**APPENDIX S1.** Details on methods regarding study area, sampling design and data on bushmeat consumption and hunting.

**METHODS**

**Study area**

The study region encompasses part of the municipalities of Santarém (with 78,790 inhabitants living in rural areas from a total of 294,580), Belterra, which was established (separated from Santarém) only 20 years ago (with 6,852 inhabitants living in rural areas from a total of 16,318) and Mojuí dos Campos, a very recently established municipality (separated from Santarém only three years ago) with no data on rural population size (total of 15,232) (IBGE 2010).

Santarém was founded in 1661, but the region has been inhabited since pre-Colombian times and has received different migratory influxes associated with various economic cycles (D’Antona *et al.* 2006). Starting around 1958, road construction and government-led colonization and land reform initiatives promoted the influx of low-income immigrants from the arid northeast, and from the southern part of the country (Castro *et al.* 2004; Nepstad *et al.* 2006). Agriculture mechanization began at the end of the 1990s, with a new migratory wave of farmers from south and midwest Brazil (Nepstad *et al.* 2006). Large-scale, mechanized agriculture has rapidly expanded in the region in recent years (SAGRI 2013a), as well as cattle ranching, with a 50 percent increase in the number of cattle between 2002 and 2012 (SAGRI 2013b).

The cattle chain in the region is diverse – there are breeding, rearing and fattening farms. The cattle are either sold alive to other states or sold to slaughterhouses in the study region. The beef supplies local urban markets or is exported to other municipalities, states and countries (Láu 2006; Minervino *et al.* 2008). The beef that is sold in the few shops that sell this item in rural areas is acquired in urban markets (shops, municipal markets or supermarkets) and resold at a higher price.

**Sampling design**

Because the RAS research program focused on land use by rural producers, within each hydrological catchment, we sampled only rural properties ≥ 1 ha that were active rural agricultural producers in 2009, regardless of producers owning the legal title to land. We first mapped all such properties in each landscape (all of which were reachable by road), and selected a random sample, stratified by the number of properties per road branch, to ensure a reasonable spatial spread across the entire hydrological catchment. We skipped individual households if the household head declined to take part in the study, or if after three visits no resident was encountered (< 5%). In total we sampled 262 households between September 2010 and March 2011. The number of sampled households per hydrological catchment varied from 2 to 26 households per landscape (median= 18, Fig. S2), given the variation in population density across landscapes. The mean nearest neighbour distance between sampled households within the same hydrological catchment was 658 m (SD=1022).

Large soy farms and cattle ranches were scattered across hydrological catchments; smaller properties were usually < 50 ha while larger ones were usually > 400 ha within each catchment. Thus different types of properties were spread across hydrological catchments and socioeconomic characteristics varied within each of them. Similarly, as we based our sampling on third or fourth order hydrological catchments, drainage system were dense and comparable among them, limiting variation in fish availability across them.

**Bushmeat consumption and hunting**

A team of six trained assistants applied the interview-based questionnaires. To avoid potential interviewer effects (such as those caused by interviewer gender, Catania *et al.* 1996; Dykema *et al.* 2012), the interviewers were randomly assigned to conduct interviews (with the restriction that more than one interviewer conducted interviews in each catchment, and each interviewer conducted interviews in several of them). In total, 40.5% of the interviews were performed by men and 59.5% by women.

**Landscape characteristics**

*Population size estimation*

To calculate the number of households we used a statistical grid developed by the Brazilian Institute of Geography and Statistics (IBGE) based on the 2010 census data from the same institute (IBGE 2016). This grid is georeferenced and divided in 1 x 1 km cells in rural areas and 200 x 200 m cells in urban areas. IBE estimated the number of households in each cell based on households’ addresses (urban area) or coordinates (rural area), that were taken during the 2010 census. However, not all households have coordinates, so they estimated their location based on the distribution of roads and types of land use (IBGE 2016). For our estimation of number of households in each buffer around the sampled households, we summed the number of households of all cells that fell in the buffer. For those cells that did not fall entirely in the buffer, we assumed that the households had a regular distribution in the cell, and that their number in each buffer was proportional to the percentage of the area of the cell that fell in the buffer.

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