SAMPLING OF FOX SCATS FOR DIET AND GENETIC ANALYSES

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PURPOSE

To collect and store scats of foxes in a way that is appropriate to determine diet and species identity of foxes (red fox VS arctic fox) where the ranges of the two species overlap. Collecting scats serves the double purpose of studying diet and identifying species occupying surveyed dens.

TIME PERIOD AND LOCATION

Scats can be collected anywhere, at any time of the year. However, we prioritize collections at dens during summer.

PROCEDURE

i) *Scats collected where species identity is known*

- *Note:* The following method of collection-storage is valid if:
    - It is known with confidence that only one of the fox species is present in the region.
    - A fresh scat is collected at a den where we already determined with confidence (i.e. recent direct observations) which species is occupying it.
- Collect entire scat in a brown paper bag without touching with bare hands.
- Only one scat must be stored per bag.
- At camp, before long-term storage, thoroughly dry scats in its paper bag outside (if weather permits) or over a heater.
- Because it is important to be able to know what season or general time period is represented by the undigested items found in the scat, it is recommended that reasonably fresh scats be collected only (i.e. not more than a week old). Although no precise technique exists to age scats, a fresh scat will generally be dark-colored compared to older scats.

ii) *Scats collected with species identification (DNA analysis) required*

- *Note:* The following method of collection-storage is prescribed if:
    - Scat is collected away from dens and both species could occur in the area.
    - Scat is collected at a den in an area where the two species co-exist and the occupants of the den have not been identified.
- Put the complete, intact scat in a vial tube, add a good quantity of silica gel beads (ratio 1:1 or more if possible), and put the airtight cap on the vial tube. Do not mix-stir the scat and the beads. For safety reasons, do not touch scat with bare hands.
- Only one scat must be stored per vial tube.
- In summer, only fresh scats (a day or less) can be collected for DNA analyses because the fox's DNA on the scat's surface quickly deteriorates. In winter, this is not an issue because scats will freeze shortly after defecation.
- It is very important that material used to take the sample is used only once or thoroughly cleaned with ethanol, in order to avoid cross-contamination of samples.

- In the field, keep samples away from heat and sunrays.
- When back from the field season, all samples should be stored at room temperature in a dry place until they are analyzed in the lab.
- If you run out of vial tubes but still have silica gel beads, you can continue collecting scats for DNA analyses by storing samples in air-tight plastic bags. These samples will need to be handled and stored with care, in order to avoid perforation of the bags or crushing of the scats.
- *Important note:* A scat collected for DNA analyses for identifying the species occupying a den remains valid for determining diet because only a thin surface layer of the scat is used to collect the fox's DNA, while the rest of the scat can be used for dietary analyses. This is why we require the storage of intact scats (not crushed, not homogenized).
- *Important note:* For identifying the species occupying a given den, take replicates (>1 sample) whenever possible because analyses may fail for some samples if the DNA on a given scat has deteriorated too much.

MATERIAL

- Field books
- Carbon pens (or pencils)
- Permanent markers
- Brown paper bags
- 25ml vial tubes & caps
- Silica gel beads (Type II, size 1/8", Sigma-Aldrich)
- GPS (It is critical use the same geo-location system; for robustness reasons, we should use in all the Arctic sites, the universal systems coordinates longitude/latitude hour-min-seconds with the WGS 84; specify the reference area and your confidence interval in seconds)

DATA MANAGEMENT

i) *Scat in vial tubes:* On a piece of paper, with a carbon pen, write the time and date of sample collection, the study site name, the GPS location, a sample number (unique for each sample), and your name. Put the paper in the vial tube with the sample. On the vial tube, using a permanent marker, write the sample number, the date, and your name.

ii) *Scats in brown paper bags:* Write all the same information (as indicated above for vial tubes) on the bag itself with a carbon pen or a pencil. Additionally, it is important that you indicate the fox species on the bag because the storing of a scat in a paper bag implies that species identity is known with confidence for that sample (no DNA analyses needed).

iii) *In the field book:* Starting with the unique sample number corresponding to the appropriate sample, re-write the same information about the sample: time, date, name of study site, GPS coordinates, name of collector and species if known. Any additional information should also be noted in the field book whenever appropriate (e.g. altitude taken with GPS and habitat type where sample collected). Additionally, if the scat was collected at a den, also indicate the den number in the notebook. Confirmation or information on freshness of samples should also be noted.