

**Determining leopard presence, land use, and prey species  
availability in  
Ruhuna (Yala) National Park Border Areas**



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**(In relation to livestock depredation retaliatory leopard killings)  
Update Report I - February 2019**

***Submitted By***



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## Background & Introduction:

Permission to begin this work was granted by the Department of Wildlife Conservation (DWC) to the Wilderness & Wildlife Conservation Trust (WWCT) under its on-going island-wide Leopard Project in June 2018. The first phase of the study was begun in July with the setting up of remote cameras in the border areas outside and adjacent to the electric fence of Ruhuna (Yala) National Park (YNP), Block I, Palatupana entrance area. Phase II will increase the monitoring in this area while Phase III hopes to study the Katagamuwa buffer zone area.

The reason for this study is twofold: 1. to better understand leopard presence and land use together with prey availability in these buffer zone areas of YNP and how this may influence the overall leopard population here. 2. To assess the impact of leopard deaths as a result of livestock retaliatory killings by cattle herders in these border areas. As a side study the efficacy of giving of pens to herders (a project carried out by a corporate sector) is also being conducted. Whether these pens are aiding or hindering overall long term conservation of leopards in the area will be analysed.

This study is being conducted as a comparative to our Central Highland leopard study in an attempt to understand the differences of land use by leopards between buffer zone areas in two different landscape types- arid zone and sub montane wet zone- in Sri Lanka. It also hopes to reveal if cattle husbandry methods, which vary between these two sites, are impacting leopard prey availability, cattle predation by leopards and the resultant retaliatory killing of leopards by cattle farmers.

The dairy industry in Sri Lanka is being intensified and non-traditional methods of cattle farming being promoted. This runs the risk of brining cattle and wildlife into closer contact. The possible competition for space and resources that could result may lead to wildlife human conflict scenarios. WWCT feels this is something that needs to be assessed and monitored at this point, to understand how the promotion of the dairy industry will in turn impact wildlife populations and play a role in the increase of human-wildlife interaction and possible conflict scenarios.



*Buffalo (feral/domestic) grazing in the buffer areas-YNP*

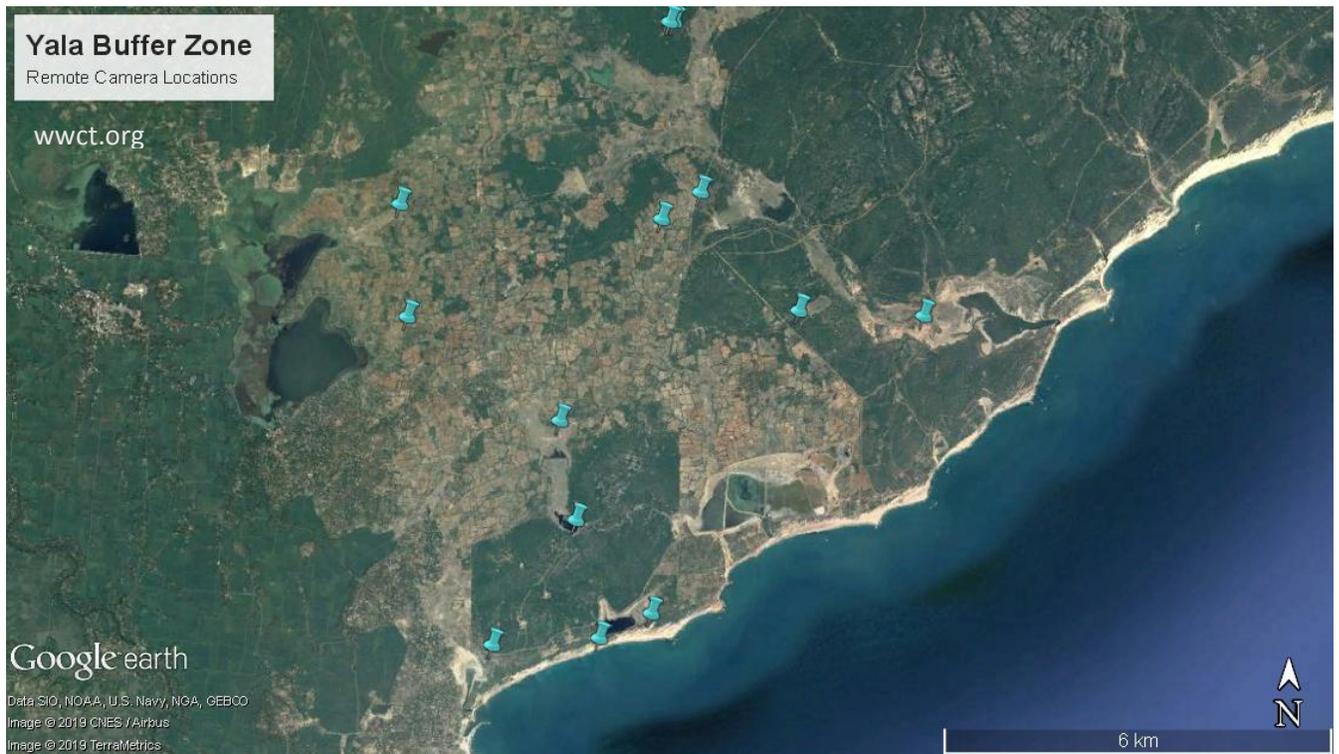
## Field Work & On-going Results

### *Study area & design*

The area on either side of the entry road from Nimalawa to the Palatupana park entrance, bordered by the park electric fence on the north and the ocean on the southeast was included as the study area (Figure 1).

Camera trapping was begun in July 2018 and for this first phase 13 station locations set up. Unfortunately theft of remote cameras meant that only 9 stations produced usable data (Table 1). A total of 217 camera trap days were recorded at these locations.

Interviews with ~ 50 cattle farmers that are now mostly permanent, that graze their cattle just outside of YNP Palatupana entrance area and some further afield were conducted. Some of these cattle farmers had been given protective pens by the Cinnamon private project that is on-going.



Map 1: Remote camera station locations for Phase I, YNP Palatupana entrance border area.

Table 1: Locations and duration of remote cameras (highlighted are cameras that were stolen and hence did not have data).

Site ID	Coordinates	Set up date	Duration of sampling (days)
Yala01	6.27637, 81.40151	09-07-2018	37
Yala02	6.27711, 81.38400	09-07-2018	36
Yala03	6.09360, 81.37022	09-07-2018	No data – stolen
Yala04	6.31731, 81.36589	09-07-2018	14
Yala05	6.29195, 81.32811	10-07-2018	No data – stolen
Yala06	6.27624, 81.32914	10-07-2018	No data – stolen
Yala07	6.24795, 81.35275	10-07-2018	35
Yala08	6.23491, 81.36330	10-07-2018	14
Yala09	6.28987, 81.36476	25-07-2018	21
Yala10	6.31733, 81.36649	25-07-2018	No data – stolen
Yala11	6.26178, 81.35049	26-07-2018	20
Yala12	6.23145, 81.35600	26-07-2018	20
Yala13	6.23050, 81.34100	26-07-2018	20

### *Species frequency*

The most abundant species within this part of the buffer zone is domestic cattle, which was detected with more than twice the frequency of the next most abundant species (spotted deer; Figure 1). The third most abundant species, buffalo, were also typically domestic. These results indicate that although wild prey species are present across the landscape it is domestic bovids that predominate here; a scenario less than ideal for a National Park buffer zone.

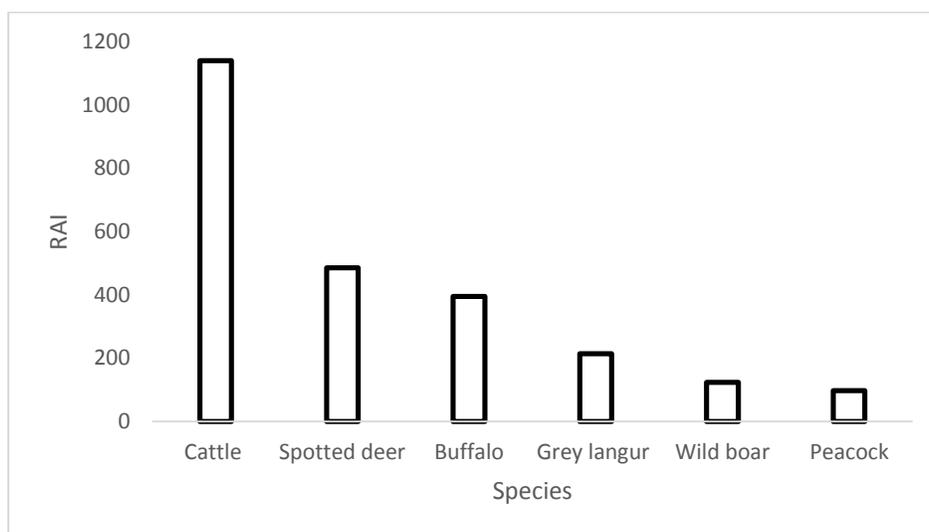


Figure 1: Relative Abundance Index (RAI = images/100 remote camera days) of six most frequently detected species in the Yala NP Block I southern buffer zone.

Although less abundant than the above species, it is also interesting to note that domestic dogs are more prevalent in this buffer zone landscape than most other species of wild animal (Figure 2). This has further potential implications for the leopard population in Yala Block I, both in terms of potential conflict arising when leopards prey on dogs and the potential for disease transmission from the dog population to wild cat populations, a scenario that has been previously seen in Eastern African National Parks.

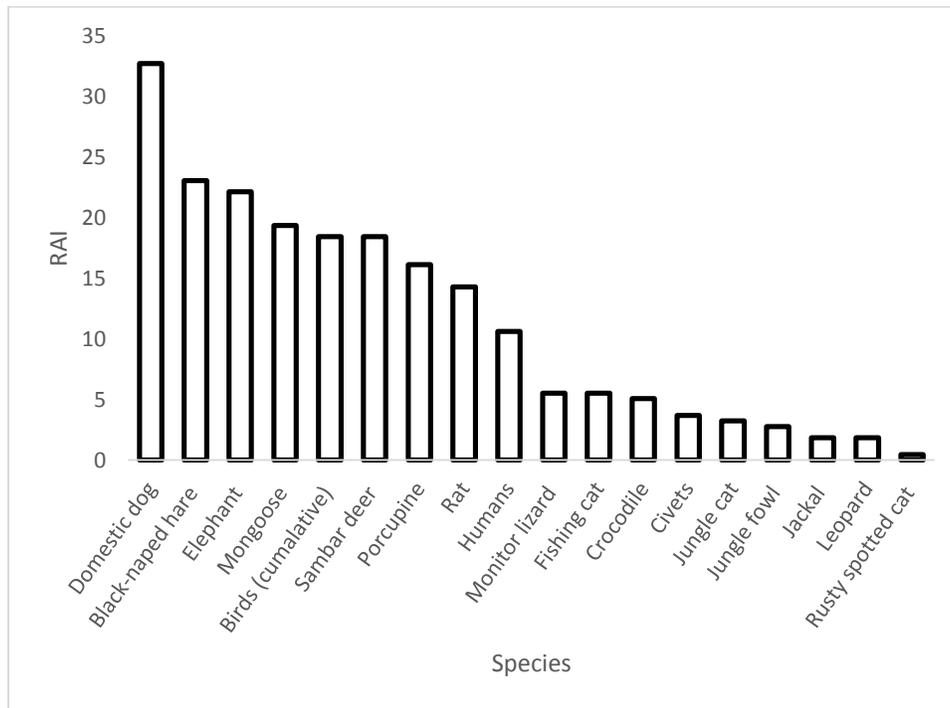


Figure 2: Relative Abundance Index (RAI = images/100 remote camera days) of other species detected in the Yala NP Block I southern buffer zone.

### *Wildcat Species*

All four cat species were detected using this buffer area (Figure 2). Although not unexpected, having documentation of this proves that buffer zone areas are vital areas for even endangered wildlife and are used by them.

However, the frequency of leopard was relatively low during this phase with a Relative Abundance Index (RAI) of < 2 leopards' detected/100 camera days. This compares with an RAI of 18.3 leopards/100 camera trap days in Wilpattu NP and 9.8 leopards/100 camera days in Gal Oya NP (ongoing), and is more similar to the RAI determined for Namal Oya (Gal Oya East) Sanctuary (0.8/100 CT days; ongoing) where cattle grazing also occurs. It is possible that camera placement resulted in a slightly lower leopard RAI as cameras were placed mainly to detect potential prey, however this result does seem to indicate that leopards are not as prevalent on the landscape here as thought by cattle

farmers who often report loss of cattle as leopard kills. Further ongoing analysis of this will hopefully give more insight into this scenario of leopards being killed as retaliation for what is perceived always as leopard-cattle conflict. It is also of note that the most prevalent wild cat in this region is the fishing cat with 5.5 detections/100 camera trap days (Figures 2, 3). This compares with 0.5 detections/100 CT days in Gal Oya NP and 0 remote camera detections in Wilpattu NP. Together with previous data from other locations this suggests the possibility that fishing cats are found in greater abundance where leopard densities are lower which might be the result of population suppression by the dominant predator. Additional analysis is needed to investigate this intriguing possibility more thoroughly.

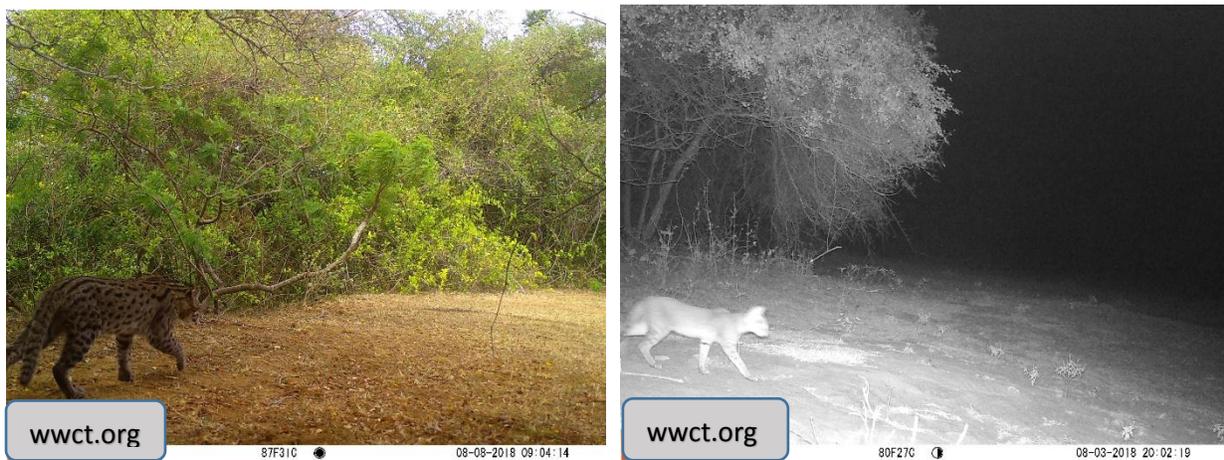


Figure 3. Fishing cat (day time) and Jungle cat (night time) detected on remote cameras within the study area.



Figure 4. Leopard detected at night at a water hole in the buffer area of YNP

### *Prey species*

The detection of leopard prey species including all three deer species, grey langur and wild boar indicates an adequate wild prey base. Black-naped hare are also common (Figure 2) which may be important given that this species is frequently preyed upon by leopards across habitat types. The high availability of cattle and domestic buffalo hints at a possible changing available prey base and scat sampling will be required to understand if leopards are indeed changing their diet and are preying on domestic cattle at a higher rate.

Another important aspect that requires dedicated monitoring is to investigate whether the high prevalence of cattle is impacting the natural grazing vegetation available to wild prey. The establishment of protective vegetation plot enclosures that will prevent cattle from grazing within will enable monitoring of vegetative growth and composition and how this is being impacted by domestic cattle grazing. Similar on-going work has been revealing in the Serengeti National Park, Tanzania landscape.

### *Other species*

The detection of sloth bear, particularly a breeding mother and cubs (Figure 5), is positive given that this species typically avoids heavily human-impacted areas. Less surprising is the presence of elephants including tuskers, jackal etc within this landscape (Figure 5). The detection of troops of grey langur (although possibly inflated due to the fact that primates tend to congregate in certain areas habitually) within this landscape is also a positive sign. A micro habitat analysis of each remote camera station location is required to further the actual extent of use by these species as it may be skewed to stations near water holes where langurs tend to congregate.



Figure 5. Mother bear with cubs and a tusked detected within this YNP buffer zone area.

## Comparative to WWCT highland study

A minimum of 21 wild mammal species were detected across WWCTs highland study site utilising a similar study method (Table 2). This is the same number as detected in the Yala buffer zone area. In both landscapes domestic dogs and humans were also detected. These results were reported previously in relevant reports. A key difference between these two areas is that in the highland study unlike here at YNP buffer areas cattle are rarely present on the landscape as cattle are mostly kept within closed shelters/little sheds with fodder being provisioned to them by owners.

This difference in husbandry practice is an important difference and WWCT hopes to better analyse if husbandry practice is what is leading to the variation in these two study sites in terms of retaliatory killing of leopards.

Table 2. Mammal species recorded across surveyed estates in the Peak Wilderness area study site of WWCT.

Family	Species	Scientific name
Cercopithecidae	Purple faced langur	<i>Trachypithecus vetulus</i>
	Toque macaque	<i>Macaca sinica</i>
Cervidae	Sambar	<i>Rusa unicolor</i>
	Barking deer	<i>Muntiacus muntjac</i>
Tragulidae	Mouse deer	<i>Maschiola kathygre</i>
Sus	Wild boar	<i>Sus scrofa</i>
Elephantidae	Asian elephant	<i>Elephas maximus</i>
Felidae	Leopard	<i>Panthera pardus kotiya</i>
	Rusty spotted cat	<i>Prionailurus rubignosa</i>
	Fishing cat	<i>Prionailurus viverrina</i>
Herpestidae	Stripe-necked mongoose	<i>Herpestes vitticollis</i>
	Indian brown mongoose	<i>Herpestes fuscus</i>
Hystricidae	Porcupine	<i>Hystrix indica</i>
Lepus	Black-naped hare	<i>Lepus nigricollis</i>
Manidae	Pangolin	<i>Manis crassicaudata</i>
Muridae	Rat	<i>Rattus sp.</i>
Viverridae	Ring tailed civet	<i>Viverricula indica</i>
	Palm civet	<i>Paradoxurus hermaphroditus</i>
	Golden palm civet	<i>Paradoxurus zeylonensis</i>
	Giant squirrel	<i>Ratufa macroura</i>
	Dusky palm squirrel	<i>Funambulus obscurus</i>

## Next Steps

As mentioned in the introduction this update reports on only the initial phase of work and remote camera trapping. Data is still being analysed and more information will be reported within the next update together with results from the interview surveys on

perceptions of leopards by cattle herders and reported loss of cattle. WWCT hopes to continue with phase II in May/June 2019 where additional remote camera stations will be set up to increase the study area and cover a larger area of this buffer zone.

Leopard scat analysis and the establishment of vegetation plot enclosures, as suggested above, to monitor grazing effects by cattle would go a long way to understand the changing dynamics occurring in the YNP buffer zone. This is increasingly relevant due the increased emphasis on developing the local cattle industry, a factor brought on by the promotion of the dairy industry in Sri Lanka, and that has resulted in increased cattle numbers in this area over the past years.

### **Acknowledgments**

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