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Environmental correlates of hunting and bushmeat consumption in the Amazonian agricultural frontier

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Hunting is an important source of protein for rural populations but a major threat to game animals. Identifying the likely environmental determinants of hunting is thus crucial for developing strategies for both conservation and food security of local human populations. However, current knowledge relies on small-scale studies that encompass highly restricted gradients of environmental variability, thereby limiting our understanding of hunting determinants at larger spatial scales. We address this problem by investigating the influence of landscape-scale forest cover and distance to urban centers on the frequency of households that hunt and/or consume bushmeat, using data from a survey of 318 households across 16 spatially discrete landscapes (~4.000-ha) in the eastern Brazilian Amazon. We hypothesize that the frequency of households hunting and consuming bushmeat should be higher in landscapes with a large proportion of forest remaining (higher availability of game animals) and far from urban centers (low availability of alternative sources of protein), since the relative benefits of hunting should increase with increasing game availability and decreasing access to alternative sources of protein. We used an information theoretic model selection approach to compare a set of candidate models describing the relationships for both hunting and consumption. We show that hunting was best explained by forest cover alone, whereas consumption was best explained by distance to urban center, though adding forest cover increased model fit. Importantly, bushmeat consumption was more frequent than hunting for many landscapes, particularly in areas with lower forest cover and nearer to urban centers. This indicates that bushmeat trade or sharing may contribute to consumption in areas where game is already depleted, increasing hunting pressure in diminishing areas of high forest cover. Because distance to urban centers is a good predictor of consumption, improved access to alternative sources of protein may reduce hunting pressure by reducing game consumption.