

# INVESTIGATION ON HUNTING, TRAPPING AND THE IMPACT IMPOSED ON MAMMALIAN WILDLIFE IN THE ENVIRONS OF INHKAI BUM MOUNTAIN RANGE, KACHIN STATE

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## Abstract

Trading, hunting and trapping status on wild mammals were investigated from Inhkai Bum mountain range, from June 2016 to June 2018. Total of (20) types of traps were utilized by local people, eight types of traps were advanced made with iron and the rest (12) traps were traditional bamboo traps. Cruel iron trap types are locally more applied than bamboo types found in this area. A total of (35) mammal species were recorded, among them ten species were enormously target species by local hunters either for the purpose of meat or medicinal uses. These species included *Manis pentadactyla* (Pangolin), *Ursus thibetanus* (Asian black bear), *Catopuma temminckii* (Asian golden cat), *Anyx cinerea* (Small claws otter), *Sus scrofa* (Wild pig), *Bos frontalis* (Gaur), *Rusa unicolor* (Sambar), *Muntiacus muntjac* (Muntjac), *Atherurus macrourus* (Asiatic brush tail porcupine), and *Petaurista petaurista* (Red giant flying squirrel). Black bear, Asian golden cat and Otter were trapped by iron traps. Chinese pangolin and brush tail porcupine were trapped by bamboo traps, Wild pig, Gaur, Sambar, Muntjac and Red giant flying squirrel were hunted with Tumi- gun by local peoples. Population of Black bear and Gaur species declined during June 2015 to June 2018, but Otter and Chinese pangolin population increased during the study period. The data from two years study indicated that although the demands on the body parts of wild species varied with the time, there is a constant demand of pangolin in the market. In the present study Pangolin species are more hunted and exploited by local people.

**Keywords:** mammals, trap types, hunting activities, Kachin State

## Introduction

The present study focused on Inhkai Bum mountain range Myitkyina Township located in the Kachin State, since no previous study on the mammals of this area has ever been attempted. Nevertheless, Rabinowitz and Saw Tun Khaing (1998) recorded 21 species of mammals from a remote region of Northern Myanmar. Moreover, Than Zaw *et al.* (2008) reported 18 small carnivores in Myanmar. The review is based on data from camera-trap surveys, between 1999 and 2005, supplemented by examination of wild mammal remains in hunting camps, villages and markets and other incidental information.

Nowadays, overexploitation of wildlife hunting for the commercial trade has resulted in significant declines and local extinctions for several wildlife species (Nooren and Claridge 2001; Anon 2005), both within and outside protected areas in south-east Asia (Bennett *et al.*, 2000; Kaul *et al.*, 2004). It directly affects the natural environment in that it throws off natural predation and population growth of the wildlife.

Over the centuries human beings have exploited carnivores, either for fur and meat or for the secretions that they produce from the scent glands. Many medium-sized carnivores are also threatened such as tiger, leopard, sun bear, and musk deer. Similarly, pangolin species are experiencing victim, because of their keratin scales.

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Rao *et al.* (2005) examined hunting patterns in tropical forests adjoining the Hkakaborazi National Park in north Myanmar. They used strip transect and camera trap surveys to generate relative weekend market. They also reported that poaching of large mammals including wild cats, clouded leopard, marbled cat and gaur are subject for live trade.

On the other hand, natural resources such as wood, fish and wildlife are also wrenched by demands from Myanmar's neighbours, China, India, Thailand and Bangladesh (Myint Aung *et al.*, 2004). Many rural people consume and trade wildlife and the country's common border with China is a powerful driver of wildlife hunting (Yiming *et al.*, 2000). Worldwide, tens of millions of mammals each year are trapped legally. Additionally, an unknown number of animals are trapped illegally and, moreover, for every target animal captured; a varying number of non-target animals are injured or killed (Lossa *et al.*, 2007).

In addition, many resources in Myanmar are currently under open access, as they belong to the state and lack rules to regulate exploitation, this particularly the case for forestry and fisheries (David *et al.*, 2015). Kachin State is fairly representative of many areas in Myanmar in which small and large mammals are found and should thus provide a baseline for country wide recommendations about the protection of these little known species.

Therefore, the present study seeks to the way of hunting and trapping situations on wildlife mammal species by local people in InHkaibum mountain areas. Moreover, it investigated in more preference target species on hunting activities.

The reason for studying traditional traps is that the researcher wants to know how much do the local people's traps affect the decreasing number of wildlife mammals. And the researcher also wants to reveal the techniques of traditional bamboo traps practiced by Kachin tribal people.

## Materials and Methods

### Study area

The area of this study is in Myitkyina Township which is located on the west bank of Ayeyawady, and in the southeast of Kachin State, (24°31' to 26° 12' N and 96° 40' to 97° 32' E) InHkai Bum Mountain range was average altitude sea levels in 2000 meter. It can be divided into hill forests, evergreen forest and mixed deciduous according to the types of forest. Moreover, in this mountain range bearing between Sumpara bum mountain areas including Bumpha Bum Wildlife sanctuary and Chin dwin regions (Thamonthi Wildlife sanctuary). Thus, according to this mountain range topography may be available seasonal local migration corridor for wild mammals tracing. Present study conducted in four study sites (Fig. 1).

### Site I (Nam Jim)

This site is situated at 25° 31' 21.19" N and 97° 24' 25.98" E at the elevation of 551 m above sea level. This site includes densely growing trees and cultivation open lowland. This study area is 2.36 km<sup>2</sup>, including four villages namely Nam Jim, Ding Galu, Aung Myae and Ahhi sha.

### Site II ( Nawng Nan)

This site is located in the west bank of Ayeyawaddy River and north part of Nam Jim village. It lies at 25° 34' 15.59" N and 97° 29' 47.57"E, at the elevation 780 m above sea level. The vegetation of the study area comprises secondary forest and cultivation area. This study area is 4.56 km<sup>2</sup> comprising nine villages namely, Gaw nan, Maw tung, La myan, Naung nan, La bang rosana, 10 mile village, 8 mile village, Yin Kaw and kawahka.

### Site III (Ar Lam )

It lies at 25° 38' 40.90" N and 97° 30' 10.81" E. This has an average height of 538 m above sea level, located of the east part Myitkyina. This site includes lowland cultivation area, bamboo forest, mountain forest and secondary forest. This study area is 3.38 km<sup>2</sup>. The area allocated five villages, Ar Lam, Sharawng kahtung, Dun gan, Lamung zup and U byit.

### Site IV (Tanphre)

This site is located near the Myitsonne confluence of Ayeyarwaddy. It lies at 25° 43' 3.72" N and 97° 29' 13.78" E at the elevation 610 m above sea level. It mainly comprises secondary forest, paddy field and agricultural area. The original mix-deciduous forests were still present. However, many kind of un-exported tree are still remaining for hewing the export trees. This study area is 3.35 km<sup>2</sup> and contains only three villages, namely Kying hkran, Tang hpre and Tiyan zup.

### Data Collection

All the information's of species in this study were collected from various habitats of Myitkyina and its environs; down-hill forest and Inhkaing Bum Mountain. For account on the species composition of study sites, the researcher accompanied with local hunter went through the jungle paths monthly. Survey was conducted every twice in a month at each of four study sites. In additionally, interview survey on hunting information of data collection was based on interviews with local traders, indigenous people hunters and also survey in markets. Random survey method was practiced in collecting data. A total of (135) people were interviewed with local residents in (21) villages during the study periods, villager from each village were invited to obtain information on wildlife hunting data such as hunting quantities and techniques (Appendix 1). Data analysis is prepared in Microsoft Excel Programmed based on field information. The data from two years study periods was used for comparison. Species identification was followed after U Tun Yin (1993), Martin *et al.* (2001), Francis (2008).

### Results

During the study period, a total of 35 species of mammal belonging to nine genera and five families and six orders namely Insectivora, Pholidota, Primate, Canivora, Artiodactyla and Rodentia were recorded (Table 1).

Among the four study sites, study Site IV represented the highest species composition of 27% and the lowest of 23% was Site II. Order wise, species composition of mammals was found to be the highest in Carnivore and Rodentia (34.28%) each, followed by Primate (11.43%)

Artiodactyla (5.71%) and the lowest was observed under Scandentia and Pholidita 5.71 % in each (Fig.2;3)

In the present study 20 types of traps were utilized, among them eight types of traps were modern trap made with iron and the rest of 12 traps were traditional traps by local peoples (Table 2 and 3; Fig 4 and 5)

Two year comparison on the price rate of target parts of wild animal species are presented in Table 4.

**Table 1 List of mammal species recorded in the study area**

Sr. No.	Family	Genus	Species	Common name
1	Tupaiaidae	<i>Tupaia</i>	<i>T. belangeri</i> (Wagner, 1841)	Tree shrew
2	Erinaceidae	<i>Neotetracus</i>	<i>N. sinensis</i> (Trouessart, 1909)	Gymnure
3	Manidae	<i>Manis</i>	<i>M. Pantadactyla</i> (Linnaeus, 1766)	Chinese pangolin
4			<i>M. Javanica</i> (Desmarest, 1822)	Sunda pangolin
5		<i>Nycticebus</i>	<i>N. bengalensis</i> (Lecèpède, 1800)	Slow loris
6	Cercopithecidae	<i>Macaca</i>	<i>M. mulatta</i> (Zimmermann, 1780)	Macaques
7		<i>Trachypithecus</i>	<i>T. shortridgei</i> (Wroughton, 1915)	Shortridge's langur/ leaf monkey
8	Hylobatidae	<i>Hoolock</i>	<i>H. hoolock</i> (Harlan, 1834)	Gibbon
9	Canidae	<i>Cuon</i> (Hodgson, 1838)	<i>C. alpinus</i> (Pallus, 1811)	Wild dog
10	Ursidae	<i>Ursus</i>	<i>U. thibetanus</i> (G. Cuvier, 1823)	Asian black bear
11			<i>H. malayanus</i> (Raffles, 1821)	Sun bear
12	Felidae	<i>Catopuma</i>	<i>C. temminckii</i> (Vigors & Horsfield, 1827)	Asia golden cat
13	Felidae	<i>Prionailurus</i>	<i>P. bengalensis</i> (Kerr, 1792)	Leopard cat
14	Mustelidae	<i>Martes</i>	<i>M. flavigula</i> (Boddaert, 1785)	Yellow-throated marten
15		<i>Arctonyx</i>	<i>A. collaris</i> (Cuvier, 1825)	Hog badger
16	Herpestidae	<i>Herpestes</i>	<i>H. Javanicus</i> (Goffroy saint-Hilaire, 1818)	Javan mongoose
17		<i>Amblonyx</i>	<i>A. cinerea</i> (Illiger, 1815)	Small-claw-otter
18	Viverridae	<i>Viverricula</i>	<i>V. indica</i> (Geoffroy Saint-Hilaire, 1803)	Small-Indian palm civet
19		<i>Arctogalida</i>	<i>A. trivirgata</i> (Gray, 1832)	Three strip palm civet
20		<i>Paradoxurus</i>	<i>P. hermaphroditus</i> (Pallus, 1777)	Common palm civet
21	Cervidae	<i>Muntiacus</i>	<i>M. muntjak</i> (Zimmermann, 1780)	Barking deer
22		<i>Rusa</i>	<i>R. unicolor</i> (Kerr, 1792)	Samber
23	Suidae	<i>Sus</i>	<i>S. scrofa</i> (Linnaeus, 1758)	Wild boar/ Wild pig
24	Sciuridae	<i>Callosciurus</i>	<i>C. caniceps</i> (Gray, 1842)	Grey-bellied squirrel
25			<i>C. finlaysonii</i> (Horsfield, 1824)	Variable squirrel
26			<i>C. erythraeus</i> (Pallas, 1779)	Pallas's squirrel
27		<i>Tamiops</i>	<i>T. mccllellandii</i> (Horsfield, 1840)	Himalayan/ Burmese strip squirrel
28	Muridae	<i>Bandicota</i>	<i>B. indica</i> (Bechstein, 1800)	Lesser bandicoot
39		<i>Rattus</i>	<i>R. rattus</i> (Linnaeus, 1758)	House rat
30			<i>R. norvegicus</i> (Berkenhout, 1769)	Norway rat
31			<i>R. adamanensis</i> (Blyth, 1860)	Sikkim rat
32		<i>Diomys</i>	<i>D. crumpi</i> (Thomas, 1917)	Crump's mouse
33	Spalacidae	<i>Cannomys</i>	<i>C. badius</i> (Hodgson, 1841)	Lesser bamboo rat
34	Hystriidae	<i>Atherurus</i>	<i>A. macrourus</i> (Linnaeus, 1758)	Brush tail porcupine
35		<i>Hystrix</i>	<i>H. brachyura</i> (Linnaeus, 1758)	porcupine

**Table 2 Utilizing of trapping categories, quantity and hunting success at In Hkai Bum Mountain range.**

Sr. No.	Study site	Village	Trap categories (apply frequency)			Trapping effort	Trap success
			Bamboo trap	Iron trap	* Other		
1	Site - I	Nam Jim	7	8	1	201	176
2		Ding Galu	9	5	1	211	100
3		Aung Myae	6	5	-	198	97
4		Ah hi sha	7	4	2	212	84
5	Site - II	Gaw Nan	2	4	2	74	47
6		Maw tung	4	5	2	60	30
7		La myan	2	4	1	70	57
8		Naung Nan	3	4	-	54	32
9		La bang Rosana	2	5	-	75	45
10		10 mile	4	4	-	84	43
11		8 mile	3	3	-	98	42
12		Yin hkaw	4	4	-	100	30
13		ka wa hka	3	6	-	123	29
14	Site - III	Ar Lam	5	4	2	130	120
15		Sha rawng kahtung	4	3	1	131	107
16		Dun Gan	5	5	3	210	171
17		Lamung Zup	5	6	2	202	174
18		U byit	4	5	3	230	170
19	Site - IV	Kyinghkag	2	6	3	206	156
20		Tang hpre	2	6	3	205	170
21		Ti Yanzup	4	6	2	202	160
<b>Total</b>			<b>89</b>	<b>102</b>	<b>28</b>	<b>3076</b>	<b>2040</b>

\* Other: Hand net, tumi gun, with bow and arrow utilizing

**Table 3 Monthly frequency of trapping and hunting activities of one year round in all study sites**

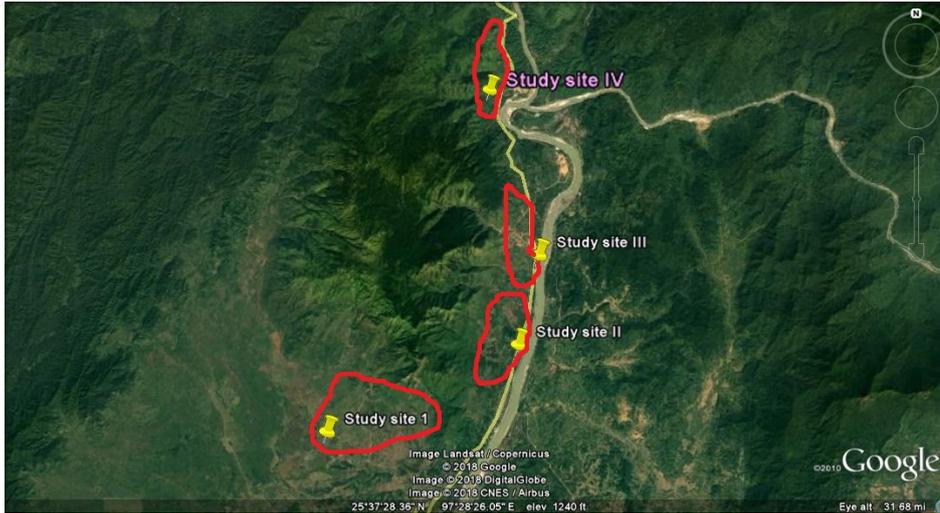
Site	* Type	Jan	Feb	Mar	Apr	May	Jun	July	Agu	Sep	Out	Nov	Dec	Total
Site I	T	4	2	1	2	2	-	-	-	-	1	2	2	14
	H	2	1	2	2	2	1	2	1	2	3	4	1	14
Site II	T	2	3	4	4	5	-	1	-	-	-	2	3	23
	H	4	1	2	3	2	2	1	1	2	2	3	2	17
Site III	T	2	3	3	4	2	-	-	-	1	-	4	1	19
	H	2	1	2	2	2	1	1	1	2	2	5	2	16
Site IV	T	4	1		5	5	1	-	-	-	2	2	3	20
	H	2	2	2	3	4	1	2	1	2	3	1	3	17
<b>Total</b>		<b>21</b>	<b>14</b>	<b>16</b>	<b>25</b>	<b>24</b>	<b>6</b>	<b>7</b>	<b>4</b>	<b>9</b>	<b>13</b>	<b>23</b>	<b>17</b>	

\* Poaching type: T= Trapping, H= Hunting by gun, hand net

**Table 4 Price rates of hunter targeted parts of wild mammal species (2016-2017)**

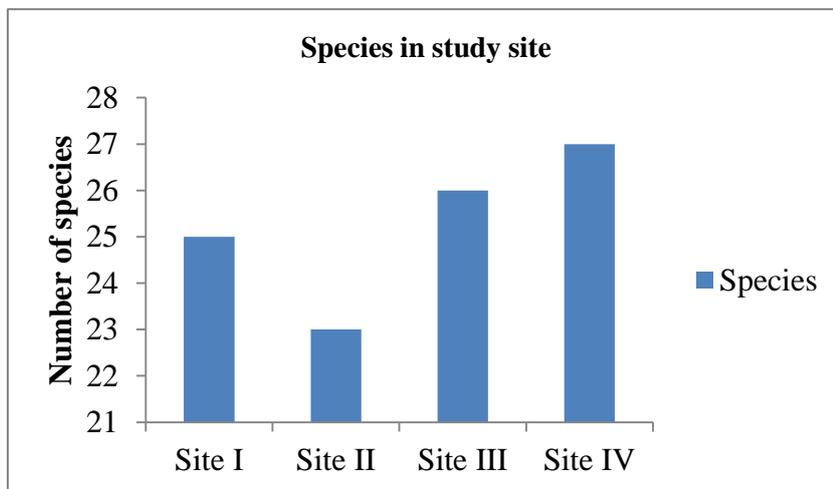
Sr. No.	Specie	Common name	Parts/categories	Unit	Cost in local (Ks-)*	
					2016	2017
1	<i>Manis pantadactyla</i>	Asia Pangolin	scale	Kg	520,069	520,069
2	<i>Manis javanica</i>	Sunda pangolin	scale	kg	489,476	489,476
3	<i>Nycticebus bengalensis</i>	Asian slow loris	live	kg	550,660	550,660
			gall bladder	g	1,856	1,000
3	Trachypithecus shortridgei	Shortridge's langur	live	kg	140,000	60,000
			skin	one	85,000	45,000
4	<i>Hoolock hoolock</i>	Hoolock gibbon	skull	one	35,000	35,000
5	<i>Ursus thibetanus</i>	Asiatic black bear	live	individual	120,000	120,000
			gall bladder(brown)	g	4,290	4,100
6	<i>Helarctos malayanus</i>	Sun bear	gall bladder(gold)	g	9,177	9,177
			gall bladder	g	4,290	2,200
7	<i>Catopuma temminkii</i>	Asian Golden cat	leg	Kg	122,369	48,948
			canine	one	30,000	15,000
8	<i>Neofelis nebulosa</i>	Clouded leopard	whole skin	one	50,000	20,000
			leg	one	50,000	20,000
9	<i>Prionailurus bendalensis</i>	Leopard cat	whole skin	one	120,000	40,000
			canine	one set	50,000	30,000
10	<i>Actogalidia trivirgata</i>	Small tooth civet	leg	pair	50,000	20,000
			whole skin	one	50,000	30,000
11	<i>Aonyx cinerea</i>	Small claw otter	whole skin	one	25,000	25,000
12	<i>Sus scrofa</i>	Wild pig	meat	kg	15,908	15,000
			whole skin	one	80,000	45,000
13	<i>Bos frontalis</i>	Gaur (wild Ox)	meat	kg	18,355	18,355
			canine	one	30000	25000
14	<i>Rusa unicolor</i>	Samber	meat	kg	30000	30000
			horn	kg	48,948	25,000
15	<i>Muntiacus muntjak</i>	Red muntjac	meat	kg	36,711	36,711
			horn	kg	24,474	12,000
16	<i>Petaurista petaurista</i>	Red flying squirrel	meat	kg	20000	5000
			leg	pair	90,000	50,000
17	<i>Atherurus macrourus</i>	Brush tail porcupine	meat	kg	12,237	10,000
			skin	one	5000	2000
18	<i>Hystrix brachyura</i>	Malay porcupine	hoof	Kg	24,474	5,500
			skin	one	80,000	30,000
19	<i>Hystrix brachyura</i>	Malay porcupine	bladder	g	1,836	1,836
19	<i>Hystrix brachyura</i>	Malay porcupine	stomach	g	2500	2500
			Spine	one	15,000	3,800

\* Ks = Myanmar Kyats

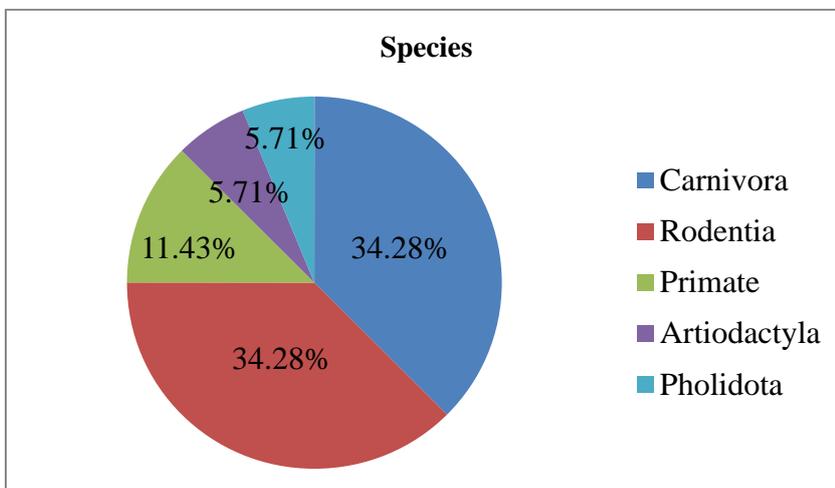


(Source: Google map)

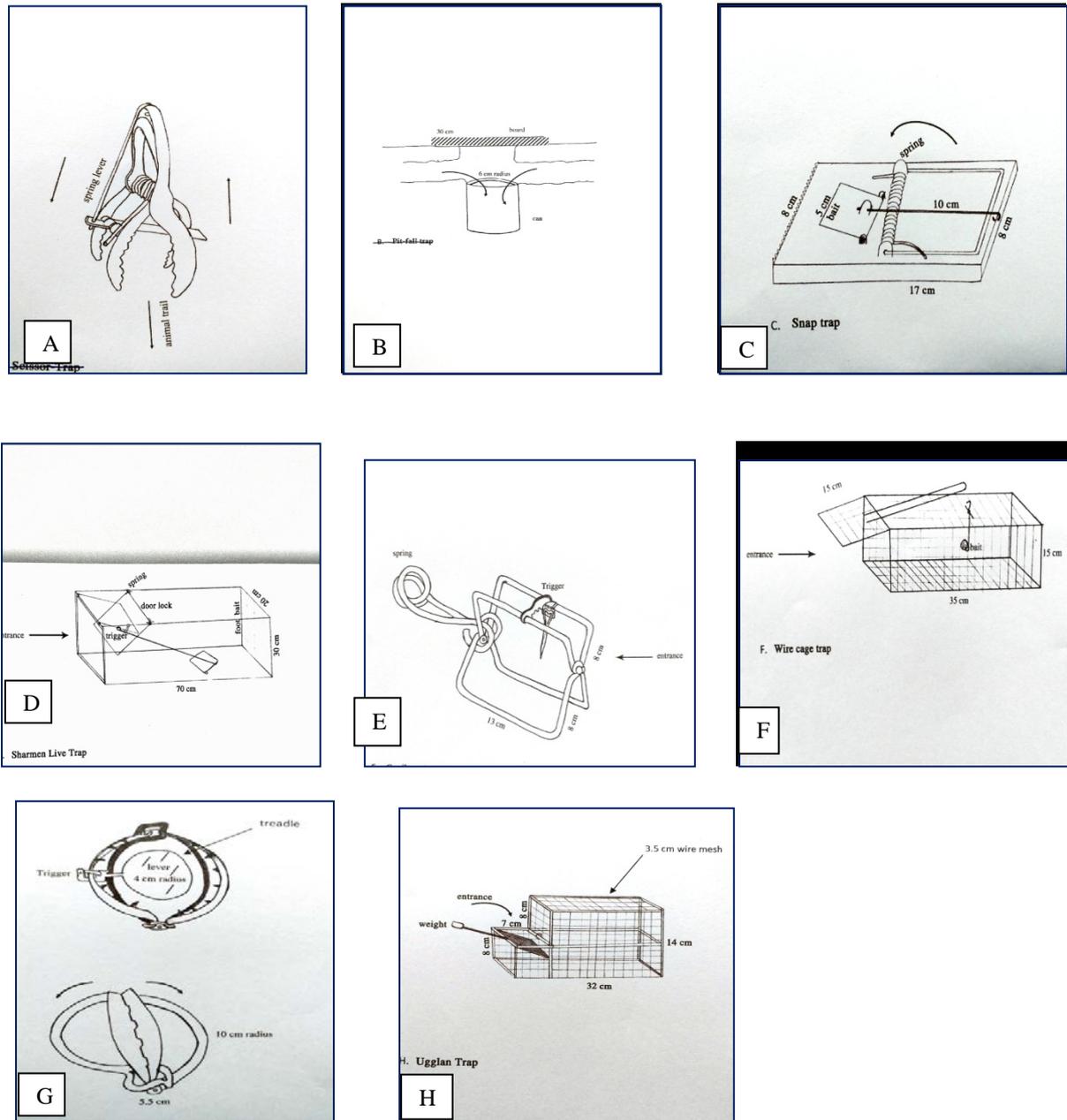
**Figure 1** Four study sites of Inhkaibum mountain range area, Myitkyina environs



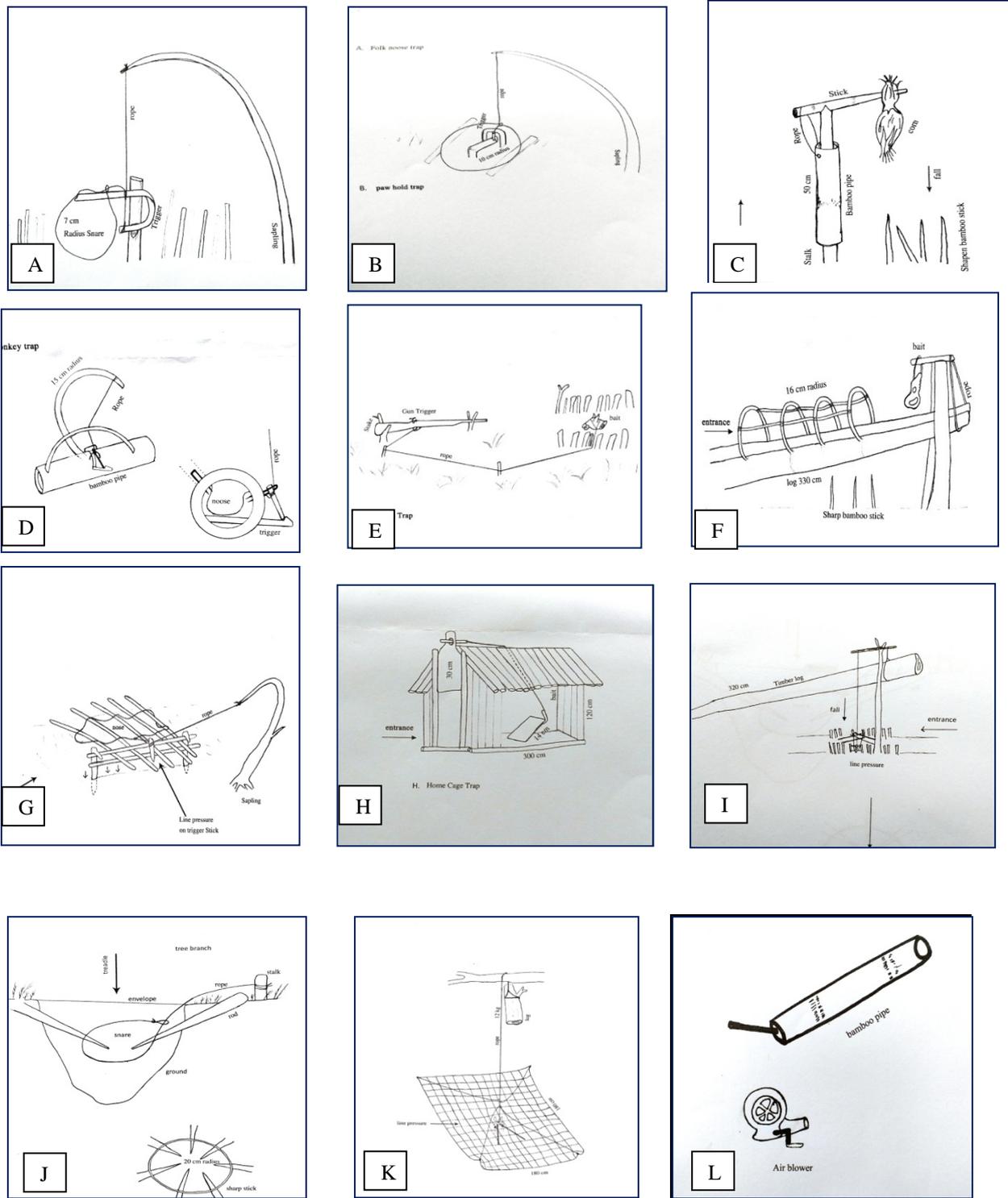
**Figure 2** Composition on the number of species in study sites



**Figure 3** Composition of mammal species in different orders



**Figure 4** Local and indigenous people use iron made trapping gears **A-** Scissor trap **B-** Pit fall trap **C-** Snap trap **D-** Shaman’s live trap **E-** Conibear trap **F-** Wire cage trap **G-** Tiger mount trap **H-** Ugglan trap



**Figure 5** Local and indigenous people use bamboo made trapping gears **A-** Folk noose trap **B-** Paw hold trap **C-** Monkey trap **D-** Bamboo pipe trap **E-** Gun trap **F-** Pull basket-work trap **G-** Treadle spring snare **H-** Homelike cage trap **I-** Heavy timber log trap **J-** Apachi noose trap **K-** Transplant net trap **L-** Smoke out

## Discussion and conclusion

The natives do hill-side cultivation in the rainy season. They grow rice to harvest in autumn. They mostly trap wild animals during the game season in late winter and summer. Thus, the number of animals' would not be decreased tactically as they have the time for reproduction and breeding. However, if the animals are over harvested for the horn, skin, skull, bladder and the animal as whole in illegal trade; they surely would become threatened in a near future.

From the overall results, it revealed that the highest frequency of poaching and hunting activity were encountered during March and April and dwindled to lowest during the peaked rainfall in September, during cultivated and harvested times (Table 3).

Yiming, 2000 explained that wildlife in Myanmar is threatened by illegal and unregulated hunting for domestic and international trade.

Nevertheless, researcher also encounter local market, where highly demands mammal species was throughout a year poaching by hunter (Table 4). According to collected data in Site IV Tanghpree area was high trapping effort among four study sites, it is assumed that this site may be due to the high species composition (Figure 2).

During the study recorded with respect to the local hunter preference trapping gear on the mammal species, it was revealed that, highly utilized tiger mount trap was in all study sites, followed by commonly used other iron trapping gears (Table 2).

Hpaw Bwe (2015) reported that (39) species of mammals were found in this mountain area, twelve species of small mammal such as, bat, mouse and wood rats were included. In this study, local hunters and peoples do not target these species. They hunt large mammals solely for the purpose of making traditional medicine, trading and for bush meat. However, in relation to traps and hunting patterns used by the hunter were that might influence among wildlife mammals fauna.

The demand for hunting wild mammal species depends upon the market. According to Hpaw Bwe, 2015, the pangolins and bears were mostly captured. This result is the same as the result of the present study. This is because their parts of the body are much more highly demanded in local market than borderline pass trade.

In normal, several of local people do not use iron made traps in catching animals. This is because it is difficult to construct those traps and also expensive. They preferably use traditional traps made of local materials without the involvement of iron materials, however, success in hatchability was not affected. On the other hand, greedier they are, the cruelled capturing methods they use. This is because people in study site among many different villages use tiger mount snap traps to capture mammals since it is the only way to get much more money for their living livelihood.

On the whole, it was found out that local people trapping effort on small mammals was for the purpose of controlling cultivation pests (Hpaw Bwe, 2015), However, overexploitation capture by trapping medium and large mammals was both for the purpose of consumption and illegal export, such as clouded leopard, sambar and black bear parts. Especially the *Pholidota*, *Manis pentadactyla* (Chinese Pangolin) is highly sought, both for consumption and use in local medicine practice and have a demand in illegal trade across the border.

It was also known that when harvested time, rats, mice and inedible species were trapped not for the purpose of reselling, consuming or blending in folk medicine, but only captured to prevent from destroying the plantation, agricultural products, domestic stock, farm and damage of species for poultry such as civet mongoose. The local people hunting activities of preference target on market demand wild mammal species in this area.

Between two types of the entrapping method, live trap and death trap methods, it is found that the local people use death traps. Moreover, they sometimes use bow and arrow, gun in catching animals. Just as Sherman live traps, the natives can't afford to use metal meshes, wire cages, tiger mouth traps in every case because they are very expensive. Thus, they use them just for catching (illegal trade) species.

Among the recorded species, ten species were target species by local hunters for the purpose of meat and medicinal used. These species were *Manis pentadactyla*, *Ursus thibetanus*, *Catopuma temminckii*, *Anyx cinerea*, *Sus scrofa*, *Bos frontalis*, *Rusa unicolor*, *Muntiacus muntjac*, *Petaurista Petaurista*, and *Atherurus macrourus*. Among the target species, except of *Sus scrofa* (wild pig) and *Muntiacus muntjac* (red muntjac) the remaining all species were decreasing in world population trend (CITES 2009). According to 2015 IUCN red list, *Manis pentadactyla* Pangolin are considered as endanger species and followed by vulnerable species were *Ursus thibetanus*, *Anyx cinerea*, *Bos frontailus*, and *Rusa unicolor*. In this present work, according to sighting and questionnaires base survey the populations of these species were gradually decreased in Inhkai bum mountain range.

In the present study, the risk of overexploitation by poaching due to weak enforcement of wildlife laws, they have encouraged hunting among poor local people communities.

Thus it appeared that, the study area, Myitkyina Township embody mammals that are at risk by world population trend and by local standard some are threatened by over exploitation and illegal trade across the border, so that there is a need to safeguard the sustainability of the mammals in Myitkyina Township for the future generations to come.

To determine relationship between wild mammals occurrence and associated with local people hunting activities are needed to further more detail survey for long term in this areas.

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**Appendix I**

## Interview survey for hunting profile

## General Hunting Interview

Location (village): \_\_\_\_\_ Interviewee \_\_\_\_\_

Position N: \_\_\_\_\_

E: \_\_\_\_\_

1. How often do you hunt? \_\_\_\_\_
2. What time taken for hunting? \_\_\_\_\_
3. What kind of weapons do you use for hunting? \_\_\_\_\_
4. What kind of your preference target animals? \_\_\_\_\_
5. In each hunt, how many animals do you usually get? \_\_\_\_\_
6. What are your purposes for hunting? \_\_\_\_\_