



Poacher's snare as threat to Indian wildlife: A review

R. KUMAR, Y. PANNERSELVAM, P. DEB, A. SHA. ARUN* AND T.R. SHARP

Wildlife SOS, Bannerghatta Bear Rescue Centre, Karnataka, India

**arun4wildlife@gmail.com*

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ABSTRACT

A snare is one of the easiest but most destructive hunting methods. In Asia, snares are the most widely used method of hunting because they are cheap to produce and easy to set in large numbers. Wildlife SOS, in collaboration with the Karnataka Forest Department, has attended a total of 42 wildlife rescue calls of sloth bears and leopards entrapped in such illegal snares or traps during the period 2009 to 2019. The snare traps entangled around the hind quarter, leads to internal organ damage and a slow death even after the rescue. Leopards and bears may also suffer serious dental problems from biting the snares, which results in medical problems and the inability to return the rescued animal to the wild. Intensive awareness programs in and around the protected areas regarding this barbaric and primitive trapping tools would help in reducing or avoiding such incidents. Human-animal conflict has been present ever since the fragmentation of forests and increase of biotic pressures have brought wild animals closer to humans in a fierce competition for survival. The present review deals with incidences of sloth bear and leopard mortality or injury due to snare documented across various districts of Karnataka and few other states, this review provides vital information about snares' threat to Indian wildlife. Based on content analysis of newspapers and news portals, we identified 446 incidents of wild animals caught in snare traps from January 2018 to October 2022. Most snare incidents involved wild boars, snakes, nilgai, Indian leopards, jackals and royal Bengal tigers. This review indicates large number of carnivore death as compared to both herbivore and omnivores. We therefore propose a shift in management focus, from current reactive practices to proactive measures that ensure safety of wildlife.

Key words: Animal welfare, electrocution, extinction, poaching, wildlife trade

INTRODUCTION

Globally poaching and illegal wildlife trade is driving many of the world's valuable species into extinction. Elephants, rhinos, and tigers are among the many exotic species that are poached for ivory, horn, and skin in order to make them targets for illegal trade (Kaul et al., 2004; Spillane, 2015). Other animals like wild pigs and deer are hunted as bush meat for protein (Warchol, 2004). Due to the development and emergence of several anti-poaching camps as well as the increased protection inside the protected areas, poachers' motives and hunting techniques have changed. Researchers believe that poachers vary; they may have varied motivations and motives, use different techniques,

and use equipment of diverse types (Pires et al., 2016). One of the simple yet deadly methods used by poachers is to set up a snare and the practice of laying snares dates to the early 80s. It is no secret that hunters and poachers use rope, wire, or brake cables for making these simple, low-tech, noose-like traps, which they set in forests in order to capture animals. Snaring is one of the effortless but most effective hunting techniques followed in Asia (Belecky et al., 2020) and other parts of the world. It is becoming increasingly common to use wire snares in Asia due to their ease of construction from readily available materials like bicycle and motorcycle cable wires. Poachers set snares targeted for specific animals. There are tiny, thin, single strand wire snares used

to catch small animals like hares at lower levels on the trails, while larger, thicker snares used to trap bigger animals like wild pigs at higher levels.

Snares are essentially long pieces of wire connected at their ends with a loop and attached to stationary objects, such as trees or logs. Using a loop of wire, the snare is suspended from a branch or small tree, catching animals by their necks as they walk through the forest. The snare grips tightly and captures the animal as it continues to move forward. Snare traps are one of the most popular types of traps, not only because they are so easy to use, but also because they are so easy to make. In technical terms, they are wire or cable nooses that are anchored somewhere. It is impossible for the animal to escape the trap once it runs over it, as the noose tightens around the animal's body, neck or limb and it is unable to escape the trap as a result even though it may be simple and effective, it is not at all humane. According to the report by Mongabay on Snare traps decline, but still pose a threat to Leuser's Sumatran rhinos they explained that "Snares are typically made of steel or nylon wire and are easy to build. In addition, they are indiscriminate in what they capture, resulting in non-target species as well as females and juveniles being caught. While most of the trapped animals end up in local wildlife markets or are sold directly to restaurants as bush meat, the high-value species are typically traded in major cities or exported to foreign markets."

Throughout Southeast Asia, snaring is one of the most common types of hunting used to capture animals for human consumption and to stock wildlife farms in order to capture wildlife for human consumption (Becker et al., 2013; Gray et al., 2018). The ungulates are a very common species that is caught in Cambodia, Lao PDR, and Viet Nam, and there is evidence that they are a species that is traded more frequently in Asian countries

(Cantlay et al., 2017). A study of wildlife seizures in Cambodia from 2005 to 2017 found that 46% of all wildlife meat seizures (61%) that likely came from snared animals (ungulates, carnivores, lagomorphs) occurred in markets (which were referred to as snared animals), whereas 48% (32% of biomass) occurred in restaurants and resorts. According to the WWF latest analysis report on Snaring crisis, it is concluded that, "There are an estimated 12.3 million snare on the ground in protected areas of Cambodia, Lao PDR and Vietnam." Similarly, according to the statement by Richard Thomas from TRAFFIC's, explained that, over 30,000 snares were removed in Cambodia in 2016 alone; it is likely that many more remain undiscovered. "As snares are a very dangerous device simply because they kill at random, which means all manner of wildlife is at risk. Snares are also very commonly used by poachers to steal tigers from Asia's forests due to their tendency to kill at random. In order to curb this crisis, there is an urgent need for the countries in the Tiger range to intensify their enforcement efforts."

The snaring technique is not only a common method in Asian countries, but all over Africa as well. As a result of the rising global demand for bushmeat in Africa, there is an increase in the silent capturing and poaching of wild animals with the use of snare traps. Since snaring has become a popular method throughout Africa because of the availability of the materials needed (e.g., fence wire, telecommunications or electrical cabling and nylon rope) at an affordable price, this method has become very widespread (Mowat et al., 1994; Obanda et al., 2008). It is widespread throughout Africa for bushmeat to be harvested using snares which is mainly done within the protected areas of forest and savanna as well as in communal or private lands. (Hitchcock, 2000; Poulsen et al., 2009; Lindsey et al., 2013; van Velden et al., 2018; van Velden et al., 2020).

Table 1. Sloth bear incidents with human hazards and distance from forest fringes

Type of hazard	Number of incidents	Average distance to forest edge (m)	Range of distances to forest edge (m)	Number of incidents in a forest area	Notes
Snares	18	2,117 (n=10)	240 - 8,825	3	5 Locations unknown

Table 2. Sloth bear incidents by gender with human hazards

Type of hazard	Number of incidents	Females (including with cubs)	Males
Snares	18	11	7

MATERIALS AND METHODS

Apart from the Table 1 and 2 data, the rest of the data collection was made through the secondary sources. The relevant information and data were collected by reviewing various website and research articles for content that explains snare wire and traps. In addition, the last five years (January 2018 - October 2022) wildlife injury and death data are collected and analyzed using daily newspapers like the Hindu, the Indian Express, as well as articles written by organizations such as WWF, Asia, etc. There is a strong presence of media in India, even in rural areas, and news about wild species is mostly covered by the media, making it a reliable source of information about large mammal conflicts. The study relied completely on information sourced from newspaper media reports, open-source government websites and remotely acquired data. Animal care and use committee approval was not required.

RESULTS AND DISCUSSION

Snares

Of the 18 sloth bears caught in snares that Wildlife SOS attempted to rescue (Table 1 and 2), twelve (67%) were eventually released back to the forest, and in all cases except one, back to the forest they were trapped nearby. Four bears (22%) died in the snare or from the wounds they received while being caught in the snare, and two bears (11%) were put into lifetime care at the Wildlife SOS Bannerghatta Bear Rescue Centre, due to the fact that their injuries were too substantial to release them back to the wild. Eleven of the bears were female, and seven of the bears were male. Half of the bears (n=9) were estimated at 2 years old or younger, the half (n=9) were estimated at 5 years or older.

Ten of the eighteen snares (56%) were found in agricultural areas, three (17%) were found in

forest or scrublands and five (28%) did not have a location documented. The average distance of those found in agricultural fields was over 2,000 meters from forest edges. Two of the three snares found in forest or scrublands were less than 300 meters from agricultural fields while one was over 800 meters from agricultural areas.

There was a spike in the number of bears caught in snares between the months of September and December. This is during the harvest time when animals enter the agricultural areas to raid the crops. Six of the bears (33%) caught in snares were caught outside of the harvesting season. However, three of these were caught in the scrub areas, not the agricultural areas, and two of the them were caught in undocumented locations. Only one bear was caught in the agricultural areas outside of the harvesting time.

Snare traps in India

The snare traps are made from materials that can readily be found, including clutch wires, fencing wires, and other materials that can be found around the house. Considering the fact that they are light and easy to carry, they can be used to capture animals without them being aware that they are being caught. Using wire snares and electrocution are the most predominant ways to kill animals. It is generally the local village communities who set up these traps to be able to catch wild boars, small herbivores, etc. that wander around in the area. It is quite common to set up snares along game trails and near watering holes (Gubbi et al., 2021) where there is a greater chance of getting caught by the trap. Wildlife killing with snares is illegal in India, but snares remain a popular method for catching wildlife Indian wildlife populations are rarely studied empirically for the effects of snares (Madhusudan and Karanth, 2002; Gurung et al., 2008; Gubbi and Linkie. 2012).



Fig. 1. Snare trap/ cable removed by Karnataka forest department

Cases of snaring in India

According to records, over the course of the last decade, India has witnessed twenty-four tigers

and one hundred and fourteen leopards becoming entangled in wire snares. Uttarakhand, Karnataka, and Madhya Pradesh are some of the states that have been high on the radar of snares. Nevertheless, a database compiled by Wildlife Protection Society of India (WPSI), a conservation organization fighting poaching and escalating wildlife trade, shows 24 tiger fatalities and 110 leopard deaths in the country in 2010-2018, including five tiger, 14 leopards and 30 other wild animals alone in Maharashtra state. It has also been reported that the greatest number of big cats, 26 leopards and three tigers, have been killed in Uttarakhand and at least 13 leopards have been injured. In Madhya Pradesh, five tigers have been killed by wire snares and one has been injured, the highest number of tigers killed in a state in the last decade.

Table 3. List of animals died by snare traps from 2018-22 in India

No.	Animal	Type	2018	2019	2020	2021	2022	Total
1	Royal Bengal Tiger	Carnivore	6	4	4	3	5	22
2	Indian leopard	Carnivore	11	7	7	2	5	32
3	Asiatic lion	Carnivore	0	0	1	1	0	2
4	Fishing cat	Carnivore	3	3	3	5	6	20
5	Wild boar	Omnivore	26	16	19	25	32	118
6	Snow leopard	Carnivore	0	0	1	0	2	3
7	Clouded leopard	Carnivore	0	0	0	0	1	1
8	Sloth bear	Omnivore	1	2	2	3	0	8
9	Indian gaur	Herbivore	0	0	0	2	0	2
10	Asian elephant	Herbivore	6	2	1	1	2	12
11	Lion tail macaque	Omnivore	0	0	1	2	3	6
12	Indian rhino	Herbivore	0	0	0	0	1	1
13	Wild water buffalo	Herbivore	0	1	0	2	0	3
14	Nilgai	Herbivore	13	5	7	9	11	45
15	Bengal fox	Carnivore	3	6	7	0	1	17
16	Striped hyena	Carnivore	1	0	0	0	0	1
17	Spotted deer	Herbivore	1	0	0	1	3	5
18	Swamp deer	Herbivore	0	0	1	0	0	1
19	Kashmir stag	Herbivore	1	0	0	0	0	1

20	Sambar deer	Herbivore	2	0	0	1	1	4
21	Indian pangolin	Carnivore	0	0	0	0	3	3
22	Hanuman langur	Omnivore	7	8	1	0	0	16
23	Indian cobra and others	Carnivore	0	12	11	24	11	58
24	Pygmy hog	Carnivore	0	1	0	0	0	1
25	Ganges shark	Carnivore	0	0	1	0	0	1
26	Red crowned roof turtle	Herbivore	3	0	1	1	1	6
27	Himalayan wolf	Carnivore	1	0	0	0	0	1
28	Nilgiri tahr	Herbivore	0	0	1	0	0	1
29	Jackals	Carnivore	7	2	13	1	3	26
30	Musk deer	Herbivore	1	0	0	0	0	1
31	Jungle cat	Carnivore	0	7	1	1	0	9
32	Wild dog	Carnivore	1	0	0	0	1	2
33	Tibetan fox	Carnivore	1	0	0	0	1	2
34	Red fox	Carnivore	1	0	0	0	0	1
35	Marbled cat	Carnivore	1	2	0	0	0	3
36	Large indian civet	Carnivore	0	0	0	1	0	1
37	Small indian civet	Carnivore	0	0	0	3	0	3
38	Asian palm civet	Omnivore	0	0	0	1	0	1
39	Himalayan black bear	Carnivore	0	0	0	1	1	2
40	Yellow throated marten	Carnivore	1	1	1	0	0	3
41	Gangetic dolphin	Carnivore	1	0	0	0	0	1
Total cases			99	79	84	90	94	446

It is common for people living in close proximity to forests or protected areas to place snare traps either as a means of hunting bushmeat or as a means of defending crops against crop damaging animals. In India, 446 wild animals were strangled in snare traps in between 2018 and 2022 i.e., on an average 89-90 animals per year. During 2018, 99 deaths are reported, followed by 79 in 2019, 84 in 2020, 90 in 2021, and 94 in 2022 (Table 2). These deaths included 22 cases of Bengal tigers, 32 cases of Indian leopards, 12 cases of Asian elephants (mainly electrocuted snare), and 118 cases of wild boars.

While snare traps are often set for small animals, it appears that large animals are most likely to fall victim to them. In spite of the fact that snare traps are often used to capture small mammals such as Indian hares, and other animals such as wild boars, the majority of the victims were non-targeted species i.e., Bengal tiger, Indian leopard and etc. The occurrence of carnivore cases is 49% (215) while omnivore cases are 33% (149) and herbivore cases are 18% (82); (Fig. 2). The following graphs are an overview of the death of wild animals from snaring from the years 2018 to 2022.

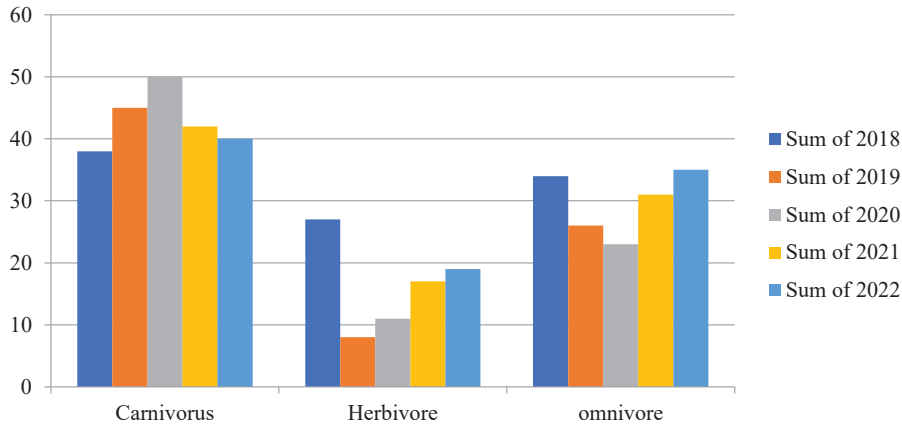


Fig. 2. Snaring victims in India in the past five years, grouped according to their diet

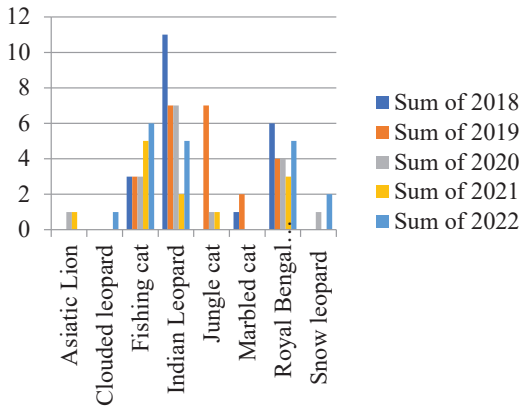


Fig. 3. Felidae

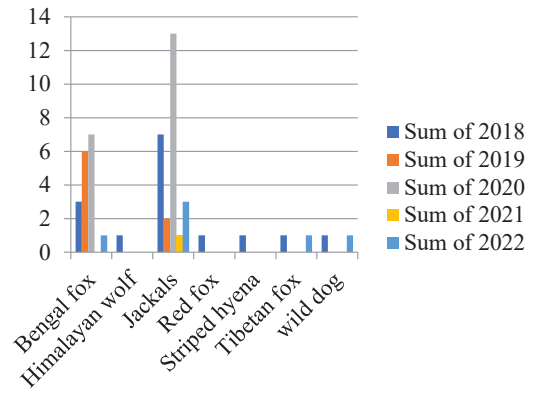


Fig. 4. Canidae

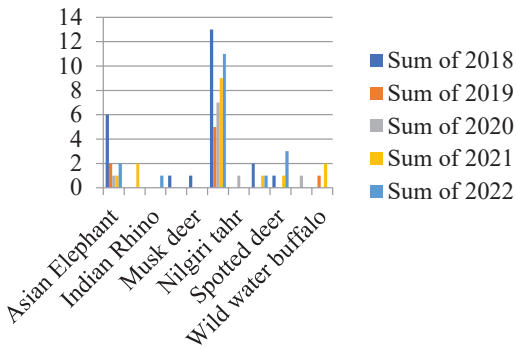


Fig. 5. Herbivores

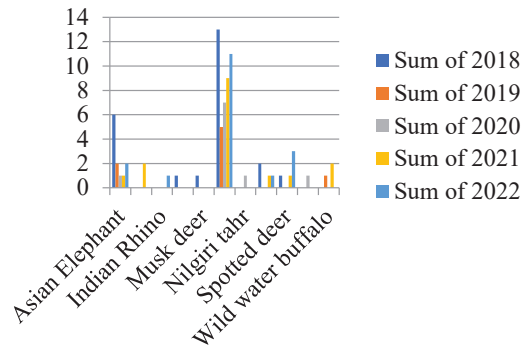


Fig. 6. Aquatic and snake

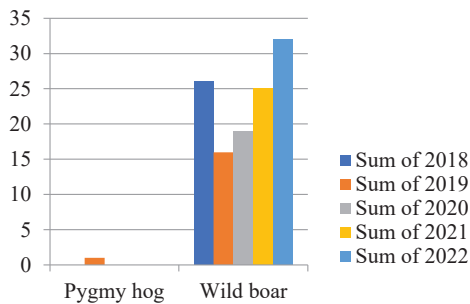


Fig. 7. Suidae

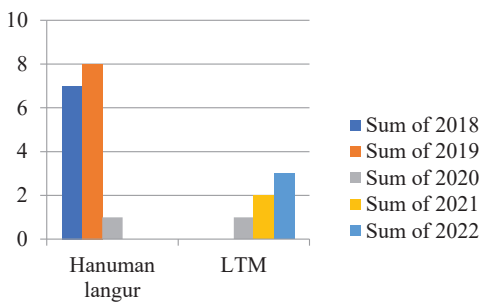


Fig. 9. Primates

Indian wildlife continues to suffer from snare setting, despite a wide range of preventative measures implemented over the years. A number of reasons exist for the prevalence of snare-based poaching in India, including the low costs involved and the low risk of being caught and prosecuted if caught. A cable snare is directly responsible for providing food for the household and indirectly for producing income through the sale of bushmeat, which is sold to the public. Gubbi et al. (2021) explained that the number of snaring incidents were extremely high during the monsoon season which is the peak cropping season when farmers tend to put extra effort into protecting their crops and their livestock, including setting snares to stop herbivores from raiding their crops. There may be a reason for the high number of leopards that get caught in snares during monsoon season.

Finding in this study indicate high number of carnivore death as compared to both herbivore and omnivore animals. Although the traps are mainly set for small mammals like wild pigs, hare's, mongoose, mouse deer, civets and squirrels

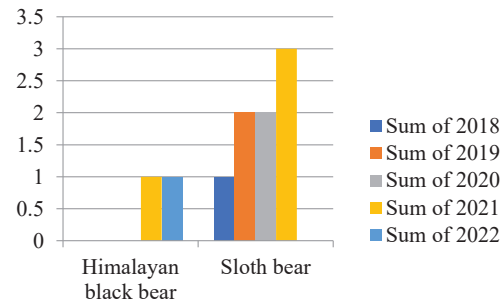


Fig. 8. Ursidae

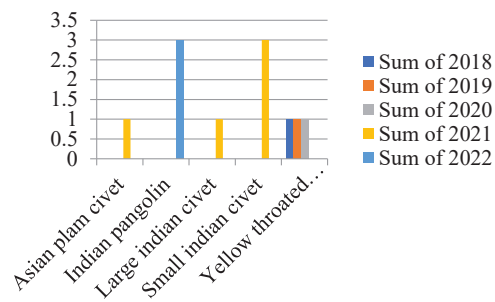


Fig. 10. Other small mammals

etc. (Fig. 15) but the prime victims were the large mammals like Bengal tiger (22 cases), Indian leopard (32 cases), nilgai (45 cases), sloth bear (8 cases), Wild boar (118 cases) and sometime even elephants etc. Apart from that, aquatic species like Gangetic dolphin (1 case), Ganges shark (1 case), red crowned roof turtles (6 cases) and snake species like Indian cobra, etc. (58 cases), have also been victims of the snare traps in India.

When it comes to hunting for human consumption and the stocking of wildlife farms in Southeast Asia, snaring is among the most prevalent methods of hunting for the purpose of capturing animals for human consumption (Harrison et al., 2016; Gray et al., 2018). In Southeast Asia, Cambodia, Lao PDR, and Viet Nam are among the nations most affected by the snaring crisis, with a greater number of snares than anywhere else in the region or in the world (Belecky and Gray, 2020). According to the data collected WWF 2020 Southeast Asia snaring crisis report, it is estimated that between 2005 and 2019 rangers from 11 protected areas in five Southeast Asian countries (Cambodia, Indonesia, Lao People's

Democratic Republic, Malaysia, and Viet Nam) removed 371,856 snares (approximately 53,000 snares a year) from 11 protected areas (Belecky and Gray, 2020). In Vietnam there is between 60% and 80% of the wildlife meat consumed in urban areas that is eaten in restaurants (Nguyen, 2003; Drury, 2011). The most commonly consumed species, which represents almost 75% of all wildlife meat consumption, is wild pig a species that is heavily hunted with snares in mainland Southeast Asia (WWF Vietnam, 2017). Similarly, a study of wildlife seizures collected in Cambodia between 2005 and 2017 revealed that 46% (representing 61% of the seized biomass) of wildlife meat that was likely to have been snared occurred in markets, whereas 48% (42% of biomass) were seized at restaurants and resorts (Heinrich et al., 2020).

Furthermore, a study conducted in Bayanga region of Central African Republic on cable snare hunting, stated that in the Bayanga hunting range, which includes Dzanga-Ndoki National Park, there are on average 4.2 cable snares per square kilometer, with an estimated 9000 total captures per year, or nine captures per square kilometer, which puts the total number of captures around 9 per square kilometer (Noss, 1998). There are, however, studies in South Africa that show that 30-60% of rural households living in communal tenure regions consume bushmeat as a matter of course (Grey-Ross et al., 2010; Martins and Shackleton, 2019).

Snares are cost-efficient, easy to carry and, unlike firearms, easy for poachers to conceal and transport throughout the world. Even though snares are simple in design, they frequently cause severe discomfort and pain to animals in controlled experiments following animal welfare guidelines. This is especially true in remote locations where hunters leave traps unattended for weeks or even months (Mowat et al., 1994; Powell, 2005; Gese et al., 2019). In spite of its indiscriminate nature, snaring has the potential to be very detrimental (i.e., non-target mortalities) (Fig. 14) and extremely wasteful if it is carried out in an irregular manner (Obanda et al., 2008; Lindsey et al., 2011).

Animals captured in such conditions will usually experience prolonged suffering before death. Some animals may be able to escape from the ensnaring trap, either by self-mutilation (such as chewing away at ensnared limbs to free themselves) or by self-harm (Noss (1998)). In order to survive, these crippled individuals will have to deal with a great deal of hardship. It is well documented that animals suffering from such injuries are likely to have smaller home ranges, to suffer from malnutrition, and to occupy degraded habitats, as they have difficulty defending their territories against healthy animals (Sunquist, 1981; Othman et al., 2019). Animals who suffer from physical ailments are more likely to engage in conflict as their behavior is altered (Becker et al., 2013). For example, it has been reported that physical impairments are the most common factor associated with human-killing tigers in Nepal (Gurung et al., 2008). It has also been reported that elephants wounded in snares pose serious dangers to rural villages, thus escalating conflict with the species that is already prone to antagonistic encounters with humans (Obanda et al., 2008; Becker et al., 2013; Abdullah et al., 2019; Othman et al., 2019).

An animal species with a dominant hunting instinct could be subjected to physical impairments including dental issues, tooth loss, and misaligned canine teeth, which could influence the genetic selection process in terms of breeding. An individual with incomplete or complete ocular or auditory deformities, as well as locomotion defects can alter the individual's behavior, hunting skills, and can even lead to the possibility of a human-wildlife conflict. In terms of physiological impact, cervical bone fractures or defects, dislocated joints, fractured limbs and physiological damages to vital organs are among the most common and leads to mortality such as kidney, spleen, liver, heart. These injuries occur as a result of an excess compression and pressure of the snare which is dependent upon the position of the snare within the animal.

Documented evidence of various types of illegally installed poacher's snare, species involved and injuries encountered by various Indian wildlife photographs are presented in Fig.11 to Fig. 15.

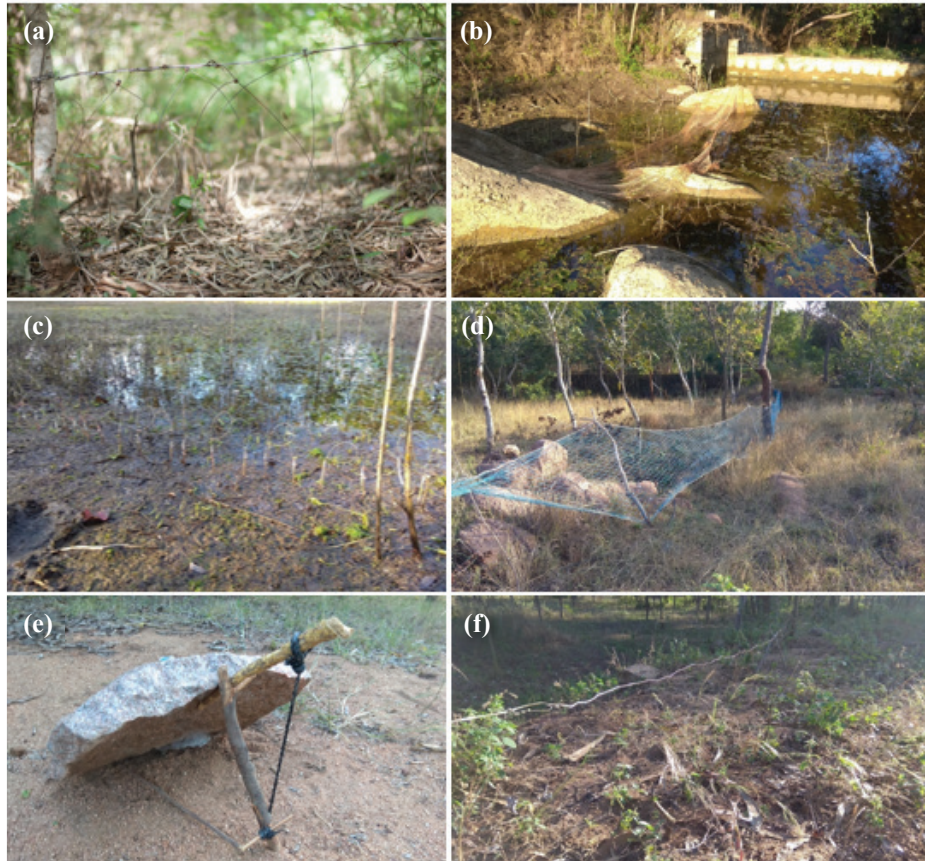


Fig. 11 (a, b, c, d, e, f). Different types of snares; Loop snares mainly used for capturing small animals like Indian hare etc.; net snare traps mainly used for capturing wild boar, spotted deer etc. and stone traps used for small mammals

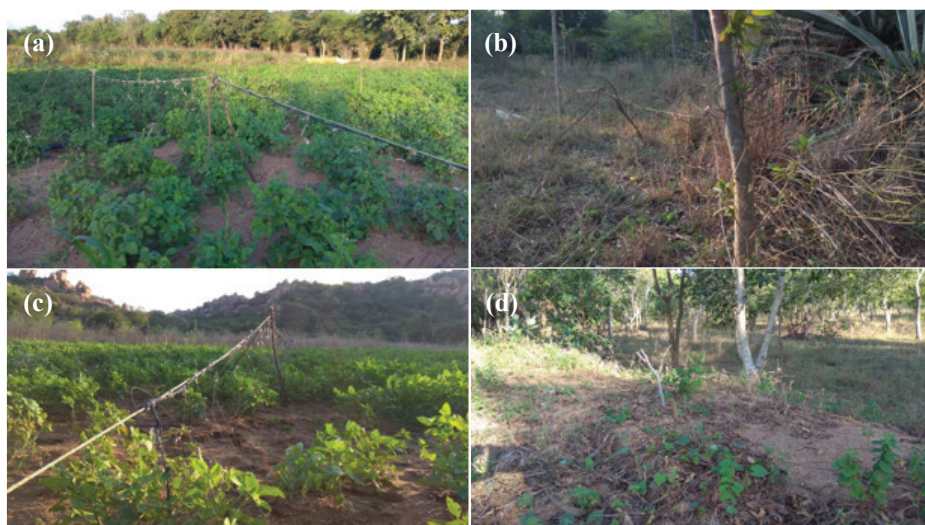


Fig. 12 (a, b, c, d). Wire snares and loops snares placed by people in agricultural fields



Fig. 13 (a, b, c, d, e). Different types of confiscated snares: Net, nylon wire, metal wire and clutch wire



Fig. 14 (a, b, c, d, e, f). Victims of some non-targetted species



Fig. 15 (a, b, c, d). Some of the most targeted species



Fig. 16 (a, b, c, d). Sloth bear (a and c) struggling after getting trapped in a barbed wire and leopard (b and d) trapped in a snare trap rescued by Wildlife SOS

RECOMMENDATIONS

A comprehensive review of this article over a wide range of wildlife snaring studies conducted in different countries and the Indian subcontinent led the author to make the following recommendations. Snare patrols should be conducted regularly in and around protected forests to pick up snares that have been set up. As part of its efforts to combat the incidence of snares, the Forest Department should seek help from a wide range of stakeholders and agencies. Poachers who use snares for illegal purposes must be punished and convicted with more severe legal consequences. Besides that, awareness sessions should be conducted continuously all the time, especially when hunting season is believed to be in full swing. Furthermore, educating the people living around forests' fringes that it is a punishable offense under the Indian Wildlife Protection Act 1972.

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REFERENCES

- Abdullah, A., Sayuti, A., Hasanuddin, H., Affan, M. and Wilson, G. 2019. People's perceptions of elephant conservation and the human-elephant conflict in Aceh Jaya, Sumatra, Indonesia. *Euro. J. Wildlife Res.* **65** (5): 69.
- Arun, A.S., Bakde, R. and Adhithyan, N.K. 2020. Successful rescue and rehabilitation of an injured wild sloth bear trapped in a poacher's snare. *e-planet* **18** (2): 158-163.
- Arun, A.S., Patil, S.P. and Shrikrishna, B. 2022a. Xenografting of tilapia fish skin for snare wound management in wild sloth bear (*Melursus ursinus*): A novel approach. *e-planet* **20** (2): 146-151.
- Arun, A.S., Virk, A.S. and Patil, S.P. 2022b. Surgical treatment of baculum fracture in sloth bear (*Melursus ursinus*): A case report. *e-planet* **20** (1): 74-78.
- Becker, M., McRobb, R., Watson, F., Droge, E., Kanyembo, B., Murdoch, J. and Kakumbi, C. 2013. Evaluating wire-snare poaching trends and the impacts of by-catch on elephants and large carnivores. *Biol. Conserv.* **158**: 26-36.
- Belecky, M., and Gray, T.N.E. 2020. Silence of the Snares: *Southeast Asia's Snaring Crisis*, WWF International.
- Cantlay, J.C., Ingram, D.J., and Meredith, A.L. 2017. A review of zoonotic infection risks associated with the wild meat trade in Malaysia. *Eco Health* **14** (2): 361-388.
- Chase, M.J., Schlossberg, S., Griffin, C.R., Bouché, P.J., Djene, S.W., Elkan, P.W., Ferreira, S., Grossman, F., Kohi, E.M., Landen, K., Omondi, P., Peltier, A., Selier, S.A. and Sutcliffe, R. 2016. Continent-wide survey reveals massive decline in African savannah elephants. *Peer J.* **31**(4): e2354.
- Drury, R. 2011. Hungry for success: urban consumer demand for wild animal products in Vietnam. *Conserv. Soc.* **9** (3): 247-257.
- Gese, E.M., Terletzky, P.A., Erb, J.D., Fuller, K.C., Grabarkewitz, J.P., Hart, J.P. and Young, J.K. 2019. Injury scores and spatial responses of wolves following capture: Cable restraints versus foothold traps. *Wildlife Soc. Bull.* **43**: 42-52.
- Gray, T.N., Hughes, A.C., Laurance, W.F., Long, B., Lynam, A.J., O'Kelly, H., Ripple, W.J., Seng, T., Scotson, L. and Wilkinson, N.M., 2018. The wildlife snaring crisis: an insidious and pervasive threat to biodiversity in Southeast Asia. *Biodiv. Conserv.* **27** (4): 1031-1037.
- Grey-Ross, R., Downs, C.T. and Kirkman, K. 2010. An assessment of illegal hunting on farmland in KwaZulu-Natal, South Africa: Implications for oribi (*Ourebia ourebi*) conservation. *South Afr. J. Wildlife Res.* **40** (1): 43-52.
- Gubbi, S. and Linkie, M. 2012. Wildlife hunting patterns, techniques, and profile of hunters in and around Periyar Tiger Reserve. *J. Bombay Nat. Hist. Soc.* **109** (3): 165-172.
- Gubbi, S., Kolekar, A. and Kumara, V. 2021. Quantifying wire snares as a threat to leopards in Karnataka, India. *Trop. Conserv. Sci.* **14**: 1-8.

- Gurung, B., Smith, J.L.D., McDougal, C., Karki, J.B. and Barlow, A. 2008. Factors associated with human-killing tigers in Chitwan National Park, Nepal. *Biol. Conserv.* **141**: 3069-3078.
- Harrison, R.D., Sreekar, R., Brodie, J.F., Brook, S., Luskin, M., O'Kelly, H., Rao, M., Scheffers, B. and Velho, N. 2016. Impacts of hunting on tropical forests in Southeast Asia. *Conserv. Biol.* **30** (5): 972-981
- Heinrich, S., Ross, J.V., Gray, T.N., Delean, S., Marx, N. and Cassey, P. 2020. Plight of the commons: 17 years of wildlife trafficking in Cambodia. *Biol. Conserv.* **241**: 108379.
- Hitchcock, R.K. 2000. Traditional African wildlife utilization: subsistence hunting, poaching, and sustainable use. *Wildlife Conserv. Sustain. Use* **12**: 389-415.
- Kaul, R., Jandrotia, H.J.S., and McGowan, P.J.K. 2004. Hunting of large mammals and pheasants in the Indian western Himalaya. *Oryx* **38** (4): 426-431.
- Kendon, T.A., Comley, J., Wilkinson, A., Grobler, M.J., Niemand, W.A., Leslie, A.J., O'Riain, M.J. and Naude, V.N. 2022. Evaluating determinants of wire-snare poaching risk in the Boland Mountain Complex of South Africa. *J. Nat. Conserv.* **70** (2): 126295.
- Lindsey, P.A., Romanach, S.S., Tambling, C.J., Chartier, K. and Groom, R. 2011. Ecological and financial impacts of illegal bushmeat trade in Zimbabwe. *Oryx* **45** (1): 96-111.
- Lindsey, P.A., Balme, G.A., Becker, M., Begg, C., Bento, C., Bocchino, C. and ZisadzaGandiwa, P. 2013. The bushmeat trade in African savannas: Impacts, drivers, and possible solutions. *Biol. Conserv.* **160** (1): 80-96.
- Madhusudan, M.D. and Karanth, K.U. 2002. Local hunting and the conservation of large mammals in India. *Ambio* **31** (1): 49-54.
- Martins, V. and Shackleton, C. M. 2019. Bushmeat use is widespread but under-researched in rural communities of South Africa. *Global Ecol. Conserv.* **17** (1): e00583.
- Mowat, G., Slough, B.G. and Rivard, R. 1994. A comparison of three live capturing devices for lynx: Capture efficiency and injuries. *Wildlife Soc. Bull.* **22**: 644-650.
- Nguyen, S.V. 2003. *Wildlife Trading in Vietnam: Why it Flourishes*. EEPSEA Research Reports, Singapore pp. 1-75.
- Noss, A.J. 1998. The Impacts of cable snare hunting on wildlife populations in the forests of the Central African Republic. *Conserv. Biol.* **12** (2): 390-398.
- Obanda, V., Ndeereh, D., Mijele, D., Lekool, I., Chege, S., Gakuya, F. and Omondi, P. 2008. Injuries of free ranging African elephants in various ranges of Kenya. *Pachyderm* **44**: 54-58.
- Othman, N., Goossens, B., Cheah, C.P.I., Nathan, S., Bumpus, R. and Ancrenaz, M. 2019. Shift of paradigm needed towards improving human-elephant coexistence in monoculture landscapes in Sabah. *Int. Zoo Yearbook* **53**: 161-173.
- Pires, S.F. and Moreto, W.D. 2016. *The Illegal Wildlife Trades*. Oxford Handbooks Online.
- Poulsen, J.R., Clark, C.J., Mavah, G. and Elkan, P.W. 2009. Bushmeat supply and consumption in a tropical logging concession in northern Congo. *Conserv. Biol.* **23** (6): 1597-1608.
- Powell, R.A. 2005. Evaluating welfare of American black bears captured in foot snares and in winter dens. *J. Mammal* **86**: 1171-1177.
- Samantaray, R.K., Roy, P.K., Das, A., Mishra, A.K., Mahapatra, S.N. and Pattanaik, A.K. 2008. Rescue of a gunshot injured sloth bear (*Melursus ursinus*) from Nuapada, Orissa, its successful treatment, translocation and rehabilitation. *e-planet* **6** (2): 27-31.
- Spillane, J.J. 2015. Africa's elephant population: Permanently declining or sustainable? *Eastern Afr. J. Hosp. Leis. Tour.* **3** (1): 1-19.
- Sunquist, M.E. 1981. The social organization of tigers in Royal Chitwan National Park, Nepal. *Smithsonian Contrib. Zool.* **336**: 1-98.
- van Velden, J., Wilson, K. and Biggs, D. 2018. The evidence for the bushmeat crisis in African savannas: A systematic quantitative literature review. *Biol. Conserv.* **221** (1): 345-356.
- van Velden, J.L., Travers, H., Moyo, B.H.Z. and Biggs, D. 2020. Using scenarios to understand community-based interventions for bushmeat hunting and consumption in African savannas. *Biol. Conserv.* **248** (1): e108676.
- Warchol, G.L. 2004. The transnational illegal wildlife trade. *Crim. Justice Stud.* **17** (1): 57-73.
- WWF. Vietnam, 2017. *Consumption of wild meat and other Wildlife Products in Hue City*. Internal Report.