

Evaluating the Use of Guide and Outfitter Knowledge and Sampling to Inform Woodland Caribou (Rangifer tarandus caribou) Conservation

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BACKGROUND:

Wildlife Disease HEALTH Surveillance:

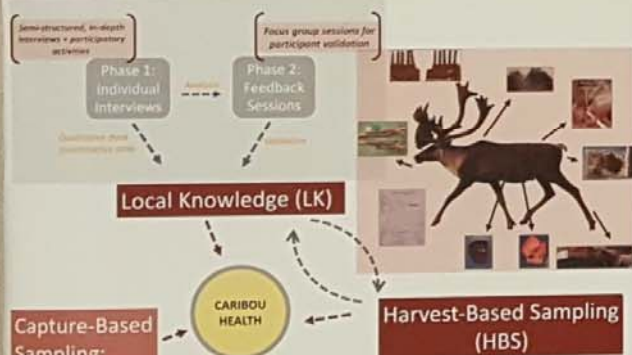
- Monitoring health status and trends of a population + integrating outcomes into management
- Multiple disciplines/methods and integrative approach essential to address complexity of 'health'^{1,2,3}
- Study Population: Northern Mountain Caribou
 - Local reports of population declines, behavioural changes
 - Limited knowledge on status, trends; no health data/ baselines^{4, 5}
- Guides & Outfitters:
 - Access to remote regions/species,
 - Opportunity for harvest-based *sample collection*,
 - Carry *local knowledge* of ecology, wildlife health, trends^{6,7}

Research Aim: Use guide & outfitter knowledge and sampling to **enhance** wildlife health surveillance

OBJECTIVES:

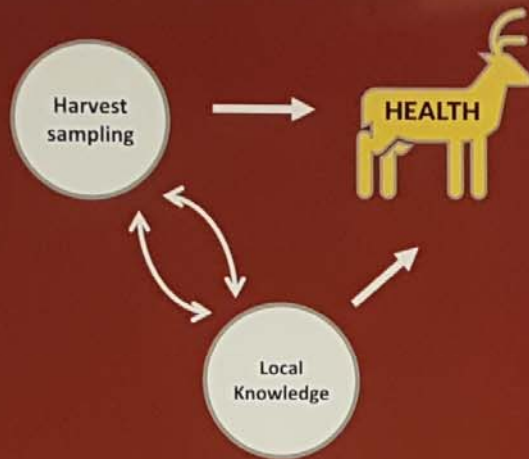
- Determine caribou health status via *harvest-based sampling*
- Explore caribou health status & trends via *local knowledge*

METHODS:



RESULTS/DISCUSSION:

- Health data (adult, trophy males, hunting season)
 - 63 HBS kit submissions in first 3 years
 - Supplements health data from traditional surveillance approaches (live capture), informs population-level health status/ outcomes
- Observational data on caribou behaviour, demographics, abundance, distribution, disruption, nutrition, health/disease
 - 16 individual guides & outfitter interviews + feedback sessions
 - LK data on health status/trends
 - Triangulation of sampling health data
- Reciprocal feedback between both approaches – adaptive, co-evolving, and co-informing our understanding of caribou health



Guide outfitter-based sampling and knowledge can enhance current approaches to wildlife health surveillance.



Take a picture to download the poster, full references, and study overview



Table 1: Indicators of caribou health, the metrics used to inform them, and the respective sampling approaches used.

Caribou Health Indicator	Sampling Approach	Metric
Condition	HBS	Marrow fat (leg, jaw)
	LK	Back fat measurement, Ribeye Fat, Hunter Assessment, Participatory Activities, P1 & 2 Interviews, Biological Assessment
Morphology	HBS	Measurements (leg, jaw)
	LK	P1 & 2 Interviews, Measurements (leg, jaw, body)
Trace Minerals (TM)/Contaminants	HBS	TM Concentrations (Liver, Kidney, Hair)
	LK	P1 & 2 Interviews, TM Concentrations (Serum)
Behaviour	LK	P1 & 2 Interviews, Participatory Activities
	HBS	Hair Cortisol Concentration, Fecal Glucocorticoid Metabolites, Enamel Hypoplasia
Stress	LK	P1 & 2 Interviews, Hair Cortisol Concentration, Fecal Glucocorticoid Metabolites
	HBS	Serology, Hide Digestions, Fecal Baermann, Floatations
Parasitic Disease	LK	P1 & 2 Interviews, Participatory Activities, Serology, Fecal Baermann, Floatations
	HBS	Serology, Histology
Bacterial & Viral Disease	LK	P1 & 2 Interviews, Participatory Activities, Serology
	HBS	Serology
Demographics / Herd Composition	LK	P1 & 2 Interviews, Participatory Activities
	HBS	Serology
Distribution	LK	P1 & 2 Interviews, Participatory Activities
	HBS	Serology
Abundance	LK	P1 & 2 Interviews, Participatory Activities
	HBS	Serology
Disturbance/Threats	LK	P1 & 2 Interviews, Participatory Activities
	HBS	Serology

Use of Guide & Outfitter HBS and LK To Evaluate Caribou Body Condition

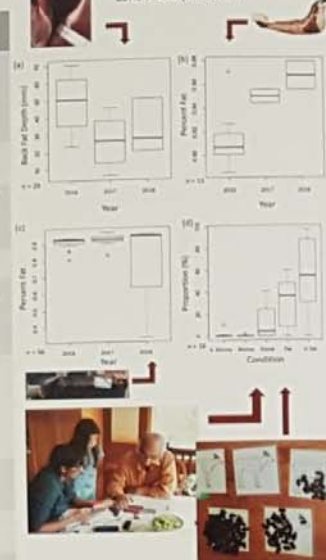


Figure 1 (above): (a) Back fat depths measured (mm) by guide/outfitter from submitted harvest-based sample kits; (b) Marrow fat content from mandibles submitted; (c) Marrow fat content from left mandibulars submitted; (d) Guide/outfitter condition assessments determined by proportional piling exercises (LK interviews).

Caribou Health Surveillance Approaches and Outcomes

	HBS	LK	CBS
Samples (or Knowledge) Reported	Blood (filter paper), hair, hide, feces, kidney, liver, metatarsus, mandible, rectum, back fat measurement, data sheet (observational data)	Habitat, behaviour, nutrition/diet, health, range, abundance, herd composition, predator-prey dynamics, disruption	Blood (WB, serum), hair, feces, data sheet (observational data)
Information Return Rates	63 sample kits	16 in-depth individual interviews, 7 focus group validation sessions	60 sample kits
Temporal Coverage	2016, 2017, 2018; restricted to late summer - early fall hunting season	Interviews conducted 2018/2019; open historical and current observations	2018, 2019 BC Caribou Recovery Program data, seasonal variability observations
Demographics Represented	Adult, trophy-hunted bulls (arbores), individual-scale	Bulls, cows, calves (caribou, other species), individual- and population-scale	Primarily cows, calves (caribou); individual scale
Herds Sampled	Little Rancheria, Homersloch, Tenegrade, Level Kawdy, Spatzel, v/ Swan Lake	Atlin, Swan Lake, Little Rancheria, Homersloch, Level Kawdy, Tenegrade, Edlira, Spatzel	Caribou, Atlin, Homersloch, Little Rancheria
Level of Community/Stakeholder Involvement	0/1	1	0/1
Health Information Method	Parasitic, viral, bacterial, prion/infection, substrate and chronic stress; morphometrics, condition, age, trace mineral profile	Habitat, behavior, diet, range, herd composition, abundance, inter-species dynamics, disruption, disease, morphometrics/condition	Parasitic, viral, bacterial, exposure/infection, substrate and chronic stress, trace mineral profile, condition/morphometrics
Potential Bias	Hunter selection bias (limited representation of age/sex/desired traits), seasonal limitation, non-random	Recal/observation bias, subjectivity, scope of profession	Limited representation of age/sex, non-random/opportunistic, seasonal limitations

Table 2 (above): Comparison of Harvest-Based Sampling (HBS), Local Knowledge (LK), and Capture-Based Sampling (CBS) approaches in investigating the health of NW BC Northern Mountain Caribou in years since 2016. *Adapted from Danaharan et al. (2005): I = Monitoring/surveillance scheme intended to involve local stakeholders in the local decision-making approach, as well as in data collection, data analysis, and monitoring based decision making; II = Intended to involve local stakeholders mainly in the data collection and monitoring based decision-making; III = Not currently intended to involve community members/local stakeholders.

