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**PROGRAM &
ABSTRACTS**

Linking red fox use of Arctic fox dens to reindeer herding practices in Fennoscandia

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The tundra of Fennoscandia is a fragmented landscape that stretches over 1,500 km along the Scandinavian Mountains from southern Norway into the low Arctic. Arctic foxes here form a meta-population that has been endangered for more than a century. Among the challenges facing arctic foxes are intensified interspecific competition and predation by red foxes, which have increased in abundance and expanded into the tundra. Red foxes, being opportunistic generalists, benefit from environmental changes and human activities that alleviate food-scarcity. The Fennoscandian tundra is also inhabited by both semi-domestic and wild reindeer, managed in various ways. Winter mortality of reindeer can provide important food subsidies to red foxes that scavenge on carcasses. While some reindeer herds migrate to the forest in winter, others remain on the tundra where mortality can be high. Indeed, previous research has linked red fox expansion to reindeer herding and mortality. However, no large-scale analyses have been carried out and little is known about the importance of reindeer herding practices relative to other environmental drivers of red fox expansion. Furthermore, occurrence of red foxes within the tundra does not necessarily imply establishment in dens. We present data about red fox activity and reproduction in more than 400 arctic fox dens that have been monitored throughout the Fennoscandian tundra over the last 20 years under the National monitoring programs for arctic foxes and analyze them in relation to the spatial distribution of reindeer winter-pastures and other environmental covariates.

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Arctic fox litter size and diel activity at dens with different proximity to human infrastructure: Insights from Yamal, Russia

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The Arctic fox (*Vulpes lagopus*) is the most common mammalian predator in the Arctic. Across its circumpolar range it exhibits wide variability in litter size and behavior in response to fluctuations in prey abundance, predator pressure, human presence and some other factors. We analyzed data from 16 arctic fox dens with confirmed breeding during June–July in 2014–2018 on the north-eastern Yamal peninsula, Russia (71.2° N, 71.5° E). Dens were equipped with automatic cameras using motion sensor to monitor 24-hours activity of juvenile and adult Arctic foxes. We divided all the dens into two groups: (1) human-proximate dens (n=9), located within 2 km of human activity (roads, cabins, gas industry objects, etc.); and (2) human-distant dens (n=7), situated further than 2 km from mentioned human activity. In total, we analyzed 1 831 camera-hours, yielding 3 491 triggered detections (10 images per trigger). To quantify activity differences within the 24-h period, we distinguished diurnal (6:00–21:00) and crepuscular (21:00–6:00) periods. The average number of juveniles per litter was higher at human-distant dens (7.14 young) than at human-proximate dens (5.1 young), though difference was statistically insignificant ($p=0.92$). Juveniles showed similar activity patterns at both groups of dens: peak activity occurred at twilight onset. Interestingly, juveniles at human-proximate dens showed an additional activity peak just before twilight transitioned to daylight. As expected, adults appeared on images less frequently than juveniles. Adults at both groups of dens exhibited cathemeral activity. While we are not hypothesizing the observed differences, we believe that studies of Arctic fox breeding ecology should continue due to anticipated increases in human presence in the Arctic.

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