest cover. Gopher Snakes are skilled climbers and well adapted to staying underground in rodent burrows, so either option seems plausible. Island dwelling populations of many species can behave in different ways when compared to their mainland cousins (Hayes et al, 2024), so without an example to work with it is difficult to rule anything out.

Adapting Survey Methods

The tried and true methods of visual and road surveys are known to be effective when applied to an area over time and with experienced surveyors (OMNRF. 2016). However, they are limited by available personnel and to a lesser extent, the skill of the surveyors. Because of this, and the nature of the Pacific Gopher Snake's uncertain existence on Galiano Island, other survey methods could be useful.

A suggested method for detection which has seen success on other projects is the use of trail cameras. A method for using them with snakes was developed by Thompson Rivers University for a long running study on Northern Pacific Rattlesnakes in Osoyoos, BC (Howarth et al, 2025). A depression is dug and a plastic bucket with two PVC tube entrances is placed inside. A trail camera is attached to the lid of the bucket, which is then covered with debris. When placed along snake fencing, this method yielded great results for snake detection, including footage of the rare and highly fossorial Desert Night Snake (*Hypsiglena torquata deserticola*). This method could be applied on Galiano Island for passive detection of Pacific Gopher Snakes. The main downside to this is that the cameras need to be checked every so often and photos sorted. Depending on permitting, scent lures could be used to try and bring snakes in. Alternatively, trail cameras could be placed near promising looking landscape features to try and capture snakes moving.

Another well used method for snake detection is the placement of artificial cover objects (OMNRF. 2016.) Though the landscape in Bluffs Park and Matthews Point has ample ground cover, there is the possibility that artificial cover could be used. Placing and checking these could be an efficient way to gather information and could be paired with trail cameras.

Public awareness is another important tool, especially when privately owned land surrounds the publicly accessible habitat. From discussions with locals, there is some knowledge of the species, but the more that can be done to get people's eyes on the landscape the better.

Conclusion

Though no snakes were found on Galiano Island this time, it was still worthwhile to become familiar with the habitat and learn from local experts about the recent history surrounding Pacific Gopher Snakes on the island. Collaboration with new groups and people could prove to be instrumental in furthering our knowledge and uncovering clues. Going forward, larger scale efforts and revised survey methods have the potential to help find information about the survival of the subspecies in Canada.

Acknowledgements

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