

## RCVS Charitable Trust: Final Report

### Comparison of behaviour and faecal cortisol metabolite levels in semi-captive orphan Asian elephants, *Elephas maximus*, before and after reintroduction into the Uda Walawe Nation Park, Sri Lanka

The report was carried out as specified in the application. The only change was the amount of time spent following the elephants in post release period. This was due to the release date of the elephants being delayed which meant I was only able to follow the elephants for a few days before flying back to the UK. The faeces of the released elephants was collected by the workers tracking the elephants after they had been released and then the faecal cortisol assay was run by a laboratory technician at the veterinary faculty of the University of Peradeniya. At this point I have submitted my final report which will be evaluated by my project supervisor and a second marker. I then have an oral defence of the project in May and a final mark will then be awarded in July.

The Asian elephant has disappeared from 95% of its historical range. As wild populations continue to decline there is a focus to reintroduce orphaned elephants back into the wild. The Elephant Transit Home is an orphanage on the edge of the Uda Walawe National Park, Sri Lanka (Fig 1.) and rears juvenile elephant on powder milk until they are weaned and released into various national parks across the country. Elephants are trained to drink milk from a tube (Fig 2.). At the time of the study the orphanage housed 43 elephants with ages ranging from three months to five years. In the wild elephants are weaned around five years of age, therefore once a group four to five of elephants at the orphanage has reached this age then they are released into various nation parks across the country.

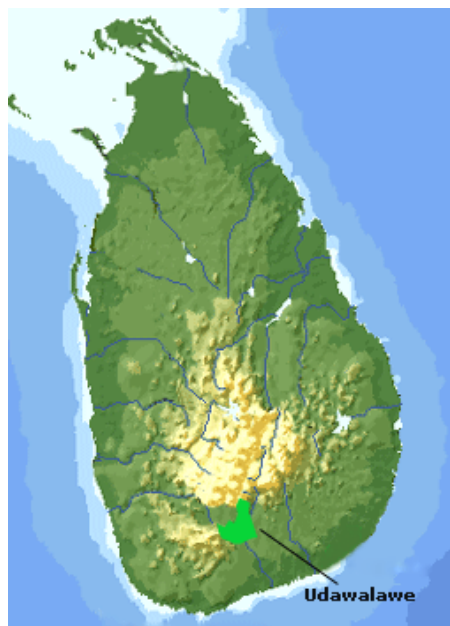


Fig 1. Map of Sri Lanka indicating the location of the Uda Walawe National Park



Fig 2. Orphan elephant being tube fed milk at the Elephant Transit Home

This study uses scan sampling of the behaviour of four elephants every 2 minutes for 90 minutes, at four different time periods after they have been tube fed milk at 6am, 9am, 12pm and 3pm. The four elephants were identified either by a letter being sprayed on their hind leg or distinguishing features such as a collar (Fig 3. & 4.). Scan sampling consists of observing the behaviour of each elephant in the study every two minutes and recording that behaviour being carried out at that moment. This technique enables the behaviour of multiple animals to be recorded at the same time, rather than following just one animal. This means that the data is not skewed by just one animal.



Fig 3. Hind limb of an elephant being labelled with an initial to aid identification in the field.



Fig 4. Sarwa was wearing a collar enabling her to be identified from the rest of the elephants

During the feeding periods the elephants are allowed to wander into the national park and forage which allows them to develop the behavioural skills to locate, manipulate and prehend a range of different food types and allow their digestive tract to develop as the elephants transition from a milk diet to a diet including vegetation as well as milk. The behaviour of the elephants was collected under four main categories (Table 1.) and these were entered into a spread sheet so they could be analysed. Faecal cortisol metabolites were analysed from 18 elephants on three consecutive days prior to being released.

<b>Behaviour category</b>	<b>Behaviour description</b>
<b>Feeding</b>	Grazing Browsing Eating mud and bark Drinking
<b>Locomotion</b>	Walking Running
<b>Resting</b>	Standing still, resting trunk on the floor
<b>Maintenance</b>	Mud bath Dust bath Bathing or showering in water Wallowing in mud Social contact Seeking shade or shelter Rubbing and scratching Grouping together Urinating and defecating

Table 1. Behavioural categories

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The behavioural and faecal cortisol metabolite data from the pre-release was taken as the baseline which is then compared with the behavioural data of two elephants post release and 11 faecal samples collected ten days post release. When a group of five elephants at the Elephant Transit Home were released into the Uda Walawe National Park it was thought that they would stay together allowing the group to be observed together in the post release period. However the group split up into three separate groups so that only two elephants could be tracked in the post release period. The released elephants were fitted with a radio collar around their neck allowing them to be located in the wild (Fig 5.). Behaviour has been identified as one of the biological systems, along with the neuroendocrine system that cope with stressors. The hypothesis is that there will be an alteration in behavioural patterns after release and after a period of acclimatisation in the wild stress levels in the elephants would have returned to a baseline level.



Fig 5. Staff at the Elephant Transit Home using the radio tracking device to locate the released elephants in the Uda Walawe National Park

The percentage of time spent performing maintenance behaviours during observational periods between 9am-12pm and 12-3pm were significantly higher than during the 6-9am and 3-6pm sessions, suggesting a rhythmic pattern to the juvenile's behaviour. During the post release period elephants were not observed to perform any maintenance behaviours compared to the corresponding time periods in the pre-release period. These behaviours may be considered as luxury behaviours which are necessary for the animal's welfare but in the short term period during a stressful event are not essential to the animal's survival. Time spent feeding and walking in the post release period significantly varied from the pre-release period. This indicates that the elephants were having to spend more time exploring their novel environment searching for food. Also they have been completely weaned off three hourly milk feeds and therefore need to supplement their diet to meet their calorie requirements.

The mean post release faecal cortisol metabolite levels were slightly lower than the pre-release levels; indicating that the neuroendocrine system has returned to normal. This neuroendocrine response was also seen in a study looking at the stress response in an Asian elephant being translocated from one zoo to

another. Therefore this implies that cortisol production returns to a baseline level within 10 days of the elephants being released and that they are not exposed to prolonged stress levels which can cause suppress the immune system if elevated for a long period of time. Therefore the welfare of the orphan elephants is not being deleteriously compromised by the reintroduction.

Post release data on the survivorship and behaviour of reintroduced animals are needed in order to increase the success of such projects. Therefore projects such as this can influence and improve the success of rehabilitation programs of elephants as well as other species.