

ANNUAL REPORT 2007
 Biological Diversity of the Guiana Shield (BDG)
 Activities 1 January to 31 December, 2007
<http://mnh.si.edu/biodiversity/bdg>

The goal of the Biological Diversity of the Guiana Shield Program (BDG) is to document, understand, and conserve the biological diversity of the Guiana Shield area. In line with that goal BDG continues to work with specimens from the Guiana Shield area of northeastern South America. We collect, sort, identify, mount, inventory, barcode, and file all plant specimens collected by the Program and we assist scientists from other departments in NMNH (Zoology, Entomology, Anthropology) in their collecting and processing efforts. We interface with other bureaus at SI (STRI, NZP, NMNH, NASM, CRC), and we collaborate with over 300 scientists around the world. We publish scientific papers and books as well as items for more general use and we train and educate staff and students from the Shield area (northeastern South America).

HIGHLIGHTS

The Database: Barcoding of the plant specimens in the US National Herbarium continues with 5814 (2310 colck + 3504 BDG) records added to the database in 2007. Currently, the total number of records is 161,108 (53556 BDG collections, 98377 historical specimens, 9175 misc. collections) all databased and barcoded by BDG.

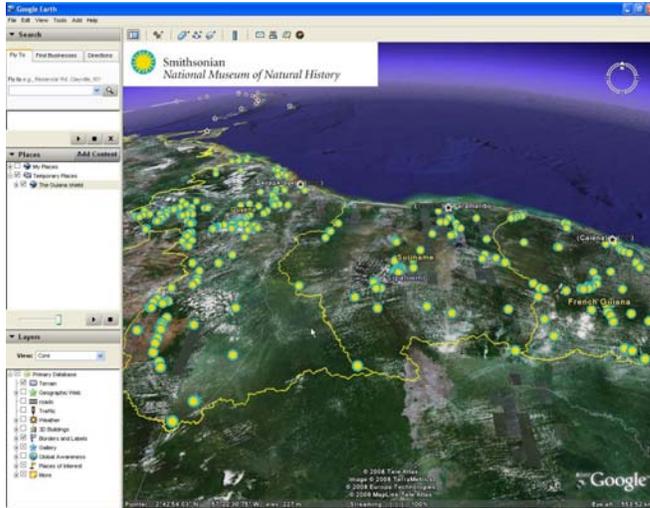
Bird Publication: The “*Field Checklist of the Birds of Guyana, 2nd Edition.*” (Braun, M.J, D.W. Finch, M.B. Robbins and B.K. Schmidt. 2007) was published. It contains 814 bird species that have been documented as occurring in Guyana. It is aimed at a general audience and is set up for bird watchers to be able to check off the species that they see.



Plant Publications: The “*Checklist of the Plants of the Guiana Shield*” (Funk, V., T. Hollowell, P. Berry, C. Kelloff, and S.N. Alexander, 2007) was published after a delay of a year caused by the departure of our database manager. It covers all vascular plants known to occur in the Guiana Shield region of northeastern South America. It is the product of the combined efforts of two research initiatives, the Smithsonian Institution’s Biological Diversity of the Guiana Shield Program (BDG) and Missouri Botanical Garden’s Flora of the Venezuelan Guayana. The President of the Missouri Botanical Garden, Dr. Peter H. Raven, wrote the foreword.

The *Checklist of the Ferns, Fern Allies, and Flowering Plants of Kaieteur National Park, Guyana* is nearly finished and will be published during the summer of 2008. This checklist covers all vascular plants known to occur in the Guyana's only national park, Kaieteur. It includes 147 families and 1409 taxa, about 16% of the total number of taxa recorded for the Guianas (Funk *et al.* 2007).

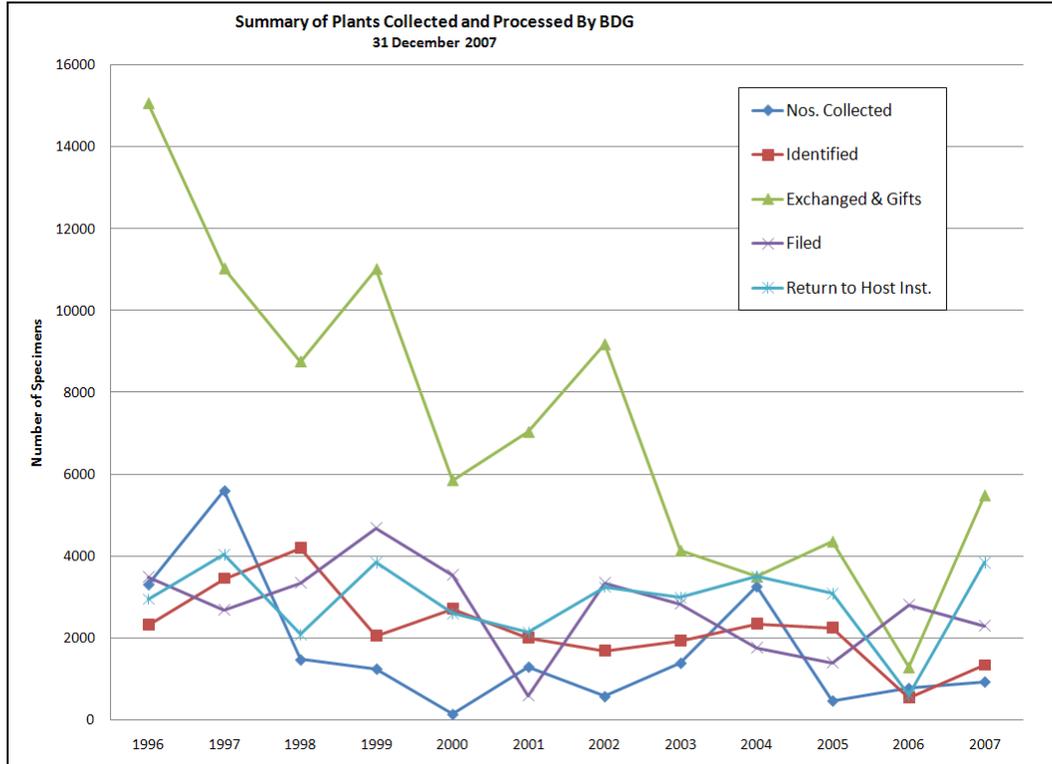
Website development: The BDG Program is working to make its data available to the scientific community. Several years ago the program lost its database manager, Tom Hollowell. The money for his salary disappeared into the general museum coffers. At that point the efforts to make the data public stalled. In October 2007 BDG hired Eduardo Garcia Milagros as a part-time contractor to georeference specimens from the Guiana Shield region of South America found in the U.S. National Herbarium type collection. These collections are being mapped using ArcMap and then displayed on Google Earth as placemarks. The project, *Georeferencing Plants of the*



Guiana Shield: US Types, displays in Google Earth and Google Maps the geographical location of the plant types housed in the US National Herbarium. The type specimens were originally collected on the Guiana Shield, sometimes by BDG staff. By March 2008 the site will include the Type collections of plants collected on the Guiana Shield (in Guyana, Suriname, or French Guiana) and housed at the US National Herbarium (ca. 1400 specimens). By the end of June the placemarks for the Venezuelan part of the Guiana Shield will be available (ca. 1900 specimens). This website is available now on the Department of Botany public website (<http://botany.si.edu/bdg/georeferencing.cfm>). The cost of a contractor to work on this project will have a negative impact on the ability of BDG to collect plants in 2008.

Plant Collecting: During 2007, despite a lower budget, BDG was able to once again have a 3 month resident collector for plants in Guyana. Dr. Karen M. Redden is a postdoctoral fellow for Dr. Pat Herendeen at George Washington University. Dr. Herendeen was very interested in obtaining collections from the Guiana Shield area so we agreed that he would pay Dr. Redden's salary from his NSF grant and BDG would pay the field expenses. Karen has made about six expeditions in Venezuela and Guyana and this year was able to get into French Guiana before returning to Guyana for a final field trip. She has made about 935 collections this year, most with silica collected leaves for DNA work. We are using the BDG data base to determine potential collecting sites so we can test the "survey gap analysis" method. Dr. Redden and Dr. Ken Wurdack are planning another trip to the area just south of the CI concession in 2008.

SPECIMEN WORK AND DATABASES.



Plants (during 2007)

Specimens determined: **1,339**

Specimens sent as gifts/loans for determination: **350**

Duplicates sent out as exchange: **5,143**

Returned to the host country: Guyana: **925**; Surinam: **1426**; French Guiana: **62**;
Venezuela: **1440**

New collections: **935** single numbers, excluding duplicate sheets (new collections)

Duplicate Labels prepared: ca. **3,839**

Sheets barcoded and inserted into the US National Herbarium: **3,504** (newly mounted)

Sheets that have been inventoried and barcoded: **2,310** (historical collections from US)

Total plant specimens collected for 2007: approximately **935** (**3,750** sheets).

EXPEDITIONS IN 2007

Plants: Guyana

Karen Redden (Post-doc, GWU), plant number series: (5077 - 6010) Conservation International concession on the Essequibo River, Warashema Mt. Range, Daniel Watusi's mining camp, Mazaruni River. Apaikwa, Meamu Mt., Meamu River, Guyana. With P. Benjamin; C. Perry; D. Singh; E. Alexander; H. James; N. John; H. Simon;



E. Joseph. 19 January 2007 – March 2007: 873 collections and 3928 sheets.

Plants: French Guyana

Karen Redden (Post-doc, GWU), Piste de St. Ellie, Bassin de Sinammary, French Guiana. With V. de Camp; R. Cozier; B. Bordenave; S. Draf; L. Pillman; M. Tarcy; M.F. Prevost; D. Barthelémy; C. Barthelémy; S. Gonzalez; O. Téllez; M.F. Prevost; C. Fontvieille; and E. Fontvieille. 15 March to 5 May 2007: 62 collections and 279 sheets.

Animals – Insects – Ants:

John LaPolla (Towson University), Iwokrama Rain Forest Reserve: White Water Camp and Turtle Mountain. With J. Bishoff, 13-26 August 2007, approx. 1000 leaf litter ants (Collections left at CSBD to be processed later in 2008).

Animals – Vertebrates – Birds:

Christopher Milensky and Brian Schmidt (SI, Birds) Mt. Holitipu, Guyana with Elford Liverpool, 12 – 27 February 2007: 384 bird specimens and 47 species. Many tissues were preserved for DNA studies.



Specimens returned to the Guianas:

300 Ants specimens

93 Birds specimens

3853 Plants returned or left in host country

POST-DOCTORAL FELLOWSHIP

The BDG and Dr. Pat Herendeen, George Washington University (NSF grant) co-sponsored Dr. Karen Redden as a post-doctoral fellow to work on the Leguminosae collections from the Guiana Shield and to organize and participate in collecting expeditions to the GS and to analyze the results. Dr. Redden has applied for a post-doc position with the U.S. National Herbarium and is planning another expedition in August 2008 to help fill in the gaps in the southeast region of Guyana that is little collected.

THE CENTRE FOR THE STUDY OF BIOLOGICAL DIVERSITY, GUYANA (CSBD)

- 1) The University of Guyana has decided to consolidate the Jenman Herbarium into the Guyana National Herbarium (GNH) in CSBD. Kelloff assisted the Scientific Officer in bundling and freezing specimens (for insect pests) from the Jenman Herbarium.
- 2) The Dutch collectors have been leaving unmounted collections at the Jenman Herbarium for over 20 years. These collections were stored, in the same condition as they were delivered to the Universtiy, in a side room of the Jenman Herbarium. Kelloff contacted the various Dutch collectors for missing labels and CSBD has begun processing this important collection to be included in the GNH.
- 3) The University of Guyana is now using students interested in biodiversity studies to work in the CSBD collections to help process and curate under the supervision of the Scientific Officers. This work/study program is helping the students learn more about the field of museum collections and has provided CSBD with a workforce.

4) Under the direction of Calvin Barnard, the Centre has begun a biodiversity seminar once a month for invited speakers and guest. This seminar is open to staff, students and the public.

5) The following was taken from "Focus on UG, March 2007":

The Smithsonian team comprised of Dr Cristian Samper, Director, Smithsonian, NMNH; Dr Vicki Funk, Director of Biological Diversity of the Guiana Shield Programme; Dr Carol Kelloff, Assistant Director, BDG Programme; Dr Hans Seuss, Director of Research and Collections and a representative from the American Embassy. The University of Guyana team comprised of Dr Marlene Cox, Director of Resource, Mobilisation & Planning, who represented the Vice-Chancellor, Mr Phillip DaSilva, Dean, Faculty of Natural Sciences and Mr Calvin Bernard, Lecturer, with responsibilities for the Bio-Diversity Centre. Discussions were based on the activities of the Centre for the Study of Biological Diversity (CSBD) and the upgrading and rehabilitation of the Library facility at the CSBD with a view of garnering support for funding for the activity. Discussions were also held with student volunteers who are involved in curation and preparation of materials at the Centre.

6) The CSBD has made a space available in one of its offices to support the *Rupununi Wetland Project*, part of the Darwin Initiative for the Survival of Species. This project aims to develop a better understanding of the impacts of different land uses on the wetlands. University of Guyana is supervising Master's degree student researcher, biodiversity monitoring, wetlands research support.

OTHER ACTIVITIES

1) BDG has finished processing the 10,000 mounted specimens from the University of Nebraska. The final total for this project is 4891 specimens retained at US (including many ca. 400 Types, 3599 duplicate sheets sent on exchange to PHN (Manila, The Philippines) and 923 to PE (Bejing, China).

2) Funk and Kelloff traveled to Saltillo, Mexico to bring back 43 boxes of unmounted ethnobotanical collections of Brent Berlin. Kelloff and Dodge (p/t contractor) have begun the processing of these collections.

3) Kelloff and Dodge received and began processing the unmounted ethnobotanical collections (part of the B. Berlin research project) from the University of Georgia.

4) Funk was awarded a grant to mount the Mexico collections of B. Berlin. The first 1000 collections have been sent for mounting.

5) Funk and Kelloff facilitated the trip to Guyana by Christian Simper and Hans Dieter Sues. They spent the week traveling to the interior of Guyana and meeting people that



have worked with BDG Program. They meet with staff at the University of Guyana and spent time taking to students and staff at CSBD. Simper and Sues also met with officials at the U.S. Embassy and Guyana government Ministries.

6) Kelloff submitted her plot paper entitled, "Structure and diversity of a riparian forest at Kaieteur National Park, Guyana" to SIDA and it

was accepted.

7) Funk worked in the herbarium at the Royal Botanic Gardens, Kew and attended a thesis defense in Aarhus, Denmark.

PUBLICATIONS 2007

LaPolla, J.S., T. Suman, J. Sossa-Calvo, and T.R. Schultz. 2007. Leaf litter ant diversity of Guyana. *Biodiversity and Conservation* **16**(2):491-510

Lathrop, A. and R.D. MacCulloch. 2007. A New Species of *Oreophrynella* (Anura: Bufonidae) from Mount Ayanganna, Guyana. *Herpetologica* **63**(1): 87-93.

MacCulloch, R.D., A. Lathrop, R.P. Reynolds, J.C. SeZaris and G.E. Schneider. 2007. Hereptofauna of Mount Roraima, Guiana Shield region, northeastern South America. *Herpetological Review* **38**(1): 24-30.

Kok, P.J.R., M.N.C. Kokubum, R.D. MacCulloch and A. Lathrop. 2007. Morphological variation in *Leptodactylus lutzii* (Anura, Leptodactylidae) with description of its advertisement call and notes on its courtship behavior. *Phyllomedusa* **6**: 45–60.

Braun, M.J, D.W. Finch, M.B. Robbins and B.K. Schmidt. 2007. *A Field Checklist of the Birds of Guyana*, 2nd Edition. Smithsonian Institution, Washington DC.

Aime, M.C., Ryvardeen, L, Henkel, T.W. 2007. Studies in Neotropical polypores 22. Additional new and rare species from Guyana. *Synopsis Fungorum* **23**: 15-31

Funk, V., T. Hollowell, P. Berry, C. Kelloff, and S.N. Alexander. 2007. Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana). *Contributions from the United States National Herbarium* **55**: 1-580.

Feuillet, F. 2007. Folia taxonomica 3. *Passiflora davidii* (Passifloraceae), a new species in subgenus *Passiflora* and a key to the sections of supersection *Stipulata*. *J. Bot. Res. Inst. Texas* **1**(2): 895-898.

Articles published in late 2006:

Cole, C.J. and P.J.R. Kok. 2006. A new species of gekkonid lizard (Sphaerodactylinae: *Gonatodes*) from Guyana, South America. *American Museum Novitates* **3524**:1-13.

Kok, P.J. 2006. A new snake of the genus *Atractus* Wagler, 1828 (Reptilia: Squamata: Colubridae) from Kaieteur National Park, Guyana, northeastern South America. *Zootaxa* **1378**: 19-35.

Kok, P.J.R., H. Sambhu, I. Roopsind, G.L. Lenglet and G.R. Bourne. 2006. A new species of *Colostethus* (Anura: Dendrobatidae) with maternal care from Kaieteur national Park, Guyana. *Zootaxa* **1238**: 35-61.

Kok, P.J. 2006. A new species of *Hypsiboas* (Amphibia: Anura: Hylidae) from Kaieteur National Park, eastern edge of the Pakaraima Mountains, Guyana. *Biologie* **76**:191-200.

LaPolla, J.S., T.R. Schultz, K.M. Kjer, and J.F. Bischoff. 2006. Phylogenetic Position of the ant genus *Acropyga* (Hymenoptera: Formicidae) and the Evolution of Trophophoresy. *Insect Systematics and Evolution* **37**(3): 197-212.

LaPolla, J.S., and J. Sossa-Calvo. 2006. Review of the Ant Genus *Rogeria* (Hymenoptera: Formicidae) in Guyana. *Zootaxa* **1330**: 59-68.

Mayor, J.R., Henkel, T.W. 2006. Do ectomycorrhizas alter leaf litter decomposition in monodominant tropical forests of Guyana? *New Phytologist* **169**(3):579-588.

BUDGET

The Program received federal funding in 2007 (note: budget is for FY07, the descriptive portion of this report is for the calendar year 2007).

Funds from sources outside our federal allocation were used to promote field work and specimen processing. In FY07 these funds came from a variety of sources including the National Science Foundation, George Washington University, Townsend University, other institutions; **the total outside funds for FY 07 was \$22,000.**