

Public Abstract

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Title:The secret lives of African forest elephants: using genetics, networks, and telemetry to understand sociality.

Knowledge of social structure is important to understanding the overall evolution and behavioral ecology of a species as it ultimately influences spatial patterns and gene flow. This dissertation focuses on the social structure of African forest elephants (*Loxodonta cyclotis*) and tests for fission-fusion sociality using satellite telemetry, non-invasive genetic sampling, and social networks. Satellite telemetry results from six adult females in Loango National Park, Gabon revealed small home ranges with low probabilities of co-occurrence between individuals, suggesting spatial avoidance among these females. In contrast, network models created from non-invasive genetic approaches from forest elephants in Lope National Park, Gabon revealed more extensive networks of individuals suggesting fission-fusion sociality. Also, adult females at distances of five kilometers or less were more closely related to each other than expected from chance. Known adult females and their associates were tracked through observations in 2006, 2008, and 2010. Social networks revealed evidence of kin-based fission-fusion sociality. Although forest elephant females associate in fission-fusion patterns, they frequently separate from them, and when preferred associations do form, it is typically with only one other individual. When comparing these results with other extant elephant species, they suggest that although there is evidence of kin-based fission-fusion sociality, forest elephant differ by having many small components and solitary individuals, and overall a disconnected network.