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The potential of Social Network Analysis as a tool for the management of zoo animals

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Abstract

Social Network Analysis (SNA) enables the fine scale of animal sociality and population structure to be quantified. SNA is widely applied to questions relating to behavioural ecology but has seen little use in the application to zoo animal management, despite its clear potential. Investment in social bonds between individuals positively affects health status, welfare state, long-term fitness and lifetime reproductive output. Such positive affective states can be maintained consistently within captive situations if more information is known about the social preferences of the individuals that are kept. Disruption to social bonds may lead to impoverished welfare and stress to individuals which have seen their social support compromised. The patterning of social relationships between individuals also influences how space is utilised and how animals interact with resources provided for them. With more detailed knowledge of the social structure of a group or population, social groupings (for example, for captive breeding) can be specifically designed to minimise social stress. Likewise, enhancing the chances of successful reproduction can be achieved if we understand the role that each individual within a network plays and how these roles may impact on the behaviour of others. This paper discusses key aspects of SNA applicable to zoo-based researchers wishing to investigate the social lives of zoo animals. We present a review of how SNA can be used to assess social behaviour and highlight directions for future research. Our aim is to stimulate new research to ultimately improve our understanding of reproductive success, decision-making, group leadership, animal health and enclosure use. We conclude that what can be learned about the dynamics of social zoo-housed species using SNA can directly impact on husbandry decisions and help underpin excellent standards of animal welfare.

Keywords: *animal welfare, evidence-based husbandry, group structure, social network analysis, social organisation, zoo animal behaviour*