DISTRIBUTION OF THE OGILVIE MOUNTAINS COLLARED LEMMING IN TOMBSTONE TERRITORIAL PARK, YUKON

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January 2013

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Environment Yukon
Fish and Wildlife Branch
TR-13-01

Acknowledgements

We thank Todd Powell (YG - Fish and Wildlife Branch), and Dorian Amos and Cameron Eckert (YG – Parks Branch) for facilitating this work and assisting with field logistics. We thank Brian Slough (private consultant), Lolita Hughes and Alice McCulley (YG – Parks Branch), Shawn Hughes (YG – Conservation Officers Services Branch), and Martin Kienzler (YG – Fish and Wildlife Branch) for superb assistance in the field. TransNorth Helicopters provided safe piloting during the course of the work. Brian Slough (private consultant) and David Nagorsen (Royal Ontario Museum) kindly assisted in identifying specimens. We thank Judith Eger (Royal Ontario Museum) for archiving our specimens at the Royal Ontario Museum.

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Suggested citation:

JUNG, T. S., AND P. M. KUKKA. 2013. Distribution of the Ogilvie Mountains Collared Lemming in Tombstone Territorial Park, Yukon. Yukon Fish and Wildlife Branch Report TR-13-01. Whitehorse, Yukon, Canada.

Summary

- In August 2011, we trapped small mammals on 12 mountains in Tombstone Territorial Park to learn more about the distribution of Ogilvie Mountains collared lemmings.
- The Ogilvie Mountains collared lemming (*Dicrostonyx nunatakensis*) is the only mammal species found in Yukon. The only specimens previously collected were all from Angelcomb Peak in Tombstone Territorial Park.
- Information from this study was needed to inform its conservation status.

Key Findings

- We collected 3 specimens of Ogilvie Mountains collared lemming from 2 of the 12 mountains surveyed.
- We suspect that Ogilvie Mountains collared lemmings may have been present on some of the other mountains that we surveyed but Arctic Ground Squirrels disabled many traps, substantially reducing our trapping effort.
- Our results suggest that Ogilvie Mountains collared lemmings may be somewhat common and widespread in suitable habitats within the local area.
- Further targeted survey efforts are needed to better document the conservation status of Ogilvie Mountains collared lemming.

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Introduction

The Ogilvie Mountains collared lemming (*Dicrostonyx nunatakensis*) is the only mammal species endemic to Yukon (Slough and Jung 2007) and among 5 mammal species found solely in Canada. Endemic species – those that are found only within a single political jurisdiction – are a high priority for conservation. The Ogilvie Mountains collared lemming is one of the least known terrestrial mammals in North America (Nagorsen 1998). Only 13 specimens have been collected, all from a single location – Angelcomb Peak in Tombstone Territorial Park, central Yukon, Canada (Slough and Jung 2007).

The Ogilvie Mountains collared lemming is distinguished from other species of collared lemmings by its grey-brown pelage colour and small skull size (Nagorsen 1998, Figure 1). Geographically, the Ogilvie Mountains collared lemming is separated from populations of Northern collared lemmings (*Dicrostonyx groenlandicus*) in northern Yukon and adjacent Alaska and Northwest Territories by more than 400 km of apparently unoccupied habitat (Nagorsen 1998). Youngman (1967) speculated that the Ogilvie Mountains collared lemming represents a relict population of collared lemmings that became isolated on nunataks (unglaciated mountain tops) more than 10,000 years ago and remains reproductively isolated.

Figure 1. Ogilvie Mountain collared lemming (*Dicrostonyx nunatakensis*) collected from the Seela Range, Tombstone Territorial Park. Photo by T. Jung

The taxonomic status of the Ogilvie Mountains collared lemming, however, is uncertain. Collared lemmings are inherently complex and experts disagree on the number of valid species. The classification of the Ogilvie Mountains collared lemming has been hampered by the confusing taxonomy of collared lemmings and by having few study specimens collected. Youngman (1967) originally described the Ogilvie Mountains collared lemming as a disjunct southern population of the Northern collared lemming. More recently, Musser and Carleton (1993), Jones et al. (1997), and Nagorsen (1998) have tentatively classified the Ogilvie Mountains collared lemming as a full species based on contrasts with other populations of nearby Northern collared lemming. Others, however, have retained the Ogilvie Mountains collared lemming as a subspecies of Northern collared lemming (Engstrom 1999; Nagy and Gower 1999).

Between 1961 and 1964 Youngman (1967, 1975) collected 10 specimens, all from Angelcomb Peak in the Ogilvie Mountains, central Yukon. An eleventh specimen was collected in 1971, also from Angelcomb Peak (P. Youngman, personal communication). Youngman (1967) gave the location of the holotype (the specimen used to name and describe the species) as 64°35'N, 138°13'W (32 km S of Chapman Lake).

Elevations provided by Youngman (1967) ranged from 1625 m to 1676 m above sea level (ASL). He described the habitat as dry rocky alpine tundra (heath) at the base of glacial cirques.

More recently, Slough and Jung (2002, 2003) conducted targeted surveys for the Ogilvie Mountains collared lemming at Angelcomb Peak, with the intent of confirming that the species still existed (it had not been recorded for 38 years) and collecting specimens for a taxonomic assessment. They collected a single individual in 2002 but none in 2003 (Slough and Jung 2007). Subsequently, during the course of small mammal surveys along the Dempster Highway in 2005, an additional specimen was collected, again from Angelcomb Peak (Slough and Jung 2007). Locations of these additional 2 specimens were similar to those of Youngman (1967).

The general status conservation rank for the Ogilvie Mountains collared lemming is *May be at Risk*, given that: a) it has been found only at a single location, b) that it appears to be a rare species at that location, and c) that it is an alpine mammal that may be potentially impacted by climate warming. A detailed status assessment has not yet been conducted by COSEWIC (Committee on the Status of Endangered Wildlife in Canada), but given its general status rank the Ogilvie Mountains collared lemming would be a candidate for assessment by COSEWIC. However, little is known about the taxonomic status, distribution, and relative abundance of the species.

Limited information is an impediment to accurately assess the

conservation status of the Ogilvie Mountains collared lemming. Surveys for the Ogilvie Mountains collared lemming have been constrained by the remote high elevation habitats they occupy and their apparent rarity. Their distribution may be larger than solely Angelcomb Peak, but targeted surveys have been limited. We conducted a targeted survey for the Ogilvie Mountains collared lemming within Tombstone Territorial Park. Our objective was to locate other locations where it can be found, and to procure further specimens for a taxonomic assessment. These data are essential for better understanding the conservation status of the Ogilvie Mountains collared lemming.

Methods

We conducted a targeted survey for the Ogilvie Mountains collared lemming on 12 mountains within the southern Ogilvie Mountains, during 19-31 August 2011. All of the mountains we surveyed were located within Tombstone Territorial Park and distributed among 5 distinct mountain ranges (Figure 2). We distributed the survey sites throughout the park to provide reasonable spatial coverage of the alpine habitat within the park. We did not sample at Angelcomb Peak because the species was already known from that mountain (Youngman 1967, 1975; Slough and Jung 2007). A helicopter was used to access the study sites.

On each mountain surveyed we selected a sampling site in alpine tundra that was similar in elevation and habitat characteristics (dry heath, gentle slope) to where Ogilvie Mountains collared lemmings were previously captured on Angelcomb Peak (Youngman 1975; Slough and Jung 2002; Figures 3 and 4). Snap-traps were laid out in variable length traplines that contained 60 trapping stations (49 trap stations in 1 case) with approximately 10-15 m spacing between trapping stations. Each trapping station contained both a Museum Special and a Victor snap-trap (Woodstream Corp., Lititz, Pennsylvania), placed 1-2 m apart. Traps were baited with peanut butter and rolled oats and left unattended for 9-11 days (Table 1). Our sampling protocol provided for a potential 14,638 trap nights of sampling effort (1 trap-night = 1 trap set for 1 night).

We checked and removed traps 9-11 days (mean = 10.3 ± 0.3 days) after setting them. We recorded the number of specimens captured per trapline and the number of traps that were not functioning at the end of the sampling period. Collected specimens were identified to species or genus, based on external morphology and pelage (Figure 1) Specimen identification was verified by two additional professional mammalogists. Frozen tissues (heart, liver) were collected for genetic studies and standard external measurements were taken. Voucher specimens are at the Royal Ontario Museum (Toronto, Ontario).

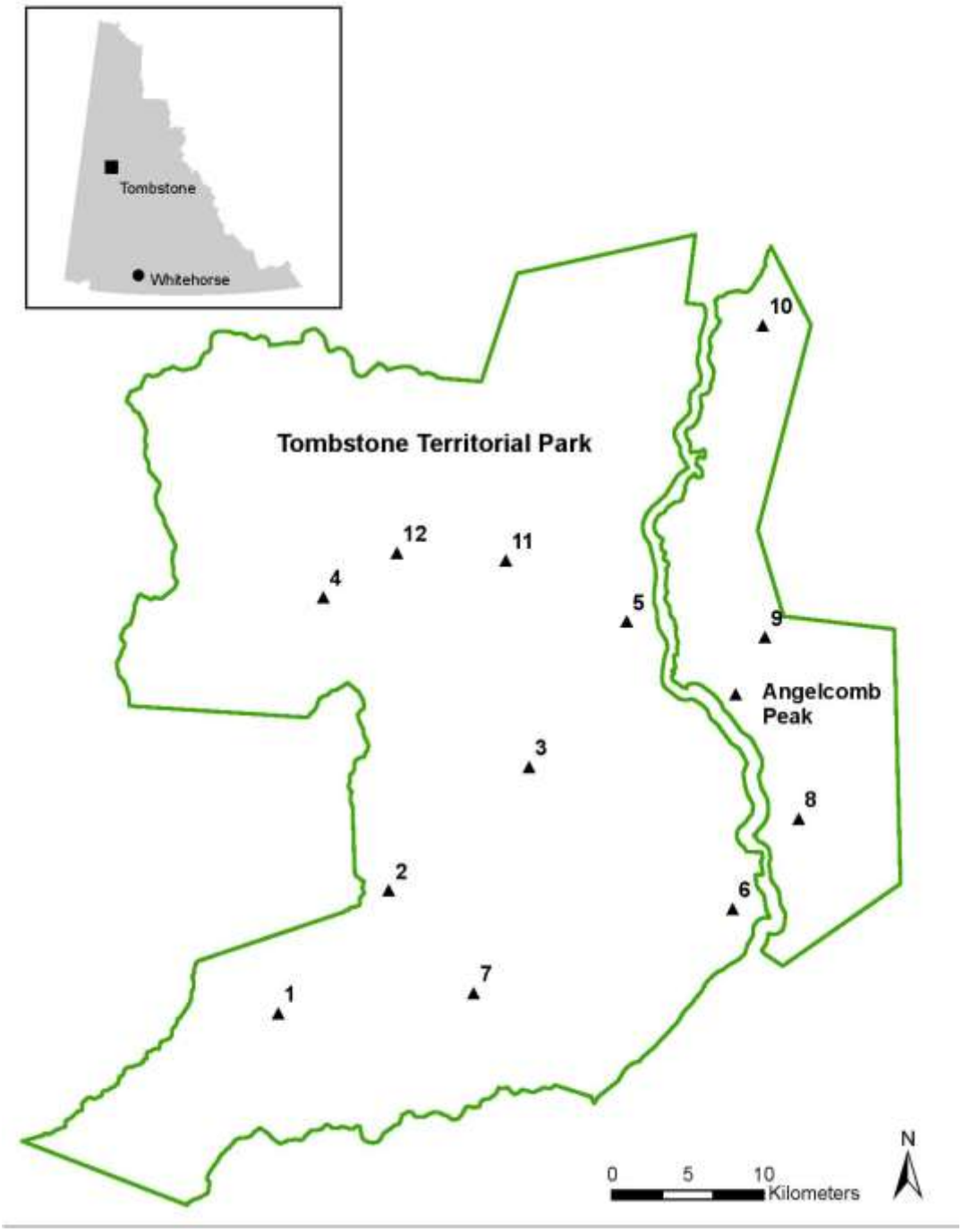

Figure 2. Map of Tombstone Territorial Park, central Yukon, including the 12 sites sampled for Ogilvie Mountains collared lemming. Note also the location of Angelcomb Peak, the site where the species was previously collected.

Figure 3. Field technicians Piia Kukka (top) and Brian Slough and Piia Kukka (bottom) setting traps for Ogilvie Mountains collared lemmings. Photos by M. Kienzler.

Figure 4. Field technicians Martin Kienzler and Piia Kukka establishing a trapping station in Tombstone Territorial Park, Yukon. Photo by B. Slough.

Results

Overall captures were low: we caught 26 small mammals from 4 species, including 3 specimens of Ogilvie Mountains collared lemming (Table 1). We collected Ogilvie Mountains collared lemmings from 2 of the 12 mountains surveyed, both of which were in the Seela Range (Table 1; Figures 1 and 5). The 2 sites where we collected Ogilvie Mountains collared lemmings were distinct mountains 5.7 km apart, and located 25.9 km and 29.6 km west of previous collections from Angelcomb Peak (Figure 2).

Ogilvie Mountains collared lemmings were collected in dry heath type habitat at elevations (1631-1709 m ASL) typical of previous captures at Angelcomb Peak (Slough and Jung 2002) (Figure 6).

Species caught in association with Ogilvie Mountains collared lemmings included 3 Northern red-backed voles (*Myodes rutilus*) at 1 site and 3 Northern red-backed voles and 2 unidentified *Microtus* voles (likely *Microtus oeconomus*) at the other site (Table 1).

Most of the traps (81.2% ± 3.7%) were prematurely sprung or missing when we returned to check them 9-11 days after they were set (Table 1), substantially reducing our sampling effort. We collected 13 additional small mammals at 7 of the 10 sites where we did not collect Ogilvie Mountains collared lemmings (Table 1).

We used 4.8 hours of helicopter time over 2 days to set up the traplines, and 4.9 hours of helicopter time over 2 days to check and remove the trapline.

Table 1. Summary of site information, sampling effort and trap captures for a targeted survey for Ogilvie Mountains collared lemmings (Dicrostonyx nunatakensis) in Tombstone Territorial Park, Yukon, August 2011.

Site	Site Information				Sampling Effort			Trap Captures			
	Mountain Range	Latitude	Longitude	Elevation (m)	Number of Traps Set	Number of Nights Trapped	Percent of Traps Sprung [1]	Ogilvie Mountains Collared Lemmings	Red-backed Voles	Tundra Voles	*Montane Shrew*
1	Tombstone	64.3923	138.8580	1551	120	11	76.7	0	4	0	1
2	Cloudy	64.4706	138.7239	1410	98	11	84.7	0	0	0	0
3	Cloudy	64.5510	138.5491	1558	120	11	86.7	0	0	3	0
4	Seela	64.6383	138.8532	1709	120	11		1	3	0	0
5	Blackstone	64.6414	138.4342	1560	120	11	100.0	0	0	0	0
6	Tombstone	64.4789	138.2529	1696	120	12	60.8	0	1	0	0
7	Tombstone	64.4157	138.5951	1338	120	10	64.2	0	2	0	0
8	Prospector	64.5352	138.1742	1548	120	10	86.7	0	0	0	0
9	Prospector	64.6397	138.2427	1607	120	10	84.2	0	1	0	0
10	McFarland	64.8221	138.2845	1356	120	9	97.5	0	1	0	0
11	Blackstone	64.6703	138.6084	1630	120	9	75.0	0	1	1	0
12	Seela	64.6686	138.7590	1631	120	9	77.5	2	3	2	0

[1] percent of traps encountered at the end of the survey that were set off without apparently capturing an animal.

Figure 5. Alice McCulley photo documenting an Ogilvie Mountain collared lemming. Photo by T. Jung.

Discussion

Fifty years after its discovery in 1961, we documented the presence of Ogilvie Mountains Collared Lemmings at 2 additional locations within the Ogilvie Mountains. There are now 3 confirmed locations of the species. A total of 16 specimens of this species have now been collected since 1961.

Small mammal captures in our study were low, given our sampling effort. We do not believe that our limited results mean that there are few small mammals on the mountains we surveyed. Rather, our survey effort was severely limited by the high number of traps that were not working during the sampling period.

There were many Arctic Ground Squirrels (*Spermophilus parryii*) at all sampling sites and were probably responsible for most of the traps that were prematurely sprung or missing.

In earlier surveys of alpine small mammals in Tombstone Territorial Park, using similar sampling methods, daily trap checks revealed that Arctic Ground Squirrels disabled most snap-traps within the first day of sampling (T.S. Jung, unpublished data). We suspect that most snap-traps were disabled early within the sampling period, resulting in the low number of small mammals captured. Ogilvie Mountains Collared Lemmings may have been present on some of the other 10 mountains we surveyed but that they may not have been collected because too few traps were working during the sampling period.

Figure 6. Habitat at the capture site (site 4) of an Ogilvie Mountains collared lemming (site 12 – top; site 4 – bottom). Photo by T. Jung.

The documentation of Ogilvie Mountains Collared Lemmings on other mountains within the Ogilvie Mountains suggests that the species may be somewhat common and widespread in suitable habitats within the local area.

Further targeted survey efforts are needed to confirm the presence of Ogilvie Mountains Collared Lemming throughout the Ogilvie Mountains. These surveys should seek means to reduce disturbance to traps by Arctic Ground Squirrels, such as placing a wire enclosure over the trap.

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