

Progress Report III

THE CONSERVATION OF THE FERNS OF ANTIGUA AND BARBUDA AND THEIR FOREST HABITATS



To

**Rufford Small Grants for Conservation
Environmental Awareness Group (EAG)**

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Cover photograph, *Pteris longifolia* and *Anemia adiantifolia* colony growing at Christian Valley, Antigua.

Photo courtesy Kevel C. Lindsay, March 2012.

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BACKGROUND

This project update report is part of *The Conservation of The Ferns of Antigua and Barbuda and their Forest Habitats* project funded by the Rufford Small Grants for Conservation, UK. The project seeks to:

- *To survey and determine the status of the ferns of the country and highlight species of critical concern;*
- *To increase the awareness of the value of native ferns and conserve and protect their habitats; and*
- *To produce a National Red List of ferns*

PROJECT UPDATE 4

This report provides a detailed account of project activities that have occurred since the last update report of December 22, 2011. It also provides an overview of upcoming activities and outputs.

The major activities and outputs for this period were the completion of the final report of the IUCN Red List of ferns for Antigua and Barbuda, the draft report on *Protecting Native Pteridophytes in Antigua, Barbuda and Redonda: A Conservation Perspective*, and the second field survey and from February 28 to March 13, 2012.

A detailed report of the visit is provided below.

OVERVIEW OF ACTIVITIES

IUCN Red List of Pteridophytes

A draft IUCN Red List of pteridophytes (ferns and fern allies) for the islands of Antigua, Barbuda and Redonda was prepared in October 30, 2011. The draft underwent several months of review by key resource people within Antigua, Barbuda, the throughout the United States and the Caribbean region. The final document, *The Red List of Pteridophytes of Antigua, Barbuda and Redonda*, was completed on January 27, 2012, and will be posted to the project website within the next three weeks.

Conservation Perspective

A draft report on *Protecting Native Pteridophytes in Antigua, Barbuda and Redonda: A Conservation Perspective*, January 25, 2012, has been disseminated within Antigua and Barbuda for review. The purpose of the Conservation Perspective is to:

- To bring together paleontological, historical, geological, ecological and other key to create a unique local perspective on the islands' pteridophyte flora ;
- To be a basis for input and guidance to new environmental protection legislation in Antigua & Barbuda;
- To encourage, promote and instill greater research into the pteridophyte and other flora of these islands;
- To increase the conservation and protection of native pteridophytes and their habitats;
- To be one of the focal points for native plant and habitat protection in Antigua and Barbuda; and
- To increase the awareness and understanding of the pteridophyte flora.

The final report will be completed for the end of March 2012.

Field Survey and Assessment: February 28 – March 13, 2012

Kevel Lindsay undertook 13 days of field survey and assessment in Antigua and Barbuda. This is the first field effort that targeted dry season conditions. The annual dry season in Antigua and Barbuda is from January to April.

Mr. Lindsay had previously undertaken official field surveys from June 23 to July 11 2011, and a non-official visit in August 2011. During the August visit, he visited the island of Barbuda for a day.

To date, a total of 31 days have been devoted to field surveys and assessments, with four days spent on Barbuda. Barbuda received less field attention because it has far fewer fern species than Antigua does.

Redonda was not visited by Mr. Lindsay for this project, but colleagues and friends who have visited the difficult to access Remote Island have provided valuable field data, including photographs and observations.

The objectives of the field survey and assessment were to:

1. *Survey and assess pteridophyte species;*
2. *Survey and assess fern habitats and issues;*
3. *Consult with local agencies and individuals on issues related to pteridophyte and habitat conservation;*
4. *Record and photograph pteridophytes and habitats;*
5. *Assess the impact of annual wildfires on natural vegetation and species;*
6. *Assess the potential impact of dry season changes on fern distributions, species, habitats, ecology and survival;*
7. *Assess the ecological relationships of pteridophytes and other plants and animals;*
8. *Provide training and support to local experts and interested persons; and*
9. *Determine opportunities for follow-up efforts after the completion of the Rufford Grant in April 2013.*

Results from the latest field visit are discussed in detail in the section on **Field Survey and Assessment Results**.

Mohammed Bin Zayed Species Conservation Fund Support

The MBZ Species Conservation Fund provided support for this latest field visit, as well as for the development of an atlas, guide and educational book on the pteridophytes of Antigua and Barbuda. An initial outline of the book has already been pulled together, and profiles on the species, background information and other details are being drafted. It is expected that an initial draft will be completed late summer 2012.

However, additional funding is needed to complete the final draft, source images, layout and final publication of the book.

FIELD SURVEY AND ASSESSMENT RESULTS

Mr. Lindsay conducted 13 days of field surveys and assessments on Antigua and on Barbuda. A total of 25 sites were surveyed in Antigua and 11 in Barbuda. **Appendix I** provides a list of the sites, including dates.

New Pteridophytes

Several new additional species of ferns have now been added to the Antigua record, and two additional records to Barbuda. These fern records may need further investigation and clarification before final confirmation, but preliminary results suggests the following species are present. Table 1.0 provides a list of the species, along with locations and comments:

Table 1.0. New pteridophyte species records for Antigua.

NO.	GENUS	SPECIES EPITHET	VAR./SSP./HYBRID	LOCATION	COMMENTS
1.	<i>Adiantum</i>	<i>pulverulentum</i>		Mount Obama.	
2.	<i>Adiantum</i>	<i>pulverulentum</i>	<i>x tetraphyllum</i>	Found in moist forest at Mount Obama.	A hybrid
3.	<i>Asplenium</i>	cf. <i>uniseriale</i>		Upper Dunnings and Fig Tree Ghaut.	Previously thought to be simply be <i>A. ocoense</i> , but further field assessments suggest that <i>A. uniseriale</i> is also present.
4.	<i>Campyloneurum</i>	<i>costatum</i>		Wallings, Christian Valley and Mount Obama.	
5.	<i>Nephrolepis</i>	<i>pendula</i>		Follys	
6.	<i>Thelypteris</i>	<i>dentata</i>	<i>x hispidula</i> var. <i>hispidula</i>	Found at Upper Dunnings.	A hybrid
7.	<i>Thelypteris</i>	<i>patens</i>	<i>scabriuscula</i>	Upper Dunnings	
8.	<i>Thelypteris</i>	<i>pennata</i>	<i>x tetragona</i>	Found in moist forest at Mount Obama.	A hybrid
9.	<i>Thelypteris</i>	cf. <i>kunthii</i>		Christian Valley.	Tentatively listed for Antigua.
10.	<i>Thelypteris</i>	cf. <i>reptans</i>		Christian Valley.	Tentatively listed for Antigua.

In addition, fieldwork has been able to provide additional support for the presence of three species, two of which were suspected based on previous field observations, and one has been reinstated to the recorded due to the continued view by some authorities that it represents a distinct species.

Adiantum fragile var. *rigidulum* (photo 1.0)
Asplenium cf. *ocoense* (photo 2.0)

Both of these species are endemic to the West Indies. *A. fragile* var. *rigidulum* is limited to Jamaica, Puerto Rico and the Virgin Islands, and is now known to occur on Antigua. It is rare.



Photo 1.0. *Adiantum fragile* var. *rigidulum*.

Asplenium ocoense previously believed restricted to Puerto Rico, although authorities have pointed out that this species is so similar to the related *A. cristatum* (also known from Antigua) that the former may easily be overlooked by most, and that similar specimens as *A. ocoense* have been reported from other regions in the Neotropics.

In addition, some specimens do resemble the more widespread species, *A. uniseriale*. This latter species has often been included as part of the *Asplenium radicans* group as a 3-pinnate variety. Some authorities go so far as to suggest that the *A. radicans* complex, along with *uniseriale*, *A. cristatum* and *A. ocoense* need further taxonomic study and genetic review.

The species *Campyloneurum brevifolium* was previously reported for Antigua, but was then named *A. latum*. However, debate continues as to the value of *A. latum* as a species and some continue to reaffirm that both species are separate. Given the fact

that evidence from the field suggests that both species are indeed quite distinct, I hereby reinstate *A. brevifolium* and *A. latum* as separate species for Antigua.

For Barbuda, field surveys have been able to finally obtain images of the sporocaps of the rare *Marsilea nashii*. In addition, two additional species have been confirmed for that island, and these include *Anemia adiantifolia* and *Thelypteris dentata*. Both species were found growing in a small abandoned quarry on the outskirts of Codrington Village, the only settlement on the island. The first species is distributed widely in the Neotropics, and its presence on Barbuda is not entirely a surprise, especially given that it seems to have an affinity for limestone substrate, of which most Barbuda is made of. *Thelypteris dentata* is paleotropical in distribution, though it is believed to be introduced wherever found in the American tropics.

This now brings the total number of species for Barbuda to about seven.



Photo 2.0. *Asplenium ocoense*.

From this most recent field survey and assessment, the total number of pteridophytes for islands has been updated to include about 86 species.

Other Plants of Interest

The field surveys and assessments are also an opportunity to simultaneously conduct additional ecological studies and to also record important data on other species of

plants and other issues. During surveys in Antigua, accompanied by colleagues, Drs. Brian Cooper and Karron James, both members of the EAG executive (Dr. James is the President), it was discovered that the Pleated-leaf Spathoglottis orchid, *Spathoglottis plicata*, a native of Southeast Asia, is now naturalized on Antigua at McNish Mountain. This is a new record for Antigua.

It was in the same area that the team also had the chance to encounter another terrestrial orchid, *Spiranthes torta*, an extremely rare species here. The species has not been seen since the late 1980s, and the only photograph taken of Antiguan specimens dates back to this period. Many of the plants were in bloom at McNish and they were photographed (photo 4.0 below). Other terrestrial orchid species are also present here, but were not in flower. The number of species present suggests that the site is very important for not only orchids, but also for the rare West Indian endemic Ophioglossid fern *Ophioglossum harrisii*. However the biggest threat to these species is the invasive Citronella grass, *Citronella citratus*. The area is often burnt during the dry season, which occurs during this time of year, and this grass contains volatile oils, which make it quite susceptible to major burns. This in turn helps to eliminate native species, including the orchids and ferns.

In Barbuda, Kevel Lindsay discovered two additional species of aquatic plants: *Echinodorus cordifolius* and *E. grandiflorus*. The latter species is known in the Caribbean only from Cuba so this new discovery is exciting. The other species is more widespread in the Greater Antilles and rare in the Lesser Antilles.

Mr. Lindsay also discovered what may be a new *Tetramicra* orchid species for Barbuda. The exact identity remains unknown, but a live specimen was collected and left with local naturalist, Mr. John Mussington, headmaster at the local Secondary School. Hopefully, the plant may produce flowers in the coming months, allowing for identification (photo 3.0 shows the plant at Palmetto Point). Evidence also suggests that the white variety of the more common *Tetramicra elegans* is indeed present on Barbuda. Mr. Lindsay had reported seeing such plants back in the 1990s, but no recent observations had been made. Live specimens of the suspected plants were also collected and left with Mr. Mussington for further study.



Photo 3.0. New *Tetramicra* orchid found growing amongst *Tetramicra elegans* (upper middle) at Palmetto Point, Barbuda.



Photo 4.0. The very rare terrestrial orchid *Spiranthes torta*.

Another interesting discovery is of an unusual population of *Thrinax* palms at Palmetto Point. These differ from the typical *Thrinax* found growing in the area by the larger

leaves, which are very glaucous above and below, giving them an unusual blue appearance. It is not understood why these palms differ from the more typical form and more field investigations and study are needed to determine the exact taxonomy of these plants. Photo 5.0 shows a beautiful specimen of these palms.



Photo 5.0. The nickname “Blue Palmetto,” *Thrinax* sp. at Palmetto Point, Barbuda.

Unfortunately, indiscriminate and widespread sand mining in the area threatens these and other plants, including rare and unusual native ecosystems. No previous ecological surveys and environmental impact assessments were carried out prior to mining, and no monitoring and recovery programs have been undertaken. Mining continues even today, and the site of the new orchid discovery is on the last high dune near the coast. This is now under threat and it is unsure how long it will be allowed to remain. Photo 6.0 shows the dune system, and the area currently being mined just southwest of it. Photo was taken atop dune. Immediately in front of dune is an area that has been mined and is now invaded by numerous exotic introduced species.



Photo 6.0. Last high dune near sea and the effects of sand mining at Palmetto Point, Barbuda.

Bat Surveys and Training

During the time spent in Antigua, Mr. Lindsay also used the opportunity to survey bats on Antigua, and to carry out training exercises. This was an opportunity to further understand the ecology of many of the island's habitats, including those critical pteridophyte habitats by including other flora, fauna and the ecological frameworks, and also to engage local counterparts engaging them in the field and on local environmental and on ecological issues and concerns.

Mr. Lindsay spent two nights training two members of staff of the Forestry Division, in the Ministry of Agriculture. These include, Mr. Adriel Thibou, head of the Division, and Ms. Camella Wallace. The team caught a total of 47 specimens, representing four of the island's eight known species. Photos 7.0 and 8.0 show the team engaged in netting bats at Fig Tree Ghaut. No bat surveys were done on Barbuda due to logistical difficulties. Photo 9.0 shows a female *Artibeus* species caught at Follys.



Photo 7.0. Camella Wallace and Kevel Lindsay setting up bat nets at Fig Tree Ghaut, Antigua during training on bat surveys.



Photo 8.0. Adriel Thibou (left) and Kevel Lindsay removing captured bats from mist net.



Photo 9.0. Female *Artibeus* bat caught during training on bat surveys on the night of March 05, 2012

Photos 7.0 to 9.0 were taken by Adriel Thibou and Camella Wallace. Photos courtesy of Adriel Thibou.

Equipment for the bat survey and training were provided courtesy of Island Resources Foundation.

FOLLOW-UP ACTIVITIES AND NEXT STEPS

Follow-up activities over the next four months include:

- ✧ Complete final report of conservation perspective - March 31, 2012;
- ✧ Complete arrangement to end Rufford grant in April 2012; and
- ✧ Continue writing draft of Pteridophyte Atlas and Guide.

The final report for the conservation perspective will incorporate results from the most recent trip and from reviews, and will be completed by the end of March 2012.

This Rufford grant will end on April 30 and a final report on the project is to be submitted to Rufford on April 30, 2012.

Though the Atlas and Guide is not a component of this Rufford grant, it was highlighted as an ongoing effort to seek further funding for its development. The fieldwork, surveys, assessments and research done under this effort has provided immense and invaluable support towards realizing this. Without Rufford, it would not be possible to develop the draft for later this summer 2012.

APPENDIX I

Fern Project

Calendar of Activities for Visit Feb to March 2012

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		Feb 28 Antigua Field Visit - Arrival in Antigua (Pm)	Feb 29 Antigua Field Visit - Visit to Wallings Forest - Hermitage - Yorks - Valley Church	Mar 1 Antigua Field Visit - Visit to Christian Valley, ghaut above Waterfall - Darkwood Area - Claremont - Johnsons Point	Mar 2 Antigua Field Visit - Christian Valley Southeast Side - English Harbour - Jones Valley	Mar 3 Antigua Field Visit - Visit to the moist forest on western slopes of Mount Obama (Boggy Peak) - Bat survey/Training at Fig Tree Ghaut
Mar 4 Antigua Field Visit - McNish & Upper Dunnings - Johnson's Point - Claremont	Mar 5 Antigua Field Visit - Christian Valley on Southwest Side - Jones Valley - Old Road - Urlings - Bat survey/Training at Follys	Mar 6 Antigua Field Visit - Follys - Jonas Road - Stoney Hill - Claremont	Mar 7 Barbuda Field Visit - Arrival in Barbuda (am) - Palmetto Road Area - Codrington Area - Palmetto Point/Coconut Plantation	Mar 8 Barbuda Field Visit - Codrington Area - Freshwater Pond Area - Palmetto Point	Mar 9 Barbuda Field Visit - Codrington Area - Palmetto Point/Coconut Plantation - Palmetto Point and Coast Road - Palmetto Road - Depart Barbuda (pm)	March 10 Antigua Field Visit - Body Ponds
Mar 11 Antigua Field Visit - Upper Dunnings - Bat Survey at Freetown (no bats caught)	Mar 12 - Boggy Peak Road & Midway Ridge - Met with Dr. Brian Cooper on mapping issues (pm)	Mar 13 - Depart Antigua (AM)				

*On field visits, the following persons accompanied me on the following dates and locations:

February 29:

Lucia Mings at Hermitage, Yorks and Valley Church.

March 02:

Dr. Brian Cooper to English Harbour and Jones Valley.

March 03:

Shaska to Boggy Peak, West side.

March 03:

Adriel Thibou and Camella Wallace to Fig Tree Ghaut for bat survey and training.

March 04:

Drs. Karron James and Brian Cooper to McNish Mountain.

March 05:

Adriel Thibou and Camella Wallace to Follys for bat survey and training.

March 11:

Lia Nicholson to Upper Dunnings.