MEDIATION OF SPATIAL ORGANIZATION IN THE SWIFT FOX, *VULPES VELOX*

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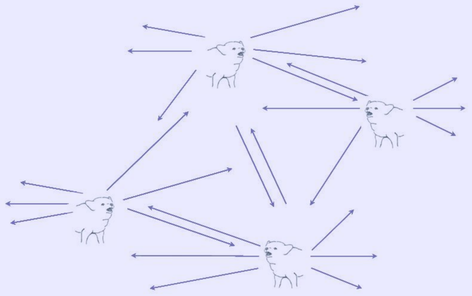
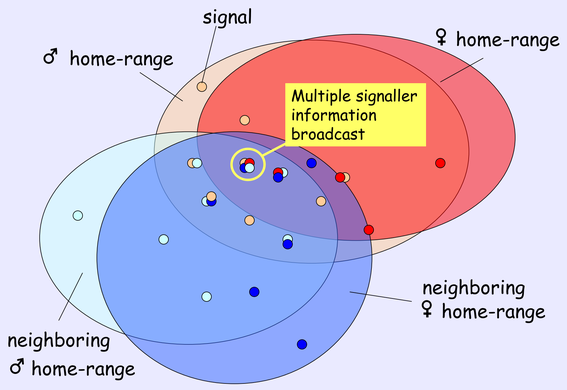
Background

Signals in Space and Time



Animals communicate in a network of individuals. Acoustic, chemical, and visual signals can operate in this network to convey information about a signaller's identity, behaviour, physiological state and location.

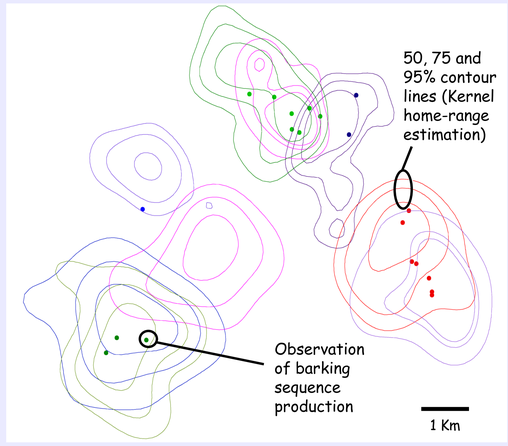


The communication of these types of information can function in maintaining social distances, attracting mates, and defending or announcing territories. Signal transmission properties determine signal value at different temporal and geographical distances from the signaller and a signal's transmission distance may influence social spacing and individual movement patterns, which themselves may influence signal modality.

Observation of Signaling Behavior

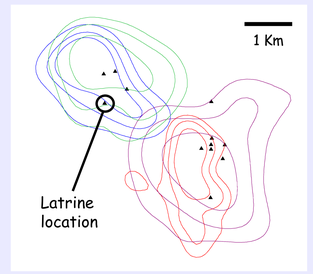
Acoustic

Swift foxes use long-ranging 'barking sequences' primarily during the mating season. Mainly males were observed to call and this vocal behavior was concentrated at home-range centers and close to sleeping dens. 'Meows' were also produced in conjunction with the barking sequence.



Chemical

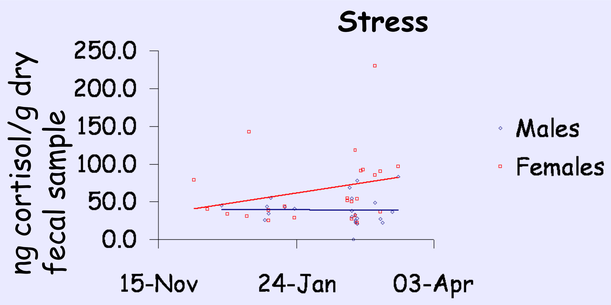
Swift foxes were observed to scent mark using scat: individual scats at food remains and clusters of scat (latrines) particularly near prominent objects in the landscape and trail intersections. Latrines were plotted opportunistically and were found to be distributed throughout individual home-ranges, but particularly at the edges of core areas (50% contour). No fresh scats were observed to be deposited in latrines during the summer, indicating seasonality, but it may also be the result of dung beetle activity.

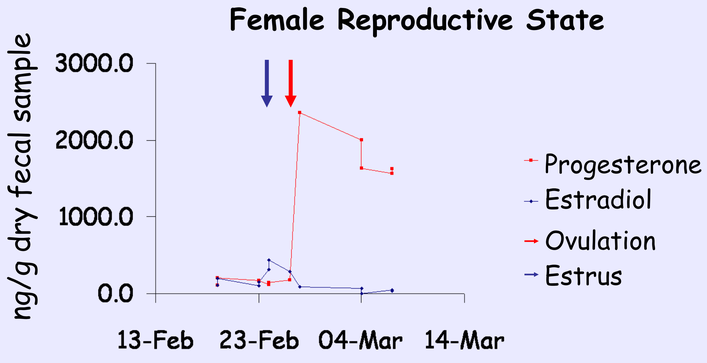


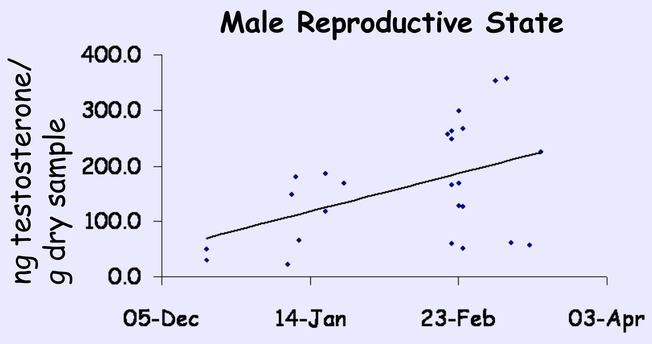
Evaluation of Potential Correlates of Signaling Behavior and Space Use

Physiology

In order to non-invasively evaluate the physiological state of individuals in the study population, we collected fresh fecal samples daily from radio-tagged foxes and analyzed each sample for hormone metabolite concentrations.





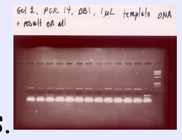


Quality

In addition to evaluating home-range parameters and stress levels, we are using measures of parental investment in assessing individual quality.

Relatedness

We are evaluating relatedness among individuals in the population using an 8 loci microsatellite analysis of DNA extracted from plucked hair samples.



Signal Transmission

We are investigating what happens to the signal value of acoustic signals transmitted over distance and chemical signals over time in a natural swift fox habitat. Barking sequences transmit for a minimum of up to 500 meters and hormone metabolite concentrations remain constant over a minimum of 6 days.

Barking sequence transmitted 80 meters

Barking sequence transmitted 300 meters

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