Radium Bighorn Sheep: Pre-Overpass Effectiveness Monitoring

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Image 1. Bighorn ewes on the Radium Springs golf course.

1 Goal

The goal of this work was to GPS collar bighorn sheep near "Mile Hill" along Highway 93, south of Radium Hot Springs, British Columbia. This is project lead by the Shuswap Band, supported by the Province of BC (MOTI and WLRS) and Biodiveristy Pathways. These data will form a portion of the "baseline" monitoring in preparation for a wildlife overpass and fencing on Mile Hill summer 2024. Of particular interest is the distribution, habitat use, and rates of highway crossings by sheep before the crossing system is built. A fulsome assessment of the effects of the crossing system will included before-after comparisons of these metrics, as well as insights from other data sources such as roadkill reports from the highway and remote cameras on the overpass.

2 Capture results

Capture was conducted between Februrary 21-23, 2024, based out of Radium Hotsprings. The capture team consisted of Province of BC biologists, Shuswap Guardians, independent scientists and veterinarians, Parks Canada staff, and Village of Radium staff. Over the

course of three days we captured 10 bighorn sheep, 8 ewes and 2 rams (Figure 1). All animals were anaesthetized by free-range dart delivered by either a Pneudart of Daninject projector.

Animals were fit with Vectronic Vertex Lite GPS collars (2D battery) that provide locations every 2 hours. We expect these collars to last 1.5-2 years. The collars were equipped with a timed (2 year) and remote drop off mechanism, meaning they will fall off the animal in 2 years from the time of collaring, or can be removed at any time by sending a prompt through the satellite connection. A backup rot off (3 layer Vectronic) was also used in case the drop off fails and we are unable to locate the animal. The relocation interval was chosen as a balance between fine scale movement and temporal coverage (collar duration). The collars will also be used to assess breaches inside the fence.

Table 1. Summary data from bighorn sheep captures.

Species	Sex	Individuals	Captures	Age estimate	Body condition (out of 5)	Chest (cm)	Neck (cm)	Weight (kg)
Bighorn sheep	F	8	8	4.6 (3-6)	2.9 (2-3.5)	99.4 (96-103)	35.3 (35-36)	76.2 (73.6-80.6)
Bighorn sheep	M	2	2	4.5 (4-5)	2 (2-2)	116 (116-116)	46 (46-46)	108.6 (99.6-117.6)

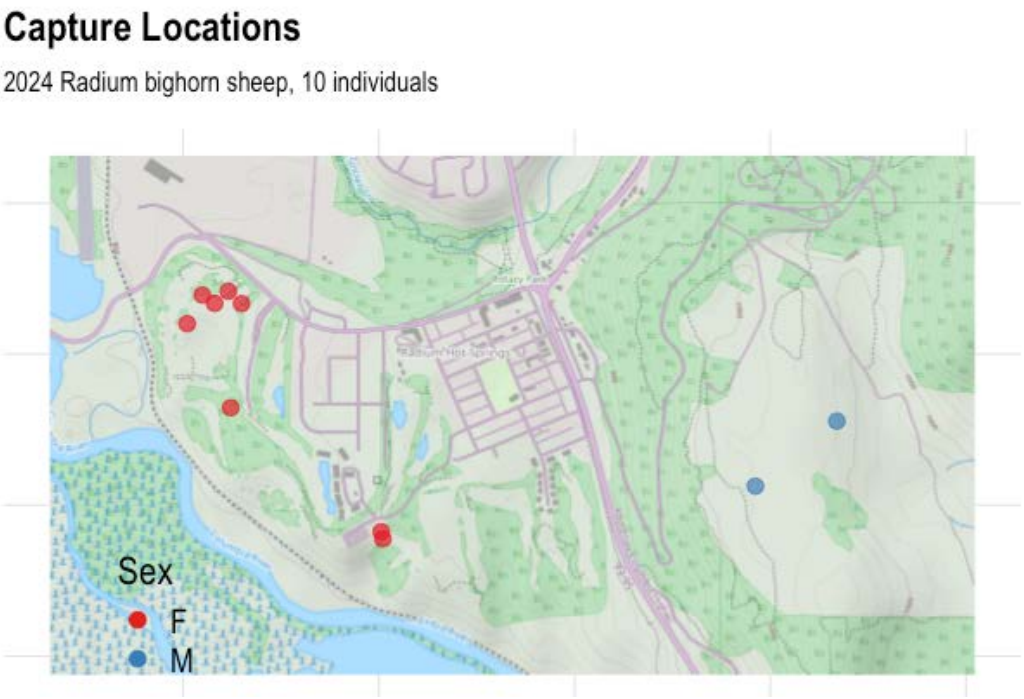

Figure 1: Capture locations.

Image 2. Capture crew observing animals before capture.

Image 3. Animals about to be aneasthetized by free-range dart.

Image 4. Capture and handling crew processing a bighorn ewe.

Image 5. Capture and handling crew processing a bighorn ram.

3 Early telemetry results

Over 3,500 GPS locations have been collected over the last month since capture (Figure 2). These data show strong spatial segregation between the ewes and rams, with most ewes staying on the golf course and rams inhabiting the restoration area above the highway. These early results are consistent with abundant local knowledge of these sheep.

Many highway crossings were detected in the last month (Figure 4). Ewes and rams seem to use the area where the overpass is proposed, which is a good sign (Figure 3). A movement corridor just south of town also seems apparent (Figure 3), providing evidence that the northern fence end should extend into the 60 zone in town to ensure animals crossing at the fence end are not struck by vehicles moving at highway speeds.

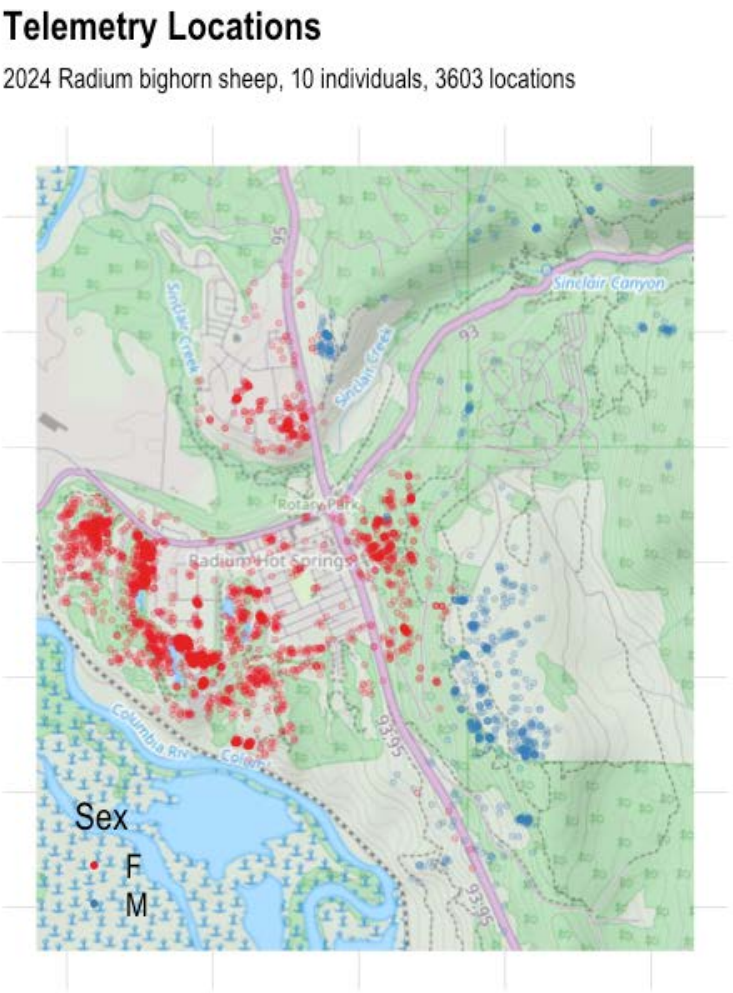

Figure 2: GPS locations of collared animals.

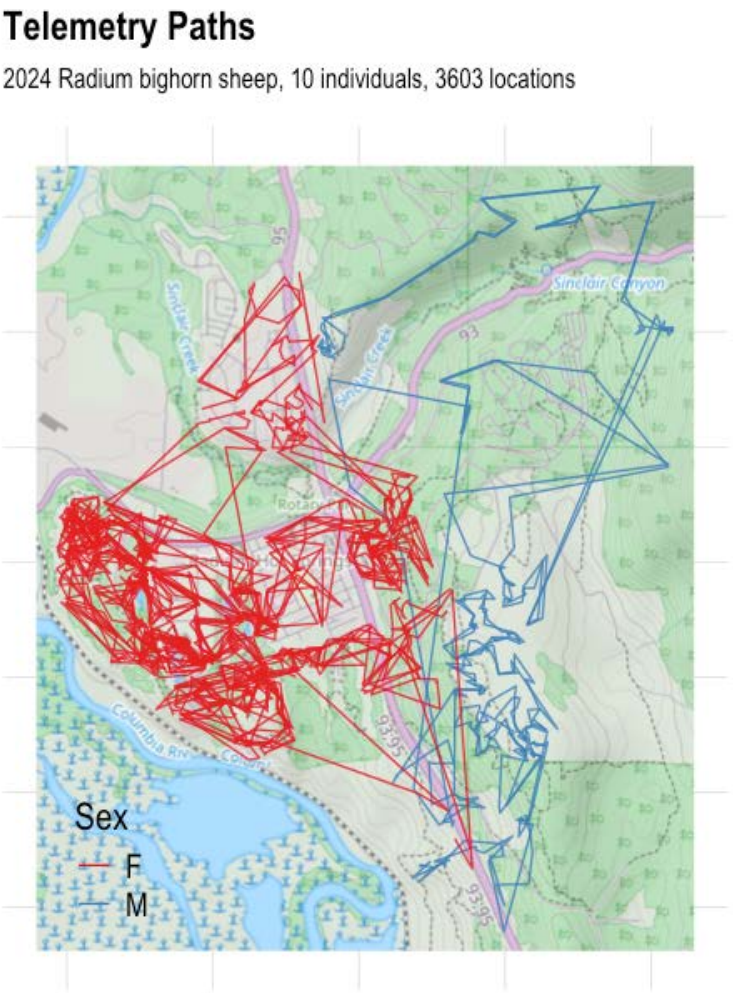

Figure 3: Movement of collared animals.

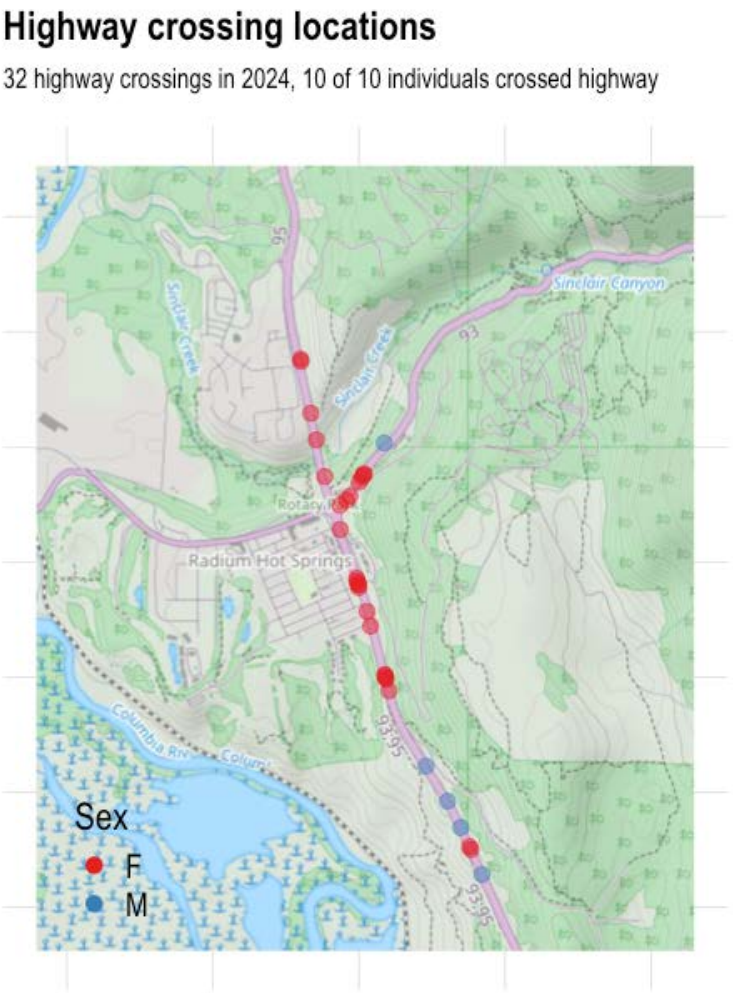

Figure 4: Highway crossings of collared animals.

Image 6. Collared ewe walking away after reversal of anaesthesia

Image 7. Collared ram waking up after reversal of anaesthesia

4 Early roadkill results

At this point we are just providing qualitative assessment of roadkill to document the spatial distribution and number of collisions each year. As expected, most sheep that have been killed on the highway around Radium occurred on Mile Hill south of town (Figure 5). Although some mortalities occur up the highway towards Kootenay National Park, north Radium, and within the Village itself. Most roadkills occurred in the late fall through to early spring (Figure 6). Few roadkills occurred over the summer (June-Sept). On average, there are 7 sheep killed per year (Figure 7) in the vicininty of Radium (Figure 5), but there have been as few as 2 and as many as 14 per year.

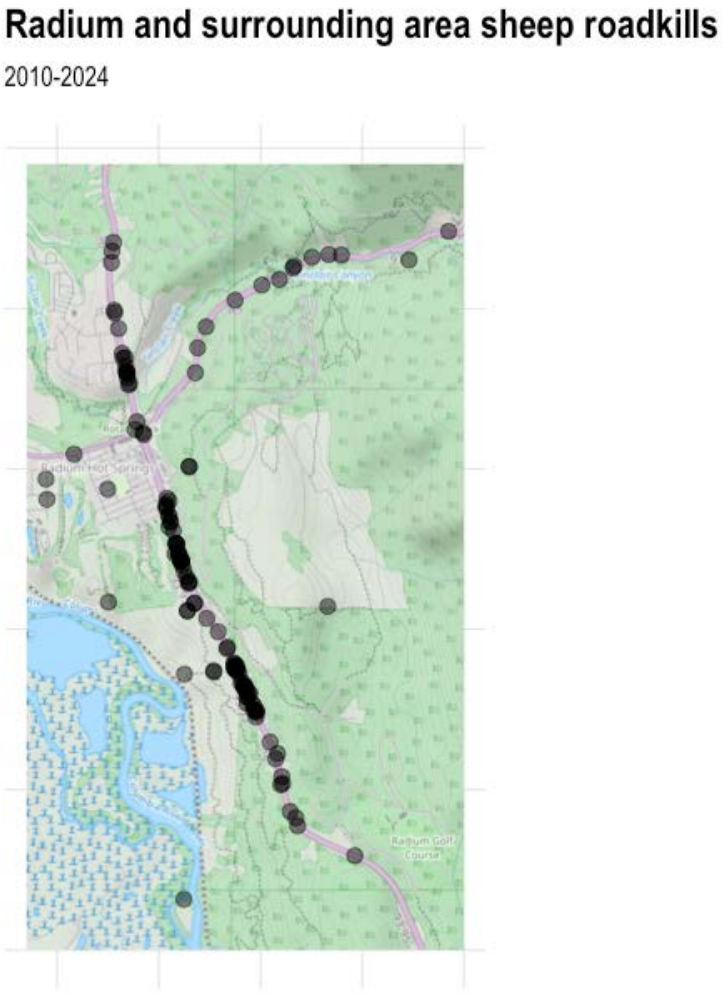

Figure 5: Map of roadkill locations along highway.

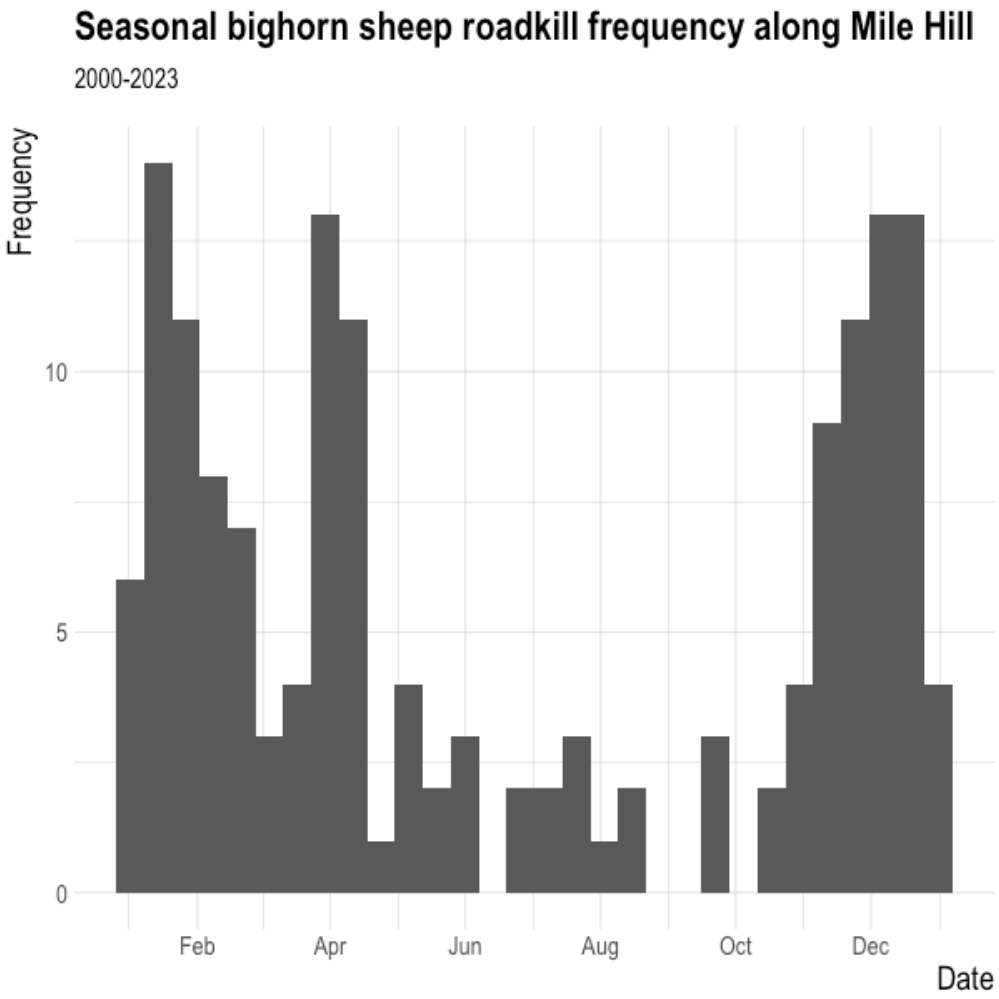

Figure 6: Roadkill by season.

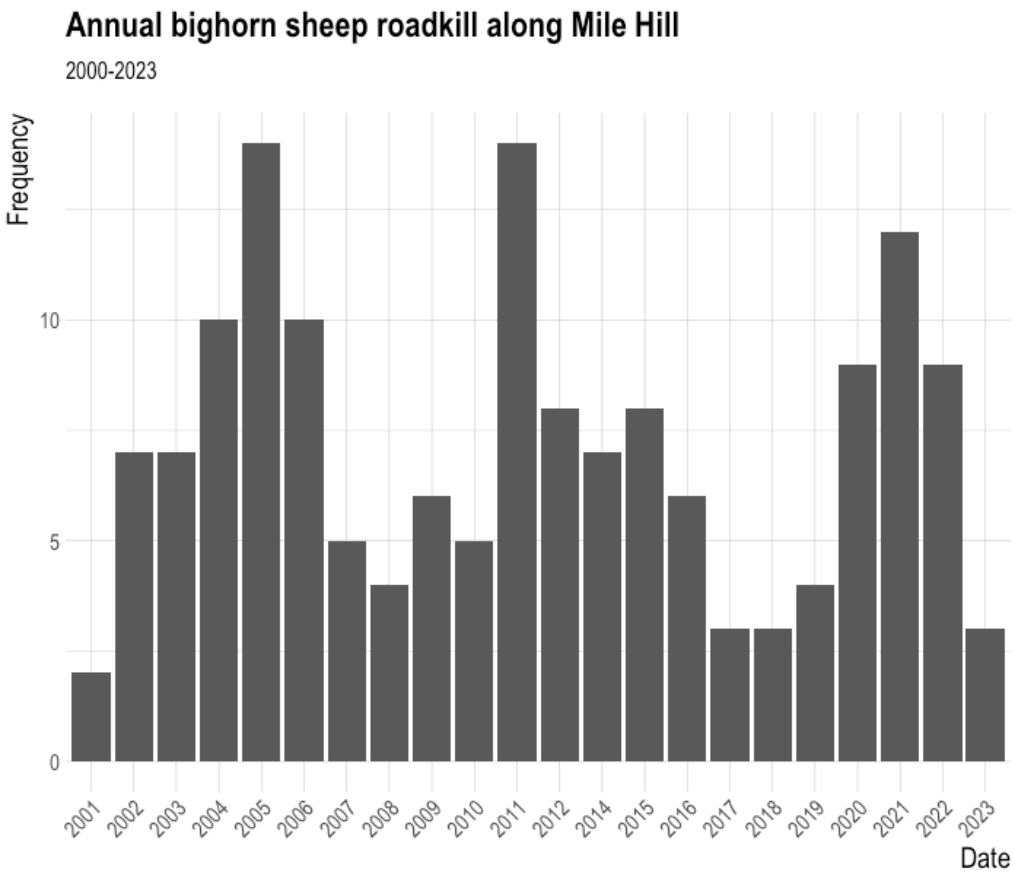

Figure 7: Roadkill by year.

5 Acknowledgements

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