NBCKC Monitoring Practices for Boreal Caribou

INDIRECT METHODS
FECAL SAMPLING

HOW DOES IT WORK?

- Study areas are surveyed (usually systematically) in winter by fixed-wing aircraft to collect fecal pellet samples. Surveys are conducted systematically for estimation of population size and trend, but may also be collected opportunistically for other purposes.
- Genetic tags (unique DNA sequences) can be extracted from the fecal pellets to identify individuals and/ or sex.
- Progesterone hormone levels can be used to assess whether an individual is pregnant

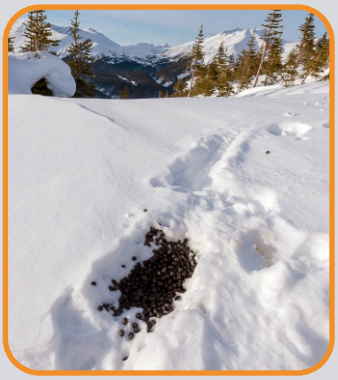

Photo credit: Samanta McFarlane & Govt of AB

WHAT CAN BE MEASURED?

- Genetic tags, in combination with capture-recapture (CR) analyses, can be used to assess population abundance, population trend and demographics.
- Fecal-DNA can also be used to estimate additional population parameters and processes such as diet, fitness, genetic diversity, dispersal, and population connectivity.

WHAT (AND WHO) IS REQUIRED?

- Costs include sampling kits and coolers for specimen collection, aircraft fees and fuel, as well as associated expenses for laboratory-based genetic analysis.
- Personnel required include: aircraft observers trained in caribou sign detection; field crew trained in fecal pellet collection; laboratory technicians trained in DNA extraction and genotyping analysis.
- Sampling can be led local by communities and informed by Indigenous Knowledge.

WHEN CAN IT BE USED?

Use: Fecal-DNA based CR studies are best suited for broad-scale studies on population abundance and demography, while non-CR genetic or hormone studies conducted at smaller scales, can be valuable for examining individual fitness, familial relationships, gene flow, and pregnancy rates.

Avoid: Fecal-DNA based CR studies are not intended for fine-scale sub-population-level abundance surveys. Fecal sampling is only recommended in winter, as fecal-DNA degrades at warm temperatures.

Previous boreal caribou application: In several regions, population abundance and trend have been derived from fecal-DNA-based capture-recapture studies, and reproductive hormones analysis from fecal samples has been used to estimate pregnancy rates of caribou.

KEY CONSIDERATIONS

- The lack of animal contact involved in this approach is advantageous where non-invasive methods are preferred.
- Fecal samples can be collected by non-specialist trained participants.
- Fecal-DNA based CR (capture-recapture) or SCR (spatial capture-recapture) analyses generate robust population abundance and demographic estimates if standardized protocols are followed.

Cost:	Logistical Complexity:	Capture/Handling:
$ -$$$	SIMPLE-COMPLEX*	NO

*Logistical complexity is considered Simple for sample collection but Complex for data analysis

For more information, including regional subtleties and method particularities, please refer to decision tree, detailed write-ups and suitability tables 1 and 2. The information contained in this factsheet is intended for rapid communication and summary purposes only.

Photo credit: Laura Finnegan