

Optimizing a key predictor of northern wildlife population dynamics: Small rodent abundance metrics based on novel camera trap monitoring



Figure 1: Picture of the attendants at workshop 2 in Tromsø. For upper right: Lily Sandstrom (UiO), Tomoki Sakiyama (University of Umeå), Emilie Andersen (INN), Albert Chacon (NINA), Nigel Yoccoz (UiT), Eeva Soininen (UiT), Rolf Ims (UiT), Eivind Flittie Kleiven (NINA), Johan Olofsson (University of Umeå), Frauke Ecke (SLU), Hanna Böhner (UiT), Dorothee Ehrich (UiT), Nina Eide (NINA), Tim Hofmeester (SLU), Anu Ruohomäki (University of Helsinki).

Background and purpose

Two complementary workshops were organized in 2025–2026 to strengthen Nordic collaboration and methodological development in camera-trap based monitoring of small rodents. Together, the workshops aimed to improve coordination across Scandinavia and to advance statistical approaches for estimating abundance from camera-trap data. The activities are directly relevant to the Nordic Board of Wildlife Research (NKV) as small rodents are a key species for many game species (e.g. ptarmigan).

Workshop 1: Statistical modelling workshop (Tromsø, 10–14 October 2025)

A one-week focused workshop was held in Tromsø with visits from Frédéric Barraquand and Simon Lacombe. The main objective was to develop statistical methods for estimating small rodent abundance from camera-trap data.

Participants developed and implemented a Royle–Nichols type model linking camera-trap detections to latent abundance. Abundance estimates from this model were compared with independent estimates derived from capture–recapture data collected at the same sites. This provided an important validation of camera-trap based abundance estimation and clarified

strengths and limitations of the approach. The workshop established a solid methodological foundation for further analyses and publications.

Workshop 2: Nordic synthesis workshop (Tromsø, 26–27 January 2026)

A two-day Nordic workshop was held at the Framsentret in Tromsø, bringing together researchers from Norway, Sweden, and Finland. The workshop focused on camera-trap based monitoring of small rodents across alpine tundra and boreal forest ecosystems. The first day provided overviews of ongoing national and long-term monitoring programs and current applications of camera traps. The second day focused on synthesis and coordination, including discussion of common recommendations for camera-trap study design (e.g. spatial replication and basic camera settings). Participants also initiated collaboration on image annotation and species identification, with the aim of developing a common identification guide for small rodents (and potentially shrews) based on camera-trap images. This is seen as an important step towards standardized analyses and future machine-learning based annotation.

Outcomes and relevance for NKV

Together, the workshops combined methodological development with Nordic coordination. Key outcomes include: - Development and evaluation of a Royle–Nichols modelling framework for abundance estimation from camera traps. - Validation of camera-trap based abundance estimates against capture–recapture data. - Agreement on the need for shared guidelines for camera-trap based monitoring. - Initiation of Nordic collaboration on image annotation and a joint synthesis manuscript. These outcomes support NKV’s goals of strengthening Nordic research collaboration and improving the scientific basis for wildlife monitoring across national borders.