North Trench Elk Collaring Project

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GOLDEN DISTRICT ROD & GUN CLUB

BRITISH COLUMBIA | Ministry of Water, Land and Resource Stewardship

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Introduction

Background

The Golden District Rod and Gun Club has partnered the Provincial Ministry of Water, Land and Resource Stewardship to propose a Rocky Mountain Elk *(Cervus canadensis)* collaring project focusing on the metapopulations of the Northern Trench Population Management Unit (PMU) of The East Kootenay - Columbia Region. This will be the first elk collaring project in this unit and will collect information on population demography and habitat use, which will ultimately contribute to the long-term persistence and conservation of this population.

The draft Kootenay Elk Stewardship Plan has identified the North Trench as a PMU that has significant data gaps for both the population and the habitat. Information sheets that accompany the regional draft Elk Stewardship plan outline these data gaps including; the sustainability of the populations, calf recruitment, disease prevalence, population distribution, migratory patterns, and population trends. This project is intended to start bridging these gaps and work towards addressing stewardship concerns that exist in this PMU. The healthy lands portion of the North Trench PMU information sheets also state there is little known about the security and quality of elk habitats. Through collecting collar data, this project aims to identify these important habitats that will in the future direct on the ground habitat assessments closing in these unknowns for the PMU. Table 1 is a direct copy from the Regional Elk Stewardship plan for the North Trench PMU.

Minimal data have been collected on elk in this PMU. Previous inventories between 1991 and 2006 were so varied in both intensity and area that their value was limited (Szkorupa and Mowat, 2010). Two more recent surveys in 2011 (Szkorupa and Thornton, 2011) and 2021 (Chow et al., unpublished) focused on the southern part of the study area in MU 4-34 and 4-35, which still leaves the northern part of the unit with information gaps. Even with that, sightability from helicopters is limited in the thick forests that cover this region and in deeper snow years, even the herds that overwinter in the wetlands are known to seek refuge in the adjacent closed canopy forest (Szkorupa and Thornton, 2011) further limiting sightability. Reliable data to base informed management decisions on is not currently available for managers. This project aims to give managers the tools needed to make decisions based on sound science, and to enable long term conservation and stewardship of this population.

Table 1: Healthy elk and healthy land objectives and performance measures for the North Trench PMU. Copied from Chow, 2023.

Direct Objective	Currently Meeting Performance Measures?
Healthy Elk	
1. The elk population is resilient and self-sustaining over the long-term	NO
2. Calf recruitment and adult female mortality are sufficient to meet population trend objectives	PARTIAL
3. Bull ratios and age structure allow for an effective, early and synchronous rut and a huntable surplus	YES
4. The population is in good physical condition with low disease prevalence	UNKNOWN
5. Current seasonal population distribution is maintained or expanded where feasible, with migratory behaviour maintained and promoted in populations	UNKNOWN
6. There is good understanding of population trend between survey years and drivers of population trend	PARTIAL
Healthy Land	
7. High value winter ranges contain adequate quality and quantity of thermal/snow interception cover, high quality forage, and are secure from disturbance	UNKNOWN
8. High value summer ranges contain adequate quality and quantity of forage, security/thermoregulation cover, and accessible water sources	UNKNOWN
9. Calving areas contain adequate quality and quantity of forage and are secure from disturbance	UNKNOWN
10. Transitional ranges and movement corridors are unobstructed, have stopover sites with high quality forage, and are secure from disturbance	UNKNOWN

Research Questions

The need for this project is evident and is imperative for the effective management of elk in this PMU into the future. Collecting and analyzing data on these herds at this juncture of time when land use is expanding and diversifying, is critical for future land use planning and much needed regulatory interventions to combat habitat loss and degradation. The research questions we are posing are:

1. What is the distribution of elk across the landscape and what are key habitat features elk are selecting for on winter range and summer range habitats?
2. What are the current elk migratory patterns (timing and location)? Are they being influenced or restricted by current land use or transportation corridors (highway or rail)?

3. What are the population estimates, demographics, and recruitment?
4. What is the survival rate of this population and what are the main sources of mortality?
5. What are the major limiting factors for elk in the NT PMU? (health, predation, human conflict etc.)

Project Area

The North Trench PMU is located in the general vicinity of the Town of Golden at the southeastern edge of British Columbia (figure 1). This Project is focused on five metapopulations (Populations) of elk whose existence is based on local knowledge (figure 2). The Populations overlap Wildlife Management Units (WMU) 4-40, 4-36, 4-34 and 4-35 in the Columbia, Blaeberry, Kicking Horse and Kootenay Watersheds. The Project area is bounded by Glacier National Park to the West and Yoho/Kootenay Jasper and Banff National Parks to the East and encompasses the northern end of the Columbia Wetlands Wildlife Management Area. Four of the five Populations persist on the Rocky Mountain side of the Rocky Mountain Trench while the fifth (Columbia Wetlands) is expected to seasonally migrate into both the Rocky and Purcell Mountains.

Population

The selected five metapopulations do not cover all of the metapopulations in the PMU but were chosen based on habitat variability and local knowledge of overwintering herds. These populations are all known to inhabit these areas in the winter months thus are likely not using the same winter range habitats, however there may or may not be genetic exchange across these metapopulations.

Habitat

The project covers the north end of the Columbia Valley where ecosystems transition from open forest/grasslands (dry Interior Douglas Fir (IDF) variants) to Interior Temperate Rainforest (moist and wet variants of Interior Cedar/Hemlock (ICH) ecosystems). The eastern flanks of the project, in the Rocky Mountains, are generally characteristic of dry-cool Montane Spruce (MSdk) ecosystems. The transition to cooler and wetter ecosystems in the project area brings deeper snowpacks than what exists in the southern trench leading to a much more limited availability of critical ungulate winter range habitat. Elk are not as abundant in the wetter North Trench as they are in the drier South Trench but there are small metapopulations distributed throughout the PMU that persist.

Currently there are no Government Action Regulation (GAR) orders in place for the portion of the project area that overlaps with the Selkirk Forest District that provisions for elk Ungulate Winter Range. Collecting data on winter range habitat use through this project will assist in identifying these specific important habitats and inform the establishment of such orders in the future. Apart from the Columbia Wetlands Wildlife Management Area, none of the PMU has any habitat protection or recreation management. The Bush River area is subject to extensive

growth in recreation activity, the Blaeberry Valley is seeing unprecedented residential development, the Beaverfoot sees heavy resource extraction, and the area between Vacation Creek and the Town of Golden provides easy access to motorized recreation. All of these areas have changed dramatically in the past decade, with no imposed management or regulation to follow the trends. Winter range in the North Trench PMU is scarce due to the wetter and colder climates and is a prevalent limiting factor for these metapopulations. Regulations are needed to conserve important habitats like overwintering areas, calving areas and migratory routes.

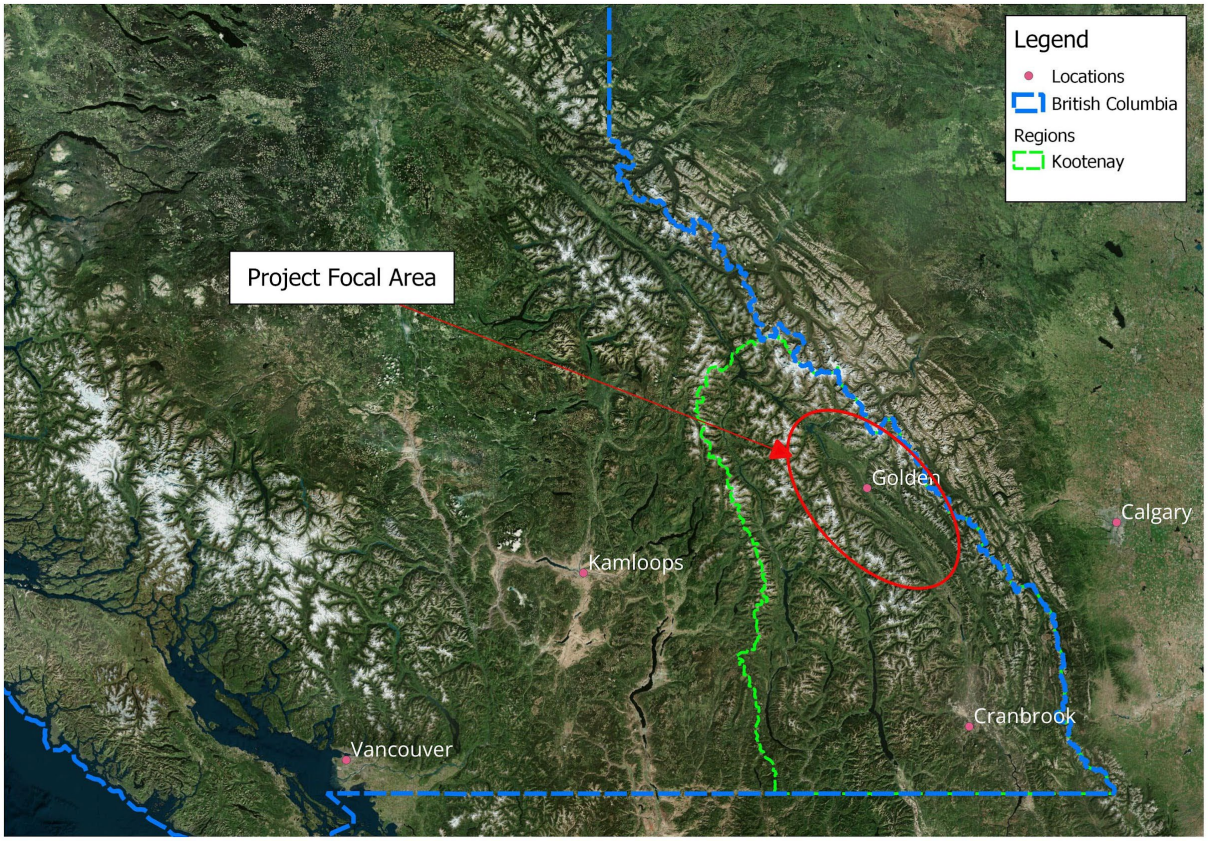

Figure 1: Overview map location the project area in the Province of British Columbia

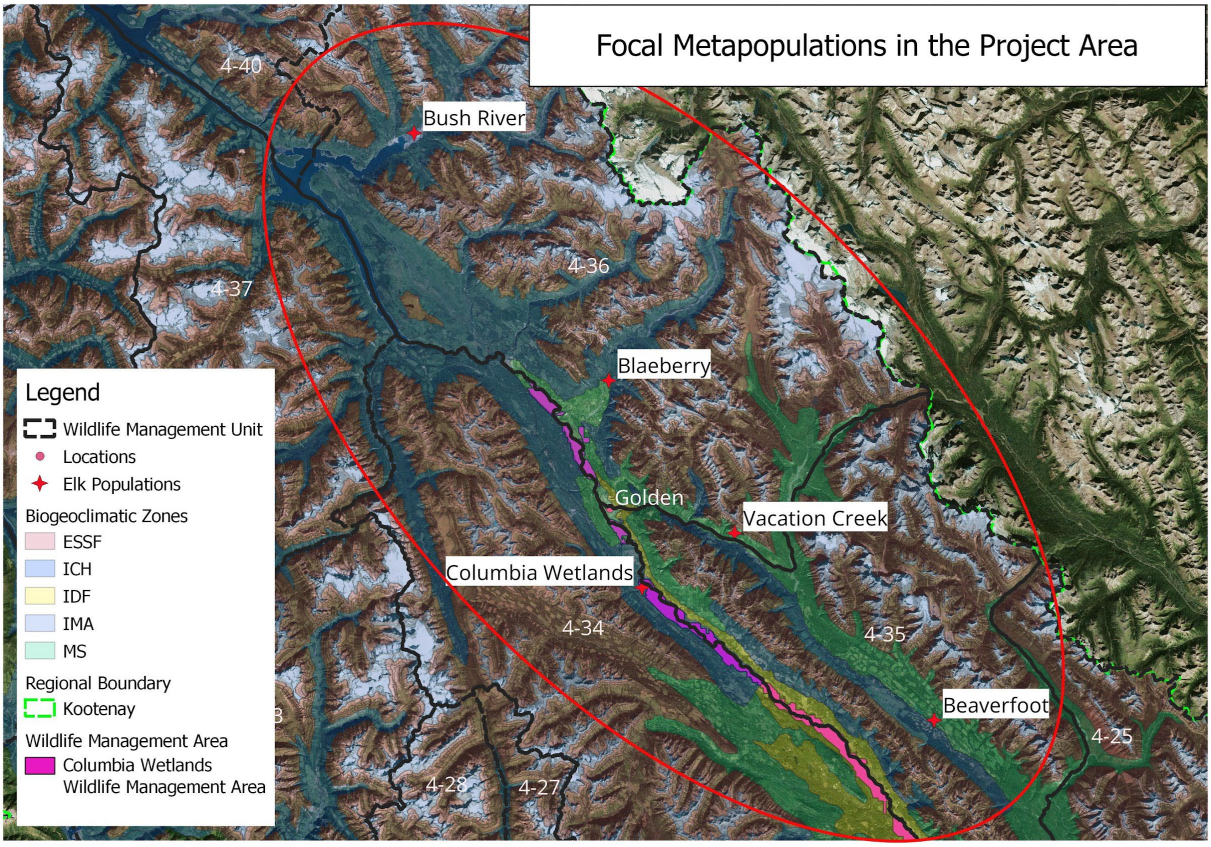

Figure 2: The five Populations in relation to the project area overlapped with biogeoclimatic ecosystem variation.

Bush River

60 km North of Donald BC on the Bush-Sullivan Forest Service Road edges into the still naturally existing portion of the Bush River flats where a small herd of elk are known to commonly overwinter (Klafki, 2007). Elk numbers are difficult to estimate in this area due to the thick ICH forests that cover the slopes. Elk are commonly observed throughout the Bush River (4-36) and southern Kinbasket Reservoir (4-40) from valley bottoms to alpine meadows. Forest management operations are the primary activity in this area with no permanent structures beyond rustic trappers cabins. The popularity of recreational activities are on the rise in the area. Banff and Jasper National Parks are to the east and north, there is likely Population interaction between the Bush River elk and the National Park herds.

Blaeberry River

The Blaeberry River enters the Columbia River 15 km north of Golden. The Blaeberry Valley in the ESSFdk2 ecosystem provides a long-braided river flat that has historically provided winter range habitats for elk. As residential development and recreational activity expands in the area, secure winter range habitats are becoming encroached and fragmented. Most of the lower

elevation forest in the Blaeberry is ICHmk5 ecozone outside the river flats near the confluence with the Columbia River.

Beaverfoot/Upper Kootenay

The Upper Kootenay valley is bordered to the south and east by Kootenay National Park and Yoho National Park to the North. The valley bottom runs between the Beaverfoot and Brisco Ranges to the west, and the Vermillion and Ottertail Ranges to the east. The headwaters of the Kootenay River flow south, while the Beaverfoot River runs north towards the Kicking Horse River.
The southwest facing slopes of the Ottertail and Vermillion Ranges provide winter range and are surrounded by Yoho and Kootenay National Parks. BEC zones on these slopes are ESSFdk2 and MSdk.

Vacation Creek

20 kms east of Golden there is known to be a small herd (~40) of elk that overwinter on the south facing slopes between Glenogle Creek and the Yoho Park Boundary. These southwest facing slopes are MSdk and ESSFdk2. GDRGC is currently enhancing winter range habitats on either side of Vacation Creek between Mt Hunter and the Yoho National Park boundary. So far nearly 50 hectares of lower elevation ingrown habitat has been thinned and enhanced for winter elk use.

Wildfire in 2021 burned an area between Vacation Creek and Hunter Creek. This has been a boon for the elk, as 2 years post burn there was lots of forage in these areas, and pellet surveys connected to the GDRGC project suggested extensive elk use through late winter and spring. Habitat in this area generally consists of thick forest at lower elevations, becoming thinner and more open as it becomes steeper in higher elevations. Stands of mature Douglas fir and aspen exist throughout, especially outside of the previously logged areas at higher elevations.

Columbia Wetlands

The Columbia Wetlands (CW) from Nicholson north to Donald is ESSFdk2 zone, while south of Nicholson it is ICHmk5. Elk can be observed in the CW year-round, but they are notably more abundant and obvious in the winter months. Numerous herds can be observed between Parson and Donald in the winter months gathering in large numbers, the origins and distance traveled by these animals is largely unknown. While elk can be observed in the wetlands year-round, many elk also traditionally migrate into the alpine basins in the Purcell and Rocky Mountains for the summer months. With the expansive growth of recreational activity, and residential developments in the area, the level of seasonal migration and the avoidance of mid-slope transitional habitat is in question.

Work Plan

Table 2: Summary of project phases, outcomes and actions used to answer the questions of this research.

Project Phases	Measurable Outcomes	Actions
Partner: Create meaningful relationships and involvement with GDRGC and FN members	• Funding provided each year to FN to participate and engage in the project	• Establish clear partnership between the GDRGC and WLRS through shared funding applications and collaboration along multiple steps of the project (formation, execution, reporting)
Collar: Deploy collars on elk in the North Trench	• At least 30 collars initially deployed across the 5 North Trench populations • Minimum 25 collars deployed at all times over 3 years	• Use suitable deployment methods applicable to North Trench sub-population to safely and efficiently collar elk

Analyze: Collect and analyze data to answer key research questions	• Map key habitats (winter range, summer range, migratory routes, calving grounds) • Understanding of the current elk migratory patterns (timing and location) • Established estimates of population trend, survival, recruitment, and cause-specific mortality • Established metrics of population health using indicators such as body condition • Knowledge of the major limiting factors	• Collect seasonal habitat use data for a minimum of 3 years. • Collect health samples during capture • Collect a range of standard health information during capture (i.e. body condition). • Conduct mortality investigations of collared elk within 48hrs of mortality alerts. • Overlay accumulated elk habitat use data with known land use. • Use accumulated collar data to identify important habitats for each Population. • Conduct seasonal ground counts to determine recruitment and composition. • Understand seasonal migratory patterns, habitat use and Population interaction. • Assess habitat quality and quantity in winter, summer, transitional and calving areas
Report: completed reporting back to funders and project partners	Awritten list of management recommendations for elk and elk habitat in the North Trench Unit Annual written reports to funding sources and partners Awritten final report (year 4) detailing project results	GDRGC and WLRS to collaborate on written recommendations and results
Communication and Outreach: communicate at the start of the project, during the project lifetime, and when final results are complete		Local presentations complete through regional science outlets (e.g. CMI, BHAtalks) Project videos and outreach through social media for awareness and updates

Management Outcomes

This study will provide information to better manage this population. Timing and locations of elk movements and migration allow for mapping of key habitats and inform land use decisions around new development and mitigation of current human use. Information about survival rates and causes of mortality allow for informed discussions around population trend, mitigating mortality, and sustainable hunting rates and timing.

Methods

Engagement and Involvement

In the development of this proposal the project team reached out to explore opportunities for meaningful involvement with regional First Nations. With the initial Notice of Intent (NOI) process facilitated by the Fish and Wildlife Compensation Program, interest in the project was expressed by the Ktunaxa Nation Council, the Shuswap Band and the Splatsin Nation. Follow up meetings and conversations were initiated to further explore interest, capacity, and avenues for collaborations. Budget items have been included in the project proposal to facilitate involvement in capture and collaring, mortality investigations, herd counts, and habitat condition surveys. Engagement between the GDRGC and the interested Nations will continue to evolve following the confirmation of project funding.

Fundraising through the GDRGC has begun, with a positive response from the membership and local community, as well as people further afield. Corral trapping will require several volunteers, which is a good way to engage local people in conservation. There is often a disconnect between local communities and wildlife research and management, so this is a great opportunity to include people outside the professional realm and encourage better stewardship of their resources through collaboration with government and First Nations.

Collaring

Timing

Capture and collaring will occur in December as animals congregate in their low elevation winter ranges, seasonal temperatures are suitable for capture and the regional elk hunting seasons are closed.

Habitat conditions are varied across the project area meaning that different approaches are required for capture. These populations are also quite variable in size meaning that some populations might be more difficult to locate than others. The Columbia Wetlands are very open with elk feeding in the openings during the winter months being obvious and easy to locate. Elk in the Bush River often use the river flats in the winter but are pushed into the surrounding

forested habitats as snow accumulates restricting feeding and locomotion in the openings. Ecosystem variability (dry vs wet), topography (mountainous vs valley bottom), and forest conditions (wetlands vs closed canopy forest) will contribute to the need for varied capture techniques.

Locating Herds

The Columbia Wetlands are generally easy to locate as they are large herds. The smaller more remote herds like the Beaverfoot and the Bush River populations will be more challenging to locate due to sightability, access and small numbers. Helicopter or fixed wing flights will be critical to locating herds in these remote areas and zeroing in capture efforts.

Capture

The emphasis for collaring animals will be on cows due to higher rates of mortality among bulls. Bulls and cows select for different habitats outside the breeding season (McCorquodale, 2013), so there is important data to collect data from both sexes but this project will focus solely on cows. The MUs 4-34 to 4-36 have a 6-point antler restriction for General Open Season (GOS), and any bull for bow only. While it is useful to have survival data on bulls, the cost and loss of data involved in losing research animals frequently to hunting remains a high risk. Collaring will be led by certified and experienced government staff and/or contractors with the assistance of GDRGC volunteers and FN staff. Dave Lewis is a regional senior wildlife capture expert that will be employed to consult and direct capture on this project.

Physical methods are sometimes favoured over chemical methods due to time and veterinary constraints, and without the use of immobilization drugs it was thought that faster methods result in less overall stress to the animal (Millspaugh et al., 2000). However, more recent research suggests that chemical capture results in lower stress when done with experienced veterinarians and knowledgeable handlers with a species-specific protocol (Arnemo et al., 2003). Chemical immobilization often has very low mortality (<1%) for moose (*Alces alces*) (Arnemo et al., 2006). For the safety of both the animals and the handlers, chemical immobilization has fewer risks, especially when done by an experienced wildlife veterinarian. Toxicity for humans and lost darts are the main risks when using opioid drugs in a field setting (Arnemo et al., 2003). Modern sedative combination drugs (BAM, MAA) are lower risk than previously used opioids.

Capture methods will depend on the habitat in the area of each herd. Options for each location are outlined in Table 3 below.

Net Gunning

Net gunning is the standard capture method used by government agencies for ungulate tagging. It is favoured due to efficiency, it takes much less time and effort, and it can be carried out without the use of chemical immobilization drugs. Extended pursuits can result in higher mortality rates from stress (McCarthy et al., 2023). However, it is not practical for steep or thick

terrain, as chasing animals with helicopters and deploying nets through trees becomes too risky and difficult. Net gunning is likely only possible in the Columbia Wetlands and Bush River areas.

Corral Trapping

Corral trapping is an effective method for ungulates in flat habitat. It involves erecting a temporary corral that elk are then baited into. This method requires a lot of people and takes time, but it enables capture of several animals per effort. This method may be practical in the Blaeberry, Columbia Wetlands, Bush River, and potentially the Beaverfoot.

Ground Darting using Bait/Blind

In areas where the terrain may not facilitate net gunning or corral trapping, such as in Vacation Creek, there is potential to immobilize using methods that more reflect hunting tactics. Baiting with hay/salt with a blind nearby would be a low cost, low effort, and low stress method for capturing elk in some of the thick forest and steep terrain in the project area. Ground stalking has been used successfully to dart moose, resulting in a low stress response (Roffe et al., 2001). This method involves no chasing or herding, so is the lowest stress method for immobilization.

Helicopter Darting

Darting directly from the helicopter is a method used as standard in Scandinavia for moose research (Arnemo et al., 2003). This can be preferable to net gunning as both require close pursuit of the animal, but when darted directly from the helicopter the animal is never physically immobilized and stress can be reduced this way. The same chase limits apply in both helicopter methods, and pursuit must be terminated if the animal shows signs of fatigue.

Drive-netting

Drive-netting involves placing a ground based net across a bottleneck location, and herding animals towards it with a helicopter. This is common for alpine ungulate captures. The advantages to this method are that we can capture several animals at once. However, it also requires significant numbers of people due to the number of animals involved. Time is a concern with this method, as more animals can be caught in the net than can reasonably be processed quickly. Care needs to be taken to ensure no animal is immobilized longer than absolutely necessary to reduce stress.

With all of the project metapopulation locations, the habitat and terrain will dictate the method of capture used. For efficiency, the most preferred capture method is net gunning. However, use of these methods will be limited to areas where helicopters can get close to elk, like in the Columbia Wetlands. Corral trapping is very labour intensive with the need to have winter access to a site, have the ability to monitor use (cell enabled trail cameras) and then revisit many times to ensure bating is effective and continuous. While the initial cost of helicopter capture methods may appear to be high, the labour and involvement costs of corral trapping will, in the end, far exceed these costs.

Table 3: Summary of habitats and preferred capture methods.

Metapopulation	Description of habitats	Preferred Capture Method
Bush River	Open river flats with dense surrounding forest.	1. Net gunning 2. Helicopter darting 3. Ground darting 4. Drive-net
Blaeberry	Open river flats with dense surrounding forest.	1. Net gunning 2. Helicopter darting 3. Ground darting 4. Drive-net
Beaverfoot	Dense forest with limited large openings, steep mountainous terrain.	1. Ground darting 2. Drive-net 3. Helicopter darting
Vacation Creek	Dense forest with limited large openings, steep mountainous terrain.	1. Ground darting 2. Drive-net 3. Helicopter darting
Columbia Wetlands	Open wetlands with pockets of deciduous forest. Dense coniferous forest surrounding wetlands.	1. Corral trap 2. Drive-net 3. Net gunning 4. Helicopter darting

Samples

During capture several samples will be taken including:

- Hair
- Blood
- Feces
- Biopsy
- Visual health (approx age, body condition, coat, hooves)

Genetics

The interaction between populations of Upper Trench Elk is not well known. Genetic sampling would assist in understanding the genetic variability and genetic structure across the North

Trench. This data will provide information on how these metapopulations interact with each other on the landscape.

Genetic data also has the benefit of creating baseline data for source populations for future non-invasive genetic sampling efforts. This can aid in research on movement, herd interactions, and even poaching investigations.

Genetic samples will be analyzed at Wildlife Genetics International in Nelson, BC and will be collected as a routine part of the capture and collaring process.

Health

Data will be collected for each captured individual, including visual health analysis and general blood and fecal sampling.

Sampled health data:

- Cortisol levels
- Pregnancy
- Trace minerals
- General blood panel
- Parasites

Standard wildlife sampling protocols will be followed to ensure repeatable data collection and safe and humane handling of wildlife.

Permitting

A permit under the wildlife act will be submitted for capture and handling of wildlife under the Wildlife Act. This will be completed when funding is confirmed with <90-day turnaround times confirmed. Permitting will include the development and approval of animal care protocol, and the approve acquisition of immobilization of drugs.

Mortality Investigations

Mortality investigations will occur within a 48-hour period following the receipt of a mortality notice from the GPS collars (collar is stationary for 8-12 hours). Mortality investigations will involve locating the animal, determining proximate, and where possible, ultimate cause of death using the BC Mortality Investigation protocol, and taking any appropriate health samples available including a femur for fat analysis, tooth for aging. Mortality investigations in the Columbia Wetland will be easiest to access on foot, but some of the higher elevation habitats in the Bush, Vacation Creek, Beaverfoot, and Blaeberry will likely require mechanized transport to access. Mortality investigations will be conducted by trained GDRGC volunteers.

Staff and Volunteers

Volunteers

Volunteers organized through the Golden District Rod and Gun Club will assist with capture, mortality investigations, and on the ground population counts. Local knowledge will be paired with professional knowledge to ensure accurate assessments, and data collection.

Professionals

Cirque Ecological, as a contractor representing the Golden District Rod and Gun Club, will be leading the planning, fieldwork, data collection, management and analysis, and reporting in partnership with Emily Chow of the Ministry of Water Land and Resource Stewardship for this project.

Data Analysis

Collar Data

Data from the collars will be downloaded and plotted in QGIS regularly to determine habitat use patterns and to ensure quality data collection is occurring. Movement will be summarized annually.

Health Data

Health data will be logged in an excel database for each individual, along with any mortality event associated with them. Any health issues will be flagged, samples collected and brought to the attention of the provincial vet for direction.

1. *What is the distribution of elk across the landscape and what are key habitat features elk are selecting for in winter range and summer range habitats?*

The data collected from the collars will be used to run a home range analysis to identify areas used for calving, overwintering, summer range and migratory paths between these seasonal habitats. This data will simply be cleaned to remove arrant locations, and a kernel analysis will be run to produce heat maps to locate key habitat features.

2. *What are the current elk migratory patterns (timing and location)? Are they being influenced or restricted by current land use or transportation corridors (highway or rail)?*

Using the above-mentioned home range analysis, timing will be extracted from the data set to understand when animals are moving on the landscape. This spatial analysis will also be overlain with the provincial digital road atlas, recreation lines, tenures and other land use layers and statistically analyzed for patterns of avoidance.

3. *What are the population estimates, demographics, and recruitment?*

In partnership, the GDRGC and the Province will use a range of approaches to gain confidence in these numbers.

- A minimum of two inventory flights will be integrated into this project at the onset of collaring, and near the end of the project, over approximately a 5-year period. Collar locations will be used to assist in focusing survey time to where individuals/the herd are known to be located at the time of survey. Standard arial survey protocol will be used for this process.
- Collar location will be used to assist in supporting the citizen science portion of this project. The herds with easier sightability, like in the Columbia Wetlands, will be located using last known points and trained volunteers will be positioned to count and determine sex and relative age.
- Areas of core habitat where enhancement work is already occurring (Vacation Creek) are being monitored by the GDRGC for presence absence using a minimal number of motion-activated camera traps. Increasing the number of cameras in this area could help support determining herd number and demographics.

4. *What is the survival rate of this population and what are the main sources of mortality?*

Mortality investigations, calf recruitment, population surveys and hunter harvest reporting will provide the data for this analysis which will consider fitness at the time of death, cause of mortality, sex, age and location. Survival will be calculated at weekly intervals following a staggered-entry Kaplan-Meier approach (Pollock et al. 1989).

5. *What are the major limiting factors for elk in the NT PMU? (health, predation, human conflict etc.)*

The combination of data analysis described above (Q 1-4) will help draw conclusions around limiting factors. These analyses will be presented in both the NT PMU as a whole and separated out as metapopulations as well. Habitat condition surveys will be conducted to determine the state of key limiting habitats, like winter range. Habitat survey location will occur near the end of the project once there is confidence in key habitat identification.

Proposed Schedule

Date	Activity	Project Personnel
Year 1		
Fall 2024	Engagement of project partners	GDRGC (Cirque)

Fall/Winter 2024	Grant Applications • FWCP • HCTF • T4W	GDRGC (Cirque) and MWLRS
Spring 2025 *Contingent on funding approval	Collar order and purchase -Prepay 2025 collar monitoring fees.	GDRGC (Cirque)
Fall 2025	Funding applications for 2026 -2027 • FWCP • HCTF	GDRGC (Cirque)
Winter 2025	Complete elk survey to locate each herd and focus capture efforts.	GDRGC (Cirque) MWLRS First Nations
Winter 2025 – 2026	Install Corral traps, bait and monitor. Capture, collar and sample elk – Up to 5 3 metapopulations	GDRGC (Cirque and Volunteers) MWLRS First Nations
Winter 2025- 2026	Net gun capture in Blaeberry and Columbia Wetlands Meta populations	GDRGC (Cirque) MWLRS First Nations External Contractor
Winter 2025 – ongoing	Mortality investigations	GDRGC (Cirque and Volunteers) First Nations - where practical
Spring 2026- ongoing	Process tissue samples collected during capture and mortality investigations	MWLRS
Spring 2026	Reporting, data management and analysis.	MWLRS GDRGC (Cirque)
Spring 2026	Project video production. Interviews, compilation of video and photos from capture. Recognize funders and raise awareness for elk conservation	GDRGC (Cirque
Year 2		
Ongoing	Monitor collar locations, collar status and mortality events. Coordinating volunteers and managing data.	GDRGC (Cirque)
Fall 2026	Funding applications for 2027-2028 • FWCP • HCTF	GDRGC (Cirque)

Winter 2026/2027	Replace collars as needed. Equipment and resource needs contingent on location of lost collars.	GDRGC (Cirque) MWLRS
Winter 2026/2027	Inventory – Populations, Demographics and recruitment. • Flights • Volunteer counts	GDRGC (Cirque and Volunteers) MWLRS First Nations
Spring 2027	Data management, analysis and reporting.	GDRGC (Cirque) MWLRS
Year 3		
Ongoing	Monitor collar locations, collar status and mortality events. Coordinating volunteers and managing data.	GDRGC (Cirque)
Fall 2027	Funding applications for 2027-2028 • FWCP • HCTF	GDRGC (Cirque)
Winter 2027/2028	Replace collars as needed. Equipment and resource needs contingent on location of lost collars.	GDRGC (Cirque) MWLRS
Winter 2027/2028	Inventory Volunteer herd counts	GDRGC Volunteers
Spring 2028	Data management, analysis and reporting.	GDRGC (Cirque) MWLRS
Year 4		
Ongoing	Monitor collar locations, collar status and mortality events. Coordinating volunteers and managing data.	GDRGC (Cirque)
Summer 2028	Habitat Condition Surveys	GDRGC (Cirque) MWLRS First Nations
Winter 2028/2029	Inventory – Populations, Demographics and recruitment. • Flights • Volunteer counts	GDRGC (Cirque and Volunteers) MWLRS First Nations
Spring 2029	Final Project Reporting • Summarize all data • Answer Research Questions • Make recommendations for future	GDRGC (Cirque) MWLRS

	management • Present Project Findings	

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