

## 🐾 The Leopard Project 🐾



# Annual Report 2016

## January 2017



**The Wilderness & Wildlife Conservation Trust**

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## **Executive Summary:**

The past 12 months have again been very busy and extremely interesting for the Wilderness & Wildlife Conservation Trust (WWCT). The main project has been in the tea estate lands that border the Peak Wilderness Sanctuary in the vicinity of the Maskeliya and Castlereigh reservoirs. This is part of the broader Human-Leopard Co-existence Initiative aimed at mitigating conflict between people and wildlife in the central highlands and encouraging peaceful co-existence. On the island-wide population genetics project progress has been slow, but some critical progress was made in 2016. This year we also initiated a new collaboration with Oxford University's Wildlife Conservation and Research Unit (WildCRU) and have initiated a new project in the vicinity of Gal Oya National Park, where almost no information is currently available about leopards and other wildlife. We continued with our education and awareness programs with 8 awareness presentations to > 500 tea estates community members, 5 lectures given by WWCT PIs at various forums and 2 in-depth training programs. The distribution of our educational material, including the new "Living with Wild Cats" pamphlet, has also continued, with more re-prints soon required. Two large educational posters were designed and printed this past year and are prominently displayed at the entrance to Wilpattu National Park and in the new Dunkeld Conservation Station, the opening of which was another important event in 2016.

The first round of the Peak Wilderness remote camera project, which was conducted across 20 tea estates from August to December, was ground breaking. No work had previously been conducted in non-Protected areas in the country and this survey has provided some very illuminating and useful data so far regarding the number of leopards living in this heavily fragmented habitat as well as their movement and activity patterns. The clear reliance on ridge forests by breeding females indicates the need to provide protection to these key landscape features. This leopard population appears to have adapted behavior to reduce potential interactions with people and while human injuries are very few, leopard deaths, typically via snares, are more common. To address this a Human-Leopard Interaction Protocol Manual was designed, produced and printed by WWCT. As land use changes and development intensifies in this landscape, the emerging data will be very useful to ensure plans are in place to maintain much of the present balance, but also reduce the number of leopard deaths that occur. The next phase of the work is already underway.

The WildCRU connection has already resulted in one broad scale analysis of leopard distribution across Sri Lanka with follow up projects in the planning stage. The Gal Oya project is also in its infancy but it is exciting to be planning work which will provide a detailed understanding of leopard ecology in this important, data deficient section of the country.

The population genetics study threw up a number of obstacles in 2016, chief among them that our large store of scat from across the island could not provide useful DNA for analysis. In 2017 a plan will be formulated to efficiently collect new, fresh samples from which useable DNA can be extracted. This new collection is underway.

In addition to the tea estate awareness program, WWCT's PIs gave talks to the Rotary Club of Colombo, the Wildlife and Nature Protection Society, senior tea estate managers, the UN Redd International Symposium on Valuation of Natural Forests and the Rufford Small Grant Sri Lanka Symposium. An online story on Monga Bay about WWCT's work garnered extensive international coverage. Finally, people always form the core of WWCT's work and this year we had a young and energetic group of students, interns, volunteers and staff that helped to make 2016 both productive and enjoyable.

## **Update of Leopard Project activities - January to December 2016**

### **I. Research**

- A. Occupancy and Abundance Survey
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- B. Human-leopard co-existence in the Central Highlands
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- D. Oxford University WildCRU collaboration
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## I. Research

### A. Occupancy and Abundance Surveys

#### i. Peak Wilderness Sanctuary

After initial recce work in 2015 as well as meetings with tea estate management, in 2016 we were able to initiate, and successfully complete, a closed population capture-recapture remote camera survey of leopards in the Bogawanthalawa valley on the north side of the Peak Wilderness Sanctuary (Fig. 1).

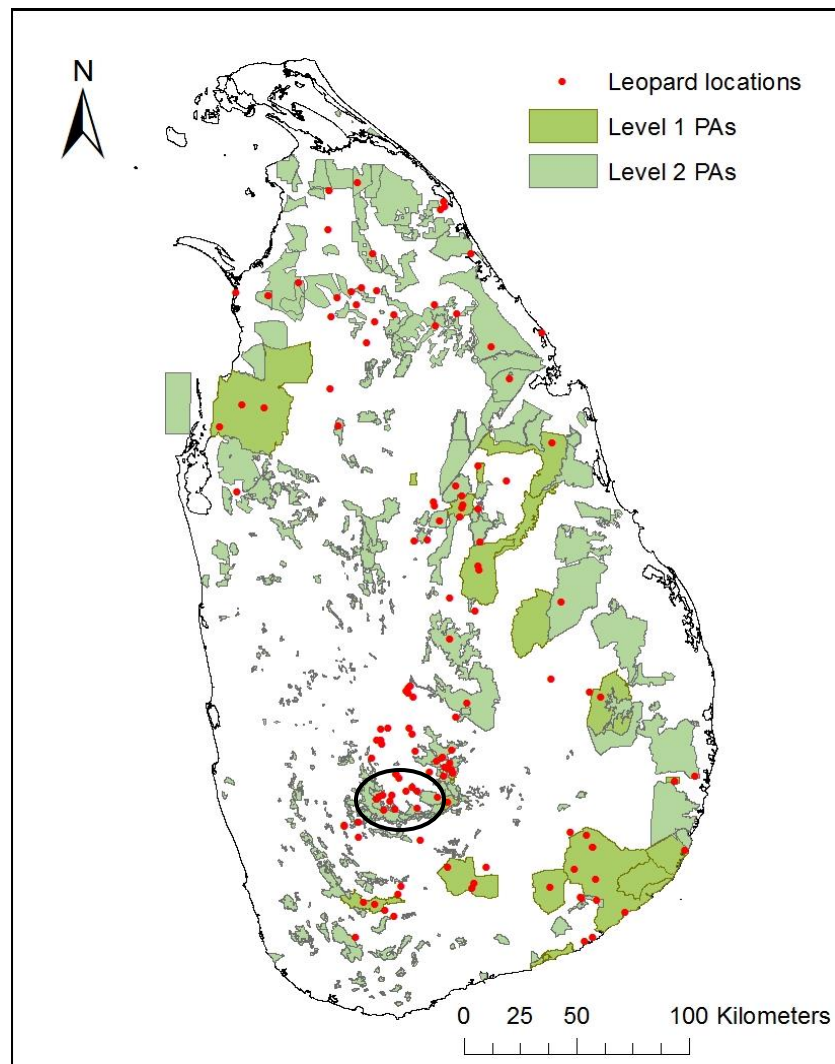


Fig. 1 Map of Sri Lanka showing leopard locations (●) from ongoing distribution work. Dark green are National Parks and Strict Natural Reserves and pale green are Forest Reserves, Sanctuaries, Reserved Forests and Other State Forests. This latter group includes the Peak Wilderness Sanctuary, in the vicinity of which WWCT conducted remote camera abundance surveys in 2016 (black circle).



This landscape is an extensive mosaic dominated by vast tea estates but interspersed with plantation forests of eucalyptus, grasslands, forest patches, streams and settlements (Fig. 2). Leopards are known to exist within the Peak Sanctuary and in the early part of 2016 there were 8 leopards killed, mostly in snares, in the Bogawantalawa valley and immediate surrounds. For this reason, we adapted our initial plan to conduct a survey within Peak Wilderness and instead focused on this mixed land-use area in an effort to begin to understand the situation leading to this spate of human-leopard interactions.



Fig. 2: Views of the study site areas; Eucalyptus trees, tea bushes and forest make up this mixed diverse landscape, highlighting the need for mixed landscape conservation as the landowners are varied.

The project ran from August to December, with 39 remote camera locations positioned across 20 different tea estates (Fig. 3). Twenty-four individual leopards (Fig. 4) were photo-captured a total of 88 times at 29 of these locations. Both the number of individuals and the remote camera success (74%) both far exceeded our initial expectations. Thankfully, only a single camera was stolen during the survey despite the very heavy human presence in the area (Fig. 5).

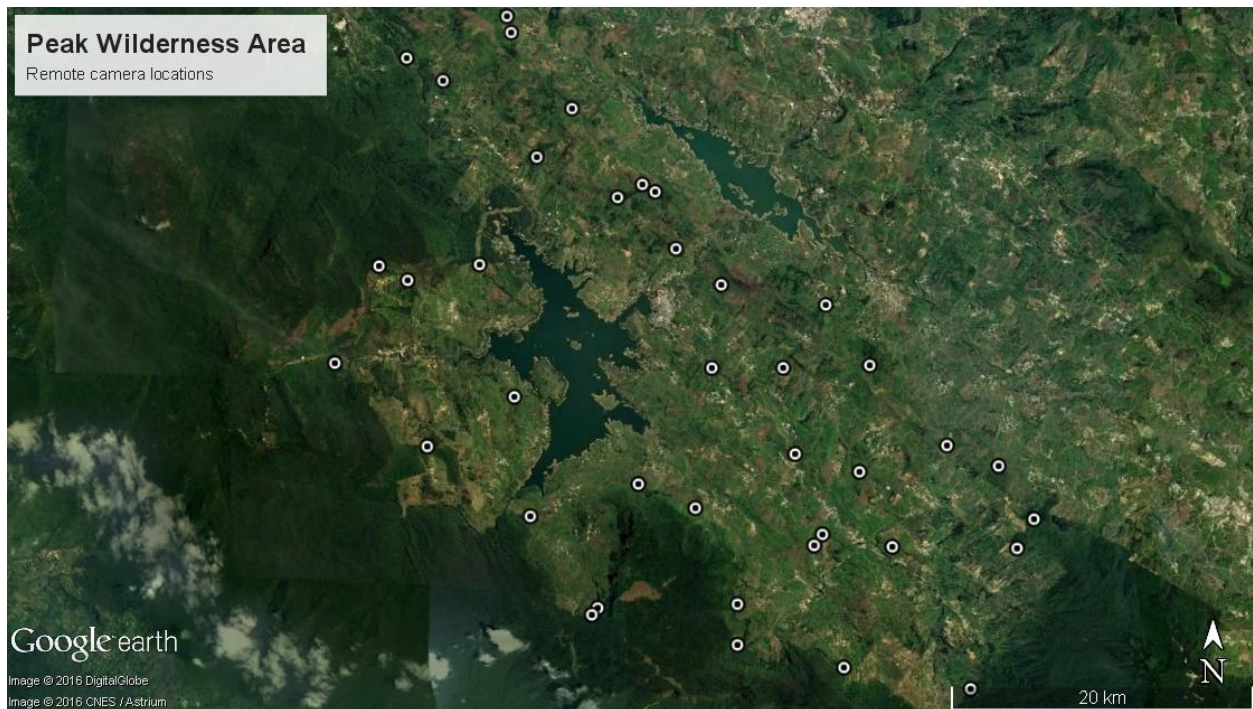


Fig. 3: Remote camera locations in the Bogawanthalawa valley from August – December 2016. Dark green is the Peak Wilderness Sanctuary with lighter green areas mostly tea estates. Two large reservoirs, the star-shaped Maskeliya reservoir and long, thin Castlereigh reservoir are visible in the approximate centre.



Fig. 4: Resident adult male photo-captured on Kew Estate near Peak Wilderness Sanctuary.





Fig. 5: Human presence was very much in evidence across remote camera locations. Here an estate worker with herbicide canister and dog walks past remote camera on Mocha Estate (L) and women gathering firewood walk past a remote camera on Norwood Estate (R).

Of the leopards photo-captured, 65% ( $n = 57$ ) were male, 33% ( $n=29$ ) female and the remainder (2%,  $n = 2$ ) were cubs. After individual identification it was determined that these represented 8 males, 14 females and 2 cubs. This sex ratio reflects the fact that males occupy larger ranges than females and typically overlap the ranges of several females. Repeated observations of 5 males suggest these are resident animals, with the balance 3 males potentially transients moving through the landscape in search of unoccupied terrain. That the number of photo-captures was biased heavily towards males reflects their more active movement patterns as they regularly traverse their larger ranges, thus exposing themselves to a larger number of cameras. The low number of cubs is not unusual for remote camera surveys which often under-represent this age class because they don't move about on roads and trails to the same extent as resident adults. Photographs showed clearly that some of the females were nursing, which indicates that more cubs were on the landscape.

An aspect of interest for this research was the time in which leopards were active on the landscape. In other areas of the country we have observed temporal niche partitioning in which humans and leopards utilize the same spaces but at different times. That same process was clearly in evidence again here with humans widespread on roads, trails and forest paths in the day and leopards walking on the same corridors during the night (Fig. 6). We plotted out the times at which remote cameras, which were taking photographs 24 hours a day, captured leopards (Fig. 7) and saw a sharp increase in activity in the hours immediately after nightfall (18:00 – 19:00), with a second spike between 22:00 – 23:00. After midnight the patterns appear to change as a function of sex, with males reducing activity and females having a lull in the early morning hours before becoming more active around dawn (5:00 – 6:00). This is instructive as these crepuscular periods (dawn and dusk) are also when humans are still somewhat active and this is therefore the time when the probability of encounter is at its highest.



Fig. 6: Tea pluckers inspecting remote camera at 17:24 on September 19<sup>th</sup> and adult female leopard walking at same location at 4:28 on September 20<sup>th</sup>.

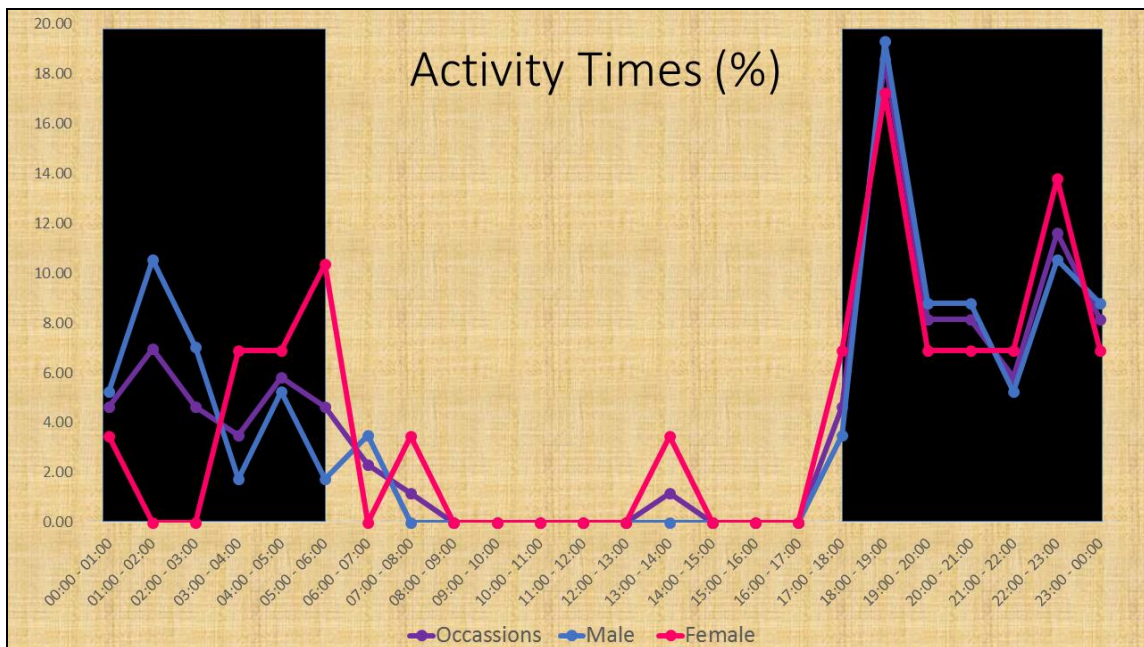


Fig. 7: Proportion of all photo captures recorded per hour by sex for leopards in the Bogawanthalawa valley between August and December 2016. Black background indicates night.

An important aspect of the central highlands remote camera surveys is to document general mammalian biodiversity as well as occupancy of the area by other wildcats. Table 1 lists the mammal species recorded on the remote cameras within the study area. In total there were 23 species representing 14 families documented, including two domestic species (cats and dogs). More detailed analysis is ongoing, including an effort to estimate relative abundance of potential prey species and identify whether domestic species are included in leopard diets in the region. Two of the three other Sri Lankan wild cat species – the Fishing cat and Rusty spotted cat – were documented on remote cameras (Fig. 8). Only 2 fishing cat images were obtained during the 3 month survey. However we obtained 30 separate images of rusty spotted cats during the survey, widely spread throughout the study area.



Table 1: List of mammalian species documented by remote cameras in Bogawanthalawa valley area near Peak Wilderness, August – December 2016.

Family	Species	Scientific name
Canidae	Dog	<i>Canis familiaris</i>
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>
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>
	Domestic cat	<i>Felis catus</i>
Herpestidae	Stripe-necked mongoose	<i>Herpestes vitticollis</i>
	Indian brown mongoose	<i>Herpestes fuscus</i>
	Ruddy mongoose	<i>Herpestes smithii</i>
Hystriidae	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>
Scuridae	Dusky palm squirrel	<i>Funambulus obscurus</i>
	Giant squirrel	<i>Ratufa macroura</i>
Sus	Wild boar	<i>Sus scrofa</i>
Tragulidae	Mouse deer	<i>Moschiola kathygre</i>
Viverridae	Ring tailed civet	<i>Viverricula indica</i>
	Palm civet	<i>Paradoxurus hermaphroditus</i>



Fig. 8: Fishing cat photo-captured on Glenugie estate (Left) and Rusty-spotted cat photo-captured on Moussakelle estate.

## B. Human-leopard co-existence in the central highlands

Between March and June 2016 there were 12 incidents in the central highlands involving humans and leopards, 9 of which resulted in leopards being killed (7 by snares and 2 poisoning; Figs. 9 and 10). During this period WWCT met with the Department of Wildlife Conservation officials on numerous occasions, including a meeting with the Director General at the time Dr. Sumith Pilapitiya, to try and come up with ways to mitigate potential conflict in the area.



Fig. 9: Young adult male leopard killed in snare in Upper Lawrence Division of Venture Estate April 21<sup>st</sup>, 2016 (Left). Adult male killed in snare, with section of flesh removed, on Yuillifield Estate June 4<sup>th</sup>, 2016 (Right). Photos by Anuradha Ediriweera



Fig. 10: WWCT's Anjali Watson taking measurements and hair samples at Department of Wildlife Conservation's Attidiya field office, from young adult male leopard killed in a snare near Gampola on April 27<sup>th</sup> 2016.

One method, which villagers in the Templestowe estate, Nawalapitiya area agitated for, was the removal of the leopard via translocation. This particular leopard was not necessarily a problem animal, but had simply been seen by a group of children as they walked to school. The problem was that this area had seen an incident the previous year in which a woman was killed and the death was ultimately blamed on a leopard (despite relatively little evidence). At that time a leopard was removed from the



area to allay people's fears, although it is uncertain as to the identity of the removed leopard. As a result the sighting of a leopard caused renewed fear in the community and they wanted this animal to also be removed. Further sightings of a group of 4 leopards in a rocky area < 100m from a cluster of homes increased the fear (Fig. 11). WWCT argued strenuously about the futility of translocation given ample evidence from around the world. Essentially this approach provides a very temporary solution as a new leopard will fill the vacant space shortly and the translocated leopard will simply continue with its behavior in another area. However, the DWC had already prepared a trap for the animal so WWCT's Dr. Andrew Kittle visited the location to view the trap and inspect the area where the leopards were seen and provide some ideas as to how to mitigate potential conflict. The trap was too large, allowing for a trapped leopard to damage itself by hurling its body at the cage walls, and this was indicated to on-site DWC vet Dr. Tharaka Prasad. In consultation with Dr. Prasad it was decided to clear the area where the leopards had been repeatedly seen on the rocks and fire off elephant crackers to disturb them and force them away. Furthermore the option was given to set barrel fires between the nearby houses and the rocky area to dissuade the animals from approaching closer. Two fresh scat samples from the rocky site were found to contain barking deer hair, indicating the leopards were feeding on wild prey (not dogs or cattle). Ultimately no leopard was caught and no more incidents were reported.



Fig. 11: Location of community in relation to where leopards were repeatedly seen at Templestowe estate near Nawalapitiya. The photo was taken from the rocks where the leopards would sit.

Following from the discussions with DWC, WWCT created a Human-leopard interaction protocol manual detailing how to deal with various incidents involving leopards (Fig. 12). Two dozen plus copies (in both English and Sinhala) of this manual were printed and supplied to the DWC head office in Malabe for distribution to field sites. Copies were also sent to the Nallathania head office, which is the closest DWC office to Peak Wilderness Sanctuary.





Samuel Cushman who was visiting from the U.S. Forestry Service's Rocky Mountain Research Station. Dr. Cushman is a prominent landscape ecologist and has been instrumental in developing some novel methods for investigating habitat suitability. Following from this visit we have undertaken an extensive analysis of leopard habitat suitability in Sri Lanka and recently submitted a manuscript about the findings. Dr. Macdonald is scheduled to visit Sri Lanka in January 2017 to further this useful collaboration.

#### E. Opening of Dunkeld Conservation Station

On August 11 the founding director of Dilmah tea, Mr. Merrill J. Fernando unveiled the Dunkeld Conservation Station on Dunkeld estate near Dickoya/Maskeliya in the central highlands. This small bungalow (Fig. 13) is now the base for WWCT as we conduct leopard research in the central highlands. The concept grew out of meetings held between Dilmah's hospitality offshoot, Resplendent Ceylon, and WWCT during which the hospitality company was convinced of the importance of the ongoing work in the highlands being conducted by WWCT. The offer of a research station on one of their properties was an outcome of their interest and it is with great pleasure that WWCT set up the station with information boards and maps and moved in to initiate the station by running the remote camera survey of the Bogawanthalawa valley described above.



Fig. 13: Clockwise from top Left: The Dunkeld Conservation Station; the interior of the station with information boards and maps from WWCT; view over Castlereigh reservoir from the station; entrance to the station with leopard photos and sitting area.

## F. Gal Oya National Park

In May WWCT received a call from the manager of the Gal Oya Lodge, a recently opened tourist facility on the western side of Gal Oya National Park. The owners of the lodge were interested in getting the assistance of WWCT to initiate some field research programs at the yet-to-be-built on-site research station. In July WWCT made their first field visit to the site and discussed the direction of future research. It was decided to initially implement some remote camera surveys on the property to document mammalian biodiversity with an eye toward implementing a greater array of biodiversity assessment techniques (transects, quadrats etc.) upon completion of the research station. WWCT has been advising the lodge owners and manager on equipment purchases and methods since then, visiting the site in November for a training program and mapping the area. A longer term plan is to conduct remote camera surveys of the adjacent forest reserve/elephant corridor as well as within the National Park, with permits to be requested and hopefully processed in 2017.

Gal Oya National Park was established in 1954 as part of the Gal Oya development project that resulted in the creation of Sri Lanka's largest reservoir, the Senanayake Samudra. The 259 km<sup>2</sup> Park protects the Senanayake Samudra's watershed and is an important reserve of tropical dry zone monsoonal evergreen forest (Fig. 14). Conducting a remote camera survey of leopards within the park will help to improve the precision of island-wide population estimates and provide useful regional information for future management.



Fig. 14: View of evergreen monsoonal forest adjacent to Gal Oya National Park.

## G. Wilpattu National Park

WWCT continues to conduct field visits to Wilpattu NP every other month for continued collection of leopard scat for diet analysis and to continue prey transects. This together with the completed remote camera survey of leopards completed in 2015 will give a better understanding of resource availability and diet choice. It is hoped that



long term monitoring via remote camera surveying every few years can be done here over the course of time so as to assess population trend changes.

## II. Education and Awareness

### A. Presentations

#### *Central hills estates*

WWCTs continued awareness work in this region focuses on speaking with the local tea estate workers and addressing their concerns about human-leopard incidents as well as discussing with them the importance of wild habitat. For this purpose targeted programmes covering 4 estates (Venture, Barcaple, Kenilworth and Templestowe) were conducted in May, a further 3 (Lonach, Kew and Annefield) in July/August, and another in September (Strathspey), together with DWC Nallathaniya field officers. A total of ~275 tea workers were addressed in the former programme which also had the participation of regional DWC staff and area police together with our team (Fig. 15). The July/August and September programmes addressed ~140 and 80 tea related workers respectively and we have had requests for more programmes. Additional programs together with the DWC Nallathaniya office, are planned for 2017.



Figure 15. Awareness programmes conducted together with DWC field staff. Clockwise from top left: local area police, estate management and field staff at Venture estate, May 9<sup>th</sup>; addressing tea pluckers in the field at Kenilworth estate, May 10<sup>th</sup>; attendees at Strathspey estate, September 26<sup>th</sup>; and at Annefield estate, July 31<sup>st</sup>.

### *Wildlife and Nature Protection Society*

On March 17<sup>th</sup> WWCT presented an overview of the status of the leopard in Sri Lanka (Fig. 16a), informed by the years of research across the island that we have conducted. The event was attended by a packed house (~150 – 200 people) and was very well received. Another WNPS presentation about the leopards of the central highlands will be organized for 2017.

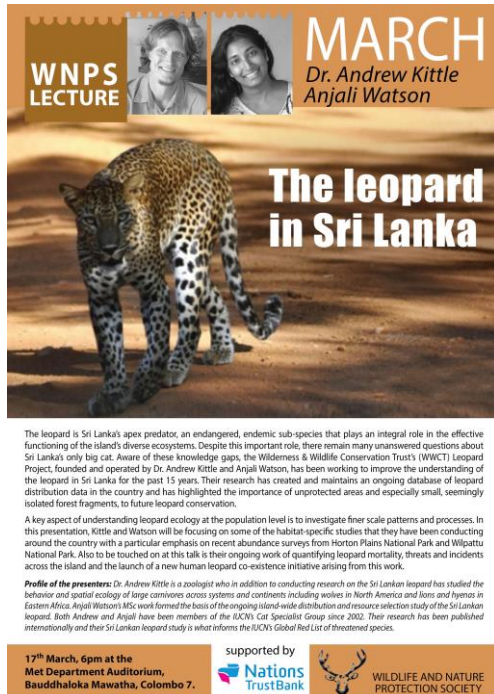


Fig. 16: a) Advertisement for the WNPS lecture, March 17<sup>th</sup>. b) WWCT's Andrew Kittle (top left) presenting at the UN Redd International Research Symposium on Valuation of Forest Ecosystems and their Services, October 18<sup>th</sup>.

### *UN Redd International Symposium*

On October 18<sup>th</sup> WWCT's Andrew Kittle gave a talk entitled "The ecological and economic value of natural forests in relation to the Sri Lankan leopard" at the International Research Symposium on Valuation of Forest Ecosystems and their Services held under the auspices of the UN Redd and Sri Lanka Next – "A Blue-Green Era" (Fig. 16b). The Symposium was held at the Bandaranaike Memorial International Conference Hall and was attended by ~150 scientists, researchers and policy experts from around the region and beyond. The abstract of the presentation was included in the published "Symposium Proceedings".

### *Rotary Club of Colombo*

On November 3<sup>rd</sup> WWCT's Anjali Watson and Andrew Kittle gave a talk at the Rotary Club of Colombo's Annual General Meeting at the Intercontinental Hotel (Fig. 17). Around 40 Rotarians were present and were most interested to hear about the ongoing work in the central highlands, which formed the main topic of the presentation. The Rotary Club consists of an influential cross-section of the Colombo business community.



Fig. 17: Promotional pamphlet for the Rotary Club of Colombo's November 3<sup>rd</sup> general meeting.

### *Rufford's Small Grant Recipients Symposium*

On November 14-16<sup>th</sup> WWCT's Anjali Watson attended a conference entitled the Rufford In-country Conference Sri Lanka and gave a talk entitled "Determining occupancy, abundance and population structure of an endangered apex predator, the Sri Lankan leopard (*Panthera pardus kotiya*)". The conference was held at the Oak Ray Regency Hotel in Kandy (Fig. 18) and was intended for past and present recipients of Rufford Small Grant schemes to present their work to their peers as well as an international representative from Rufford. Anjali also co-chaired a session with Dr. Lalith Ekanayake and was part of the summary session together with the day's keynote speaker Professor Siril Wijesundera from the National Institute of Fundamental Studies



and Professor emeritus Jayanthi Edirisinghe, Zoology Department, University of Peradeniya.



Fig. 18: WWCT's Anjali Watson presents at the Rufford in-country conference – Sri Lanka on November 14<sup>th</sup> (left); and participates in the day's summary session with Professor Siril Wijesundera (IFS) and Professor Jayanthi Edirisinghe (University of Peradeniya).

#### *Bogawanthalawa valley estate manager's meeting*

On December 15<sup>th</sup>, WWCT gave two presentations at the Maskeliya Planter's Club in Maskeliya, Central Province. The first was an overview of leopard research and conservation in Sri Lanka which was attended by ~30 tea estate middle managers from the area. The second presentation was much more targeted, presented to the top management of many of the tea estates in which the central highlands remote camera survey was conducted. This lecture presented results and recommendations from the initial three months of the project, including the emerging demography and structure of the area's leopard population and key activity times for leopard's in the area. The managers were appreciative of the recommendations given that were based on empirical evidence gathered over the previous months.

#### **B. Training programs**

Two training programs were held during 2016 by WWCT, the first in June at the Tea Trails' Norwood bungalow and the second in November at the the Gal Oya Lodge. During both programs WWCT's Anjali Watson and Andrew Kittle gave comprehensive presentations about the status of the leopard globally and locally, the ecology and behavior of the Sri Lankan leopard and the context of our work. We then trained participants on identifying leopard spoor (including pugmarks, scat and scrapes), using GPS equipment and filling data forms. Both sets of trainees are involved in guiding tourists and it is important that accurate information gets transferred about the leopard in Sri Lanka, so details about leopard abundance, range use and diet were all carefully explained.

## Posters

In January, WWCT designed and printed a large (60 x 36 inch) educational poster providing information about the current status of the leopard in Sri Lanka and detailing the numerous projects undertaken during the past 15 years (Fig. 19a). This poster was presented to the Department of Wildlife Conservation for display at their head office and is also displayed in the Dunkeld Conservation Station (Fig. 13). In December we designed and printed a similarly large (72 x 30 inch) educational poster highlighting results from the Wilpattu population survey conducted in 2015 (Fig. 19b). This poster was presented to the warden of Wilpattu National Park, Mr. Manoj, and is displayed at the visitor centre at the Park's main entrance and another will be presented to the DWC head office for display.

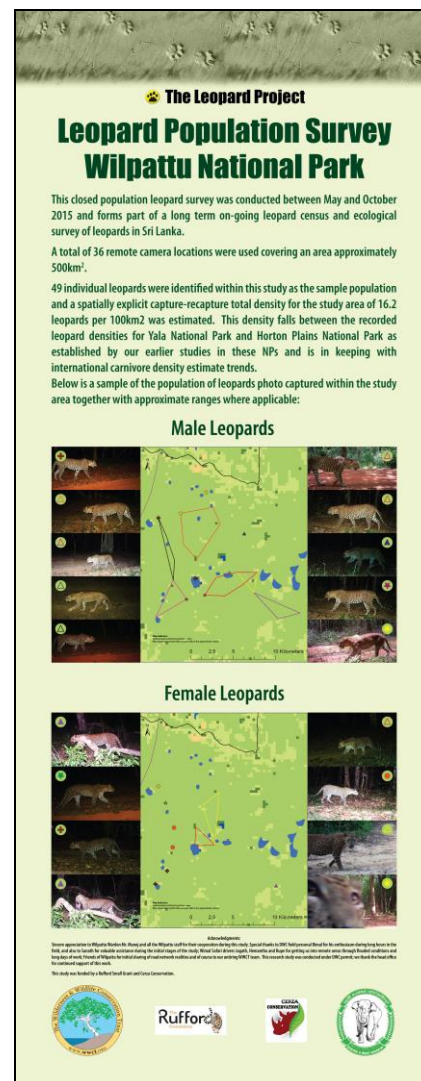
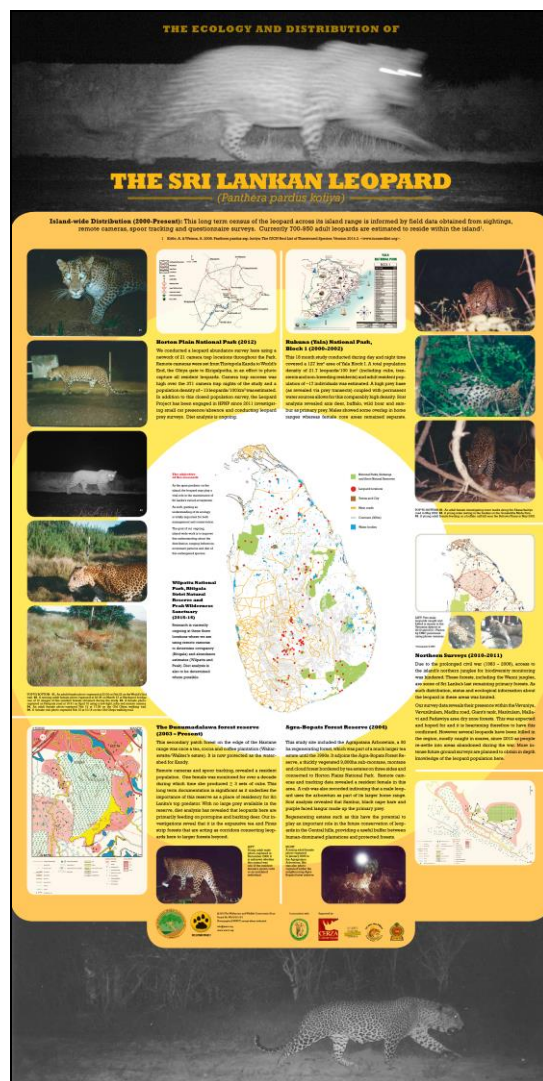


Fig. 19: a) a 60 x 36 inch poster providing and update of the current status of the Sri Lankan leopard with detail from WWCT's various field projects (Yala, Horton Plains NP, Dunumadallawa, Agrapatana, the Wanni) over the past 15 years and b) a 72 x 30 inch poster providing highlights of the 2015 remote camera leopard survey of Wilpattu National Park.

In June WWCT designed and printed a trilingual leaflet entitled 'Living with Wildcats' (Fig. 20). This pamphlet has also been widely distributed at awareness presentations and lectures and also given to DWC offices for use. This pamphlet reminds people of the simple solutions that can be carried out as part of daily life in order to avoid incidents with leopards. We continue to carry out these programmes as we move through the estates and work closely with Department of Wildlife Conservation field staff and estate management to ensure co-existence between humans and wildlife is fostered.





Fig. 21: Information boards designed by WWCT for the Dunkeld Research Station. Left side board provides description of leopards in the central highlands; right top is about threats to leopards in this area, mostly snares; and right bottom provides information about the central highlands in general.

#### D. Students/Interns/Volunteers/Staff

In January and February, a final year BSc. student from the University of Jaffna's Vavuniya campus, **Samith Indika Maddumage**, finished his field work in the Vavunikulam Sanctuary in Northern Sri Lanka's Wanni area. His final report was submitted to the University and WWCT in March. Samith conducted presence/absence sign surveys in the Sanctuary and surrounding forests, as well as questionnaire surveys to understand general biodiversity trends, wild cat presence and estimate the level of human-leopard interaction in the region. All four Sri Lankan wildcats (leopard, fishing cat, jungle cat and rusty spotted cat) were detected in the area with 67% of respondents having seen leopards in the recent past. All habitat types (paddy, jungle and scrub) were used by wildcats according to respondents. Human-leopard interaction centered around cattle predation and while only 3 incidents were observed during the study, a total of 88 cattle predation events were reported by villagers. This represents 13% of the total cattle in the area and indicates the possibility of problematic interactions in this recently re-settled region.

**Jonathan Gnanapragasam** joined WWCT for a one-month internship from Australia's Deakin University from December 27<sup>th</sup> 2015 to January 31<sup>st</sup>. The internship was undertaken as part of the practical field training component of his final year in a BSc in Biological Sciences. He enjoyed the internship so much that he joined WWCT as a

volunteer for an additional two months. During these periods he spent many hours cataloguing thousands of remote camera images from the 2015 Wilpattu study, translating awareness material into Tamil and proof reading WWCTs other Tamil literature, and assisting Samith Indika in his field data collection. Jonathan has now joined WWCT as a research assistant.

In June, University of Edinburgh MSc. student **Gyanada Acharya**, who undertook her field data collection with WWCT in 2015, submitted her final thesis entitled “Human-leopard interaction in Sri Lanka with a focus on the Central province hill country”. In this thesis she analyzed the 112 leopard-related incidents (98 leopard deaths) documented by WWCT since 2000. She highlighted the emergence of the central highlands as a hotspot for interactions and the fact that snaring was the most common cause of leopard death in this region. From extensive questionnaire surveys she identified dog predation as the leading type of human-leopard interaction, followed by leopard deaths and finally, human injury. In her summary she suggested that human-leopard conflict is not severe in Sri Lanka, but that proactive education and awareness, as well as research is necessary to ensure it does not become so.

From August to January 2017, **Maya Situnayake**, a MSc. student from Wageningen University in the Netherlands, joined WWCT. She conducted her final year thesis field work, under WWCT guidance, in the central highlands, investigating the factors underlying human-leopard interactions in the region. Maya gathered fine scale environmental and anthropogenic data at interaction and random locations in the Bogawanthalawa valley. The interaction locations were provided by WWCT and her data collection facilitated by us. Maya also undertook laboratory analysis of WWCT's leopard scat samples from the region to understand leopard diet in these fragmented, unprotected areas. Her analysis will continue back in the Netherlands with a final report submitted to WWCT in 2017.

Another Deakin University student, **Chiharu Higushi**, joined WWCT for the month of October for an internship. During this time she spent some time in the office, but was mostly out with Maya, taking part in field data collection in the central highlands and assisting with laboratory analysis of leopard scat. This broad range of experiences gave her a greater appreciation of the multi-faceted nature of this kind of work.

From October through December, **Elrik du Saillant** joined WWCT to assist with the non-invasive DNA analysis. Originally from Nice, France, Elrik had recently completed his MSc. at the University of Nevada, Reno where he conducted genetic analysis of a Californian black bear population using non-invasive fecal analysis. In Sri Lanka, Elrik joined with Dr. Venura Herath at the University of Peradeniya to analyze WWCT's old fecal samples. He shared his MSc. protocol with Dr. Herath and together they came up with a more effective collection protocol for WWCT's project.

Also in October, recent A-level graduate **Raheema Mohammed** joined WWCT as a volunteer. She worked tirelessly in the office organizing leopard scat, maintaining the leopard incident database, undertaking a host of administrative tasks, and cataloguing

thousands of remote camera images from the 2015 Wilpattu project and the current central highlands project. Raheema proved so efficient and her work so useful that she has now been hired as a part-time Office Assistant and is also now in charge of the WWCT website ([www.wwct.org](http://www.wwct.org)).

Our other staff members in 2016 were **Nimalka Sanjeewani**, **Riahn Pieris** and **Emad Sangani**. Nimalka is a long standing WWCT member who took a position as a lecturer at the University of Jaffna's Vavuniya campus this past year. She remains an Awareness Outreach Officer and conducts most of our school and plantation-sector awareness programs together with the DWC. Riahn and Emad volunteered for WWCT on the 2015 Wilpattu project and were so eager and useful that they were hired on 6-month contracts upon completion of their A-levels. They were instrumental in the day-to-day running of the Bogawanthalawa valley remote camera survey, conducted from August to December. Both are off to Australia for higher studies in February 2017, and while we will miss them a great deal, we wish them well.

#### E. Media

##### **Leopard and Landmines – post war carnivore research**

<https://news.mongabay.com/wildtech/2016/09/leopards-and-landmines/>

##### **Lankan Leopard in the spotlight :::DailyFT - Be Empowered**

[www.ft.lk](http://www.ft.lk) > FT Lite Mar 19, 2016 - The **Sri Lankan leopard**, or *panthera pardus kotiya* as it is ... small, seemingly isolated forest fragments, to future **leopard conservation**

The Leopard in Sri Lanka <http://www.sundaytimes.lk/160313/plus/wnps-lecture-the-leopard-in-sri-lanka-186068.html>

#### F. Publications

Kittle, A.M., Watson, A.C., & T.S.P. Fernando. 2017. The ecology and behaviour of a protected area Sri Lankan leopard (*Panthera pardus kotiya*) population. *Tropical Ecology* 58(1):

Kittle, A.M., P.H.S.C. Kumara, D.G. Pathirathna, H.K.N. Sanjeewani, H.T.J. Seneviratne, and A.C. Watson. 2016. A comparison of floral and faunal diversity between two small, disturbed forest patches in Sri Lanka's Central Highlands. *WildLanka* 4(3):133-141

Kittle, A.M., A.C. Watson, S.A. Cushman and D.W. Macdonald. 2016. The ecological and economic value of natural forests in relation to the Sri Lankan leopard. In: International Research Symposium Proceedings for Valuation of



Forest Ecosystems and their Services, October 18, 2016. The Ministry of Mahaweli Development and Environment, Sri Lanka.

Mukherjee, S., Duckworth, J.W., Silva, A., Appel, A. & Kittle, A. 2016. *Prionailurus rubiginosus*. The IUCN Red List of Threatened Species 2016: e.T18149A50662471. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T18149A50662471.en>.

### III: Acknowledgements:

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