

Comparative Study of Wild Elephant Social Behavior in Sri Lanka

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Summary

The Udawalawe elephant research project, ongoing in Udawalawe National Park (UWNP) Sri Lanka since 2006, is to our knowledge the longest running continuous study of Asian elephants in the wild and thus provides a unique opportunity to understand the needs and behavior of wild Asian elephants, which is a fundamental necessity if elephant populations are to be appropriately managed. Minneriya National Park, located in the central part of the country, also seasonally hosts a large elephant population and is a popular tourist destination. This elephant population has never been seriously studied. This project continues the ongoing monitoring effort at UWNP and conducts a preliminary excursion to MNP to begin building an ID catalogue for this population. We will use this as a basis for observations in additional years, after which we will attempt to rigorously estimate the elephant population size passing through this area. In the long term we hope to compare and contrast the two elephant populations in terms of their behavior and demography. One major concern highlighted last year was the illegal capture of calves from the wild for private ownership, an issue in many parts of Asia.

Differences are already evident from informal observations, namely the tendency of elephants in UWNP to persist in distinct social groups which seldom aggregate in numbers as large those observed in Minneriya. This was one of the motivations for comparing the two populations. The female social groups in Udawalawe are extremely flexible, changing from day-to-day in what is termed a “fission-fusion” social dynamic, but individuals nevertheless maintain long-term relationships across years with their putative relatives. Minneriya aggregations consist of discrete social groups which are difficult to distinguish when together as a herd but break up with the onset of rain. Although daily fission-fusion is not observable in this population simply because they can only be viewed over a small area which constitutes a dry reservoir basin, we will be interested to see if the same sets of individuals associate repeatedly across different years in Minneriya. We will also be interested in characterizing the structure of relationships among males in both populations.

Overall objectives

Our eventual aims are to compare the behavior and demography of elephants in the two populations occupying Udawalawe National Park (UWNP) and Minneriya National Park (MNP) respectively, both of which are popular tourist destinations and likely host a combined total of more than 2000 elephants. The study at Udawalawe builds on research ongoing over almost ten years whereas the elephants in Minneriya have never formally been studied. The conservation needs being addressed are that Asian elephants are poorly studied in the wild thus basic data on population numbers, behavior and demographic dynamics throughout Asia are lacking.

Specific objectives

Our aims during this year were 1) continue long-term monitoring of the elephant population in Udawalawe National Park and 2) to conduct a preliminary investigation of Minneriya National Park to establish an individual-identification catalogue similar to what we have established in Udawalawe and assess how monitoring could be conducted at this site. We expended 81 field days in UWNP (mornings and afternoons) and 16 field days in MNP (afternoons), with the remaining workdays spent on photo cataloguing, data entry, and processing as well as logistical activities such as vehicle repair and maintenance, trips to Colombo to the Department of Wildlife Conservation etc. This breaks down into approximately 30 % of working days per year in the field and 70 % of time in office or other supporting activities.

Activities

- 1) Monitoring at UWNP: We conducted road-based observations of elephants, photographing all individuals upon encounter and marking locations with GPS. We tried to assign calves to their mothers whenever possible, and thus keep track of new births, growth and deaths.

Concurrently the project hosted visiting researchers. Cornell University graduate student Michael Pardo was present from January – July 2015, studying elephant vocal communication alongside our daily activities. Dr. Lucy King from Save The Elephants' Elephants and Bees Project was present in July conducting playback experiments to assess Asian elephants responses to local honeybees. Our field staff provided help to these two projects, primarily in the form of logistical assistance and by identifying the elephants that were present. Both therefore shared field and staff costs with UWERP.

Findings and conservation outcomes

18 new calves were recorded among the known individuals which included surprisingly three females who had not previously been observed to have any calves during the study (i.e. their intervals between calves were > 6 years). We also documented two tuskiers that had newly arrived in the population: one sub-adult and one young-adult male. We also documented injuries if observed. Some notable instances involved the attempted abduction of calves, for

captive use. We, along with other local conservationists, drew media attention to these illegal activities, which also brought attention from several foreign nonprofits. International press included an article in Mongabay as well as a one-on-one Q&A interview with SdS on National Geographic's blog *A Voice For Elephants*, though the majority of reporting was in local news. SdS also highlighted the issue in talks and public lectures. The cumulative effect was greater public awareness, however political action was limited until the transition to a new government in January 2015. The new administration has been more proactive in prosecuting these activities, and we will continue to monitor the status of wild populations as well as the calves now confiscated from private owners.



Figure 1. [T458], a 3 year old calf known since birth, exhibiting what appear to be rope marks around his left foreleg. The other foreleg also had similar marks. Fortunately, it appears he was able to escape. It's unknown how many such calves simply go missing – we would then simply presume them to be dead. From breeding standpoint, it's equivalent since these animals would not contribute to wild populations.

- 2) Preliminary visit to MNP: Observations were conducted in August 2014. Elephants were best observed in afternoons in MNP, unfortunately we discovered that there are extremely high numbers of tourists as well. We focused on building photo IDs for this population. As in UWNP, we photographed animals upon encounter and marked their positions using a hand-held GPS. *Deviations from original plans:* It took slightly longer to get the necessary permit to work in MNP and make the necessary arrangements from the DWC as well as to complete some needed repairs for one of our vehicles, therefore we went there a bit later than originally anticipated, starting in mid-August instead of at the beginning of the month. Although we expected to conduct behavioral studies in future years, the high density of tourists congregating around elephants impeded observing undisturbed natural behavior. At this stage this did not affect our work as our primary aim was to identify individuals. In 2015 we will attempt to arrive earlier in the season and assess whether conditions are any better.

Findings and conservation outcomes

We are currently creating the individual-identification catalogue for Minneriya NP. This catalogue will be provided to the Department of Wildlife Conservation. So far we have identified an additional 26 males and 96 females. Work is still in progress and more individuals will be identified in coming months.



Figure 2: Adult female, sub-adult and a calf born in 2014.

We are also counting individuals by age-class (Figure 2), following our work in Udawalawe. Because the females themselves are not fully catalogued yet, keeping track of individual calves will not be feasible (since at this stage they can only be identified through their mothers). However, we can coarsely determine the proportions of individuals in the rough age classes adult, sub-adult, juvenile, infant, newborn as we did during the initial stages of our work in Udawalawe. If we come to know certain individuals better over multiple years, we hope to be able to refine these age classes into 10 year bins. As seen from Figure 3, six tuskers were seen in August 2014 in Minneriya NP. Three were mature adults males, two were sub-adults and one was a juvenile. It had already commenced raining by the end of August so the elephant herds scattered and no further observations were possible.

Other updates and activities

Both SdS and NJ received the President's Award for Scientific publication in October 2014 in recognition of their scholarship in previous years.

The Udawalawe Elephant Research Project, together with Michael Pardo (Cornell University) and Lucy King (Save The Elephants, Elephants & Bees Project) gave back to back presentations for a group of 9-10 grade students from a school adjacent to UWNP and the UWNP staff (see photos).

SdS presented research at the Society for Conservation Biology's Asia section meeting in Malacca in August of 2014 and was invited to present as a plenary speaker for the Association for Tropical Biology and Conservation Asia section meeting in Cambodia in 2015. In addition she presented her work at the University of Sheffield and Oxford University, in the UK, in 2015. She also participated remotely in a DEFRA workshop on indicators of well-being for captive elephants in the UK, offering expertise on resources that are critical for the well-being of Asian elephants. Lastly, SdS has been recently been invited to join the Asian Elephant Specialist Group.



Figure 3: Six tuskers were identified in Minneriya NP.

Evaluation of success

Our short term goals in Udawalawe are to maintain daily monitoring activities, which were relatively successful except that we could not simultaneously monitor both UWNP and MNP due to our limited staff. Our short term goals in Minneriya were to examine the logistics and costs of conducting a study as well as create a preliminary photo catalogue, which was successful. Unfortunately, we are unsure at this time whether we would be able to train new staff to work only in MNP as the seasonal nature of observations will always require that staff only work on a part-time basis. It is difficult to train skilled personnel on such short-term projects and it would likely be difficult to retain them year after year if there are gaps in the work load. An alternative possibility is to hire additional staff that would also work full time in UWNP and send them out to MNP on a rotating basis each year during the dry season. In the long run it would be more attractive as a form of employment for local staff, however a sustainable source of funding would need to be in place. In terms of our long-term aims, UWNP has already been quite a successful program that has shed a lot of light the basic biology of wild elephants. It is yet to be seen whether MNP will be so, however our preliminary observations are satisfactory.

Next steps

We submit reports to the Department of Wildlife Conservation of Sri Lanka periodically on all research projects. When we have completed the preliminary ID catalogue for the Minneriya elephants we will also provide this to the DWC. This catalogue will likely be modified and added to in coming years. This will serve as the basis for future observations and population estimates. In 2015 we will spend another month in MNP, hopefully earlier in the season this time so that we are well ahead of the rain.

In Udawalawe, our next step is to try to get a more statistically valid estimate for the number of male elephants using the park, and the nature of their relationships. This has so far been challenging because the males are more ephemeral occupants of the park, and their numbers seem to fluctuate more dramatically. As noted, we do continue to see completely new adults in the population, which is uncommon with females. Such instability makes it more difficult to estimate the true numbers, or indeed to understand how large an area the estimate should apply to, since the males are likely ranging further than the females.

We look forward to attending the BECT/IEF joint conference in Sri Lanka in September and presenting some of these results.

Thank you once again for your support!