

Short Communication

Chimpanzees in mantraps: lethal crop protection and conservation in Uganda

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Abstract A main concern of farmers worldwide is how to reduce crop losses to wildlife. Some potentially lethal crop protection methods are non-selective. It is important to understand the impact of such methods on species of conservation concern. Uganda has important populations of Endangered eastern chimpanzees *Pan troglodytes schweinfurthii*. Farmers sometimes use large metal mantraps to guard their fields against crop-raiding wildlife, particularly baboons *Papio anubis* and wild pigs *Potamochoerus* sp.. Chimpanzees that range onto farmland also step in these illegal devices and without rapid veterinary intervention face severe injury or eventual death. Unlike inadvertent snaring of great apes in African forests, the problem of mantraps in forest–farm ecotones has received little attention. We report 10 cases of entrapped chimpanzees in the cultivated landscape surrounding Uganda’s Budongo Forest during 2007–2011, undoubtedly only a portion of the actual number of cases. Mantraps currently present a substantial threat to ape populations in this important conservation landscape. Our data underscore the need for conservation programmes to consider the techniques used by rural farmers to protect their livelihoods from wild animals.

Keywords Chimpanzee, crop protection, crop-raiding, human–wildlife conflict, *Pan troglodytes schweinfurthii*, traps, Uganda

The problem of how to reduce or eliminate crop losses to wildlife is common to farmers everywhere (Conover, 2002). Where agriculture is central to sustaining rural

livelihoods crop-raiding may be perceived as a fundamental factor affecting peoples’ livelihood security (Hill et al., 2002). In tropical Africa farmers employ both lethal and non-lethal methods to protect crops from wildlife, including guarding, fencing, chasing, hunting, trapping and poisoning (Osborn & Hill, 2005). Some potentially lethal methods are non-selective, causing injury or death to both target and non-target animals. The impact of such methods on threatened wildlife is poorly understood. Across Africa great apes increasingly range within human-modified, cultivated landscapes and raid crops (Hockings & Humle, 2009; Hockings & McLennan, 2012). This exposes them to potentially lethal crop-protection methods.

Landscapes surrounding Uganda’s protected areas are characterized by expanding, high-density agricultural communities and rapid conversion of unprotected habitat for farming (Mwavu & Witkowski, 2008; Naughton-Treves et al., 2011). Crop-raiding is a primary concern of farmers throughout western Uganda (Hill, 2004; Hartter, 2009; Ferrie et al., 2011). Among the crop protection methods employed are large steel jaw traps, here referred to as mantraps. These consist of parallel jaws held open by a spring mechanism and tethered by a chain to the ground or a tree (Plate 1). Measuring 40–60 cm in length and weighing 10–15 kg or more, they are larger and heavier than gin traps or leg-hold traps used to capture or kill wildlife elsewhere; e.g. foxes *Vulpes vulpes* (Englund, 1982), coyotes *Canis latrans* (Phillips et al., 1996) and possums *Trichosurus vulpecula* (Warburton & Orchard, 1996). While extensive data exist on use of such traps for research and management, particularly in North America and Europe (Iossa et al., 2007), we are unaware of studies detailing use of large jaw traps for crop protection by rural African farmers outside Uganda.

Mantraps are often concealed beneath soil or vegetation along forest edges; when stepped in the jaws snap shut, firmly entrapping the animal’s limb. Owing to their size and strength, they inflict severe injury or eventual death even to large mammals (Munn & Kalema, 1999–2000). Mantraps are illegal but laws are not currently enforced. Although sometimes used to procure meat they are also used to kill or maim crop-raiding mammals, particularly baboons *Papio anubis*, wild pigs *Potamochoerus* sp., tanzania monkeys *Chlorocebus tantalus* and porcupines *Hystrix*

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crinata (Reynolds, 2005). It is important to distinguish mantraps placed around fields by farmers from snares set by hunters to catch forest game. Here the term trap refers specifically to mantraps.

Primates are not traditionally hunted for meat in Uganda. Nevertheless, crop-raiding chimpanzees face harassment and occasional retaliatory hunting from humans (McLennan, 2008; Hyeroba et al., 2011). Additionally, several instances of entrapped chimpanzees have been reported in the forest–agriculture matrix surrounding the Budongo Forest (Reynolds, 2005). In one documented case an adult male chimpanzee, unable to free his hand from the trap, succumbed to septicaemia 1 week later (Munn & Kalema, 1999–2000). Here, we report new cases of

chimpanzees in mantraps in the greater Budongo landscape. Where possible veterinary interventions were attempted because mantraps cause serious injury (e.g. loss of limbs) or death if not removed, chimpanzees are Endangered and legally protected, and it is a human-caused problem.

Budongo Forest Reserve supports one of Uganda's largest chimpanzee populations (> 500 individuals; Plumptre et al., 2010; Fig. 1). South of the Reserve, chimpanzees inhabit remnant forest patches across a cultivated landscape of > 600 km². These small forests are being extensively logged and cleared for farming (McLennan, 2008; McLennan & Plumptre, 2012). Chimpanzees traverse farmland between fragments and raid crops throughout this forest–agriculture matrix. Between 2007 and July 2011 we received 10 reports of chimpanzees in mantraps in this region (Table 1; Fig. 1). Eight were reported to us by local residents. Although nine cases occurred in forest–farm ecotones outside Budongo, including five at one site (Bulindi), one fatal entrapment at the reserve border involved a chimpanzee from a study community within Budongo (Case 8, Table 1). Known victims included adult males, adult and subadult females, and a juvenile male. Although most were probably trapped inadvertently, there was some indication that crop-raiding chimpanzees were targeted intentionally (Cases 1 and 2).

Veterinary interventions were attempted in seven cases, in six of which chimpanzees were successfully anaesthetized, traps were removed and wounds treated (Plate 2). Although these individuals were not well habituated, limited follow-up observations indicated a satisfactory recovery in at least five cases, including one subadult female that sustained severe injuries (Case 6). One intervention was abandoned because of potential risks involved in darting and because



PLATE 1 A large steel mantrap used to kill or maim crop-raiding animals and/or procure meat.

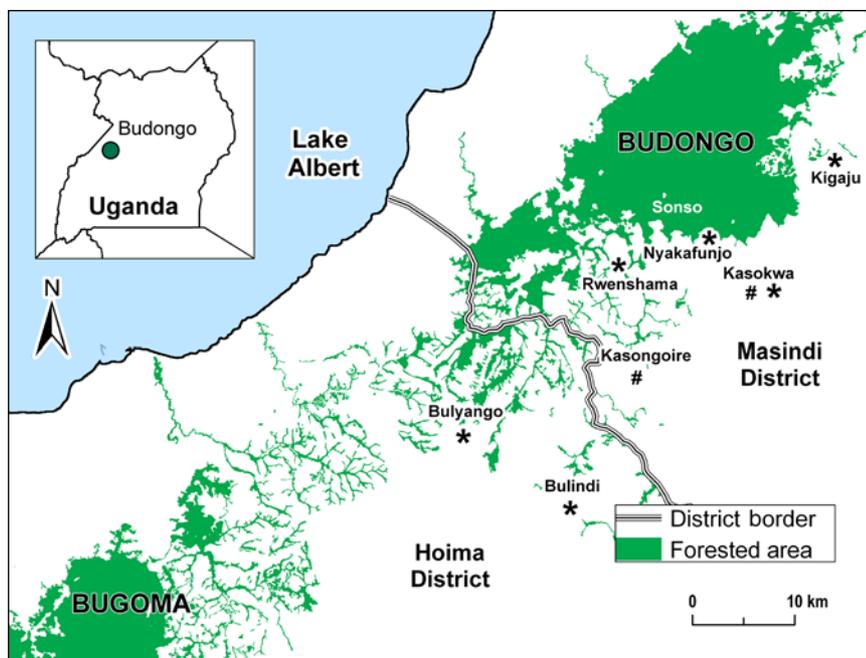


FIG. 1 Budongo Forest in the Masindi District of western Uganda and the nearest main forest block to the south-west, Bugoma Forest (in Hoima District). Small riverine forest patches occur throughout the intervening region, which is heavily cultivated. Most forest patches are unprotected and are being cut down. Multiple eastern chimpanzee *Pan troglodytes schweinfurthii* communities inhabit this forest–agriculture mosaic (McLennan, 2008). Place names indicate locations of known chimpanzee trappings: *, trap locations reported in this study (Table 1); #, trap locations reported previously (Munn & Kalema, 1999–2000; Reynolds, 2005). Adapted from a vegetation map provided by Nadine Laporte of the Woods Hole Research Center's Africa Program and WCS–Kampala. The inset indicates the location of Budongo in Uganda.

TABLE 1 Description of 10 cases of eastern chimpanzees *Pan troglodytes schweinfurthii* caught in large metal mantraps around the Budongo Forest, Uganda during 2007–July 2011.

Case no.	Date	Location (habitat status)	Age/sex of victim	Circumstance ¹	Intervention? (organization ¹)	Remarks	Outcome ²
1	Apr. 2007	Bulindi, Hoima District (unprotected forest patches)	Unknown	Chimpanzee seen by hunters dragging trap; reportedly entrapped in nearby sugarcane garden. Reported to local field assistants of MM > 1 week later (residents reluctant to inform research team, fearing prosecution).	No	Trap possibly set to deter chimpanzees raiding sugarcane; attempt to track chimpanzee unsuccessful	No injured chimpanzee subsequently seen; individual may have died. Alleged trap owner denied knowledge of incident.
2	May 2007	Bulindi, Hoima District (unprotected forest patches)	Unknown	Chimpanzee trapped in sugarcane garden at forest edge. Reported to local field assistants of MM c. 1 week later (residents reluctant to inform research team, fearing prosecution).	No	Sugarcane farmer previously complained to MM about chimpanzee crop-raiding; trap probably set as deterrent. Chimpanzee reportedly freed itself after several days (leaving foot in trap); other apes reportedly remained at trap site throughout, preventing approach of people.	No injured chimpanzee subsequently seen; individual may have died. Alleged trap owner denied knowledge of incident.
3	May 2007	Kigaju, Masindi District (unprotected forest patch)	Juvenile male	Trapped chimpanzee first sighted by local conservation organization that conducts tourism activities in forest patch	Yes (JGI)	Trap may have been set in forest fragment to catch small ungulates for meat. Trap on left arm; device successfully removed under anaesthesia.	Satisfactory recovery observed
4	July 2008	Bulindi, Hoima District (unprotected forest patches)	Adult male	Male seen with trap in forest fragment by local residents; reported to BCFS	Yes (BCFS, JGI)	After 5 days waiting for opportunity to intervene safely, the animal was successfully darted & the trap removed	Satisfactory recovery reported by local field assistants
5	Jan. 2009	Bulindi, Hoima District (unprotected forest patches)	Subadult female	Female trapped in garden near forest edge; incident reported to local field assistants who informed BCFS	Yes (BCFS, JGI)	Female dragged trap short distance into swamp where it became entangled; trap attached to right wrist. Field assistants monitored chimpanzee until following day when trap was removed under anaesthesia.	Female's injuries relatively minor, owing in part to speed of intervention; satisfactory recovery reported by local field assistants

6	June 2009	Rwenshama, Masindi District (unprotected forest patches near S edge of Budongo Forest Reserve)	Subadult female	Reported to BCFS by local people	Yes (BCFS, JGI)	Trap removed under anaesthesia the following day; trap caused compound fracture of right tibia. Chimpanzee taken to Entebbe; limb amputated below the knee.	Chimpanzee recovered despite severity of injury & subsequently released at intervention site. Satisfactory recovery reported by field assistants; female reintegrated successfully into group, appeared to adjust well to disability.
7	Aug. 2009	Kasokwa, Masindi District (small forest reserve & unprotected forest patches near S edge of Budongo Forest Reserve) ³	Adult male	Chimpanzee from monitored community seen with trap on hand by field assistant	Yes (BFCS)	Trap smaller & lighter than in other cases; male able to walk bipedally carrying trap; situation not considered life-threatening. Decision made not to dart animal owing to risks involved but to monitor progress instead.	Chimpanzee seen without trap in mid October & missing two fingers; satisfactory recovery made
8	Aug. 2010	Nyakafunjo, Masindi District (village bordering Budongo Forest Reserve)	Adult female	Chimpanzee seen dead in tree; reported to BCFS by local people	No	Decaying cadaver c. 20 m high in tree; trap attached to right foot connected to heavy chain entangled in climbers around tree trunk. Infant female (c. 4 years) in adjacent tree, presumed offspring of dead female.	DNA analysis of infants' faeces confirmed dead chimpanzee was missing adult female (Sabrina) of Sonso study community in Budongo Forest. Infant reappeared within Sonso range after 1 month in company of community members.
9	Jan. 2011	Bulindi, Hoima District (unprotected forest patches)	Adult male	Local people saw chimpanzee dragging trap; reported to CSWCT field staff. Chimpanzee entrapped c. 1 week previously.	Yes (BCFS, CSWCT, JGI)	After 2 days waiting for opportunity to intervene safely, the animal was successfully darted & the trap removed (Plate 2). Trap on right arm; necrosis set in.	Chimpanzee observed climbing tree 2 days after intervention; unconfirmed local report suggests chimpanzee subsequently lost right hand
10	July 2011	Bulyango, Hoima District (small forest reserve & unprotected forest patches)	Adult female	Local resident reportedly set trap for tanzalus monkeys <i>Chlorocebus tantalus</i> & baboons <i>Papio anubis</i> that were raiding his crops; found chimpanzee in trap & reported to CSWCT field staff	Yes (BCFS, CSWCT, JGI)	Left fingers injured by trap; animal anaesthetised, trap removed & treatment administered	Satisfactory recovery reported

¹Non-government organizations involved in attempted interventions: BCFS, Budongo Conservation Field Station; CSWCT, Chimpanzee Sanctuary and Wildlife Conservation Trust; JGI, Jane Goodall Institute

²'Satisfactory recovery' reported if follow-up observations indicated the wound caused by the trap had healed and the animal was feeding without difficulty and interacting socially with other group members

³An earlier, fatal case of chimpanzee entrapment at Kasokwa was reported by Munn & Kalema (1999–2000)



PLATE 2 Right arm of an adult male chimpanzee *Pan troglodytes schweinfurthii* caught in a steel mantrap in an unprotected forest fragment in Bulindi, January 2011 (Case 9, Table 1). The chimpanzee has been anaesthetized so that the trap can be removed and the wound treated.

the situation was judged non-life threatening (Case 7). In the remaining cases information about a trapping was received from local people after a delay of ≥ 1 week, by which time the whereabouts of chimpanzee victims was unclear (Cases 1 and 2), or the chimpanzee had already died (Case 8).

Our observations indicate a conservation problem requiring urgent attention. Although several chimpanzee fatalities from mantraps have been recorded previously (Munn & Kalema, 1999–2000; Reynolds, 2005), reports of trappings have increased around Budongo since 2007, probably because of greater engagement of local communities by conservation organizations. For example, the five cases reported from Bulindi reflect the fact that chimpanzees there were subjects of an 18-month research project (McLennan & Hill, 2010) and NGOs have worked closely with villagers since 2007. Four of five other cases were reported from locations where residents have regular contact with conservation workers and/or researchers. There is no suggestion that farmers at these sites are especially likely to use mantraps. Elsewhere in the forest–agriculture matrix trappings probably go unreported and chimpanzee victims may die. We expect the cases reported here represent only a portion of actual trappings in the region. Whether the rise in reported cases also reflects increased use of traps by farmers is unclear. Landscapes surrounding Uganda's protected areas are undergoing major changes in land-use cover. The area south of Budongo has experienced rapid human population growth and unsustainable agricultural expansion, including a 17-fold increase in commercial sugarcane plantations during 1988–2002, associated with an 8.2% loss of forest/woodland cover (Mwavu & Witkowski, 2008). Forest patches have been further degraded by uncontrolled logging (McLennan & Plumptre, 2012). Across this region villagers report seeing chimpanzees on cultivated land (McLennan, 2008).

Therefore, a diminishing tolerance of wildlife, including chimpanzees, could potentially have led to more farmers setting traps.

More data are needed to quantify the impact of traps on chimpanzees regionally. Currently, few populations are monitored. At least five chimpanzees were trapped within 4 years at Bulindi, c. 20% of this small population or c. 30% of adult and subadult community members (McLennan & Hill, 2010). Without rapid veterinary intervention to remove traps many victims will die. Consequently, mantraps probably represent a significant source of chimpanzee mortality in forest–farm mosaics in this region. Our data also confirm that chimpanzees in large, protected areas such as Budongo occasionally step in traps when entering adjacent farmland. These observations demonstrate that wildlife authorities and conservation organizations must consider the techniques used by rural farmers to protect their livelihoods from wild animals. There is an urgent need for a targeted strategy to address the mantrap problem in Uganda, as was developed to tackle illegal snaring (e.g. Babweteera et al., 2008). Priority must be given to law enforcement, education and support for improved non-lethal crop protection to reduce human–wildlife conflicts.

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Biographical sketches

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