Intra-seasonal variations in the spatial behaviour of an Arctic predator

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Résumé

Animals have to constantly adjust their behaviour in order to cope with biotic and abiotic parameters that vary in space and time. More specifically, individuals can modify their spatial behaviour at different spatiotemporal scales to exploit profitable resources or flee from detrimental conditions. In extreme ecosystems such as the Arctic, animals must constantly adjust their fine-scale movements to survive highly fluctuating and extreme conditions. Yet, to date most studies have focused on large scales, inter-seasonal differences in animal movements.
To fill this gap, we studied the fine-scale, intra-seasonal movement patterns of a territorial predator, the Arctic fox (*Vulpes lagopus*). We used GPS data collected on 20 individuals between 2017- 2023 in Nort-East Greenland to detect temporal trends at several spatiotemporal scales.

We showed that foxes full and core weekly home ranges, distance from centroid and proportion of activity did not substantially vary throughout the summer season (June-August). However, foxes' mean speed and weekly cumulative distance showed high intra-seasonal variations. Both metrics values increased steadily, peaked at the beginning of July, before decreasing steadily until the end of August. These intra-seasonal variations depended on reproductive status, with breeding foxes being slower and travelling smaller distances than non-breeding foxes, but until mid-July only. Males also tended to travel farther during the same period. Variations in litter sizes, environmental variables, and personality could also explain the high inter-individual differences observed.

This study helps understanding what drives individual variations in the spatial behaviour of a territorial predator at various spatiotemporal scales in a fast-changing ecosystem.

Mots-Clés: Spatiotemporal patterns, Movement ecology, Vulpes lagopus, home range, telemetry

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