

Svalbard reindeer abundance and mortality — Coastal study areas

Motivation

COAT Svalbard ungulate module: Conduct annual census of the reindeer population in Brøggerhalvøya, Sarsøyra and Kaffiøyra to estimate the population abundance (sex and age distribution).

This protocol is for 2000-today. For more information about the protocol from 1979-2000 see Tyler and Øritsland (1999) and Hansen et al. (2013).

State variables:

Svalbard reindeer abundance and demographic structure (summer – all study locations)

Svalbard reindeer abundance and demographic structure (winter – all study locations)

Spatial study design

The study area for this reindeer census includes Brøggerhalvøya, Sarsøyra and Kaffiøyra.



Figure 1. Map of the study areas.

Temporal study design

March/April every year

July/August every year.

Procedure

The data collection is done along approximate routes walked/snowmobiled by 2-4 observers. Hand-held binoculars (10 x 42) is used for scanning all areas for reindeer.

Information recorded in the field on reindeer abundance:

Short	Explanation	Winter	Summer
C	Calf	x	x
FC	Female calf	x	-
MC	Male calf	x	-
FY	Female yearling	x	x
MY	Male yearling	x	x
UY	Unknown sex yearling	x	x
MA	Male adult	x	x
FA	Female adult	x	x
UA	Unknown adult	x	x
U	Unknown age/sex of individual	x	x

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- 1** Date
 - 2** Time start of the day – time end of the day
 - 3** General area or name of the route you walk
 - 4** Label each group/carcass from number 1 and upwards
 - 5** Group size and group composition (classes as above)
 - 6** NB! Location – mark observation down on field map. Label obs. with the running numbers in your field book for that observation.
 - 7** Observer
 - 8** Mark (collar, ear tag etc.)
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Aging of animals

NB! In doubt about age and sex write that and do not guess!!!!

NB! In doubt – take a photo and label it well and you can look at it afterwards!

NB! In Adventdalen animals will still have winter fur in Ny-Å over a period of a month they will change quite a lot in terms of fur and antler development!

CALVES	Calves are identified by their small body size, infantile behavior and that they are observed together with their mother. Calves are born mostly in the first half of June, but the early survey in Adventdalen can risk overlooking calves or calves not being born. Be aware of that!
YEARLINGS	<ol style="list-style-type: none"> 1. Yearlings (born last year) are identified by their small body size, and small antlers compared to adult animals. Their size is considerably larger than calves but still smaller than adults. 2. The yearlings are more curious of humans than older animals and often operate in groups of several yearlings. This age group contains animals of 12-14 months of age. 3. The width of the stomach and rear parts seen from behind are smaller than for older animals. Younger look. 4. Yearlings and 2-year-olds are difficult to distinguish by body size. A large yearling might be as large as a small 2-year old and a small 2-year-old might be mistaken as a yearling. To avoid increasing the yearling group with older animals, we classify animals that most likely are 2 years old, but due to small body size (not fully adult size) could be a large yearling into a class named: Yearlings/2-year olds (see next page).
ADULT	<ol style="list-style-type: none"> 1. Animals older than (24 months) are classified as adults. The body size of adults is considerably larger than the three younger age group classes. 2. The males have large antlers. 3. Females are mostly distinguished by large body size (larger than yearling and 2-year olds).

Sex of animal

ADULT FEMALE	<ol style="list-style-type: none"> 1. The sex of an adult females is identified by the presence of calf. Look especially carefully in Adventdalen since we are early in the summer. 2. Female without calf by observing urine stain on the pelage (behind) (only on winter fur is this possible to see). 3. Shape of the head (more "upward" nose). 4. Antler type. 5. Up close you can wait till the animal pie.
ADULT MALE	<ol style="list-style-type: none"> 1. Large antlers in velvet is used as identification of adult males. 2. In some cases, penis of the male is observed.
YEARLING	<ol style="list-style-type: none"> 1. Determination of sex was done by observing urine stain on the pelage (winter fur). 2. Urine in the bottom (behind) FEMALE or under the belly MALE. 3. Observe animal urinate to check where urine is coming from.

References

- Aanes, R., B. E. Saether, E. J. Solberg, S. Aanes, O. Strand, and N. A. Oritsland. 2003. Synchrony in Svalbard reindeer population dynamics. *Canadian Journal of Zoology-Revue Canadienne De Zoologie* **81**:103-110.
- Hansen, B. B., Grøtan V., Aanes, R., Sæther, B-E., Stien, A., Fuglei, E., Ims, R. A., Yoccoz, N. G., Pedersen, Å. Ø. 2013. Climate events synchronize the dynamics of a resident vertebrate community in the High Arctic. *Science* 339:313-315. <https://doi.org/10.1126/science.1226766>
- Le Moullec, M., A. O. Pedersen, N. G. Yoccoz, R. Aanes, J. Tufto, and B. B. Hansen. 2017. Ungulate population monitoring in an open tundra landscape: distance sampling versus total counts. *Wildlife Biology*.

Appendices

There is a route description available, but it needs to be revised before uploaded.
