

Curiosity killed the bird: arbitrary hunting of Harpy Eagles *Harpia harpyja* on an agricultural frontier in southern Brazilian Amazonia

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Durante pesquisas ecológicas na fronteira agrícola do norte do Mato Grosso, foram registrados vários casos de abate de harpias *Harpia harpyja* por caçadores locais, motivados por simples curiosidade ou sua intolerância ao suposto perigo para suas criações domésticas. A caça arbitrária de harpias não parece ser muito freqüente, mas pode ter um impacto relativamente grande sobre as populações locais, considerando sua baixa densidade, e também para o ecossistema, por causa do papel ecológico da espécie, como um predador de topo. Entre as possíveis estratégias mitigadoras, sugere-se utilizar a harpia como espécie bandeira para o desenvolvimento de programas de conservação na região.

With adult female body weights of up to 10 kg, Harpy Eagles *Harpia harpyja* (Fig. 1) are the New World's largest raptors, and occur in tropical forests from Middle America to northern Argentina^{4,14,17,22}. They are relatively sensitive to anthropogenic disturbance and are among the first species to disappear from areas colonised by humans. Currently assigned to the IUCN category Near Threatened², the species is now extinct in many parts of its original range, e.g. most of the Brazilian Atlantic Forest¹⁷, but is still widespread in Amazonia.

Despite their relatively large size, Harpy Eagles are not typically hunted as game, although they are captured occasionally by indigenous hunters for ceremonial purposes^{3,17,18}. However, during recent studies of hunting on a rural frontier^{7,20} in southern Brazilian Amazonia, several interviewees reported Harpy Eagle kills, which are presented and discussed here. Whilst the extent of its effects on the local Harpy Eagle population is unclear, such pressure undoubtedly constitutes an additional, possibly avoidable, impact on a relatively sensitive species.

The study was conducted in the municipalities of Alta Floresta (09°53'S 56°28'W) and Nova Bandeirantes (09°11'S 61°57'W), in northern Mato Grosso, Brazil. Both are typical Amazonian frontier towns, characterised by immigration from southern and eastern Brazil, and ongoing fragmentation of the original forest cover. The town of Alta Floresta was founded in 1976, since when the environs have suffered high deforestation rates. By 2003, for example, only 37% of original forest cover remained in the municipality south of the rio Teles Pires⁹. Nova Bandeirantes was initially colonised in 1981, but intensive settlement commenced only in 1996. Despite the loss of less than 15% of the municipality's original forest by 2004, landowners have generally upheld federal legislation, which limits deforestation to 50% of each property.

Hunting pressure in both municipalities is considerable, but most game species are still relatively abundant in Nova Bandeirantes²⁰, whereas some large-bodied species have been extirpated near the town of Alta Floresta (F. Michalski unpubl.). Despite large gamebirds such

Table 1. Records of Harpy Eagles *Harpia harpyja* shot by *colonos* in the municipalities of Alta Floresta, Juruena, Nova Bandeirantes and Nova Monte Verde, Mato Grosso, Brazil, gleaned from semi-structured interviews with local residents.

Municipality	Evidence	Motive	Comments
Alta Floresta	Report	Hunter unfamiliar with species	
	Photograph	Hunter unfamiliar with species	
	Tarsus	Predation of livestock	Chickens
	Photograph	Predation of livestock	Chickens
	Fig. 2	Perceived risk to livestock	
	Report	Perceived risk to livestock	
Juruena	Skeleton	Revenge against environmentally conscious landowner	Juvenile shot at nest
Nova Bandeirantes	Fig. 3	Hunter unfamiliar with species	
	Fig. 4	Hunter unfamiliar with species	Hunter reprimanded by landowner
Nova Monte Verde	Photograph	Hunter unfamiliar with species	
	Report	Displaced nestling attacked agricultural worker	
	Report	Perceived risk to pets and small children	Eagle observed in the vicinity of house

as Cracidae being still abundant around Nova Bandeirantes¹⁹, the 14 hunters monitored trapped only mammals, primarily ungulates, during the seven-month study. Similarly, in Alta Floresta, gamebirds accounted for just 0.6% of responses in 149 interviews of rural households requested to rank their five most important game species (F. Michalski unpubl.).

Reports of hunted Harpy Eagles were obtained *ad. lib.* from other informants during complementary research in the study area in 2000–07 (Table 1, Figs. 2–4). In five cases (including a report from the municipality of Juruena, contiguous with Nova Bandeirantes), the eagle was killed simply to satisfy curiosity. A possible contributory factor is that most *colonos* are immigrants from rural south and east of Brazil, where Harpy Eagles are either extremely rare or extinct. In several instances, the motive for killing the eagle was the perceived or actual risk to small livestock such as chickens. This was more apparent at Alta Floresta and may reflect depletion of the eagle's natural prey due to habitat fragmentation; Nova Bandeirantes still possesses significant forest cover with natural Harpy prey such as primates¹⁹ and Two-toed Sloths *Choloepus didactylus*²¹. For example, a pair of Harpy Eagles at a nest within a degraded 230-ha suburban forest fragment at Alta Floresta⁶ was suspected to be preying small-bodied livestock (B. Davis pers. comm.). However, a similar report is available from the municipality of Nova Monte Verde, east of Nova Bandeirantes, which also has good forest cover.

As these reports were compiled informally, it is unclear how reliable a sample they represent of the frequency of such events in the region. Even if only episodic, they could still impact negatively on the local Harpy Eagle population, given that a single breeding pair may possess a home range of over 25 × 25 km^{1,12}. However, most landowners were aware of other instances of large forest eagles being shot on neighbouring properties, and some may have declined to report their own actions given their illegality. Additionally, several other raptors, including Crested Eagles *Morphnus guianensis* and Ornate Hawk-Eagles *Spizaetus ornatus* (Fig. 5) were persecuted by smallholders in Alta Floresta following the loss of livestock such as domestic chickens. Ornate Hawk-Eagles are killed in Nova Bandeirantes for the same reason (F. B. L. Palmeira pers. comm.).

Unlike other apex predators such as Jaguars *Panthera onca*, Harpy Eagles are relatively easy targets for a hunter armed with a shotgun and motivated by fear or curiosity. Harpies are naturally slow breeders—typically, one chick every two years—compared to Jaguars, which breed annually and typically have multiple cubs. Persecution belies the fact that Harpies (again, unlike Jaguars) constitute a negligible threat to

most livestock and virtually none to humans¹². Some interviewees nevertheless reported raptors systematically decimating chicken stocks⁶.

On the other hand, Harpy Eagles play an important role in the forest ecosystems they inhabit, by regulating the populations of mesopredators such as capuchins *Cebus* spp., which otherwise may contribute to cascade effects and accelerate local extinctions of disturbance-sensitive species¹¹. Thus, removal of such arbitrary hunting pressure would undoubtedly contribute significantly to long-term conservation.

If ignorance is the main enemy of the Harpy Eagle on the Amazonian frontier, education is surely its principal ally, and the same characteristics that attract the attention of the curious hunter, i.e. its large size and prominent silhouette in the forest canopy, can undoubtedly be part of a well-planned education programme to not only satisfy the local population's curiosity and eliminate misconceptions about the species, but to provide a springboard for conservation initiatives in frontier municipalities.

The relative visibility of the Harpy Eagle, yet mystique that surrounds it, support its potential adoption as a flagship for conservation programmes in the Amazon. In fact, its image is already prominent in many societies: the Harpy Eagle is the national bird of Panama, where it features on the country's coat of arms (Fig. 6), as it does on those of the Brazilian state of Paraná. The coat of arms of Mato Grosso—in which Nova Bandeirantes and Alta Floresta are situated—features a phoenix (Fig. 6), which is remarkably similar to a Harpy Eagle, with its prominent crest of feathers. Those of other major Amazonian states, such as Amazonas and Pará, also depict eagles. In Brazil, state citizenship is valued almost as much as nationality, thus invoking partisan sentiments based on these symbols of statehood could offer a potential strategy for disseminating interest and garnering support.

The involvement of local communities has proven successful in the conservation efforts for one Brazilian bird species, Spix's Macaw *Cyanopsitta spixii*¹⁶, despite coming too late to save the species from extinction in the wild, and lessons can be learned from projects of this type. Local ranchers may also be key conservation players on the Amazonian frontier⁸, as well as elsewhere in South America, where fiscal incentives may be one potential strategy^{5,10}. In the specific case of Nova Bandeirantes, the principal landowner (who reprimanded a *colono* for shooting a Harpy) is highly respected by local residents because he has supported colonisation programmes and donated land.

As a flagship species, the Harpy Eagle would obviously contribute to broader conservation

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Figure 1. Adult Harpy Eagle *Harpia harpyja*, Alta Floresta, July 2006 (Alexander C. Lees)



Figure 2. Tarsus of adult Harpy Eagle *Harpia harpyja* shot in Alta Floresta, June 2005 (Alexander C. Lees)



Figure 3. Young Harpy Eagle *Harpia harpyja* shot in Jurueña (Anon.)

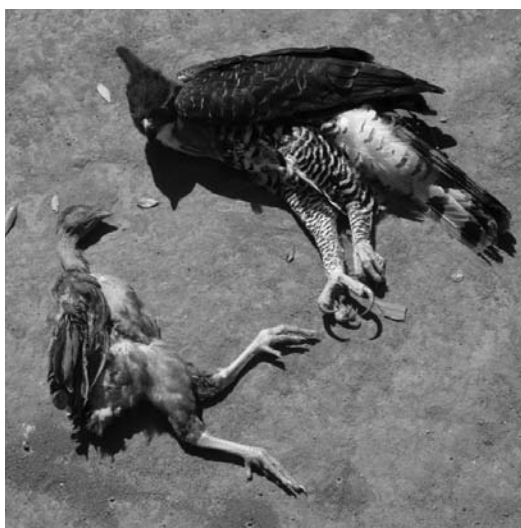


Figure 5. Mortally wounded adult male Ornate Hawk-Eagle *Spizatus ornatus* and the chicken that cost it its life, Alta Floresta, July 2006 (Alexander C. Lees)



Figure 4. Adult female Harpy Eagle *Harpia harpyja* shot by a *colono* in Nova Bandeirantes (Leonar Dallagnol)



Figure 6. The coats of arms of Panama (left), and the Brazilian states of Paraná (middle) and Mato Grosso (right).

objectives within the region. Whilst species such as *H. harpyja* are not yet officially endangered, there can be no room for complacency.

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