



Darwin Initiative Main/Post/D+ Project Half Year Report (due 31 October 2016)

Project Ref No	22-002
Project Title	Complete Altitudinal Rainforest Transect for research and conservation in PNG
Country(ies)/Territory(ies)	Papua New Guinea
Lead Organisation	University of Sussex
Partner(s)	Binatang Research Center, Papua New Guinea
Project Leader	Dr Alan J A Stewart
Report date and number (e.g., HYR3)	7/11/16, HYR2
Project website/ Twitter/ Blog/ Instagram etc	
Funder (DFID/Defra)	Defra

1. Outline progress over the last 6 months (April – Sept) against the agreed baseline timetable for the project (if your project has started less than 6 months ago, please report on the period since start up to end September).

Output 1: Focal plant and animal taxa (plants, ants, moths, butterflies, amphibians and birds) surveyed along CART as base-line information for climate change impact monitoring, and results published.

The following activities have been conducted on the CART in the last 6 months:

- (i) an extensive survey of birds and their food resources, particularly fruits, along the CART transect, by UoS PhD student R. Hazell, three BRC paraecologists (G. Kaina, B. Koane and L. Paul) and eight local assistants who also received training in the methods of surveys.
- (ii) surveys of fig trees and fig wasps, supervised by BRC staff. Further, we have written a manuscript that is being reviewed by *Oikos*:
Volf, M., Segar, S., Zima, J., Isua, B., Brus, E., Sam, L., Sam, K., Souto-Vilaros, D. & Novotny, V. 2016. Limitations to gene flow between lowland and montane populations of *Ficus*.
- (iii) continued sampling insects from translocated fig trees and also analysis of natural communities for publication, including a phylogenetic structure of geometrid moths along the altitudinal CART gradient. Further, the community data contributed to the paper:
Beck, J. McCain, C. M., Axmacher, J. C., Ashton, L., Bärtschi, F., Brehm, G., Cizek, O., Colwell, R. K., Fiedler, K., Francois, C. L., Holloway, J. D., Intachat, J., Kadlec, T., Kitching, R. L., Maunsell, S. M., Merckx, T., Nakamura, A., Odell, E., Sang, W., Toko, P., Zamecnik, J., Zou, Y. & Novotny, V. Elevational species richness gradients in a hyperdiverse insect taxon: a global meta-study on geometrid moths. *Global Ecology and Biogeography*, in press.
- (iv) collaboration with R. Morris et al. (Oxford University) to conduct surveys of food gardens and local communities along the CART gradient, within the framework of a NERC project to monitor the impact of El Nino on indigenous communities. This project will have marked synergies with DI, using CART infrastructure and paraecologists while also bringing income to local communities and information useful for conservation to BRC. We have completed the first survey of gardens along CART, with a team of three BRC students and paraecologists with local assistants
- (v) BRC staff and CART local assistants were trained as a part of two new projects at CART, on parasitoid communities of *Drosophila* flies (J. Hrcek and O. Lewis, Oxford University) and on parasitoid communities of caterpillars (J. Hrcek and M. Libra, Czech Academy of Sciences).
- (vi) The results of community surveys on ants, butterflies, and birds (as well as ferns, analysed outside the DI project) at Mt Wilhelm were included in a high profile paper:
Colwell, R. K., Gotelli, N. J., Ashton, L., Beck, J., Brehm, G., Fayle, T. M., Fiedler, K., Forister, M. L., Kessler, M., Kitching, R. L., Klimes, P., Kluge, J., Longino, J. T., Maunsell, S. C., McCain, C. M.,

Moses, J., Noben, S., Sam, K., Sam, L., Shapiro, A. M., Wang, X. & Novotny, V. 2016. Midpoint attractors and species richness: Modelling the interaction between environmental drivers and geometric constraints. *Ecology Letters*, DOI: 10.1111/ele.12640.

with the Mt Wilhelm CART transect also featuring on the cover of the journal (including acknowledged of the DI project). This study proposes a new method for the analysis of transect biodiversity data and tests it using Mt Wilhelm (and other) data.

- (vii) Further, BRC paraecologist activities supported by our current - and previous - DI projects were featured in the paper detailing BRC as one of the leading paraecologists activities in the tropics: Schmiedel, U., Araya, Y., Bortolotto, I. M., Boeckenhoff, L., Hallwachs, W., Janzen, D., Kolipaka, S. S., Novotny, V., Palm, M., Parfondry, & M., Smanis, A. & Toko, P. 2016. The role of paraecologists and parataxonomists in leading citizen science into the biodiversity-rich world. *Conservation Biology* 30, 506-519, DOI: 10.1111/cobi.12661.

Output 2: Locally recruited field assistants, BRC para-ecologists and researchers trained in biodiversity surveys and biodiversity data interpretation to assist research along CART.

The following training activities have taken place in the last 6 months:

- (i) continued training of J. Yombai in ant ecology and taxonomy; based on his performance, we have encouraged him to apply for M. Phil. postgraduate study in Forestry at the PNG University of Technology. The application is pending.
- (ii) continued training of the 12 field assistants (from the 15 originally selected as three left for family and other personal reasons). This training included (i) botanical surveys, (ii) ornithology surveys, (iii) insect surveys, and also basics in data management and record keeping. These assistants also worked on the biodiversity survey projects detailed above as research practice for them.
- (iii) series of seminars presented by local or overseas researchers visiting BRC (including presentations from Agriculture University Prague Czech Rep., Smithsonian Tropical Research Institute Panama, Sussex University UK, University of South Bohemia Czech Rep., Natural History Museum of Denmark, University of Minnesota USA, Divine Word University PNG)
- (iv) Tropical Ecology university-level course taught by V. Novotny for BRC students and staff in a series of 12 standard lectures.
- (v) BRC opened the new 'Postgraduate Center for Biology', in collaboration with all major PNG Universities, in September. This event, attended by representatives of five PNG universities, several conservation NGOs, a representative from the Ministry of Education and local political representatives, marked the transition of BRC student training to a qualitatively new level, as BRC now hosts the largest group of postgraduate biology students in PNG. Although this was not strictly a Darwin initiative event, the Center will greatly benefit DI-sponsored students and activities.
- (vi) Para-ecologists Graham Kaina (botany) and Bonny Koane (ornithology) had a 2-month training visit to various Darwin Initiative project collaborators including:
 - a one-month stay in the UK, receiving training from: A. Stewart & M. Peck (Univ. Sussex) on data analysis techniques; M. Wilson (National Museum of Wales) on entomology and curatorial techniques; R. Morris & O. Lewis (Zoology Department, Oxford) on field entomology and experimentation
 - one month visit to the Biology Centre of the Czech Academy of Sciences and the Zoology Department at the University of South Bohemia in the Czech Republic, as long-term partners of BRC running several research projects at CART (K. Sam – birds, S. Segar – *Ficus* trees and their pollinators, L. Sam – *Ficus* trees and their herbivores, J. Hrcsek – *Drosophila* communities and their parasitoids, M. Libra – caterpillars and their parasitoids).
 - one week visit to Malaysia where T. Fayle (Imperial College London and Czech Academy of Sciences) hosted them on his field research project at the SAFE rainforest fragmentation experiment (<https://www.safeproject.net/>), and they also visited the Mt. Kinabalu altitudinal rainforest transect – the closest parallel to the Mt. Wilhelm CART in the Australian-Pacific region.
 - 3-day visit to the National University of Singapore, hosted by D. Bickford to see conservation research projects at the Department of Biological Sciences.
 - they gave talks/seminars on their work at the Biology Centre of the Czech Academy of Sciences, University of Sussex (twice), University of Oxford, and National Museum of Wales.

Output 3: PNG Honours and M.Sc. students trained in biodiversity research.

All students continue their projects. G. Aubona was accepted for MSc study at the University of Goroka and is presently on a 2-months study trip in Sweden funded by an EU stipend.

Output 4: New forest conservation areas established by local landowners along CART.

We have continued our work with the landowner communities, explaining the benefits and addressing the problems of conservation on their lands. This work, done by BRC paraecologists at all seven sites, culminated by a community-wide meeting on 23-24 July at Numba Village with representatives of communities and landowners from along the entire Mt Wilhelm transect from 200 to 3200 m asl. (i.e. from the lowlands to the upper border of the existing Mt Wilhelm National Park). Since then, we have

continued working with individual communities, addressing their concerns. In September, we dispatched a BRC survey team to map the borders of proposed protected areas in each community, using GPS. This has been completed and we are now in the process of evaluating the results. The next steps will be: (i) finalizing the areas proposed for conservation, (ii) signing community deeds with the landowners, (iii) writing a proposal for the Conservation and Environment Protection Agency (CEPA) of the PNG Government, (iv) getting approval from the Provincial Government, (v) getting approval from CEPA and having the PNG Government declare the Conservation Area. BRC hosted the local Member of Parliament for Usino-Bundi, Anton Yagama, in July at BRC premises to discuss the Conservation Area. BRC representative Pagi Toko was invited by CEPA to take part in a seminar on reviewing the new law on conservation areas and national parks that is being drafted for the PNG Parliament. BRC was approached by Rainforest Alliance (<https://www.rainforesttrust.org/>) to submit a proposal for financial support to implement CART conservation; the proposal is in preparation for the December 1st deadline.

Output 5: Financial situation of indigenous forest owners improved along CART.

We have started plans with the local community to upgrade the camp in Numba, at the centre of CART, to be suitable for tourist visit accommodation. These plans should be implemented in 2017. During the community meeting in July, we have started developing an entry fee structure and started the community process to appoint personnel to be trained for financial management and logistics. The training process and the creation of relevant management and visitor rules will only be possible after the land borders for the conservation area have been clarified, during the next 6-month period of the project.

2a. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

On their way to the UK this summer, the two para-ecologists (Graham Kaina and Bonny Koane) were prevented from boarding their flight from Colombo airport, Sri Lanka to London. They were held in transit for two days but despite numerous enquiries, we were unable to establish the reason for this, either before or since. We are currently in dispute with Sri Lankan Airlines over the £2,244 that we had to spend to enable them to continue their journey to Europe. Once the visitors had safely reached their destination, I informed Eilidh Young on 17th August.

2b. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?

Discussed with LTS: Yes/No

Formal change request submitted: Yes/No

Received confirmation of change acceptance Yes/No

3a. Do you currently expect to have any significant (e.g., more than £5,000) underspend in your budget for this year?

Yes No Estimated underspend: £

4. Are there any other issues you wish to raise relating to the project or to Darwin’s management, monitoring, or financial procedures?

No, but please see attached responses to issues raised in the review of our first Annual Report.

If you were asked to provide a response to this year’s annual report review with your next half year report, please attach your response to this document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also be raised with LTS International through a Change Request.**

Please send your **completed report by email** to Eilidh Young at Darwin-Projects@ltsi.co.uk. The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g., Subject: 22-035 Darwin Half Year Report**