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NEWS AND PERSPECTIVES

Deactivation of snares by wild chimpanzees

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Abstract Snare injuries to chimpanzees (*Pan troglodytes*) have been reported at many study sites across Africa, and in some cases cause the death of the ensnared animal. However, very few snare injuries have been reported concerning the chimpanzees of Bossou, Guinea. The rarity of snare injuries in this study group warrants further consideration, given the exceptionally close proximity of the Bossou chimpanzees to human settlements and the widespread practice of snare hunting in the area. Herein we report a total of six observations of chimpanzees attempting to break and deactivate snares, successfully doing so on two of these occasions. We observed the behavior in 5 males, ranging in age from juveniles to adults. We argue that such active responses to snares must be contributing to the rarity of injuries in this group. Based on our observations, we suggest that the behavior has transmitted down the group. Our research team at Bossou continues to remove snares from the forest, but the threat of ensnarement still remains. We discuss potential ways to achieve a good balance between human subsistence activities and the conservation of chimpanzees at Bossou, which will increasingly be an area of great concern in the future.

Keywords Chimpanzee · Snare · Culture · Bush meat · Conservation · Bossou

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Introduction

Bush meat is a highly prized resource in Africa, and as a result, large numbers of snares are continuously set in countless locations, including chimpanzee habitat. A typical snare, for example one made by the Manon people of Bossou, Guinea, consists of a loop of iron wire connected by a vine rope to an arched stick, often a sapling (Fig. 1). The arched stick or sapling creates tension in the rope, and once an animal passes through the looped wire of the snare, the trap is sprung and the sapling pulls up the wire, which then tightens around the neck or leg of the animal (e.g., Sato 1983). Snares cause indiscriminate damage, ensnaring any and all animals that come into contact with them.

Snare injuries to chimpanzees have been reported on a number of occasions. In Kalinzu Forest, Uganda, for example, ten out of 16 identified adult males had injuries on their limbs, and nine of them were considered to be caused by snares (Hashimoto 1999). In Budongo Forest, Uganda, eleven of the 52 chimpanzees exhibit limb deformities, and ten of them were diagnosed as injuries caused by wire snares or leg-hold traps (Waller and Reynolds 2001). Similarly, at least three cases of snare injuries have been reported in Gombe National Park, Tanzania (Pusey et al. 2007). These individuals have to cope with serious physical impairments for the rest of their lives (Stokes and Byrne 2001; Byrne and Stokes 2002). In one documented case, a chimpanzee was observed to help an ensnared individual remove the wire, but the trapped individual suffered an injury from the event nonetheless (Amiti et al. 2008). These snare injuries are a serious problem not only in East Africa, but also in West Africa. In Tai Forest, Cote d'Ivoire, chimpanzees regularly step into snares, and juveniles are usually most affected, sometimes dying of necroses caused by wounds from the cable cutting into their flesh. In one report, the whole social

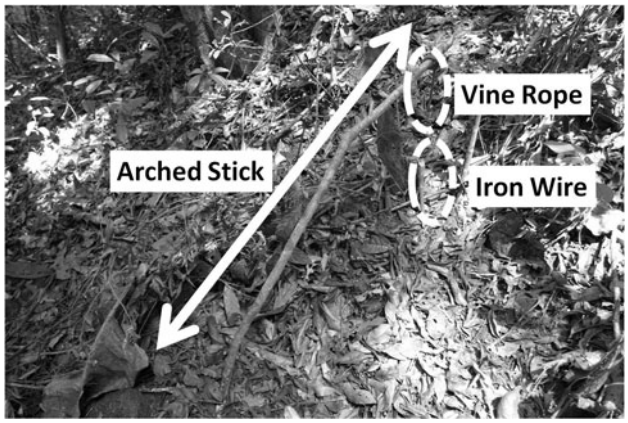

Fig. 1 A typical snare, made by local Manon people. They make a loop of iron wire, and connect it with vine rope. The rope is tensed by an arched wooden stick. They often use a natural sapling in place of a stick

structure of the group was seriously disturbed when the alpha male was handicapped by a snare cable around his wrist (Boesch and Boesch-Achermann 2000). The clear dangers posed by snares to chimpanzee welfare have prompted the creation of snare-removal patrols involving cooperation between researchers and local research assistants in areas in which snare hunting is common (Reynolds 2005; Hashimoto et al. 2007). In total, thirty-two of the 422 chimpanzees had injuries that were identified as snare related at ten chimpanzee study sites in East and West Africa (Quiatt et al. 2002).

In contrast to most study sites, surprisingly, very few snare injuries have been reported in the chimpanzee group at Bossou, Guinea (Matsuzawa 1994), despite the facts that their habitat is extremely close to human settlements and snare hunting activity is widespread throughout their home range. Local hunters at Bossou use strong wires from bicycle brake cables in their snares, which are commonly available at Bossou market. Once set, it is difficult not only for animals to avoid the snares but also for humans to find them. In some cases, rotten snares are found within the forest, because poachers often cannot find their snares again once they are set. Not only do animals caught by such snares suffer pain and die, but the event goes unnoticed and the carcass is wasted. The lack of snare injuries in these chimpanzees thus presents a puzzle in light of the dangers associated with snare hunting in the area. To present a possible explanation for the rarity of such injuries, we report herein observations during which chimpanzees actively approached and safely deactivated snares encountered in the forest.

Methods

Our study was conducted at Bossou, which is located in the southeastern corner of the Republic of Guinea (7°39′N and 8°30′W). A group of wild chimpanzees at Bossou has been studied since 1976 (Sugiyama and Koman 1979). Their home range covers about 15 km^2 of primary and open secondary forest surrounded by cultivated and abandoned fields. Along the boundaries between the forest and cultivated fields, a lot of snares have been set, though they are also found in the forest. Snares mainly target cane rats, but duikers (approximately 1 m in length) are sometimes trapped as well. We conducted observations from July 2002 to March 2003 (period 1) and from April to September 2004 (period 2). We used focal animal sampling to observe one alpha male during period 1 and three adult males during period 2. When the chimpanzees encountered snares, we recorded their behavior ad libitum.

Results

We observed chimpanzees attempt to deactivate snares on 6 occasions over 222 observation days. In two of these cases (case 1 and case 4), we confirmed that the chimpanzees actually did disable the snares. We present these cases in the following section.

Case 1

On 1 August 2002, the alpha male (FF) descended from a resting tree and began moving on the ground at 11:20 h. The party consisted of 10 individuals, including the alpha male (FF), two adult females (Ka and Yo), two adolescent males (YL and PO), two adolescent females (Ft and Vv), one juvenile male (JJ), and two infants (FK and Ve). At 11:23 h, FF stopped at the boundary between the forest and a cultivated field and grasped a snare stick with his hands. Standing bipedally, he shook it back and forth 15 times, at which point the snare broke and was rendered harmless. After moving approximately 4 m, FF, now standing quadrupedally, quickly poked two times at the wire, which was attached to the end of the snare. At this point, the two adolescent males, YL and PO, were 3 m away from FF, with the other 7 chimpanzees nearby. At 11:27 h, FF moved approximately 5 m into the field, and sat down on the ground. PO, a 9-year-old adolescent male, approached the broken snare and stared at it. Standing quadrupedally, PO quickly poked the vine rope of the snare with his hand twice. At 11:29 h, PO moved away from the snare in the direction of FF, and the other individuals also started to move in the same direction. At 11:31 h, all of the 10 individuals had left the area.

Case 2

On 1 August 2002, FF descended from a resting tree and began moving alone on the ground at 13:51 h. At 13:59 h,

FF arrived at a small stream and produced a pant-hoot in combination with buttress drumming. When he stopped quadrupedally immediately following his pant-hoot, we heard Ft (an 11-year-old female) whimpering from behind. FF began to move back in the direction of the female. At 14:02 h, FF also started to whimper slightly, and stopped in a quadrupedal stance. About 7 m away from FF, a duiker (*Cephalophus* sp.) was found caught in a snare. The duiker was approximately 1 m in length, and had died. An adult female, Vl, was standing quadrupedally about 3 m away from the duiker carcass. Ft and her infant, FK (a 1-year-old male), were also visible. At 14:03 h, Vl slapped the duiker twice while grimacing, jumped away from it, and approached it again. At 14:04 h, FF also approached the carcass and stopped next to Vl. At 14:05 h, FF grasped the arched sapling of the snare with his hands. FF shook it back and forth twice, stopped for approximately 2 s, and then started to shake it again vigorously. At 14:06 h, FF moved roughly 7 m away, and stared at the area where the snare and Vl remained. At 14:07 h, FF began moving up a hill. We continued to follow FF, but asked the local assistants to stay with the snare. After FF had left the area, Vl again slapped at the animal two times, before also leaving the area.

Case 3

On 12 June 2004, FF encountered a snare in the forest at 18:37 h while moving alone on the ground. He grasped the arched stick of the snare with his hands and shook it back and forth for approximately 3 s. He did not show any grimace expression. The snare did not break, but FF abandoned the snare and left the area nonetheless.

Case 4

On 29 July 2004, two adult males (FF and TA), an adult female (Pm), and a 6-year-old juvenile male (PE) arrived at Bouton Valley at 15:32 h. They started to feed on stems of *Pennisetum purpureum*. At 15:43 h, PE approached a snare at the edge of the patch of *Pennisetum*. He hung on the arched stick with his hands, and the vine rope came untied from the stick. PE jumped down onto the ground, pulling the vine rope, and the snare was completely deactivated. PE beat the ground with the rope twice. The other chimpanzees did not approach PE during his interactions with the snare. FF started to move away from the area at 15:44 h, and Pm and TA followed shortly thereafter. PE remained in the area until the other individuals were approximately 10 m away, at which point he followed after them.

Case 5

On 17 August 2004, seven chimpanzees encountered a snare from which the wire had already been removed by humans. The party consisted of two adult males (FF and YL), three adult females (Jr, Pm, and Yo), and two juvenile males (JJ and PE). At 17:45 h, PE, a 6-year-old male, grasped the stick with his hands and moved his face closer to the knot connecting the vine rope to the snare stick. YL, a 13-year-old male, approached and grasped the snare stick, drawing it toward his face. PE moved away from the snare. YL then stopped sniffing at the snare and released his hold of it before starting to move out of the area.

Case 6

On 17 August 2004, seven chimpanzees encountered another snare immediately after the events described in case 5. At 17:45 h, PE climbed a shrub and touched the arched sapling of a snare with his hand for 5 s. JJ, another 6-year-old male, approached the snare on the ground. He lightly knocked twice at the root of the arched sapling with his fist, and then grasped it. The other chimpanzees continued to move along the ground, and PE climbed down from the shrub to join them. JJ released his hold of the snare and climbed up another nearby shrub. PE stopped moving to look back at JJ. JJ moved his face closer to the knot connecting the vine rope to the arched sapling for 3 s. PE stopped observing JJ and followed the other chimpanzees out of the area. JJ pushed the arched sapling from the shrub three times (Fig. 2). At 17:46 h, JJ climbed down from the shrub and started to move along the ground away from the snare.

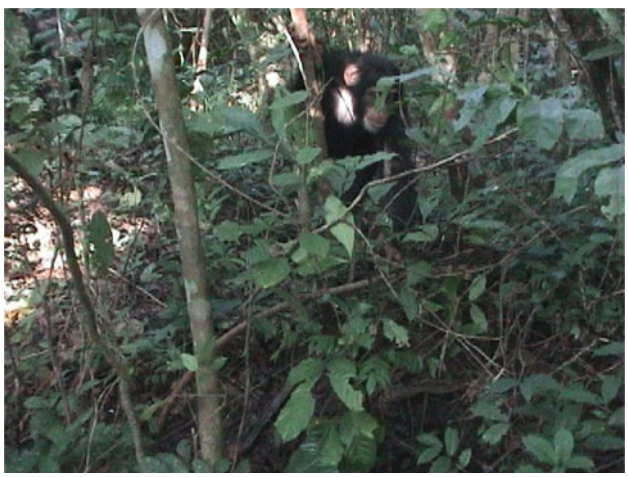

Fig. 2 JJ, a 6-year-old male, pushed the arched sapling from the shrub three times

Discussion

The observations presented in this study indicate that some chimpanzees at Bossou recognize snares as dangerous objects, and that they can safely deactivate them while avoiding injury. Moreover, the chimpanzees appear to know which parts of the snare are dangerous and which are not. In all of the cases, they touched or grasped the arched stick of the snares, while completely avoiding the looped wire. In case 1, the alpha male did poke at the wire, but only after he had previously deactivated the snare. He did not, however, make contact with the looped part of the wire.

Snare deactivation by chimpanzees has not been observed at other study sites. This presents a puzzle, because snare injuries continue to be a problem threatening these animals across Africa (Quiatt et al. 2002). One possible explanation for its occurrence at Bossou is the long history during which chimpanzees and humans have coexisted (Yamakoshi et al. 1999). Long-term exposure to snares may have allowed Bossou chimpanzees to learn about the dangers associated with them, and possibly how to interact safely with and eventually deactivate them. It is also possible that these initial active responses to snares have been passed down through the generations and carried on in the group as culture. Indeed, when the adult male broke the snare in case 1, another juvenile male closely observed the situation and subsequently also interacted with the snare. Of the 6 cases presented, 5 out of 6 males in the group (excluding infants) actively responded to snares in some form. Cultural behavior among chimpanzees has been documented for a number of behaviors (Whiten et al. 1999), including nut cracking (Biro et al. 2006). Ultimately, these acquired responses and the ability of chimpanzees to interact safely with snares can probably explain the rarity of snare injuries in the Bossou group. We did not observe that female chimpanzees approached the snares, whereas they were nearby on the cases mentioned above. There might be some sex differences in the attitude to human-related environment (Hockings et al. 2006).

While these cases suggest that chimpanzees are capable of safely interacting with and even deactivating snares, the risk of injury remains a clear possibility at Bossou. Since 1976, at least two out of 56 chimpanzees have incurred snare injuries. Yu, a 4-year-old female, was ensnared in 1989 and her left ankle was badly injured. She continued to have difficulty with locomotion for months until the wire was finally taken off (Matsuzawa 1994). In 2009, another 4-year-old female, Jy, was caught by a snare, and three digits of her right hand were injured. She finally lost the tip of her little finger as a result of these injuries. Each of these two juvenile females had a younger sibling at the time, and they had therefore already begun to move independently around their mothers. Despite their new-found independence, neither female was much experienced with the kind of danger imposed by snares in the forest.

In a concerted attempt to reduce the dangers of snare injuries facing the chimpanzees at Bossou, we initiated a project in 2004 in which one local assistant began to concentrate explicitly on snare removal within the home range of these animals. Despite our efforts, unfortunately, the threats still remain. Achieving an appropriate balance between human activities and the conservation of chimpanzees is an important issue facing researchers in the future at Bossou and other sites across Africa. Recently, a local nongovernmental organization (NGO) started farming cane rats in the village. If farming cane rats provides adequate subsistence for local people at Bossou, then snare hunting activity for bush meat may become less necessary and the risks facing chimpanzees should subsequently diminish.

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