

ORAL PRESENTATION

Assessing the scent marking behaviour of wild brown bears; an exploration of time and energy investment, marking motor patterns and age-related development

Melanie Clapham^{1*}, Owen T. Nevin², Andrew D. Ramsey¹ and Frank Rosell³

¹ Centre for Wildlife Conservation, University of Cumbria, Penrith, United Kingdom, CA11 0AH.

² CQUniversity, Bryan Jordan Drive, Gladstone, 4680, Australia.

³ Faculty of Art and Sciences, Department of Environmental and Health Studies, Telemark University College, Norway.

*Presenting author: Melanie Clapham, melanie.clapham@cumbria.ac.uk

Members of the order Carnivora employ a wide range of postures and stereotyped patterns to mark their scent onto objects and thereby communicate with conspecifics. Despite much anecdotal evidence on the marking behaviour of ursids, empirical evidence of scent marking motor patterns displayed by wild populations is lacking. Analysing the time bears spend at marking trees and the behaviours involved, could provide further insight into the function of marking and highlight time and energy investment. Over a three year period, camera traps stationed at marking trees were used to investigate scent marking and investigatory behaviour by wild brown bears *Ursus arctos* in coastal British Columbia. This work follows on from data presented at the 18th, 19th & 20th IBA conferences.

Evidence was found to support the prediction that males would invest more time and energy in marking than other age sex classes, which suggests they gain higher net fitness benefits from chemical signalling. As time and energy investment at marking trees did not appear to vary between seasons for any age sex class, chemical signalling may contribute to individual fitness throughout the whole non-denning period. Transitions between marking postures were assessed using Markov chain analysis. Scent marking patterns varied by age and sex; adult males exhibited a stereotyped pattern of marking behaviour which included some postures which were continually used more often than others, termed here 'core' and 'secondary' marking postures. The marking behaviour of adult females was less repetitive than adult males and displayed core marking postures only. The behaviour of subadults (sexes combined) was a variation and simplification of the patterns displayed by adult males and females. The wider variety of marking postures selected by adult males may function to convey a more complex chemical signal. The behaviour of cubs depended on their age and the behaviour of their mother. Younger cubs were more likely to conduct the same behaviour as their mother, whereas older cubs exhibited behaviours independently. Scent marking in brown bear cubs may function in learning or safety.

This study is the first to assess the time invested in marking and receiving scents, and to present empirical data on stereotyped marking behaviour in wild ursids. This study also presents the first assessment of the behaviour of young at marking trees in any member of the Ursidae, and evidence on the development of marking behaviour in young bears.