


First described case of self-inflicted injury in a brown bear (*Ursus arctos* Linnaeus, 1758) following capture with an Aldrich snare

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Abstract: Trapping bears (Ursidae) with Aldrich leg snares has established itself as one of the most successful methods of trapping live animals with minimal injury. Most documented injuries are related to damage caused by the trap and prolonged exposure to it. Various physiological and behavioural responses have been observed, however self-eating of the toes of the captured foot has not been described so far. In November 2017 an adult male brown bear was caught with a standard Aldrich type leg snare. When the research team arrived, the bear tore off and swallowed phalanges of the first toe of its rear left foot before it could be sedated. The bear was measured and marked with GPS-GSM collar. Following the instalment of the collar, the animal was monitored for the duration of 23 months when the drop-off mechanism of the collar was activated. This rule out the possibility that a serious life threatening complications arised from the trauma.

Keywords: behaviour response, capture, self-injury, *Ursus arctos*

Introduction

Trapping mammals has been a constant part of the work of researchers and nature managers in recent decades. Despite its indisputable scientific contributions, capturing and tagging mammals poses certain risks to the animals' health. Many aspects of an animal's physiological state are affected by its stay in the different types of traps (Cattet et al., 2008; Kreeger et al., 1990; White et al., 1991). Bears are a group of animals that are impossible for handling with unless they are captured and immobilised. Snares are a relatively selective method of trapping bears when properly set (Jonkel, 1993; Pereira et al., 2022). Although the documented cases of injury because of capture are few, such possibility is by no means excluded. Short stays in the traps reduce the likelihood of injury, but not always (Powell & Proulx, 2003; Seaman & Powell, 2008). An assessment of the

risk of injury in trapping bears with Aldrich traps was made based on 208 American black bears, *Ursus americanus* Pallas, 1780 trapped 340 times, an injury scoring system was added, and a success rate of over 95% with minor injuries was found (Powell, 2005). There are many cases of undocumented deaths of bears during capture (Kaczensky et al., 2002). The authors cite personal correspondence with colleagues in which deaths and injuries are mentioned. Risk of injury during snaring can be reduced by proper trap placement (Jonkel, 1993) and minimising the time spent in snare (Woodbury, 1996). Most authors consider that possible injuries could come only from the placement and tightening of the noose rope (Powell, 2005). There are documented cases of wolves dying during trapping (Ballenberghe, 1984; Kirilyuk et al., 2021). Mortality due to anaesthetisation was also considered as a percentage of mortality from captured individuals, with the rate dropping



Fig. 1. [a] Dorsal view of left rear foot of *Ursus arctos* (from Post, 2016); [b] view of the self-inflicted injury of the rear left foot of the individual captured 7 November 2017, showing the missing first toe.

dramatically to 0.3% after anaesthetics were modernised (Arnemo et al., 2006). However, to date there are no reports (at least to the authors' knowledge) on self-inflicted harm by trapped brown bears.

Materials and methods

On 7 November 2017 an adult male brown bear was caught with a standard Aldrich type leg snare at the edge of a meadow bordering deciduous forest near a feeding site of state hunting enterprise "Rusalka" in the land of the town of Apriltsi, Bulgaria. (N 42.78°; E 24.94°). The bear was caught for tagging with a GPS-GSM collar, as part of the activities of a project to study individual territories, migrations and activity of bears in Stara Planina Mountains. The site was located about a kilometre from the end of the city. The area has one of the highest density of bears in the country (Kaczensky et al., 2013). The capture was carried out on non-rainy-day at 06:27 h. A photo trap with MMS and e-mail function (LTL Acorn 5310) was used as an alarm system. The research team arrived at capture site at 06:57 h, 30 minutes after the registered capture. The tranquiliser (tiletamine/

zolazepam – 5 mg/kg) was shot at 07:12 h and the animal was sedated 5 minutes following it.

The established wound was treated with povidone-Iodine for cleansing and then liberally smeared with antibiotic paste (gentamicin).

Results

In the time interval between the arrival of the team and the first dart (15 min) an interesting behaviour was observed. With its mouth, the bear tore off and swallowed the distal (distal phalanx), proximal (proximal phalanx) and first metatarsal (1-st metatarsal), phalanges of the first toe of the rear left foot, on which it was caught (Fig. 1). The age was determined approximately by the condition of the teeth of an approximately 8–10-year-old animal. The bear was measured (body length 202 cm, chest circumference 171 cm, head length 48 cm, head circumference 78 cm, front right paw width 16 cm, temperature 39,3). Due to the large size of the animal, its weight could not be measured by the small team of two researchers. The bear was marked with GPS-GSM collar Followit (Tellus GPS Medium Plus, Followit, Lindesberg AB, Sweden). The animal

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started to move its head at 07:55 h and it was on his feet at 10:46 h and departed far away from the capture site.

Discussion

About 30 bears were caught with Aldrich snares in Bulgaria between 2007 and 2021. So far, apart from some slight superficial skin injuries, no other traumas have been detected. Such self-eating behaviour was never observed. After reviewing the literature, it can be argued that such a case has not been reported anywhere and this is the first ever reported case of a bear self-injuring itself during capture. The regular inspection of the traps can reduce the risk of injury, but there are always exceptions (Powell & Proulx, 2003; Proulx & Rodtka, 2017, 2019). Increased stress levels in the not yet fatigued animal and its inability to escape a second immediate threat (i.e., the arrival of the team at the place of capture) are likely the reason for this unusual response, in which the animal is trying to free itself at all cost, even sacrificing part of its paw. It should be noted that the animal was monitored with the GPS-GSM collar for the duration of 23 months when the drop-off mechanism was activated, which rules out the possibility that a serious life-threatening complications arised from the trauma. Tracking showed no differences in movement and individual territories established for male bears in the same area (Todorov et al., 2020). Furthermore, the individual was detected on photo traps 10 months after being marked, and it does not appear that the trauma affected its physical condition.

There are some known undocumented cases of injury and even death to animals caught with Aldrich traps in Europe (Kaczensky et al., 2002), as well as a number of sightings of minor snaring injuries in North America. In reviewing all the available literature, we did not find such a case documented anywhere. However, it is possible that similar cases of self-inflicted injuries have occurred before, but the authors did not think it necessary to announce them. Shedding more light on this overlooked topic could help to improve and optimise the generally accepted practices for capturing and handling wild animals and by so, preventing, or at the very least, minimising the harm, caused by unwanted injuries. For instance, it would be beneficial, if when reporting the success-rate of trapping with live traps, an information about

the adverse consequences that occurred on the animals during the trapping process should also be applied. Such information would be useful for optimising the research process and reducing human-caused damage to the study animals.

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