Interim Report

Khao Laem: Conservation

in one of Thailand's Frontier Tiger Parks

NOTE- FOR SECURITY PURPOSES MAY LOCATIONS HAVE BEEN REMOVED FROM THIS REPORT

Report February to July 2019

Introduction

This report represents activities conducted in Western Thailand's Khao Laem National Park designed to investigate the importance of the park in the distribution and conservation of Indochinese tigers (Panthera tigris corbetti). Work is led by Khao Laem officials from the Department of National Park, Wildlife and Plant Conservation (DNP), with technical support from Freeland via the WILDCATS Conservation Alliance. Prior to this year, limited low level wildlife surveys were conducted with data concluded here (see appendix). This led to the realisation that tigers (and Indochinese leopards) are present in this park and this warrants further investigation. Activities during 2019 will provide foundations for a Specially Explicit Capture Recapture (SECR) camera trap survey immediately after this first phase concludes in early 2020. Activities reported here represent activities over the first six months of this project between February and July 2019.

Project Background

Khao Laem National Park is one of 17 protected areas in Thailand's Western Forest Complex. The park covers an area of 935,625 rai or 1,497 km2, with land area of 1,109 km2 (a central part was inundated by the Vajiralongkorn dam in 2001). It is located in the Tenasserim mountain range which extends north to south along the borders of Thailand and Myanmar. The park is contiguous with the Southwest border of Thung Yai Naresuan Wildlife Sanctuary, Lam Khlong Ngu National Park to the east and Thong Pha Phum National Park to the west. This large forest area is a mosaic of bamboo forest, hill evergreen forest, dry evergreen forest, mixed deciduous and deciduous dipterocarp forest. The landscape of the park is mostly steep limestone mountain kaste on north-south axis. It is the water source of many rivers such as Rantee River, Songkalia River, Bickee River and many further small streams flowing into Khao Laem Reservoir (Vachiralongkorn Dam). The site lies in the convergence of three bio-geographical zones, resulting in high biodiversity richness and has representations of wildlife from both southern and northern parts of Thailand. Due to its inaccessibility and remoteness it remains suitable habitat for a diverse variety of wildlife, including both large and small carnivores from the family Felidae.

Khao Laem National Park, in collaboration with Freeland Thailand Foundation have initiated rapid survey techniques including camera traps to record wildlife and found 6 species of Felidae including; Leopard Cat (*Prionailurus bengalensis*) , Marbled Cat (*Pardofelis marmorata*) , Golden Cat (*Catopuma temminckii*) , Clouded Leopard (*Neofelis nebulosa*) , Indochinese Leopard (*Panthera pardus*) and Indochinese Tiger (*Panthera tigris*.)

Examples of Khao Laem Felidae Carnivores

Ungulates

Totally 32 species of wildlife were found; with the species that can be prey for tigers, including Serow, Red Muntjac, Fea's Muntjac, Gaur, Wild Boar (additional data from the image frequency obtained from wildlife camera traps installed between 2016-2018).

Other significant wildlife recorded

Project Objectives with immediate results

1) Improve the capacity of KNLP to lead and manage camera-trap based tiger surveys.
This objective is being monitored by collating information from several key indicators and comparing them. A key part of this project is to establish baseline data in both surveys and SMART monitoring**:**

From the designated area of 5 survey grids representing an area of 45km2 this was increased to 12 grids or 108 km2 each with a minimum of 2 cameras per grid and more in some instances, This represents a 41.67% increase in survey area

Since the start of the survey, 28 camera traps were in operation for a total of 3,854 nights

During this part of the survey only 1 of the previously recorded tigers (from 5 known individuals) was recorded. Some initial theories consider seasonality (was a very dry season), fires, or other anthropogenic disturbance such as poachers.

Five tiger prey species were recorded, including Red Muntjac, Fea's Muntjac, Serow, Gaur, Wild Boar (notably sambar deer were not recorded)

Six survey reports were generated each month with highlights presented (by the project survey staff) during monthly SMART patrol planning meetings.

2) **Improve park capacity to conduct patrol-based monitoring**

Project Impact
Long term Impact: Recovery and long-term protection of Indochinese tigers in Thailand's Southern Western Forest Complex (SWEFCOM) which represents the largest single breeding metapopulation of this species.

Conservation Outcome:
Improved knowledge of potential resident tigers in KLNP and an increased understanding of KLNP**'**s role in facilitating tiger dispersal within WEFCOM and;
Improved management and protection strategies for KLNP and WEFCOM as a key tiger conservation landscape

Patrolling intensity data within the project's time frame covering 1,164 km2 or 78.75% of Khao

Laem National Park area (1,497 km2).

Results
Data of patrolling efforts within the project's time frame; 8 patrol teams, 185 Patrols over the course of 663 days covering distance of 6,841.14 km2.

The number of violations interdicted by the patrol teams in 2019 include; 8 encroachment cases, 9 logging cases, 4 poaching offences

From patrol data, 4 tiger tracks were found, wildlife signs was recorded in 514 locations and threat factors were found in 115 spots.

Smart Patrol Reports were concluded every month between January-July 2019

These indicators are measured against both baseline data as well as against previous data on a monthly basis to quantify progression during this project period**.**

Project Narrative Report

1. Khao Laem was given a grid square overlay that corresponds with the same projection that is used in all parks across WEFCOM. This ensures that data is comparable and initiates the first stage of a synchronized complex-wide survey. Our initial surveys were then focused on existing tiger data, from our previous efforts and from SMART data and further focused down using tiger needs as a guide to specifically locate cameras including trails, access to water and prey.

Due to limited resources we decided to concentrate on the eastern sector of the park adjacent to the west side of Thungyai Naresuan Wildlife Sanctuary, in which has a known tiger population.

We have planned and initiated a plan as follows;
Grid Phase 1 consists of Grid ID Numbers**.**
Grid Phase 2 consists of Grid ID Number**:**
Grid Phase 3 consists of Grid ID Number**:**
(see map included in this report of the entire park and the survey grid squares reference numbers)

These 3 grid phases were operated by 16 forest patrol officers with a minimum of 3 Freeland staff who installed camera traps while conducting on-job-training for the participating rangers.

2. Installation of a tiger and tiger's prey population monitoring system using camera traps. The camera trap is a camera system capturing images of tigers and other animals. The system will be triggered automatically by an infrared beam as animals are detected. The camera traps had been operated in the area for 60 days. The images of wildlife obtained from the traps were studied and the data of wildlife species, the density of tiger population and tiger's prey population within the interested area were collected and summarized.

Images of the camera trap setting

Choosing and clearing the area

Camera preparation (Location in metadata)

Recording the area and noting camera details

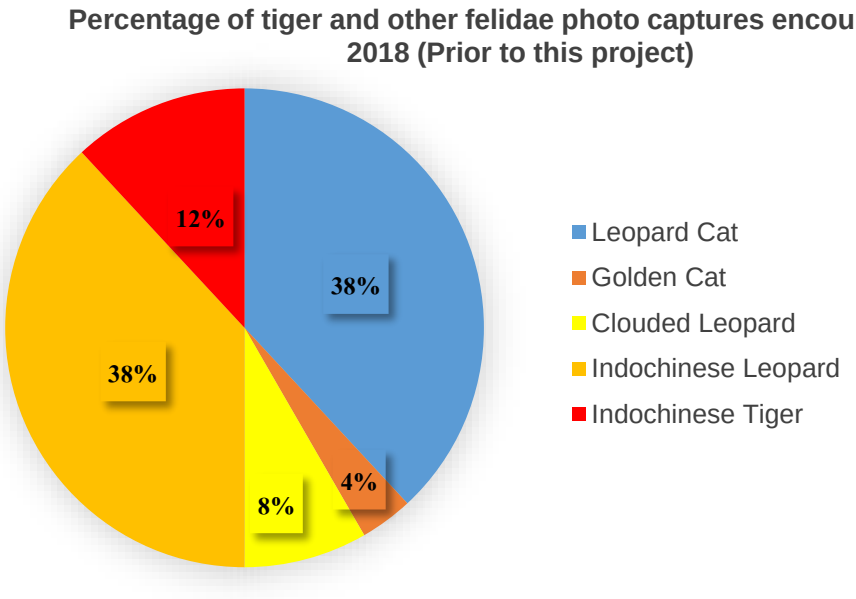
Camera trap installation

Camera trap setting

Activity 1 – Exploratory Camera-trap based Tiger Surveys

From the exploratory camera-trap based tiger and tiger's prey population survey in **2018** that covered **5** Grids; animals in Tiger and Felidae Families were detected **84** times with **339** images.

These images include **5** species of felidae as follows; Leopard Cat (*Prionailurus bengalensis*), Golden Cat (*Catopuma temminckii*), Clouded Leopard (*Neofelis nebulosa*), Indochinese Leopard (*Panthera pardus*), Indochinese Tiger (*Panthera tigris*)



Results 2019

Survey results no. 1, from January 10, 2019 - May 17, 2019, 11 camera traps installed with 2 installation cycles, covering the area of 5 Grids as follows:

From the studies of images obtained from the camera traps, 21 species of wildlife were found. The tigers and felidae were encountered 14 times with 24 images of 2 tiger and felidae types which are Leopard Cat (Prionailurus bengalensis.) and Indochinese Leopard (Panthera pardus.). 6 species of tiger's prey were also found as follows; Red Muntjac (*Muntiacus muntjak.*) ,Fea's Muntjac (*Muntiacus feae*.) ,Serow (*Capricornis sumaatraensis*.) ,Gaur (*Bos gaurus*.) ,Wild Boar (*Sus scrofa*.)

Indochinese Leopard (*Panthera pardus*.)
11 encounters with 21 images captured

Leopard Cat (Prionailurus bengalensis)
3 encounters with 3 images captured

Six prey species were recorded as follows; Red Muntjac (*Muntiacus muntjak*,Fea's Muntjac (*Muntiacus feae*), Serow (*Capricornis sumaatraensis*), Gaur (*Bos gaurus*), Wild Boar (*Sus scrofa*.)

Red Muntjac (*Muntiacus muntjak*)
3 encounters with 7 images recorded

Fea's Muntjac (*Muntiacus feae*)
43 encounters with 82 images recorded

Serow (*Capricornis sumaatraensis*)
44 encounters with 132 images recorded

Gaur (Bos gaurus)
7 encounters with 35 images captured

Wild Boar (*Sus scrofa*.)
35 encounters with 466 images recorded

Graph showing the number of animals in tiger and felidae images taken during 10/1/2019 - 14/5/2019

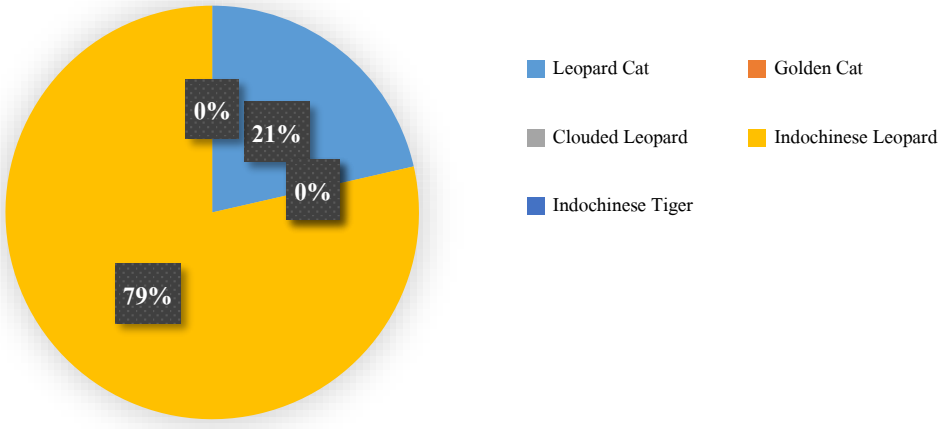
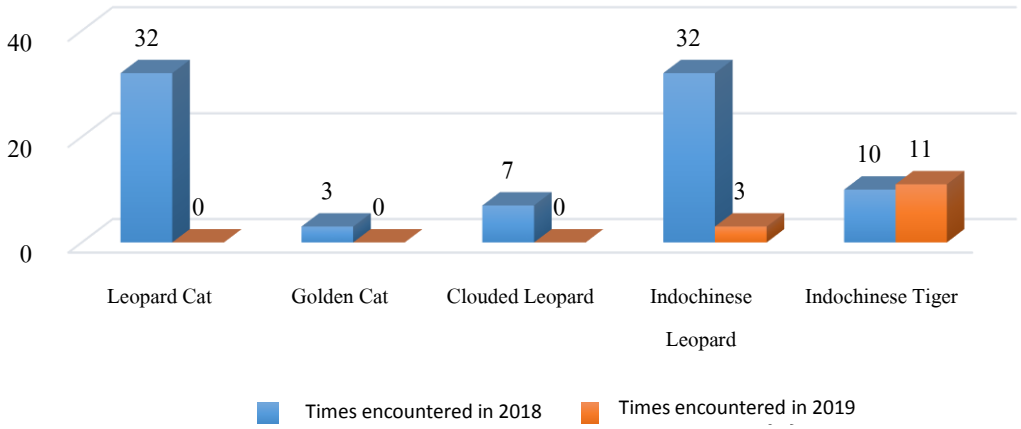


Chart comparing the number of times tigers and other animals in tiger and felidae families were encountered



When comparing the survey results taken from the Grid, during January-May 2018 to that of January-May 2019, it can be seen that from the January-May 2019 survey, the number of wildlife in tiger and felidae family in the area has decreased. Tigers were not found in the area but the tiger preys were still plentiful.

Comparison of tiger prey species images taken in 2019

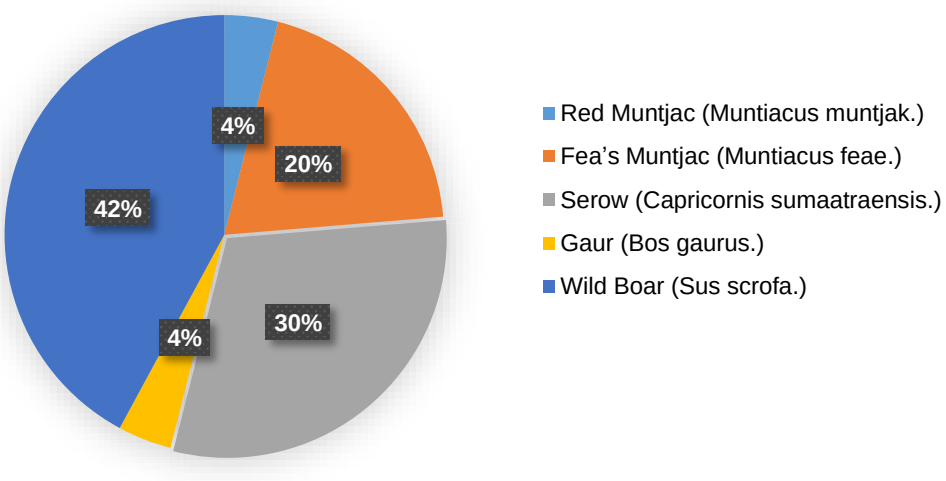
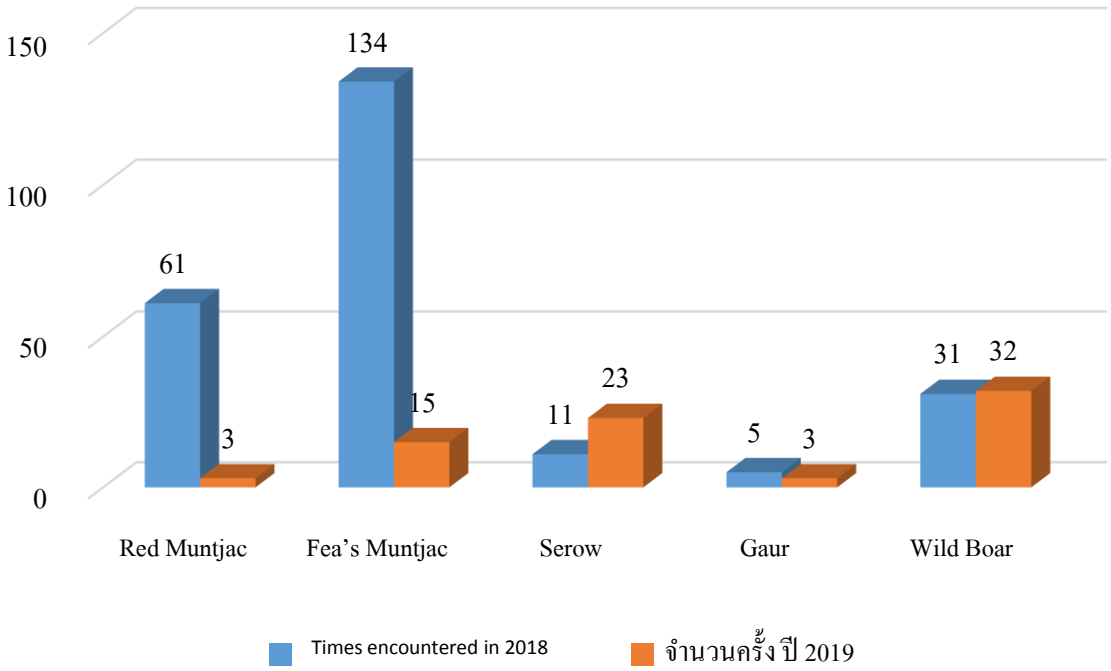


Chart comparing potential prey for tigers encountered in January - May comparing 2018 and 2019



Activity 2 – Support for Patrolling and Patrol-based Monitoring

Here follows a short comparison of patrol data

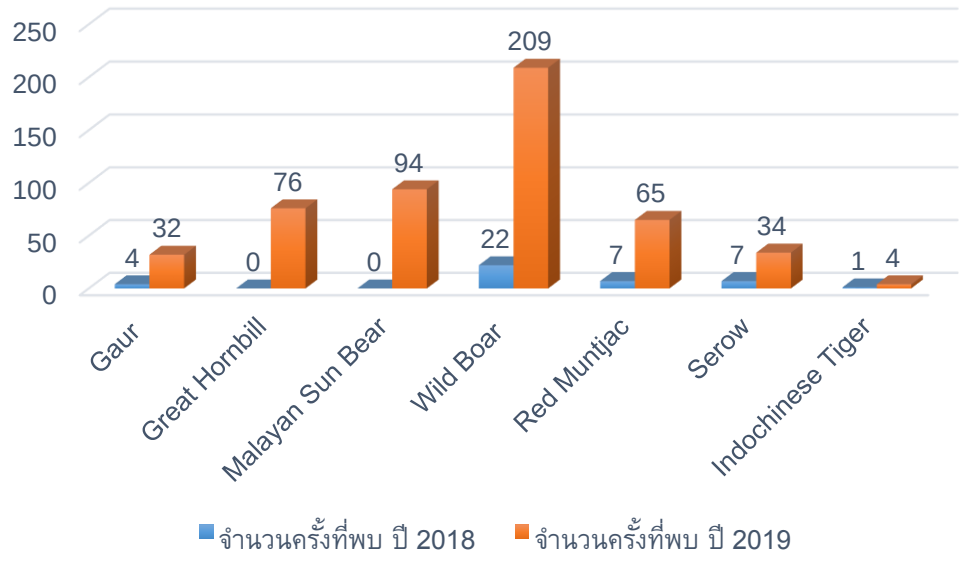
During January-April 2018; Khao Laem's 8 patrol teams conducted 154 patrols over 503 patrol days, covering the total distance of 7,378.32 kilometres, Wildlife data reported from these patrols included 41 wildlife locations, tiger tracks and 33 violations were found. Intensity of the patrols covered 1,185 km2, accounted for 80.10% of Khao Laem National Park (1,497 km2).

Patrol data from January - June 2019 (July data still being collated); 8 patrol teams conducted 185 patrols over 663 patrol days, covering a total distance of 6,841.14 kilometres. Wildlife data reported from these patrols recorded 514 distinct locations which included 4 tiger tracks, 115 violations and 21 cases were sent to the police for prosecution. The intensity of the patrols covered 1,164 km2 which accounts for 78.10% of the total park are Khao Laem National Park (1,497 km2). This is very slightly less than 2018, but we expect this to increase as the year progresses.

No.	Forest Protection Unit	Patrol (times)		Patrol (days)		Distance (km.)	
		2018	2019	2018	2019	2018	2019
1	Kroeng Krawia	18	23	58	85	694.14	493.22
2	Pokana	21	24	57	85	578.74	490.81
3	Pha Phueng	16	20	60	77	952.38	1139.24
4	Ligia	24	23	68	77	876.35	489.65
5	Office	24	25	72	85	1273.92	427.11
6	Nong Kum	14	23	60	86	808.21	1340.76
7	Huai Kayeng	19	25	66	86	1365.9	1593.87
8	Ong Phra	18	22	62	82	828.67	866.48
	Total	**154**	**185**	**503**	**663**	**7,378.32**	**6,841.14**

Khao Laem patrol team effort, comparing 2018 and 2019.

Wildlife track and sign reported from patrols in 2018 compared to 2019



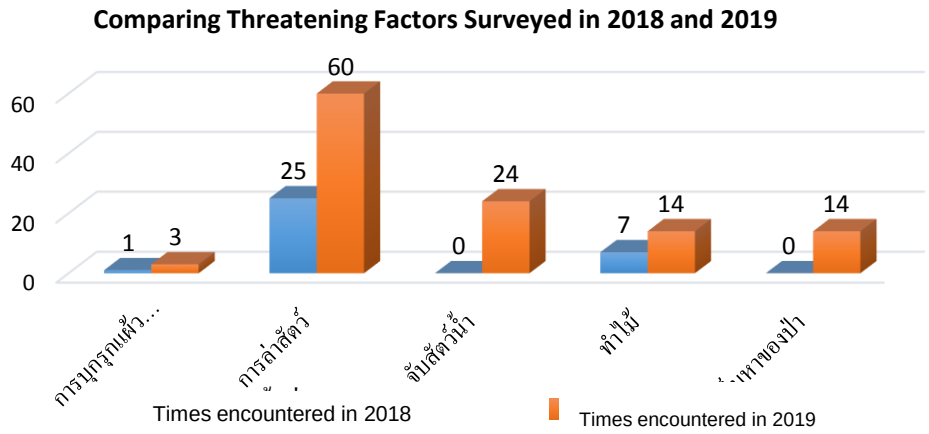


Table comparing violations between 2018-9

Year	Encroachment			Logging			Poaching		
	cases	offenders	Area (Rai)	Cases	offenders	m3	Cases	offenders	kg.
2018	16	5	215.1.60	15	10	4.83	5	2	13.8
2019	8	-	365.38	9	2	2.82	4	6	1

When comparing patrol data from 2018 and 2019, it can be seen that the number of patrol days, the distribution of wildlife and consequently, the threats interdicted have increased. From information gleaned during Smart Patrol Monthly Meetings at Khao Laem we can see all 8 patrol teams are more interested in patrolling because they have a clearer understood of what data should be collected. They also now know how to identify threats and have improved they identification of wildlife track and sign. Much of this is due to the support for food provisions, data collecting equipment and first aid kits from the Department of Wildlife and Plant Conservation and Freeland Foundation.

Other interesting or related points

Results of discussions from both meetings, the data were analysed and there was a mutual opinion among officials that a key wildlife sign indicator should change from recording bear sign (which is quite common) to be recording elephant sign instead.

There have not been any problems in general patrol planning. However, new recruits to the patrol teams have reduced patrol efficiency and led to some errors in data recording. It has been suggested that ranger training courses with topics such as navigation (including compass, map and GPS), weapon training, self-defense, patrol tactics and arrest techniques. Ranger based data collection training is also needed in topics such as data collection, analysis and wildlife sign identification. At one ranger meeting, a request for more patrol support, first aid kits, patrol equipment. Equipment identified as urgently needed include; hammocks with mosquito nets, flysheets, backpacks, mosquito repellent and waterproof bags for electronic devices.

Conclusion

Results from January to May 2019 survey grids D42, D43, D44, E58 and E59 indicated a decrease in the number of wildlife records, especially a reduction of tigers and felidae population in the area. From the survey, no tigers were found in that particular survey area. However, prey species are still abundant when comparing the same period (January – May) in 2018. From the survey of the designated area 1 during January - May 2019, the change in the population and the frequency of the wildlife encountered can be observed and summarized as follows;

1. Location unspecified, which is one area of project operation and known tiger's territory was opened to the public. This ecological disturbance is thought to be one of the influences that displaced large carnivores. Information gained from this project is useful for demonstrating why high conservation value areas need to allow limited access to visitors.

2. Secondly, it was a very hot dry season during this period and water was scarce everywhere.

3. Furthermore, there was a large forest fire throughout the survey area, which is a ridge area covered with grass and bamboo forest, this too may have caused a migration of wildlife populations.

Survey teams consisted of 16 patrol officers, covering 2 camera trap installation routes, accompanied by Freeland staff, who gave advice during camera trap installation, site evaluation and worked on the actual installation including data collection.

When comparing patrol data from 2018 to the data from 2019, it is clear patrol frequencies of all 8 teams have increased, the wildlife distribution analysis and threat factors are more evident, more data have been collected and implementation of Smart data collection efficiency has improved.

Interesting images captured by the camera traps from January - May 2019

Phase 1 (10/1/2019 – 13/3/2019) Images of animals in Felidae family

Phase 1 (10/1/2019 – 13/3/2019)

Phase 1 (13/3/2019 – 14/5/2019) Images Felidae family

Phase 1 (13/3/2019 – 14/5/2019)

Appendix – Images of survey teams in the field