

Clapham, Melanie, Nevin, Owen ORCID: <https://orcid.org/0000-0003-3513-8053>, Ramsey, Andrew D. ORCID: <https://orcid.org/0000-0002-5550-9977> and Rosell, Frank (2013) Assessing the scent marking behaviour of wild brown bears: an exploration of time and energy investment, motor patterns and age-related development. In: 22nd International Association for Bear Research and Management (IBA) Conference, 15-20 September 2013, Provo, Utah, USA. (Unpublished)

Downloaded from: <http://insight.cumbria.ac.uk/id/eprint/3564/>

*Usage of any items from the University of Cumbria's institutional repository 'Insight' must conform to the following fair usage guidelines.*

Any item and its associated metadata held in the University of Cumbria's institutional repository Insight (unless stated otherwise on the metadata record) may be copied, displayed or performed, and stored in line with the JISC fair dealing guidelines (available [here](#)) for educational and not-for-profit activities

**provided that**

- the authors, title and full bibliographic details of the item are cited clearly when any part of the work is referred to verbally or in the written form
- a hyperlink/URL to the original Insight record of that item is included in any citations of the work
- the content is not changed in any way
- all files required for usage of the item are kept together with the main item file.

**You may not**

- sell any part of an item
- refer to any part of an item without citation
- amend any item or contextualise it in a way that will impugn the creator's reputation
- remove or alter the copyright statement on an item.

The full policy can be found [here](#).

Alternatively contact the University of Cumbria Repository Editor by emailing [insight@cumbria.ac.uk](mailto:insight@cumbria.ac.uk).

## 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**<sup>1\*</sup>, Owen T. Nevin<sup>2</sup>, Andrew D. Ramsey<sup>1</sup> and Frank Rosell<sup>3</sup>

<sup>1</sup> *Centre for Wildlife Conservation, University of Cumbria, Penrith, United Kingdom, CA11 0AH.*

<sup>2</sup> *CQUniversity, Bryan Jordan Drive, Gladstone, 4680, Australia.*

<sup>3</sup> *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 18<sup>th</sup>, 19<sup>th</sup> & 20<sup>th</sup> 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.