# Final Project Evaluation Report

| Your Details | |
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| **Full Name** | Bimal Raj Shrestha |
| **Project Title** | Butterfly Communities along Elevational Gradient and Conservation Initiatives in Trans-Himalayan Region, Nepal. |
| **Application ID** | 23980-1 |
| **Grant Amount** | £4980 |
| **Email Address** | bimalrstha9@gmail.com |
| **Date of this Report** | 29 Dec. 2018 |

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

| Objectives | Not achieved | Partially achieved | Fully achieved | Comments |
|---|---|---|---|---|
| Illustrate the diversity and distribution patterns of butterfly along elevational gradients in the southern aspect of the study area. | | | | During two surveys, April-May (pre-monsoon) and September-October (post-monsoon) 2018, a total of 40 butterfly species belonging to 33 genera and six families (Nymphalidae, Pieridae, Lycaenidae, Hesperiidae, Papilionidae and Riodinidae) were recorded. The family Nymphalidae has contributed highest majority in terms of species richness (19 species of 15 genera) followed by Lycaenidae (seven species of six genera), Pieridae (six species of five genera), Hesperiidae and Papilionidae contributed similar number of butterfly species richness (three species of three genera) and Riodinidae contributed the least number (two species of one genus) (see. Table 1). Comparing the recorded species richness of butterfly between two surveys, more butterflies were found during pre-monsoon (N=30) than post-monsoon (N=24) whereas 14 butterfly species was recorded from both the time periods (see Table 2). During the survey period we recorded the butterflies of families Nymphalidae and Papilionidae showed high elevational range cover whereas for specific species concern *Aglais cashmerensis* (Family: Nymphalidae) has been recorded covering maximum elevational range cover (i.e. 2200-5000 m).<br>Shannon-Weiner's diversity index (H') was used to calculate the butterfly diversity along the elevational gradients. So as, highest diversity index was obtained at the elevational |

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| | | | | range of 2000-2200 m i.e. H'=2.751. |
| Identify the status and update the checklists of butterfly from study sites | | | | The local status of recorded butterfly species in the study sites was measured on the basis of the number of individuals of the species counted during the study period. The butterflies were categorised into four categories: if the number of individuals of the species was one to two, the species was categorised as very rare; if three to nine, rare; if 10-20, common; and if more than 20, very common. On the basis of the frequency of butterfly species recorded, the status of 18 species were found very rare, eight rare, six common and eight very common. The detailed status of specific species of butterfly with number of individual recorded from study sites was provided in Table 1.<br>The first record of *Pontia daplidice* and a new high elevation record of *Carterocephalus avanti* (http://www.entomologyjournals.com/download/256/3-5-20-654.pdf) from the study sites provided significant update of butterfly species from the region. |
| School Conservation Education Programme and formation of conservation groups | | | | The school conservation education programme was conducted at seven schools in involvement of teaching staffs and more than 150 students of different localities. The students were found listening interestingly throughout the programmes and hence motivated in butterfly conservation. They also actively participated in drawing competition. We also have formed five six member conservation groups named "Friends of Butterflies". The members of the group were made from Grade 8, 9 and 10. However, in some schools, the student number was too small and we could not make the conservation groups. The main aim to form conservation groups is to established |

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| | | | | long-term conservation concept and hoping for regular monitoring of butterflies by the students within the localities in our absence. |
| Conservation awareness education initiation within the local communities | | | | We conducted community based conservation awareness education within local communities, hoteliers, herders, local tourists guide etc. at different localities. We found they have positive impact through this programme and we obtained kind support from them. However, in some localities the presence of local people was less in the programme as they are busy in their own occupation and business. Hence we could not reach them. |

**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.**

Weather challenge was only the major difficulties we faced during the project time period. Above 3000 m in second week of May, there was heavy snow fall that hindered the regular field work in the study sites. Thus, we had to extend our field days more than as we expected.

**3. Briefly describe the three most important outcomes of your project.**
**The three most important outcomes were;**

a) Diversity and distribution of butterfly along elevational gradients.
b) First record of *Pontia daplidice* and a new high elevation record of rare Himalayan butterfly species, *Carterocephalus avanti,* from the study sites.
c) Formation of conservation groups with participation of students.

**4. Briefly describe the involvement of local communities and how they have benefitted from the project.**

According to local communities this was the first community based conservation awareness programme conducted in the district regarding butterfly conservation. Hence we could not find the local people having good knowledge on butterfly ecology and taxonomy. However, this project plausible the fact that we could generate the citizen scientists which further can make their contribution in butterfly conservation. Furthermore, hoteliers, herders, local tourist guides and some other interested personalities of localities were supportive and fully satisfied indeed through the programmes and showed positive and responsive towards butterfly conservation.

**5. Are there any plans to continue this work?**

I am planning to extend such research in other sites of the trans-Himalayan area which could be very interesting to understand butterfly range extension and identifying the ecological significant variables. Besides these the current study site is a second most important tourist destination of the country thus building more local capacity and identifying butterfly sighting spots could be very important recreation and livelihood.

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

I am very much hopeful that sooner or later I could published the result of my project in scientific research paper. In addition I am planning to share my work through presentation in different wildlife conservation organisation, universities and schools of my own locality.

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

The grant was used over 9-month period (April-December 2018). Unlike the estimated time period for field work, due to snowfall during first field trip, we have to spend 5 days more for field work, otherwise rest of the project works were completed in actual time as mention in the project time schedules.

**8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.**

| Item | Budgeted Amount | Actual Amount | Difference | Comments |
|---|---|---|---|---|
| Field Materials | 160 | 150 | +10 | |
| Stationary Materials | 108 | 108 | - | |
| First-Aid | 75 | 75 | - | |
| Transportation | 132 | 132 | - | |
| Food (Including food for participation in conservation awareness programmes) and Accommodation 1300 + 215 | 1515 | 1535 | -20 | |
| Conservation Awareness Materials | 1552 | 1552 | - | |
| Field Allowance | 1318 | 1355 | -37 | |
| Report Preparation | 60 | 50 | +10 | |

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| Communication and Miscellaneous | 60 | 40 | +20 | |
| **Total** | **4980** | **4997** | -17 | |

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

I think extending study ranges in that region could be the important next steps. As this field visit provided only the information of butterflies from southern aspect of the study sites covering the elevation ranges of 2000-5200 m. Also we could only collaborate the local communities and schools located within that region. Hence, exploration of the butterfly range extension and strengthening conservation awareness could be the important next steps.

**10. 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, the logo of The Rufford Foundation was used in all conservation materials like posters, pamphlets, banners, t-shirts and in awards materials like certificates of appreciation and medals.

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

We had made five members team for the successful completion of this project.

1. **Bimal Raj Shrestha:** During the field period I generally work on data collection, identification and photography of butterfly. Sometimes I used to capture the confusing butterflies as well. My role was also to conduct the awareness programmes in schools and local communities.
2. **Min Bahadur Gurung:** During the field period he was giving to work to use field materials like GPS, Clinometer, thermometer etc. to collect data of geographical variables like elevation, latitudes, longitudes, temperature etc.
3. **Kiran Thapa Magar:** His role in the field was to capture the butterfly through butterfly net and also the photography of butterflies.
4. **Sanjaya Tamang:** He was hired in the second field. He has good knowledge in butterfly identification. Hence, he had contributed in butterfly identification, and conducting conservation awareness programmes.
5. **Tshering Lama:** He was hired as a guide.

Besides these helpful people, for the successful completion of this project I had obtained sound support from many expertise of the wildlife field like Prof. Dr Bhaiya Khanal, Dr Maan Rokaya, Dr Arjun Thapa, Mr Rishi Baral and Mr Sanej Prasad Suwal.

**12. Any other comments?**

This generous support by Rufford Foundation for my project make me more mature in the field of butterfly research. I feel myself honour to achieve the generous

support from the Rufford Foundation and helping me to explore some hidden facts related to butterfly from the trans-Himalayan region of Nepal. So I am truly grateful to the Rufford Foundation, UK. I would like to give much more contribution in butterfly research and their conservation throughout country sides in coming days so I expecting more support from the foundation in future.

Table **1**: Detail Checklists of Butterflies with their elevational range cover, abundance, preferred habitat and local status recorded from the Study Sites.

| SN | Family/Scientific Name | Elevational Range Cover (m) | Abundance | Habitat preferred | Local Status |
|---|---|---|---|---|---|
| | **Family: Nymphalidae** | | | | |
| **1.** | Nemetis chandica Moore 1857 | 2400-2600 | 1 | Forest area | VR |
| **2.** | Hestinalis nama Doubleday 1844 | 2000-2200 | 1 | Forest area | VR |
| **3.** | Aulocera swaha Kollar 1844 | 2600-3400 | 13 | Agricultural field and Forest area | C |
| **4.** | Aulocera saraswati Kollar 1844 | 2000-3000 | 3 | Forest area | R |
| **5.** | Danaus genutia Cramer 1779 | 2000-2200 | 2 | Edge of the forest | VR |
| **6.** | Danaus chrysippus Linnaeus 1758 | 2400-2600 | 1 | Agricultural field | VR |
| **7.** | Lethe sidonis Hewitson 1863 | 2000-2200 | 1 | Forest area | VR |
| **8.** | Lethe baladeva Moore 1865 | 2000-2200 | 1 | Forest area | VR |
| **9.** | Aporia agathon Gray 1831 | 2000-2200 | 7 | Wetland, Forest edge | R |
| **10.** | Ypthima sakra Moore 1857 | 2200-2400 | 1 | Open stepp hill | VR |
| **11.** | Vanessa indica Herbst 1794 | 2200-3400 | 10 | Agricultural field, Forest area, forest edge, grassland | C |
| **12.** | Vanessa curdi Linnaeus 1758 | 2200-4400 | 23 | Agricultural field, Forest area, Grassland, rocky and steppe hills | VC |
| **13.** | Argynnis children Gray 1831 | 2000-2200 | 1 | Forest area | VR |
| **14.** | Polygonia agnicula Moore 1872 | 3400-4200 | 9 | Grassland, Forest area | R |
| **15.** | Issoria isaea Gray 1846 | 2400-4200 | 60 | Agricultural field, Forest area, Grassland, rocky hills | VC |
| **16.** | Rhapicera moorei Butler | 2600-2800 | 1 | Forest area | VR |

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| | 1857 | | | | |
| **17.** | Euploea mulciber Cramer 1777 | 2000-2200 | 2 | Forest edge | VR |
| **18.** | Aglais cashmerensis Kollar 1844 | 2200-5000 | 40 | Agricultural area, forest area/or alpine forest area Grassland, rocky and steppe hills | VC |
| **19.** | Neope pulaha Moore 1857 | 2200-2400 | 1 | Forest Edge | VC |
| | **Family: Pieridae** | | | | |
| **20.** | Pontia daplidice* Linnaeus 1758 | 2400-2600 | 1 | Grassland | VR |
| **21.** | Colias fieldii Menetries 1855 | 2200-4200 | 91 | Agricultural area, forest area/or alpine forest area Grassland, rocky and steppe hills | VC |
| **22.** | Colias erate Esper 1805 | 3400-3600 | 2 | Grassland | VR |
| **23.** | Delias belladonna Fabricius 1793 | 2000-2200 | 8 | Wetland, Grassland | R |
| **24.** | Pieris canidia Linnaeus 1768 | 2200-3600 | 53 | Agricultural field, Forest edge, Grassland | VC |
| **25.** | Gonepteryx rhamni Linnaeus 1758 | 2200-3600 | 2 | Forest area | VR |
| | **Family: Lycaenidae** | | | | |
| **26.** | Lycaena phlaeas Linnaeus 1761 | 2600-3800 | 10 | Agricultural field, Grassland | C |
| **27.** | Acytolepis puspa Horsfield 1828 | 2000-2400 | 14 | Agricultural field, Grassland | C |
| **28.** | Celastrina huegeli Moore 1882 | 2000-2800 | 37 | Forest edge, wetland, Grassland | VC |
| **29.** | Polyommatus stoliczkanus Felder &Felder 1865 | 2600-4200 | 36 | Agricultural field, Forest edge, Grassland | VC |
| **30.** | Polyommatus nepalensis Forster 1961 | 3200-3800 | 12 | Agricultural field, Grassland, | C |
| **31.** | Heliophorus androcles Westwood 1851 | 2600-2800 | 1 | Forest area | VR |
| **32.** | Lampides boeticus Linnaeus 1767 | 2000-3600 | 13 | Agricultural Forest edge, grassland | C |
| | **Family: Hesperiidae** | | | | |
| **33.** | Carterocephalus avanti DeNiceville 1886 | 4200-4400 | 2 | Open steppe slopes | VR |
| **34.** | Taractrocera danna Moore 1865 | 3200-3400 | 1 | Grassland | VR |
| **35.** | Parnara guttata Bremer & Gray 1852 | 2000-3000 | 6 | Agricultural field, Grassland | R |
| | **Family: Papilionidae** | | | | |

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| **36.** | Parnassius hardwickei Gray 1831 | 4000-4800 | 7 | Open steppes slope | R |
| **37.** | Byasa latreillei Donovan 1826 | 2400-2600 | 2 | Forest area | VR |
| **38.** | Papilio machaon Linnaeus 1758 | 2800-4200 | 3 | Agricultural field, open steppe slope | R |
| | **Family: Riodinidae** | | | | |
| **39.** | Dodona dipoea Hewiston 1865 | 2400-2600 | 2 | Forest area | VR |
| **40.** | Dodona ouida Moore 1865 | 2000-2600 | 3 | Forest area | R |

Table **2:** Butterfly Species recorded during Pre-Monsoon and Post-Monsoon from the study sites.

| SN | Family/Scientific Name | Pre-Monsoon | Post-Monsoon |
|---|---|---|---|
| | **Family: Nymphalidae** | | |
| **1.** | Nemetis chandica Moore 1857 | 1 | 0 |
| **2.** | Hestinalis nama Doubleday 1844 | 0 | 1 |
| **3.** | Aulocera swaha Kollar 1844 | 0 | 1 |
| **4.** | Aulocera saraswati Kollar 1844 | 0 | 1 |
| **5.** | Danaus genutia Cramer 1779 | 1 | 0 |
| **6.** | Danaus chrysippus Linnaeus 1758 | 1 | 0 |
| **7.** | Lethe sidonis Hewitson 1863 | 0 | 1 |
| **8.** | Lethe baladeva Moore 1865 | 1 | 0 |
| **9.** | Aporia agathon Gray 1831 | 1 | 0 |
| **10.** | Ypthima sakra Moore 1857 | 1 | 0 |
| **11.** | Vanessa indica Herbst 1794 | 1 | 1 |
| **12.** | Vanessa curdi Linnaeus 1758 | 1 | 1 |
| **13.** | Argynnis children Gray 1831 | 0 | 1 |
| **14.** | Polygonia agnicula Moore 1872 | 1 | 1 |
| **15.** | Issoria isaea Gray 1846 | 1 | 1 |
| **16.** | Rhapicera moorei Butler 1857 | 0 | 1 |
| **17.** | Euploea mulciber Cramer 1777 | 1 | 0 |
| **18.** | Aglais cashmerensis Kollar 1844 | 1 | 1 |
| **19.** | Neope pulaha Moore 1857 | 1 | 0 |
| | **Family: Pieridae** | | |
| **20.** | Pontia daplidice* Linnaeus 1758 | 1 | 0 |
| **21.** | Colias fieldii Menetries 1855 | 1 | 1 |
| **22.** | Colias erate Esper 1805 | 0 | 1 |
| **23.** | Delias belladonna Fabricius 1793 | 1 | 0 |
| **24.** | Pieris canidia Linnaeus 1768 | 1 | 1 |
| **25.** | Gonepteryx rhamni Linnaeus 1758 | 1 | 0 |
| | **Family: Lycaenidae** | | |
| **26.** | Lycaena phlaeas Linnaeus 1761 | 1 | 1 |
| **27.** | Acytolepis puspa Horsfield 1828 | 1 | 0 |
| **28.** | Celastrina huegeli Moore 1882 | 1 | 1 |

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|---|---|---|---|
| **29.** | Polyommatus stoliczkanus Felder &Felder 1865 | 1 | 1 |
| **30.** | Polyommatus nepalensis Forster 1961 | 1 | 1 |
| **31.** | Heliophorus androcles Westwood 1851 | 0 | 1 |
| **32.** | Lampides boeticus Linnaeus 1767 | 1 | 1 |
| | **Family: Hesperiidae** | | |
| **33.** | Carterocephalus avanti DeNiceville 1886 | 1 | 0 |
| **34.** | Taractrocera danna Moore 1865 | 1 | 0 |
| **35.** | Parnara guttata Bremer &Gray 1852 | 0 | 1 |
| | **Family: Papilionidae** | | |
| **36.** | Parnassius hardwickei Gray 1831 | 1 | 1 |
| **37.** | Byasa latreillei Donovan 1826 | 1 | 0 |
| **38.** | Papilio machaon Linnaeus 1758 | 1 | 0 |
| | **Family: Riodinidae** | | |
| **39.** | Dodona dipoea Hewiston 1865 | 1 | 1 |
| **40.** | Dodona ouida Moore 1865 | 0 | 1 |

Note: * First record species from the study sites. "1" indicates presence and "0" indicates absence


Save Butterfly save Nature (Locality: Pisang, Manang Elev. 3200 m) (PC: Sanjaya Tamang)

Research Assistant Min Bahadur Gurung collecting the GPS data (PC: Bimal Raj Shrestha)


Heavy Snowfall during first field at Tilicho Base Camp, Manang (Elev. 4100 m) (PC: Min Bahadur Gurung)