Final Evaluation Report

Your Details	
Full Name	Dulan Pathum Jayasekara
Project Title	Conservation of Medium Sized Carnivores in and Around Three Protected Areas in Sri Lanka
Application ID	31593-1
Date of this Report	17/07/2022

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Species occurrence maps and data			☑	Species occurrence maps were created for all the focal species in all three study areas. Occupancy was evaluated habitat wise as well. Species distribution modelling was also conducted.
Generate population density estimates			☑	For the first time in Sri Lanka and for some focal species globally, population densities were estimated using the most updated methods in all three study areas. This data will immensely help the status evaluation for conservation and management. Few papers have already published. Data was provided to the Department Wildlife Conservation Sri Lanka.
Species identification methods (food analysis/genetic analysis/direct or indirect methods)		☑		Species identification was established via morphological features to a great extent. However, there was a drawback in genetic analysis due to unavoidable circumstances that arose due to the financial situation of the country. Direct and indirect identification methods are currently being investigated based on gathered data.
Knowledge dissemination		☑		Participation in national and international symposia and conferences (eight) publishing in conference proceedings. Six full paper publications in international peer reviewed journals. More paper publications to follow. Generated information has been and will be provided to relevant organisations (DWC/IUCN/CITES).
Conservation awareness			☑	Amid the unstable situation in our country, we were able to conduct conservation awareness programmes for school children in areas nearby the

Objective				Comments
				study sites. We were also able to construct roadside awareness boards and species information boards in and outside the protected areas (national parks) which was quite successful. We organised a creative writing and drawing competition for students. Newspaper articles and social media campaigns were also carried out parallel to this work. Development of mobile applications (species guides) has not been completed yet.
Generating data to help the status evaluation of the species of concern				A reasonable amount of new knowledge added to help status evaluations.
Conservation of habitats with high importance to the species				We could identify critical habitats and areas within each study site based on species occupancy and distribution modelling (MaxEnt) which will be highly useful for conservation of critical habitats.
Increasing visitor awareness in the protected areas				Information boards and road signs. Questionnaires could not be conducted due to Covid situation.
Creating a complete documentary on the focal species (medium sized carnivores)				This objective was included mid-way in the project after consulting The Rufford Foundation and trustees. We have obtained a reasonable amount of camera trap and other video footage and will be completing the video in the coming months.

2. Describe the three most important outcomes of your project.

a). Being able to evaluate the population densities of the focal species (12) in each of the study areas which would ultimately help the status evaluation and conservation.

b). The awareness programmes carried out in and around the protected areas

c). The vast amount of knowledge that was generated and disseminated.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

The field work was tough especially in Maduru Oya where we had to deal with elephants as well as poachers. We lost two camera traps during the project which

were stolen by poachers and illegal activists within the protected areas. However, our team was well determined and united with a great passion for conservation of wildlife. We received a great support from park officials as well. We were able to successfully complete camera trapping to the desired level in each of the protected areas. The latter part of the project was hugely affected by the financial crisis our country faced. The fuel prices, and all other costs drastically increased while the long-distance transport almost came to a halt. However, we were able to conduct the awareness programmes for school children especially in Sinharaja area (during the economic crisis) and we also completed several field visits even during the last month of our project. In mid stage of the project, the work was affected by Covid-19 pandemic, and it affected the workshops intended for school children and villagers. However, we could complete most of the pre-planned work at the end except a few. As a result of the financial instability of the country (lack of foreign currency) we were in short supply of imported chemicals and could not send samples for analysis abroad. We thank the Rufford trustees for granting an alteration of funds from genetic analysis to focus on creating a documentary. I am pleased to inform that we could obtain all the equipment we requested, and a good amount of footage has already been captured. However, to provide the final documentary we may need time as you would understand (there's a lot of work that needs to be completed in the from of obtaining publication rights from the relevant authorities, editing, formatting, narrating and related work which are currently in process).

4. Describe the involvement of local communities and how they have benefitted from the project.

We received a reasonable amount of support from the local communities during the project. There were wildlife and forest rangers who helped us immensely with our field work. Consequently, most of them were from the nearby areas of the parks and it helped us to send the message of conservation to their families and neighbours. During the camera trapping in areas adjacent to the parks/forest reserves, the enthusiasm shown by local stakeholders (farmers/teachers/school children/government officers/past wildlife officers) was something that should be mentioned. We believe that the workshops conducted helped us to reach the younger generation, especially in schools. Rather than working with elders, in the long term, if we were able to plant the slightest message on conservation and sustainable livelihoods, we believe that it is the most important outcome of the project. It will help sustaining and preserving these habitats and wildlife for generations to come. The leaflets, information boards, and roadside signs were used as resources to share knowledge and to build awareness on the medium sized carnivores in the study areas. We could observe an increase in the interest shown towards the focal animas (especially by school children) and the identification of species was more accurate following our outreach programmes. We organised a creative writing and drawing competition for students and provided stationery and information brochures for all the participated children and prizes for the most creative students.

5. Are there any plans to continue this work?

There are plans to continue this work in other protected areas of the Sri Lanka as well as targeting some other additional species such as leopard and sloth bear. We believe that the work carried out can be used as an example to conduct similar work in remaining critical forested areas of the country. Most of the work and information generated during the project were first time data/methods/results for the study areas and even for the island. Therefore, we plan to extend our work countrywide to help preserve the critical habitats for these carnivores integrating *in-situ* conservation and community outreach programmes.

6. How do you plan to share the results of your work with others?

We have already disseminated the results obtained during our work in the form of conference proceedings (eight, including Rufford in-country conference held in Kandy, Sri Lanka 2022), six peer reviewed journal articles. More publications are due.

We have shared our reports with Department of Wildlife Conservation and Forest Department of Sri Lanka. The local officers have been informed about critical areas for the medium sized carnivores, threats, and management requirements.

Knowledge sharing with the public and local stakeholders was achieved by information boards, information leaflets/brochures, and workshops.

Though not achieved yet, we hope to develop digital guides for species identification based on the information gathered during our work.

Finally, we are in the process of creating a documentary film which we hope would reach a greater audience delivering the message of conservation.

7. Looking ahead, what do you feel are the important next steps?

The implementation of the project recommendations is the most important next step that needs to be conducted by the government authorities as well as all other stakeholders. Extending the project to other areas of the country is also important which would help the island wide status evaluation and conservation of focal species. We hope to finalize the documentary that is being created using the gathered data before the end of this year.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Yes. We have used the Rufford logo in the leaflets, information boards in national park info-centres, and during our conference presentations (local and international). We hope to use the Rufford logo in the upcoming documentary to acknowledge the funding we received. There will be social media (Facebook/YouTube) programmes that we indent to conduct for further knowledge sharing.

9. Provide a full list of all the members of your team and their role in the project.

Dulan Jayasekara – Project investigator. Project management, organizing field work, coordinating with authorities, camera trapping, data analysis, publications and conducting workshops

Chathuranga Dharmarathna – Participating in the field work, sharing his field knowledge, camera trapping, publications. participation in special projects.

Sahani Chandrasiri – Participation during fields and special projects.

Prabhath Maldeniya - Participation during fields and special projects.

Praneeth Silva - Participating in the field work and project coordination work, participation in special projects.

Tharanga Dassanayake - Participating in the field work and project coordination work. Camera trapping, Workshop team member, participation in special projects.

Terani Kalhari – Field work, camera trapping, participation in special projects.

Wathmini de Silva - Participation during fields and special projects. Providing gifts for school children during workshops.

Dushantha Jayakody - Participating in the field work and project coordination work. participation in special projects.

Vinuri Mendis - Participation during fields and special projects. Providing gifts for school children during workshops.

Harsha Jayawickrama - Participation during fields and special projects.

Pawan Wishmith - Participation during fields and special projects.

Tharanga Prasad - Forest ranger - Field experience in Sinharaja Forest reserve, Villager from the nearby area of Sinharaja Forest, camera trapping, taking care of camera traps, guiding inside the forest.

Suranga Lakshitha - Wildlife ranger - Field experience in Maduru Oya, guiding inside the park, camera trapping, taking care of camera traps, transport.

Subash Hettiarachchi – Helped us design the information and sign boards, participation in special projects.

10. Any other comments?

I would like to acknowledge The Rufford Foundation, trustees, grant managers, and trust managers for providing me with the opportunity to initiate and conduct this project with your funding. As an early career researcher and post graduate student

(PhD) this Rufford Small Grant immensely helped me to achieve my objectives and research goals. My gratitude is extended to my PhD supervisor Prof. Dharshani Mahaulpatha for her guidance throughout. I thank my grant referees for their comments during the application process. Wildlife Circle team and everyone who supported are thanked.

At the completion of the project, I do believe that our work has contributed to update the much-needed knowledge on the occupancy, distribution, habitat associations, population densities of medium sized carnivores and critical areas that are important for their survival. Furthermore, we have carried out knowledge dissemination via information boards, info-leaflets, publications and by presenting in conferences. The community outreach and awareness building programmes carried out integrating roadside sign bords, and workshops to school children would deliver the message of conservation to the necessary stakeholders in a sustainable and long-term manner.

Publications:

In peer-reviewed journals

Jayasekara, D., Mahaulpatha, D., and Miththapala, S. (2021). Population density estimation of meso-mammal carnivores using camera traps without the individual recognition in Maduru Oya National Park, Sri Lanka. *Hystrix, the Italian Journal of Mammalogy*, *32*(2): 0. https://doi.org/10.4404/hystrix-00452-2021

Jayasekara, D. and Mahaulpatha, W.A.D. (2021). Modelling the habitat suitability for sympatric small and medium sized felids and investigating the spatiotemporal niche overlapping in Maduru Oya National Park, Sri Lanka. *Journal of Wildlife and Biodiversity. Journal of Wildlife and Biodiversity - doi: 10.22120/jwb.2021.534472.1247*

Jayasekara, D., P.K.P.M.P. Kumara and Mahaulpatha, W.A.D. (2021). Mapping the vegetation cover and habitat categorization of Maduru Oya and Horton Plains National Parks using Landsat 8 (Oli) imagery to assist the ecological studies. *Wildlanka*, 9(1): 122-135.

Jayasekara E.G.D.P. and Mahaulpatha W.A.D. (2019). Distribution, abundance, activity patterns and habitat characteristics associated with family Herpestidae (Mammalia: Carnivora) in three protected areas representing three main bioclimatic regions of Sri Lanka. *International Journal of Multidisciplinary Studies, 6*(2):79-91.

Jayasekara, D., Dharmarathne, W. D. C., Padmalal, U. K. K., Mahaulpatha, W. A. D., 2022. Camera trap data reveal the habitat associations, activity patterns and population density of Indian pangolin (*Manis crassicaudata*) in Maduru Oya National Park, Sri Lanka. Animal Biodiversity and Conservation, 45: 225-236, DOI: https://doi.org/10.32800/abc.2022.45.0225 (related research)

Dharmarathne, S.C., Jayasekara, E.G.D.P., Mahaulpatha, D. and de Silva, K., 2022. Camera trap data reveals the habitat use and activity patterns of a secretive forest

bird, Sri Lanka Spurfowl *Galloperdix bicalcarata*. Journal of Wildlife and Biodiversity, 6(X). (Related research)

Abstracts and conference proceedings

Presented in the Rufford in-country conference held in Kandy, Sri Lanka in January 2022.

Jayasekara, E.G.D.P., Mohomad, M.R., Lakshitha, S., Silva, G.KV.V.P.T. and Mahaulpatha, W.A.D. (2019). Assessing the mammalian assemblage of Maduru Oya National Park using camera traps. In: *proceedings of WILDLANKA International Symposium 2019.* Colombo (Sri Lanka).

Jayasekara, E.G.D.P. and Mahaulpatha, W.A.D. (2020). Investigating the Assemblage and Activity Patterns of Mesomammals of Order: Carnivora in Maduru Oya National Park Using Camera Trap. In: *Proceedings of International Forestry and Environment Symposium* (Vol. 25). Colombo (Sri Lanka).

Jayasekara, E.G.D.P. and Mahaulpatha, W.A.D. (2019). Abundance and Distribution of Family Herpestidae in Three Protected Areas Representing Three Bioclimatic Zones in Sri Lanka. In: *Proceedings of the 6th International Conference on Multidisciplinary Approaches (iCMA)* 2019. Colombo (Sri Lanka). pp. 118.

Jayasekara, E.G.D.P. and Mahaulpatha, W.A.D. (2020). Meso-mammal carnivore abundance and activity patterns in Horton Plains National Park. In: *Proceedings of the 7th International Conference on Multidisciplinary Approaches (iCMA)* 2020. Colombo (Sri Lanka).

Jayasekara, E.G.D.P. and Mahaulpatha, W.A.D. (2021). Modelling habitat suitability for small and medium sized felids in Maduru Oya National Park, Sri Lanka. In: *proceedings of International Conference on Wildlife Ecology and Biodiversity Conservation (ICWEB 2021)*, Arak University, Arak, Iran. pp.21.

Jayasekara, E.G.D.P. and Mahaulpatha, W.A.D. (2021). Meso-mammal carnivore abundance and activity patterns in Sinharaja, Sri Lanka. In: *Proceedings of 8th International Conference on Multidisciplinary Approaches (iCMA)*. Colombo (Sri Lanka).

Jayasekara, E.G.D.P., Silva, G.K.V.P.T., Dassanayake, T.D. and Mahaulpatha, W.A.D. (2021). Meso-Mammal Carnivore Coexistence and Habitat Niche Partitioning in Maduru Oya National Park. In: *Proceedings of Wildlanka International Symposium 2021.* Colombo, Sri Lanka.

Road-side Awareness and Information Board Establishing in the Study Sites

Sample conference presentation slide screen shots

MODELING THE DISTRIBUTION OF HERPESTIDS AND VIVERRIDS IN THREE PROTECTED AREAS IN DIFFERENT BIOCLIMATIC ZONES OF SRI LANKA

E.G.D.P. Jayasekara and Dharshani Mahaulpatha
Department of Zoology, University of Sri Jayewardenepura

Acknowledgement