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Human-wildlife conflict in subsistence and commercial farmers in north-eastern South Africa

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ABSTRACT

Human-wildlife conflict (HWC) occurs when wild animals depredate crops and livestock and threaten human safety, which subsequently results in retaliatory or deliberate persecution of wildlife by farmers. The aim of my study was to establish how subsistence and commercial farmers that ranched or cultivated in the same geographic area were affected by and responded to problem animals in selected localities of north-eastern South Africa. I first conducted a global meta-analysis of the scientific literature concerning HWC, which revealed several findings. 1) Local communities contiguous with protected areas worldwide were affected by the highest number of damage-causing wildlife (49 species) compared with subsistence farmers and commercial farmers. 2) Contrary to my prediction, subsistence farmers did not experience the highest number of depredation incidences, instead, commercial farmers were more prone to HWC, possibly due to a greater research focus on commercial agri-pastoral farming. 3) Consistent with the prediction that developing countries could potentially experience regular encounters with wildlife, rural people in Africa and Asia experienced conflict with the broadest diversity of mammals. 4) South Africa offers a regional exemplar of global patterns in HWC.

Subsequently, I investigated how subsistence and commercial farmers that operated concurrently in selected localities of north-eastern South Africa were affected by and managed damage-causing wildlife. In addition, I gauged the attitudes and opinions of subsistence and commercial farmers to wildlife and conservation issues, and assessed the attitudes and opinions of conservation practitioners towards people living on protected area boundaries. Finally, I investigated the movement patterns of African wild dog (wild dog) *Lycaon pictus* in areas where they are lethally persecuted, as a case study of HWC. To achieve these aims, I employed a combination of methods and approaches to acquire information regarding the demographic and physical attributes (such as fencing and use of irrigation) of subsistence and commercial farms, in addition to respondent attitudes and opinions that were collectively important predictors of the scale of HWC. These included semi-structured questionnaire interviews, site inspections on farms and subsistence gardens to verify farm attributes, geographic information system attitude indexes (methods to visualise the spatial distribution of respondent attitudes) and satellite or radio-collared wild dog individuals.

Several variables, such as large households (≥ seven occupants per household) and environmental-related challenges (e.g. insect pests, soil erosion, and the absence of electrified

fencing) exacerbated HWC, especially regarding carnivores. Maize *Zea mays*, was the most frequently raided crop (by primates) on both subsistence and commercial farms. Poultry and young livestock were most often depredated throughout the study sites, with caracal *Caracal caracal*, wild dog and leopard *Panthera pardus* being the main depredators. My findings supported the prediction that commercial farmers more readily shot and poisoned wildlife compared to subsistence farmers. Commercial farmers most frequently persecuted carnivores, while subsistence farmers mainly persecuted primates. Subsistence and commercial farmers held positive and negative attitudes towards wildlife for different reasons. Collectively, positive attitudes related to ecocentric values (concern for the ecosystem) such as environmental education, tourism and a willingness to learn about non-harmful damage-causing animal control, while negative attitudes pertained to stray wildlife and resource damage, specifically to crop and livestock depredation. Although conservation practitioners held positive attitudes of local human communities (relating to community-conservation oriented values), negative attitudes also existed (pertaining to a disinterest and indifference towards the socio-economic needs of local human communities and poaching). My study of wild dogs showed that although the home range of free-ranging packs intersected with lethal-controlling commercial farmers, one pack in the Waterberg, Limpopo Province, reduced potential encounters with farmers by utilising vegetation thickets as refugia.

I concluded that subsistence farmers and commercial farmers were similarly affected by HWC but differed in the type of farming commodity depredated. While commercial farmers may be able to discourage depredation by using fencing and lethal control, such resources are unaffordable or unavailable to subsistence farmers. Instead, they utilised passive methods to deter wildlife (e.g. chasing, guarding fields). The loss of household food to depredation coupled with adverse environmental factors may compromise the food security of poor households. Although tensions between local human communities and conservation authorities exist, the positive attitudes and opinions of subsistence and commercial farmers towards biodiversity, as well as the reported alacrity of conservation authorities for community conservation, may provide the basis for future discussions on joint wildlife management. In the absence of such collaborations, wildlife will continue to experience conflict in farmed areas, or they might adapt by modifying their behaviour, as demonstrated in one wild dog pack.