



*Tropical Andean Butterfly Diversity  
Project*

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*Proyecto Diversidad de las Mariposas  
Andinas Tropicales*



# **Darwin Initiative Annual Report 1 2005-2006**

10 April 2006

# ***Darwin Initiative for the Survival of Species*** **Tropical Andean Butterfly Diversity Project**

## ***Annual Report***

### **1. Darwin Project Information**

Project Ref. Number	475 or 14-047
Project Title	Tropical Andean Butterfly Diversity Project
Country (ies)	Venezuela, Colombia, Ecuador, Perú, Bolivia, USA, UK.
UK Contractor	University College London (UCL)
Partner Organisation(s)	<b>Venezuela:</b> Museo del Instituto de Zoología Agrícola, Universidad Central de Venezuela, Maracay; <b>Colombia:</b> Instituto de Ciencias Naturales, Universidad Nacional de Colombia; <b>Ecuador:</b> Museo Ecuatoriano de Ciencias Naturales, Quito; <b>Perú:</b> Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima; <b>Bolivia:</b> Museo Noel Kempff M., Santa Cruz. <b>USA:</b> McGuire Center for Lepidoptera, Florida; <b>Andes Region:</b> Conservation International. <b>UK:</b> The Natural History Museum (NHM).
Darwin Grant Value	£ 149,187
Start/End dates	August 2005/6- Apr-Mar 2008/9
Reporting period (1 Apr 200x to 31 Mar 200y) and report number (1,2,3..)	1 Apr 2005 to 31 Mar 2006 Annual report number 1
Project website	TBA
Author(s), date	J. Mallet, K. Willmott, B. Huertas, 20 April 2006

### **2. Project Background**

The Tropical Andean Butterfly Diversity Project is a collaborative initiative involving the UK, USA and five tropical Andean countries. To date the majority of work has been conducted in the Natural History Museum London and the McGuire Centre for Tropical Lepidoptera and Biodiversity, USA, with additional work at the other institutions listed above as partner organisations.

The Convention on Biological Diversity (CBD) requires signatory countries to identify and conserve globally important components of their biodiversity. Meeting this obligation requires knowledge of the diversity, distribution and ecology of species. While such knowledge might be available for some vertebrate groups, data are almost non-existent for insects, which make up 70% of terrestrial species, are often highly endemic and are vital to ecosystem health.

Among insect groups, butterflies are regarded as one of the best potential indicator groups for biodiversity conservation because of the extent of existing knowledge, relative ease of survey and value in communicating ideas about conservation to the public. However, despite a recent renaissance in research on Andean butterflies, the world's richest and most poorly known fauna, Andean countries still lack an adequate knowledge of their national butterfly faunas.

Institutions and governments throughout the Andean region have highlighted the urgent need for basic systematic and biological data, and a number of small-scale

efforts to compile such information exist (e.g. by Conservation International (CI); project at Museo del Instituto de Zoología Agrícola Francisco Fernández Yépez [MIZA], Venezuela). However, such efforts are hindered because taxonomic expertise and the world's richest sources of collections information still reside mainly in UK (the NHM has c. 20% of world specimens) and the USA.

The project aims to address the biodiversity challenge posed by tropical Andean butterflies. This challenge consists of increasing the number of trained workers on the region's butterflies, making distribution data and photographs of specimens widely available, assessing the true diversity of species and subspecies, resolving the systematics and classification at many levels, obtaining baseline data on biology and distribution, and applying such data to begin to conserve threatened elements of the fauna.

### 3. Project Purpose and Outputs

Our purpose is to establish a regional research and conservation programme on tropical Andean butterflies, by building national institutional capacity and providing a vital baseline of information on butterfly diversity, distribution and abundance. We have three main goals:

- 1) To compile existing data on the distribution and abundance of 'true' butterflies (Papilionoidea - c. 3500 species) occurring in tropical Andean countries
- 2) To provide training to national institution staff and students, a network of taxonomic experts and the necessary tools (curated collections and databases) for butterfly diversity data to be maintained and augmented in the future; and
- 3) To analyse data in order to apply World Conservation Union (IUCN) criteria of conservation status to species and, together with project partners, produce a clear strategy for future butterfly research and effective conservation throughout the region.

**Note:** None of the proposed outputs has been modified since the project start date.

### 4. Progress

The project as a whole has been underway for three months, starting in January 2006, although some activities were begun in August 2005, since a key staff member, Blanca Huertas (BH), was available earlier than anticipated. The two principal activities have been work on the distribution database and organisation of the project planning workshop for April.

**Database:** A Microsoft Access database for recording museum specimen data has been completed and database protocols established. The database allows users to enter only existing taxon and locality names from other tables, thus permitting control of data input quality. Images of a representative male and female of the species are shown to permit verification of identification. Over 11,000 specimens of Papilionidae and type specimen information have been databased from the Natural History Museum, with curation where necessary. Photographs of a significant number of Papilionidae types have been taken in the Natural History Museum (c. 2,000 digital images). This progress has been significantly more rapid than anticipated due to the earlier hiring of BH.

**Website:** the website has not yet been established as originally planned. The main reasons for this include not only the greater amount of time spent organising the workshop because of its larger size, but also a desire to integrate the website with other new initiatives. For example, Dr Chris Jiggins at the University of Edinburgh established an online database of genetic data and we have been discussing how best to allow genetic and distribution data to be combined from separate databases. Issues discussed include methods for updating data sources, programming

languages, interfaces and web servers. We are also implementing a close data match between the data of the Neotropical Butterfly Checklist of Dr. Gerardo Lamas, and its implementation in the LepIndex database (<http://www.nhm.ac.uk/research-curation/projects/lepindex/>), which is separately funded by The Global Biodiversity Information Facility (GBIF). The Florida Museum of Natural History (FLMNH) has agreed to provide the server space for the Darwin website, in addition to IT support. A website developer has been contacted and agreed to undertake the work required to develop the database interface. We thus plan to have an operational website by mid-2006. This slight delay meant that publicising the project and recruiting volunteers will also have to wait (a project website containing useful data is important for such activities).

**Planning workshop:** At the time of submitting this report, we are developing the First Regional Meeting of the project in Florida, USA. We have confirmed 16 national experts, representing all tropical Andean countries and including regional coordinators and other local authorities. Facilities such as travelling (international and national), accommodation, invitation letters and VISA applications aid have been organised for all participants. The meeting will be held in the McGuire Centre at the Florida Museum of Natural History (FLMNH). FLMNH has also donated \$10,000 (US dollars) towards the meeting costs, permitting approximately twice as many participants to be invited as initially planned. The final Meeting outline (and Spanish version) and original proposal of the project, have been distributed, discussed and agreed with all participants (see Appendix 2). We have designed a logo for use in all publicity (see cover of this report). Specialised equipment such as cameras, laptops etc have been bought, some of which will be distributed during the meeting to Andean country participants. The project has been formally presented to the Directors of the Natural History Museum and McGuire Centre. Two volunteers have joined the project in the UK.

Curation of the McGuire Center collections (needed prior to databasing) has not proceeded as planned, due to an unexpected volume of donated collections which has taken up much curatorial staff time and lack of drawers for housing these donations. In addition, KW has been involved almost full time in preparing the student course lectures prior to the workshop. It is expected that more resources for curation will be available in May and KW will be working then to complete a significant amount of curation.

Discussion with Conservation International staff has suggested the importance of a site-based approach to prioritisation of conservation areas, rather than the grid-cell approach originally envisaged. A number of additional institutions and individuals in host countries have become involved in the project and pledged assistance in organising student courses.

<b>Project implementation timetable for period April – September 2006 (half-year report due)</b>		
<b>Date</b>	<b>Financial year</b>	<b>Key milestones</b>
Apr 2006	Apr-Mar 2006/7	Project planning and training workshop at MCLB, Gainesville, for national coordinators, UK members and other specialists, to finalise methods, goals, and develop training programmes. Computers, cameras and field equipment purchased.
May 2006	Apr-Mar 2006/7	Student training course content finalised. 1 <sup>st</sup> student training courses advertised in Andean universities. Curation of MCLB Ithomiinae collection complete. Databasing of MCLB collection started. Databasing and photography in NHM of Pieridae and Melitaeini underway. Project website established. Preliminary curation of Andean collections and databasing underway.
Jun 2006	Apr-Mar 2006/7	Project website database interface in operation. Students for 1 <sup>st</sup> training courses selected from submitted CVs and statements of interest. Standard field survey techniques manual published and online.
Jul 2006	Apr-Mar 2006/7	Preliminary curation of Andean collections (c. 80,000 specimens) complete.
Sep 2006	Apr-Mar 2006/7	Preliminary curation of MCLB focal groups complete. First student training courses completed (60 students in 2 countries). Staff training in identification, curation and databasing. Additional curation of Andean collections.

## **5. Actions taken in response to previous reviews (if applicable)**

Not applicable

## **6. Partnerships**

During the first 8 months of the project we have been in continual contact with representatives and delegates from partner institutions, mainly via email, discussing project goals and activities and arranging the details for the Gainesville meeting. The project has already successfully established and coordinated an international network of butterfly biodiversity specialists.

We have contributed data to “Repatriation of data of the Lepidoptera deposited in the collection of the McGuire Center for Lepidoptera and Biodiversity”, funded by Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO), a project on diversity and conservation of Mexican butterflies. In turn, they will contribute Mexican distribution data for tropical Andean butterflies. We are collaborating with the German museums GART-GloBIS butterfly project by sharing and contributing photographs of type specimens of neotropical Papilionidae. We have also been able to secure copies of digital images of Pierinae types in the NHM and the US National Museum of Natural History (USNM) from Dr Stanislav Abadjiev, who recently completed a number of papers on type specimens of this subfamily. Both of the latter projects/individuals have permitted us to use their images on the Darwin project website.

## **7. Impact and Sustainability**

Beyond our contacts with specialists from the partner countries, no efforts have been made to promote the project in host countries. Such promotion will take place after finalisation of project goals and activities at the April workshop, and when the establishment of a functional project website is complete.

The project was introduced by José Clavijo (Venezuela coordinator) during the meeting of CABI Bioscience in England on Feb/2006, during the annual meeting of ABBIF in Campinas, Brazil and together with Gonzalo Andrade (Colombian coordinator) at the AndinoNET meeting in Curitiba, Brazil in March 2006. Additional further publicising of the project, including in entomological journals and newsletters, will be done after a project website is available.

## **8. Post-Project Follow up Activities (max 300 words)**

Not applicable

## **9. Outputs, Outcomes and Dissemination**

**Training products:** 10 lectures (Microsoft Powerpoint) were completed in preparation for the April workshop and to be used in the student courses. These lectures cover topics including systematics, ecology, evolution, biogeography, conservation and museum resources. Lectures will be translated into Spanish and used in the student courses organised by this project, as well as being made available to host country institutions for their own training use. No lectures were expected to be completed by this stage, but it was decided that it would be important to have these ready for discussion at the April workshop.

**Scientific articles:** 18 articles on neotropical butterflies by principal project members have been published (Table 2, Appendix 3) or are submitted or in press. These articles concern systematics, evolution and biology and broaden knowledge and understanding of tropical Andean species. Electronic versions will be made freely available (where permitted under copyright laws) on the project website.

**Database and other digital outputs:** the database is substantially more advanced than predicted by the end of the report year due to the early hire of BH. In addition to development of the database structure (original goal), c. 11,000 Papilionidae specimens have been databased from the NHM (see also 4 above). WORLDMAP software was initially intended to be developed for each country. However, recent discussions with staff from Conservation International have suggested we adopt a site-based rather than grid-based approach to area prioritisation, so no further steps have been made to develop this software. Approximately 30% of species are represented in the digital photograph collection, which contains some 7,000 images, including donations from two other projects. Coverage of subspecies and individuals is much higher than originally anticipated and should greatly help identification.

**Website:** The project website is not yet established as originally planned. This is due to reallocation of time to preparing student lectures (see above) and the desire to enable the database to be integrated with other new online databases that have only recently become available. Discussions with website developers and other lepidopterological initiatives with online databases have agreed on programming languages and web server for the website, and final design will be discussed during the April meeting.

**Resources raised:** £18,231 of additional contributions were secured towards the project, including all those identified in the original proposal. Additional resources raised include a donation of \$10,000 from the Florida Museum of Natural History and McGuire Center towards the cost of the planning workshop at the end of April, and contributions from Andean country institutions and individuals towards the travel costs of meeting participants (i.e Instituto Venezolano de Investigaciones Científicas, Venezuela; Conservation International; Museo Noel Kempff, Bolivia; Universidad de los Andes, Colombia).

**Dissemination activities:** none have been conducted to date.

**Table 1. Project Outputs (According to Standard Output Measures)**

Code No.	Quantity	Description
7	1	10 lectures (Microsoft Powerpoint) on neotropical butterfly biology and conservation for student training courses
11A	6	6 research papers on tropical Andean butterflies published in peer-reviewed journals by principal project members (Mallet, Willmott, Huertas, Lamas) See Appendix 3.
11B	12	12 research papers on tropical Andean butterflies submitted to peer-reviewed journals by principal project members (Mallet, Willmott, Huertas, Lamas) See Appendix 3.
12A	3	Taxonomic database: contains 10,959 records for species-level taxa; locality database: contains 6,846 locality records for museum specimens; specimen and literature record database: contains c. 11,000 specimen records for Papilionidae at BMNH
23	£18,231	Contribution from FLMNH towards organising workshop in Gainesville (£5882); Contributions from partner institutions and workshop participants towards travel expenses (c. £2500); overheads (UCL, FLMNH and South American institutions) (£3666); salary time of project members (£6183)

**Table 2: Publications\***

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost to project £
Journal	2006. Brower, A. V. Z., Freitas, A. V. L., Lee, M.-M., Silva Brandão, K. L., Whinnett, A., and <b>K. R. Willmott</b> . Phylogenetic relationships among the Ithomiini (Lepidoptera: Nymphalidae) inferred from one mitochondrial and two nuclear gene regions. <i>Systematic Entomology</i> , 31(2): 288-301.	Royal Entomological Society	<a href="http://www.ucl.ac.uk/taxome/jim">http://www.ucl.ac.uk/taxome/jim</a>	0
Journal	2005. Whinnett, A., <b>Willmott, K.R.</b> , Brower, A.V.Z., Simpson, F., <b>Lamas, G. &amp; Mallet, J.</b> Mitochondrial DNA provides an insight into the mechanisms driving diversification in the ithomiine butterfly <i>Hyposcada anchiala</i> (Lepidoptera: Nymphalidae, Ithomiinae). <i>European Journal of Entomology</i> 102: 633-639.	Institute of Entomology of the Czech Academy of Sciences	<a href="http://www.ucl.ac.uk/taxome/jim">http://www.ucl.ac.uk/taxome/jim</a>	0
Journal	2005. Whinnett, A., Zimmermann, M., <b>Willmott, K.R.</b> , Herrera, N., Mallarino, R., Simpson, F., Joron, M., <b>Lamas, G.</b> and <b>Mallet, J.</b> Strikingly variable divergence times inferred across an Amazonian butterfly 'suture zone'. <i>Proceedings of the Royal Society B</i> 272: 2525-2533.	The Royal Society	<a href="http://www.ucl.ac.uk/taxome/jim">http://www.ucl.ac.uk/taxome/jim</a>	0

Journal	2005. Whinnett, A., Brower, A.V.Z., Lee, M.-M., <b>Willmott, K.R., &amp; Mallet, J.</b> (2005). Phylogenetic utility of Tektin, a novel region for inferring systematic relationships amongst Lepidoptera. <i>Annals of the Entomological Society of America</i> 98: 873-886.	The Entomological Society of America	<a href="http://www.ucl.ac.uk/taxome/jim">http://www.ucl.ac.uk/taxome/jim</a>	0
Journal	2005. Hall, J. P. W., and <b>K. R. Willmott.</b> A new species of <i>Paiwarria</i> (Lepidoptera: Lycaenidae: Eumaeini) from western Ecuador. <i>Proceedings of the Entomological Society of Washington</i> , 107(4): 960-967.	The Entomological Society of America	PDF will be made available on project website	0

\* See also Appendix 3

## 10. Project Expenditure

## 11. Monitoring, Evaluation and Lessons

**Tangible outputs:** progress on compiling information on distribution of tropical Andean butterflies has been evaluated via the number of records in the project database, the number of species represented and number of distinct localities represented. The number of butterfly images and species with images permits assessment of progress towards a complete taxonomic digital archive for the region. Completion of lectures by individual project members permits assessment of development of student courses and thus progress towards student training.

**Written reports:** no written reports have yet been requested from participants since the project has only been underway in its entirety for 3 months.

**Evidence that outputs contribute to project purpose:** such evidence would include publications using data compiled by the project which advance understanding of tropical Andean butterflies, publications by students and staff involved in the project on tropical Andean butterflies as evidence of training value of project, implementation of conservation action by Conservation International (allocation of resources, training, etc) and other organisations based on recommendations published by the project and project data. Such evidence is likely to accumulate only during the second and third project years and subsequent years.

**Lessons:** none to date.

## 12. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum)

We have successfully coordinated international expertise between UK, USA and Latin America to build the project team. This team is now in the process of assembling, for the first time, readily available information of the butterflies of the World's most diverse terrestrial hotspot.



Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2005/2006

Project summary	Measurable Indicators	Progress and Achievements April 2005-Mar 2006	Actions required/planned for next period
<ul style="list-style-type: none"> <li>• <b>Goal:</b> To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve-                             <ul style="list-style-type: none"> <li>▪ The conservation of biological diversity,</li> <li>▪ The sustainable use of its components, and</li> <li>▪ The fair and equitable sharing of benefits arising out of the utilisation of genetic resources</li> </ul> </li> </ul>			
<p><b>Purpose</b> To establish a regional research programme and conservation priorities for tropical Andean butterflies, through improved knowledge of their diversity, distribution and abundance.</p>	<p>Enhanced institutional capacity for butterfly research and conservation</p> <p>Synthesised knowledge of butterfly diversity, distribution and abundance</p> <p>Current and future priorities for research and conservation identified.</p>	<p>Training and planning workshop in Gainesville end April 2006 organised.</p> <p>Butterfly distribution database with partially complete locality, taxonomic and specimen data.</p> <p>Data shared with CONABIO project on Mexican butterflies.</p>	<p><b>Lessons:</b> stronger involvement of host country institutions and individuals should make project activities more effective</p> <p><b>Actions:</b> completion of training/planning workshop; completion of first set of student courses; establishment of website and publication on web of first distribution dataset for a large Andean butterfly group (Papilionidae)</p>
<p><b>Outputs</b></p>			
<p>Enhanced institution staff capacity for butterfly research.</p>	<p>10 staff from 5 partner institutions trained in identification, curation, databasing and grant proposal writing.</p>	<p>Training and planning workshop: 16 participants, flights booked, accommodation, transport organised; meeting outline and agendas drawn up; project logo designed; network of experts established</p>	<p><b>Lessons:</b> staff of host institutions have a very broad level of knowledge, so difficult to design a single training course for all; solution was to present the same course to be offered to students to ensure equal baseline knowledge prior to meeting discussion; workshop took longer to organise than anticipated, in part due to donation of money from FLMNH which permitted more participants to be invited</p> <p><b>Actions:</b> Workshop end of April</p>
<p>Students trained in butterfly systematics, field survey methods and</p>	<p>Field survey manual; 2 student-training workshops of 1 week per country (30 students per course,</p>	<p>10 of the 16 lectures planned for the student field courses written as</p>	<p><b>Lessons:</b> Involvement of host country specialists to give lectures on their own</p>

data analysis.	total 300 students). 40 students receive further training and support for dissertation research.	Powerpoint presentations	research <b>Actions:</b> Preparation of field survey manual; Planning workshop in Gainesville to finalise details of student courses, including location, timing, costs, personnel, and course content. Discussion of possible dissertation projects.
Curated national collections.	National collections (minimum of 5, 1 per country) curated and identified.	None to date	<b>Actions:</b> assist host country preliminary collections curation via visits in person and e-mail and provision of digital images, mostly of type specimens
Darwin Andean Butterfly Database.	Taxonomic and photographic database established; NHM, MCLB and partner collections databased (3500 species, 150,000 specimens).	Database structure established; taxonomic data uploaded (10,959 taxa); locality data entered (6,846 records); NHM Papilionidae databased (c. 11,000 specimens); databasing underway at MECN (Ecuador); c. 2000 photographs of Papilionidae type specimens taken; images (c. 4000) also obtained of NHM and USNM Pierinae types and NHM Papilionidae types from other projects	<b>Lessons:</b> assistance of volunteers extremely useful; 2 volunteers recruited for NHM work <b>Actions:</b> continue with select Nymphalidae and Pieridae at NHM; curate and start databasing MCLB collection; start/continue with databasing in host countries; continue to expand image collection
Taxonomic revisions	10 taxonomic papers submitted to peer-reviewed journals.	4 taxonomic reviews or revisions of tropical Andean butterfly groups submitted/published ( <i>Manerebia</i> , <i>Hyalenna</i> , <i>Forsterinaria</i> , new genus)	<b>Actions:</b> review of <i>Hyposcada</i> planned for submission; host country members to be encouraged to work on one taxonomic paper per country
Regional research and conservation strategy, with 50 Key Butterfly Areas identified.	Workshop (Yr 3) in Gainesville; data analysis complete; publication detailing regional research and conservation strategies.	None to date	None

*Note: Please do NOT expand rows to include activities since their completion and outcomes should be reported under the column on progress and achievements at output and purpose levels.*

Appendix 1. Logical framework from original proposal.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> <li>• the conservation of biological diversity,</li> <li>• the sustainable use of its components, and</li> <li>• the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</li> </ul>			
<p>Purpose</p>			
<p>To establish a regional research programme and conservation priorities for tropical Andean butterflies, through improved knowledge of their diversity, distribution and abundance.</p>	<p>Enhanced institutional capacity for butterfly research and conservation.</p> <p>Synthesised knowledge of butterfly diversity, distribution and abundance.</p> <p>Current and future priorities for research and conservation identified.</p>	<p>Institutions capable of securing funding and conducting research into butterfly diversity and conservation.</p> <p>Distribution and taxonomic data from collections and literature compiled into a single database.</p> <p>Published "Regional Strategy for Butterfly Research and Conservation in the Tropical Andes".</p>	<p>Partner institutions and taxonomists remain committed to research and conservation work on tropical Andean butterflies.</p>
<p>Outputs</p>			
<p>Enhanced institution staff capacity for butterfly research.</p> <p>Students trained in butterfly systematics, field survey methods and data analysis.</p> <p>Curated national collections.</p> <p>Darwin Andean Butterfly Database.</p>	<p>10 staff from 5 partner institutions trained in identification, curation, databasing and grant proposal writing.</p> <p>Field survey manual; 2 student training workshops of 1 week per country (30 students per course, total 300 students). 40 students receive further training and support for dissertation research.</p> <p>National collections (minimum of 5, 1 per country) curated and identified.</p> <p>Taxonomic and photographic database established; NHM, MCLB and partner collections databased (3500 species, 150,000 specimens).</p>	<p>Annual report by national co-ordinators.</p> <p>Annual student supervisor reports and national co-ordinator reports.</p> <p>Six-monthly reports by national coordinators; data in database.</p> <p>Six-monthly reports by national coordinators; database online and CD, also sent to DI.</p>	<p>Andean institutions continue to employ staff who pass on knowledge.</p> <p>At least some students use knowledge gained to take higher degrees and become next generation of butterfly researchers.</p> <p>Institutions maintain collections.</p> <p>Data quality sufficient for achieving conservation and research goals; database maintained in future.</p>

Taxonomic revisions.	10 taxonomic papers submitted to peer-reviewed journals.	Pre-prints/reprints at project website.	-
Regional research and conservation strategy, with 50 Key Butterfly Areas identified.	Workshop (Yr 3) in Gainesville; data analysis complete; publication detailing regional research and conservation strategies.	Published strategy in hard copy and CD, sent to DI, and available on project website.	Strategy is followed by major research institutions and conservation organisations within the region.
<b>Activities</b>	<b>Activity Milestones (Summary of Project Implementation Timetable)</b>		
Institution staff training and student workshops.	Project planning workshop to establish methods, goals and develop training programme (Yr 1, Apr 06). 1 <sup>st</sup> student training courses completed (Yr 1, Aug 06). 2 <sup>nd</sup> student training courses completed (Yr 2, Aug 07). Staff training in identification, curation and databasing complete (Yr 2, Aug 07).		
Databasing, development of digital products.	Database structure complete. WORLDMAP software developed. Website established. Digital photograph collection established (30% complete) (Yr 1, Mar 06). Online database with Ithomiinae, Limenitidinae (Yr 1, Dec 2006). Photography complete (Yr 2, Jul 07). Database complete (Yr 3, Feb 08) and online (Dec 08).		
Curation of collections.	MCLB complete (Yr 1, Jun 06). Preliminary curation of Andes collections complete (Yr 1, Jul 06). NHM complete for focal groups (Yr 2, Jul 07). Andes countries curation complete (Yr 2, Jul 07).		
Taxonomic revisions.	5 papers submitted to peer-reviewed journals (Yr 2, Jul 07). 5 papers submitted (Yr 3, Nov 08).		
Data analysis and development of long-term research and conservation strategy.	Analysis of results (Yr 3, Apr 08). Strategy planning workshop with project members, taxonomists and conservation organisations (Yr 3, May 08). 50 Key Butterfly Areas identified (Yr 3, May 08). 2 papers submitted on Andean butterfly diversity and conservation. "Regional Strategy for Butterfly Research and Conservation in the Tropical Andes" published (Yr 3, Dec 08).		

**PRIMER ENCUENTRO, 23 AL 30 DE ABRIL 2006  
CENTRO MCGUIRE PARA LOS LEPIDOPTERA Y LA BIODIVERSIDAD,  
UNIVERSIDAD DE FLORIDA, GAINESVILLE, ESTADOS UNIDOS.**

**Participantes confirmados**

- JM. Jim Mallet, University College of London, INGLATERRA.
- KW. Keith Willmott, McGuire Center for Tropical Lepidoptera and Biodiversity, Florida, USA.
- BH. Blanca Huertas, Natural History Museum, London, INGLATERRA.
- GL. Gerardo Lamas, Universidad Mayor de San Marcos, PERU.
- MA. Marco Altamirano, Museo Ecuatoriano de Ciencias Naturales, ECUADOR.
- JC. José Clavijo, Museo de Zoología del Instituto Agrícola Francisco Fernández Y., VENEZUELA.
- GA. Gonzalo Andrade, Instituto de Ciencias Naturales, Universidad Nacional, COLOMBIA.
- JA. José Luis Aramayo, Museo Noel Kempff Mercado, BOLIVIA.
- AV. Ángel Vilorio, Universidad de Zulia, VENEZUELA.
- VC. Varsovia Cevallos, Museo Ecuatoriano de Ciencias Naturales, ECUADOR.
- PP. Patricio Ponce, Centro McGuire, ECUADOR
- YG. Yuvinka Gareca, Museo Noel Kempff Mercado, BOLIVIA.
- JFL. Jean Francois Le Crom, Editor Mariposas de Colombia, COLOMBIA.
- JR. José Vicente Rodríguez, CONSERVACION INTERNACIONAL.
- JL. Julieta Ledezma, Museo Noel Kempff Mercado, BOLIVIA.
- ML. Mauricio Linares, Universidad de los Andes, COLOMBIA.

**Programación General**

**Domingo 23 Abril:**

1600-1900: Llegada de los participantes a Orlando. Transporte colectivo a Gainesville hotel.

2100-2300: Llegada al Hotel Reitz Union, Gainesville, Florida

(<http://www.union.ufl.edu/hotel/>). Bienvenida con una cena informal.

**Lunes 24 de Abril:**

0900-0930: Bienvenida general y presentación de cada participante.

Introducción general al proyecto, objetivos, personas e instituciones involucradas. Programa del encuentro. (KW)

Comienzo del curso para estudiantes, prueba Día 1 (Cada presentación ira seguida de 5-10 minutos de retroevaluación de su contenido)

0930-1000: Introducción a la diversidad de mariposas en contexto mundial (JM)

1000-1030: Principios de la sistemática 1 (GL)

1030-1100: Receso Café / Té

1100-1130: Principios de la sistemática 1 (continuación)

1130-1230: Principios de la sistemática 2 (KW)

1230-1330: Almuerzo

1330-1430: Morfología de las mariposas (GL)  
1430-1500: Técnicas en sistemática (KW)  
1500-1530: Receso Café/ Té  
1530-1600: Técnicas en sistemática (continuación) (KW)  
Todas las presentaciones de los invitados, estarán seguidas de 10-15 minutos de preguntas y discusión(2)  
1600-1630: Presentación de Andino Net (José Clavijo, VENEZUELA)  
1630-1700: Presentación 1 Coordinador/Invitado de BOLIVIA  
1700-1730: Presentación 2 Coordinador/Invitado de ECUADOR

### **Martes 25 de Abril:**

Curso para estudiantes, prueba Día 2 (Cada presentación irá seguida de 5-10 minutos de retroevaluación de su contenido)  
0830-0930: Historia de la clasificación de las mariposas (GL)  
0930-1000: Un vistazo a la biología de mariposas (GL)  
1000-1030: Receso Café/ Te  
1030-1100: Un vistazo a la biología de mariposas (continuación) (GL)  
1100-1200: Ecología de las mariposas 1 (KW).  
1200-1300: Almuerzo  
1300-1400: Ecología de las mariposas 2 (KW).  
1400-1430: Museos y colecciones (BH)  
Todas las presentaciones de los invitados, estarán seguidas de 10-15 minutos de preguntas y discusión(2).  
1430-1500: Presentación 3 Coordinador/Invitado de COLOMBIA  
1500-1530: Receso Café/ Té  
1530-1600: Presentación Gerardo Lamas, Coordinador de PERU, incluyendo una actualización sobre el proyecto "Electronic butterfly checklist".  
1600-1730: Acceso a las colecciones y recursos bibliográficos del centro McGuire.

### **Miércoles Abril 26:**

Curso para estudiantes, prueba Día 3 (Cada presentación ira seguida por 5-10 minutos de retroevaluación de su contenido )  
0830-0930: Diversidad de Lepidópteros Neotropicales (KW).  
0930-1030: Biogeografía de mariposas Neotropicales (KW).  
1030-1100: Receso Café/ Té  
1100-1200: Conservación de mariposas 1 (KW).  
1200-1300: Almuerzo  
1300-1400: Visita al bosque de mariposas del McGuire Center.  
1400-1430: Tópicos en la aplicación de proyectos y fondos nacionales e internacionales (BH).  
1430-1530: Conservación de Mariposas 2 (KW)  
1530-1600: Receso Café/Té  
Todas las presentaciones de los invitados, estarán seguidas de 10-15 minutos de preguntas y discusión (2).  
1600-1730: Acceso a las colecciones o recursos bibliográficos del centro McGuire.

### **Jueves 27 de Abril:**

0830-0900: Objetivos, prioridades y manejo del Proyecto TABD 1.  
0900-1030: CURSOS PARA ESTUDIANTES: organización, discusión y acuerdo en cada país sobre:

1. Que: Definición del programa definitivo del curso para estudiantes, basado en las pruebas y evaluación hecha durante los días anteriores.
2. Cuando: Fechas adecuadas, publicidad y selección de estudiantes: definición del perfil de los candidatos, requisitos, proceso de selección y registro.
3. Donde y como: Lugar de ejecución, acomodación (para campo y ciudad), facilidades (computadores, microscopios, AV, equipo de campo), fondos para la asistencia de los participantes.
4. Quien: Expertos en cada país y otros que podrían colaborar o dictar charlas, quien será responsable de cada presentación y de las prácticas en campo y laboratorio
5. Costo: Estimación del costo total por estudiante y asistencia económica (personal e institucional) (los coordinadores serán confirmados después del encuentro), definición del programa de becas.

1030-1100 Receso Café/ Té

1100-1230: BASES DE DATOS:

1. Preparación de una lista preliminar de los investigadores de Lepidoptera en cada país.
2. Preparación de una lista preliminar de todas las colecciones y selección de aquellas a ser incluidas en el proceso de base de datos y curación, definiendo quien será el responsable.
3. Protocolos para la toma de datos y fotografías, definiendo especímenes, códigos, fechas de trabajo y fechas límite. Datos a ser incluidos y estandarización.

1230-1330: Almuerzo

1330-1500: PROPIEDAD DE LOS DATOS:

1. Donde se mantendrán los principales datos colectados y por quien (datos de las etiquetas de los especímenes y fotografías especialmente)
2. Que datos estarán disponibles en la Internet y cuando; Como se usarán (Ej. Acceso con registro ilimitado, limitado etc.)
3. Como las fuentes de datos del proyecto y sus patrocinadores serán agradecidos; autoría de artículos y / o libros usando los datos.
4. Nuevos registros, especies sin describir.

1500-1530 Refresco y caminata por el campus del Dickinson Hall.

1530-1730 Conferencia Magistral: "Especiación en Mariposas Andinas" (JM) y encuentro informal con otros colegas del museo.

### **Viernes 28 de Abril:**

Objetivos, prioridades y manejo del Proyecto TABD 2.

0830-1030: LOGROS A ESPERAR DEL PROYECTO: Guía de métodos de campo, artículos (incluyendo tópicos específicos), Libro Rojo de las Mariposas Andinas, informe final del proyecto y otras publicaciones, documentos específicos a cada país, otros: autoría, cronogramas, donde publicar. Problemas con la evaluación de los criterios para ubicar las especies en las categorías de IUCN.

1030-1100: Receso Café/ Té

1100-1200: Reportes e informes del Proyecto: Quien es responsable, de que y cuando. Compromisos y fechas límite. Formatos, parámetros y estilo a seguir en la elaboración de los informes.

1200-1300: Almuerzo

1300-1500: PRESUPUESTO y responsabilidades financieras:

1. Números generales para ser gastados en el proyecto. Quien será responsable de pagar las actividades principales y equipos: computadores, cámaras, cursos, viajes para los encuentros, otros.
2. Establecimiento de cómo los fondos serán manejados como un todo y en cada país, cuentas bancarias, contabilidad, gastos anuales etc.
3. Clarificar el uso de los recursos del proyecto incluyendo dineros y equipos en cada país. Delimitación de los gastos a realizar.
4. Borrador para un acuerdo institucional y demás pasos para alianzas y convenios.

1500-1530: Presentación José Vicente Rodríguez CONSERVACION INTERNACIONAL

1530-1600: Receso Café/ Té

1600-1730: Pagina Web: discusión de la página existente, sugerencias y mejoras a realizar. Organización preliminar de la red de lepidopterólogos andinos y los vínculos con otras instituciones participantes. Cambios adicionales.

### **Sábado 29 de Abril:**

Aspectos prácticos del manejo de las bases de datos y otros tópicos pendientes.

0830-1030: Introducción a las bases de datos y su estructura y uso; discusión sobre las bases de datos y preguntas; practica de toma de fotos y toma de datos con especímenes de la colección.

1030-1100: Café/ Té

1100-1200: Culminación con el desarrollo de la base de datos

1200-1300: Almuerzo

1300-1600: Oportunidad presentar las inquietudes y comentarios de cada participante después del encuentro acerca del proyecto y establecimiento de cuales técnicas /métodos serán más útiles, técnicas de disección, curación, fotografía, métodos en computadores y estadística. Visita y trabajo en la colección. Otros, ver 1 abajo.

1600-? : Picnic y fiesta de "hasta pronto" en el Lago Wauberg.

FIN DEL ENCUENTRO

### **1. Otros tópicos a incluir:**

1. Taxonomía de mariposas y técnicas de DNA
2. Acceso a las preparaciones de genitales.
3. Prestamos interinstitucionales e internacionales de especímenes, genitalia, bibliografía etc.
4. Sustentabilidad del proyecto y perspectivas.
5. Futuros proyectos: Digitalización de bibliografía.

2. Tópicos a ser incluidos en las charlas preparadas por los invitados de cada país:



**( \* necesario - opcional)**

- \*Vistazo general de la participación de su institución en el proyecto
  - \*Objetivos en términos de la futura investigación en mariposas
  - \*Recursos a ofrecer para los estudiantes
  - \*actividad Actual de investigación y proyectos conocidos
  - \*Otras Fuentes de información en el país (Colecciones, bibliotecas)
  - \*Investigación, colección y permisos de importación en cada país, generalidades y autoridades
- 
- ONGS en cada país relacionadas y dispuestas a trabajar con el proyecto
  - Biogeografía e información general sobre el país
  - Estado del conocimiento de las mariposas
  - Prioridades del país en términos de la investigación
  - Ideas para el desarrollo de proyectos de investigación en Lepidoptera.

Appendix 3. Publications in peer-reviewed journals by principal project members (Jim Mallet, Keith Willmott, Blanca Huertas, Gerardo Lamas) on tropical Andean butterflies since start of project in August 2005. Some of these and various additional publications are available from: <http://www.ucl.ac.uk/taxome/jim>

**Submitted or in press:**

2006. Bull, V., Beltrán, M., Jiggins, C.D., McMillan, W.O., Bermingham, E. and **Mallet, J.** (2006) Polyphyly and gene flow between non-sibling *Heliconius* species. BMC Biology, in press.
2006. **Willmott, K. R.**, and **G. Lamas**. A revision of *Pachacutia*, a new genus of rare Andean ithomiine butterflies (Nymphalidae: Ithomiinae), with the description of two new species. Annals of the Entomological Society of America, accepted for publication.
2006. Pyrcz, T. W., **Willmott, K. R.**, Hall, J. P. W., and A. L. Vilorio. A review of the genus *Manerebia* Staudinger (Lepidoptera: Nymphalidae: Satyrinae) in the northern Andes. Journal of Research on the Lepidoptera, in press.
2006. Hall, J. P. W., and **K. R. Willmott**. Four new species of Symmachiini from Ecuador (Lepidoptera: Riodinidae). Tropical Lepidoptera, in press.
2006. Brehm, G., Hartmann, T., and **K. R. Willmott**. Pyrrolizidine alkaloids and pharmacophagous Lepidoptera visitors of *Prestonia amabilis* (Apocynaceae) in a montane rain forest in Ecuador. Annals of the Missouri Botanical Garden, in review.
2006. Jiggins, C. D., Mallarino, R., **Willmott, K. R.**, and E. Bermingham. Phylogenetic evidence for speciation caused by ecological adaptation in neotropical *Ithomia* butterflies (Lepidoptera; Nymphalidae). Evolution, accepted for publication.
2006. **Willmott, K. R.**, and A. V. L. Freitas. Higher-level phylogeny of the Ithomiinae (Lepidoptera: Nymphalidae): classification, patterns of larval hostplant colonisation and diversification. Cladistics, accepted for publication.
2006. **Willmott, K. R.**, and **G. Lamas**. A phylogenetic reassessment of *Hyalenna* Forbes and *Dircenna* Doubleday, with a revision of *Hyalenna* (Lepidoptera: Nymphalidae: Ithomiinae). Systematic Entomology, in press.
2006. González, J. R., Orellana, A. M., and **G. Lamas**. Adiciones, rectificaciones y actualizaciones a “Mariposas de Venezuela” por Théophile Raymond. IV. Pieridae y Hesperidae (Lepidoptera). Entomotropica, in press.
2006. Hay-Roe, M. M., **Lamas, G.**, and J. L. Nation. Pre- and postzygotic isolation and Haldane rule effects in reciprocal crosses of *Danaus erippus* and *Danaus plexippus* (Lepidoptera: Danainae), supported by differentiation of cuticular hydrocarbons, establish their status as separate species. Zoological Journal of the Linnean Society, in review.
2006. Hall, J. P. W., and **G. Lamas**. Four new symmachiine taxa from the eastern Andes of Peru and Ecuador (Lepidoptera: Riodinidae). Proceedings of the Entomological Society of Washington, in press.

2006. **Lamas, G.** Invalidation of five neotypes among Neotropical butterflies (Lepidoptera: HesperIIDae, Pieridae, Lycaenidae and Nymphalidae). *Revista Peruana de Entomología*, in press.

**Published:**

2006. Brower, A. V. Z., Freitas, A. V. L., Lee, M.-M., Silva Brandão, K. L., Whinnett, A., and **K. R. Willmott**. Phylogenetic relationships among the Ithomiini (Lepidoptera: Nymphalidae) inferred from one mitochondrial and two nuclear gene regions. *Systematic Entomology*, 31(2): 288-301.
2005. Hall, J. P. W., and **K. R. Willmott**. A new species of *Paiwarria* (Lepidoptera: Lycaenidae: Eumaeini) from western Ecuador. *Proceedings of the Entomological Society of Washington*, 107(4): 960-967.
2005. Whinnett, A., Zimmermann, M., **Willmott, K.R.**, Herrera, N., Mallarino, R., Simpson, F., Joron, M., **Lamas, G.** and **Mallet, J.** Strikingly variable divergence times inferred across an Amazonian butterfly 'suture zone'. *Proceedings of the Royal Society B* 272: 2525-2533.
2005. Whinnett, A., **Willmott, K.R.**, Brower, A.V.Z., Simpson, F., **Lamas, G.** & **Mallet, J.** Mitochondrial DNA provides an insight into the mechanisms driving diversification in the ithomiine butterfly *Hyposcada anchiala* (Lepidoptera: Nymphalidae, Ithomiinae). *European Journal of Entomology* 102: 633-639.
2005. Whinnett, A., Brower, A.V.Z., Lee, M.-M., **Willmott, K.R.**, & **Mallet, J.** (2005). Phylogenetic utility of Tektin, a novel region for inferring systematic relationships amongst Lepidoptera. *Annals of the Entomological Society of America* 98: 873-886.
2005. Peña, C., & **G. Lamas**. Revision of the butterfly genus *Forsterinaria* Gray, 1973 (Lepidoptera: Nymphalidae, Satyrinae). *Revista Peruana de Biología* 12(1): 5-48.