The Rufford Foundation
Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Ugyen Tshering
Project title	Environmental Impact of Logging Activities on Red Panda (*Ailurus fulgens*) and their habitats in Forest Management Unit, Selela, Haa District, Bhutan.
RSG reference	21549-1
Reporting period	March 2017 – March 2018
Amount of grant	£4986
Your email address	ugyentse09@gmail.com
Date of this report	10th March, 2018

1. Please 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
Develop geo-referenced database of Red panda presence or absence in a given area. This database will provide reference point for long term monitoring of Red panda for Selela FMU.				Although no direct sighting of red panda was made along the transect lines during survey periods, GPS coordinates of indirect signs like bamboo nipping were recorded for future monitoring of animals with camera traps. Their potential habitat of 9.6 km^2, with important parameters of elevation range, forest types and river networks, has been mapped and developed GIS shapefile for FMU to facilitate future monitoring and assessment of red panda presence. This potential habitat will be permanent unit of habitat for future monitoring and assessment.
Estimate occurrence and relative abundance of Red panda in a given area. The estimates will help FMU to understand the change in population size and structure over time. Further, it will serve as baseline to assess impact of a particular threat, effectiveness of a conservation program and help the FMU to decide when and where to focus management interventions.				Systematic sampling was applied to estimate relative abundance. Although survey could not detect direct evidence of red panda during survey, we are of the opinion that an absence of evidence does not confirm the absence of red panda. Habitat suitability and other indirect signs were recorded with coordinates. This would help Selela FMU and Division to focus management intervention. From our study, we feel there is need and will recommend Selela FMU to assess presence or absence of red panda with installation of camera-traps within identified potential habitat in future.
Analyze habitat suitability and their preferences. This model would help to understand types of				Data recorded in the field during survey will be useful in analysing whether or not the potential habitat identified and mapped can support a red panda population.

habitat preference by species and designate some of areas as critical habitat to support a Red panda population.				This habitat preference by species will be baseline information for future assessment. Although 338 ha will be declared as an ecological reserve area, the area would not suffice. To this, to support and protect habitat from degradation through logging, upper portion of the identified potential habitat will be prescribed for protection in the next management plan.
Assess conservation threats and impact of logging. The assessment would help FMU to review forest management plan and decide an immediate conservation interventions.				Information on conservation threats and disturbances along transects and at each sampling plots recorded. Through this project, we observed more growth of bamboo in the understorey in logged areas than unlogged areas.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

The cost of hiring private vehicle for transportation of survey equipment and to reach surveyor escalated during negotiation with private vehicle owners. Limited pickup vehicles at the locality were the sole factor for price escalation. However, only two local guides were involved and five staff for survey and manage to take vehicles at hiring cost insisted by vehicle owners for the survey.

3. Briefly describe the three most important outcomes of your project.

- Identification and mapping of potential habitat of red panda for Selela FMU to better understand logging impact on their habitat was one of the achievements of the project. The potential habitat was identified and mapped through consultation and considering three important parameters of elevation range, forest types and river networks and previous locations of red panda through ground truth and land use and land cover 2016. This will serve as a permanent research or assessment habitat for red panda and other endangered animals to assess how timber logging affects their habitat.

  As direct sightings were not detected during survey period, logging impact on animal seems to be convincing. Nonetheless, inferences through analysis of survey information should confirm potential impact from logging operations. Further, more and periodic assessment through use of camera traps and different approach needs to be initiated in future to infer impact on habitat through logging even if growth of bamboos are promoted through openings of forest areas through logging operations. GIS shapefile has been

developed and Selela FMU will use this file as a reference point for monitoring of red panda within potential habitat and assess impact of logging over the years here after.

- Through this project, about 338 ha of undisturbed forest within FMU has been delineated as biodiversity reserve area for not only endangered fauna like red panda and others, but also for the benefits of several birds and floral diversity conservation from second phase of the management plan period. The existing biodiversity area would be extended further with prominent and permanent ground features for better management and conservation of the areas. With this reserve area from now, Selela FMU is expected to focus on ecosystem management as well besides management practices on sustained yield basis.

- Education of local communities on importance and co-existence of faunal to balance ecosystem services and development. Through this project, local people, especially residing within and adjoining Selela FMU, were educated on importance of red panda and education programme has raised level of awareness and understanding of local people on ecological and social benefits. Their commitment and support they wishes to provide to conservationist through their active engagement in anti-poaching, surveillance, protection, etc., was some of the positive indicative signs of effective collaborative approach in conservation and protection of such endangered animals hereafter.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Involvement of local communities is a crucial component in sustainable management of forests and Selela Forest Management Plan emphasise participation of local communities for plan implementation. In this project, local communities, particularly residing nearby potential habitat and ecological reserve area, have been involved at various levels. Firstly, local communities were involved during education on importance of red panda and other endangered species, their fundamental responsibilities and support, and participation in conservation and protection of those endangered animals. Secondly, people were involved during identification of potential habitat of Red panda and helped project to map 9.6 km^2 area of FMU, which will be incorporated into the management plan of Selela FMU from 2018. Thirdly, two local people were engaged during entire field survey with the team; escorting team members through thick forest with bamboo and helping team to guard survey equipments and camping site.

Through this project, as commented and provided feedback from local communities during education program, people have acknowledge the project team on educating them on status of red panda and other faunal species found within the FMU, and their cooperation and continued support to protect and conserve for wider ecological benefits. Further, they also knew about the presence of endangered faunal nearby their settlement and ecological role they play within

ecosystem. Towards this, they felt, to our best judgement, that their crucial role and support to be provided to the Forestry Department to protect through active engagement with forestry personals during anti-poaching activities to protect those animals from illegal hunting and killing by miscreants. To engage local communities, Selela FMU will programmed anti-poaching activities on annual basis from second phase of plan period to educate local communities and protect endangered animals from poaching.

5. Are there any plans to continue this work?

Absolutely, we will continue this work. This is the beginning of conservation works within sustainable forest management context. As a management planner, the obvious plan is to incorporate this conservation work plan into the Management Plan of Selela FMU from second plan period, which would commence from mid-year of 2018 with management inventory program.

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

The results and importance of the work will be shared as follows:

- With Selela FMU-Level Management Committee and other stakeholders of FMU in 2018 during initial stage of plan revision.
- The results will also be shared to the Natural Resources Development Corporation (NRDCL) to educate them on location of the conservation area and to avoid timber logging from second phase of the management plan period as per plan prescriptions.
- The incorporation of enlarged conservation areas will be shared to the Department of Forests and Park Services during plan presentation to the Department.
- Project results will be shared with the local communities of FMU to understand location of conservation area and their support for protection and avoidance from timber harvesting and any disturbances.
- Findings from the project will be published in a peer review journal for wider circulation of information.

7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?

With start of consultation programme in April 2017 and final survey in January 2018, the Rufford Foundation grant was used over a period of about 11 months.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Meeting with experts and local people to acquire better insights on red panda status, locality, and suitability of forests as habitat through consultation meeting	178	178	0	
Workshop training for survey team members on questionnaire survey formats, study area, duration, data recording and management for 3 days	250	276	-26	Could complete within two days. Expenditure was incurred for food items, refreshment and travel and daily allowances as per the government rate.
Purchase of survey equipment and survey gears	1500	1455	45	Two numbers of three men tents, two binoculars, 4 field torches and survey gears were purchased.
Field survey and data collection of 80 days by 7 survey enumerators and 5 local people as guide for four seasons	2700	2745	-45	Unexpected cost escalated for hiring of private vehicles for transportation of survey equipment and surveyors and guide due to worse condition of forest road and limited private vehicles. As a result, only two local guide and five staff (excluding project leader) were engaged for field survey.
Data management and compilation by engaging survey enumerators and local experts for 10 days	238	215	23	Four enumerators were engaged in data transfer, validation of data and compilation from raw field survey data format into computer excel spreadsheet. Expenditure was incurred for travel and daily allowance, working lunch and refreshment as entitled.

Presentation of survey findings to the department of forests and park services	120	70	50	Presented final potential habitat of red panda and 338 hectares ecological reserve areas to logging corporation and FMU.
	4986	4939		The balance today is 47 £ sterling because there are ongoing activities such as final presentation to the FMU-Level Management Committee in 2018.

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

My next step is to review and validate consolidated survey data for analysis and present to the Selela FMU-Level Committee in mid or by end of 2018. I will have to incorporate identified potential habitat of 9.6 km^2 into Selela FMU plan revision to facilitate Selela FMU for periodic monitoring of red panda and other faunal species. As current management plan lacks any prescriptions on impact assessment besides sustained yield management, from next plan period, there will be focus on ecosystem management as well, which will address some of the thematic elements of sustainable forest management. The conservation programs through community-based red panda monitoring within this identified potential habitat will be emphasised in the next plan period.

The next crucial steps is to incorporate 388 ha of area as ecological reserve area to serve as a part of potential habitat for not only red panda and other animals, but also to see future logging impact on both flora and fauna from 2019 and disseminate updates to Selela FMU and logging corporation for protection from Second Management Plan period. Selela FMU management plan will prescribe this area as Protection Working Circle wherein, no logging operation will be allowed henceforth.

To strengthen conservation efforts, management plan will have provision on annual anti-poaching activities within Selela FMU from second phase of plan period. Monitoring and assessment of red panda presence and absence within FMU through installation of camera traps will be another programme in the management plan. Educate local communities on tangible benefits on ecosystem through conservation of faunal and their active role and fundamental responsibilities to safeguard faunal species. To enable these next steps to happen, I will emphasise all these components and clearly prescribed as some of the management prescriptions of the plan for FMU.

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

Yes. The Rufford Foundation logo was used in presentation during consultation meeting and inception workshop at Haa, April 2017. The foundation logo was also used at presentation of red panda conservation work within Selela FMU and education on awareness to the local communities of Bampo village. Later, foundation logo was used during initial update of project work on foundation website.

In future, the Rufford Foundation will be used during final presentation of findings to the FMU-Level Management Committee. The foundation logo will be used in any future materials published out of this project.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

The following were the team members:

Mr. Ugyen Tshering, Project leader. He is responsible for coordination, data collection, analysis, communication and report writing.
Mr. Sonam Dorji, Unit in-charge, Haa-East FMU, Haa district. He was a member of project core team and helped project in logistic planning and field survey.
Mr. Sonam Jamtsho, Forest Ranger, Selela FMU, Haa district. He assisted project in developing survey design using GIS. He is also a core team member of project and assisted field survey.
Mr. Karma Nidup, Forest Ranger, Lon chhu FMU, Haa assisted project to carry our field survey.
Mr. Lhab Tshering, Senior Forester, Lon chhu FMU, Haa district. He helped for survey.
Mr. Kezang, Forester, Range Office, Haa district. He helped during field survey.
Mr. Tashi Dorji (Local guide), Haa district. He was responsible to guide survey team and as an assistant during field survey.
Mr. Sangay (Local guide), Haa district. He is also responsible to guide survey team and assist during field survey.

12. Any other comments?

I am extremely thankful to the Rufford Foundation for support of grants to peruse this important and crucial project towards conservation of endangered species. Through this project, potential conservation area of red panda has been identified and will be part of Selela FMU management from next plan period, which would commence from 2018 with management inventory for plan revision through financial support of Global Environment Facility-Least Developed Countries Fund project.

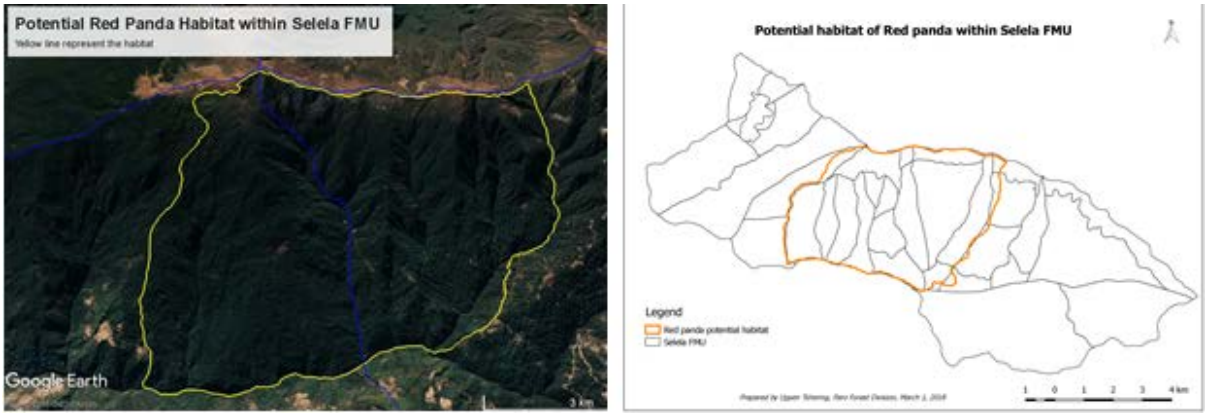

Figure 1. Study are with potential habitat map of Red Panda within Selela FMU in Kmz and QGIS shapefile as a reference point for future monitoring and conservation of species.

Figure 2. Profuse growth of bamboo along the logged corridor of Selela FMU and falls within potential habitat of Red panda.

Figure 3 (a). Red Panda at Tegola, which adjoins the identified potential habitat of Selela FMU. ©N.B.Pradhan (Sept., 2017). Figure 3 (b). Same individual. With its location & direction of movement, animal has just moved out from the identified potential habitat.

Figure 4. Habitat within logged areas (location of previous red panda direct sightings)