ORAL PRESENTATION

PRELIMINARY FINDINGS ASSESSING THE OLFACTORY COMMUNICATION STRATEGIES OF BROWN BEARS

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Chemical communication research on large carnivores has in the past predominantly concentrated on social species, with more elusive solitary large felids and ursids receiving little attention. This study aims to bridge the gap between olfactory communication research in social and solitary carnivores by using comparative studies to assess territorial and non-territorial solitary carnivore species and the methods they employ to communicate chemically with conspecifics. We aim to gain a more coherent understanding of the behavioural motive behind scent marking in brown bears (*Ursus arctos*), giant pandas (*Ailuropoda melanoleuca*) and tigers (*Panthera tigris*), and the similarities within the order Carnivora.

Initial brown bear studies conducted in June and July 2009, examined tree selection for scent marking, assessing the hypothesis that selection is non-random and focusing on which individuals in a population conduct scent marking, on an estimated population size of 50 individuals. Direct visual observations, vegetation transects and remote camera traps were used to identify individuals, identify vegetation preferences for marking, and capture the behaviour of the animal during scent marking. The latter builds on data previously collected by Nevin, O.T. (May/June 2005-2006) and presented at the 18th International Conference on Bear Research and Management.

Our initial findings indicate that brown bear selection of trees for marking is non-random (χ^2 =138.99 P<0.05). The two tree species which were found to have the

highest degree of marking attributed were the least represented in the landscape. Further investigation into the defining characteristics of scent marked trees found that both species of the tree ($P<0.001$) and its DBH ($P=0.014$) contributed to a marking response, with a slight preference for larger trees. We found no significant difference in the angle/lean of trees that were marked as opposed to those which were not ($U=2309.50$, $P=0.95$). Location of the tree was also taken for future analysis of the positioning of scent mark trees within the landscape.

When assessing differences between age and sex class of individuals conducting scent marking behaviour, collaborative data from 2005, 2006 and 2009 shows that from a maximum sample size of 14 individuals, adult males were significantly more likely to mark than females or subadults, relative to their presence in the population ($\chi^2=17.78$ $P<0.001$). There was also a highly significant difference between the frequency of use of trails containing active rub trees by different age-sex classes in proportion to the population ($\chi^2=41.42$ $P<0.001$). Further data collection is planned for 2010 and 2011.

This study of chemical communication is important to bear conservation as non-invasive methods used in population assessment (e.g. DNA from hair snares) often make use of scent lures and/or marking behaviour. A more detailed knowledge of the social and functional aspects of scent marking, and related temporal patterns, can allow better estimates to be derived from these techniques by accounting for behavioural bias in sampling. By assessing how olfactory communication plays a role in the social organisation of solitary carnivores, we will be better equipped to understand the processes involved in territoriality, dispersal and reproduction. Such knowledge is fundamental when assessing the ecological needs of a species and the governing of population management.