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Home Range Overlap in Female Bornean Orangutans: Responses to Fluctuations in Food Availability

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Bornean orangutans (*Pongo pygmaeus wurmbii*) are large bodied great apes that live in rainforests dominated by mast-fruiting dipterocarp trees with extreme fluctuations in fruit availability. Orangutans respond to this temporal and spatial variability in fruit production by ranging over large areas and adopting a semi-solitary social structure. Females have overlapping home ranges, engage in both scramble and contest competition for food, and actively avoid each other. Overlap requires individuals to share access to resources and adjust ranging to optimize energy intake, thus habitat quality likely influences ranging patterns. Here we investigate whether habitat and food availability are significant predictors of female orangutan home range overlap using data collected at Gunung Palung National Park, Indonesia, a site with 7 distinct habitats. Researchers collected GPS waypoints of orangutan movements during all day focal follows. Fruit availability was measured through monthly monitoring of over 6000 trees, across 60 plots. We used R to calculate range overlap per habitat between pairs of adult female orangutans over three-month periods (2013-2019). Our results show a trend towards a negative relationship between overlap and fruit availability (N=15, Pearson's $R = -0.322$, $p = 0.242$). We also found habitat to be a predictor of female range overlap, with overlap most likely to occur in the alluvial bench habitat and significantly less likely in the peat swamp ($p < 0.05$). These findings reveal the independent influences of fruit availability and habitat type on female orangutan home range overlap, highlighting the potential importance of habitat-specific food availability on ranging behavior and contest competition.

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