



Darwin Initiative Action Plan for the Coastal Biodiversity of Anegada, British Virgin Islands



We dedicate this document to the people of Anegada; the stewards of Anegada's biodiversity and to Raymond Walker of the BVI National Parks Trust who tragically died after a very short illness during the course of this project.

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1. Introduction

It well known that Anegada has globally important biodiversity. Indeed, biodiversity is the basis for most livelihoods; supporting fisheries and leading to the attractiveness that is such a draw to visitors.

Over the last three years (2003-2006), a project was undertaken on Anegada with a wide range of activities focussing towards this Biodiversity Action Plan. From the outset it was known that the island hosts a globally important coral reef system, regionally significant populations of marine turtles, is of regional importance to birds and supports globally important endemic plants.

The project arose following the encouragement of Anegada community members and subsequent extensive consultation between Dr. Godley (University of Exeter) and heads of BVI Conservation and Fisheries Department (CFD) and BVI National Parks Trust (NPT) who requested that funding be sourced for a project which:

1. Allowed the coastal biodiversity of Anegada to be assessed;
2. That contributed significantly to local institutional capacity;
3. That contributed to environmental awareness both in Anegada and the wider BVI.

The support from partner organisations in the BVI and overseas was apparent with the substantial contribution being offered from their limited human resources and operating costs. Furthermore, the Governor of the BVI endorsed this project as a priority. It is without a doubt that this project had unconditional local support and that the project outcomes were needed and desired locally.

The project aimed to carry out a detailed assessment of the coastal biodiversity of Anegada leading to a Biodiversity Action Plan but this is not the first planning document for Anegada. We refer the reader to **Section 8** for the details of planning documents specifically for the Anegada rock iguana and a visioning meeting focussing on the overall management of Anegada. The current project contributed to many of the actions suggested in these documents but there is still much work to be done.

In this document we distil the immense body of knowledge that has been gathered in this Darwin project regarding the main foci (Plants, Birds and Turtles) highlighting the key actions to contribute to their maintenance and recovery. In addition, perhaps more importantly, we report "The Bigger Picture" the results of the Biodiversity Action Plan workshop in Anegada where members of the Anegada Community, BVI and UK project partners got together to overview the major issues for biodiversity on the island and explore their resolution.

The plan is deliberately brief to promote readability but the detail can be found both in the online and printed resources highlighted in **Section 8** and all biological information is also safely stored within the biodiversity layers of the BVI National GIS.

2. Habitats of Anegada

- Anegada supports a wide variety of habitats that sustain globally important species.
- Habitat-type responds primarily to two types of environmental gradients. There is an east west gradient of limestone elevation where limestone is at the surface and provides the substrate for plant growth in the east whilst in the west it is overlain by sand which provides the main substrate for plant establishment and growth. The second gradient is the influence of water. The presence of salt water supports salt-tolerant plant communities including mangroves and herbaceous communities around the edges of salt ponds. The amount of fresh-water determines whether a scrub or woodland community is supported, although many areas show a transition reflecting historical land clearance.
- BVI's largest tract of mangrove woodland occurs along the south-eastern coast of Anegada
- The key terrestrial habitats in the west of the island are sand dune communities: foredune communities influenced by salt spray and wind; dune scrub and thicket dependent on the degree to which shrubs and small trees establish. Bones Bight and Windlass Bight are key areas of intact dune communities with few invasive species and comprising the primary habitat for several key species including *Metastelma anegadense* and *Cordia rupicola*.
- Limestone dominates the east of the island and the cays of the Western Salt Ponds. These support a variety of habitats including limestone scrub, thicket and woodland depending on the degree of intact tree cover. The limestone cays of the Western Salt Ponds are particularly important as are areas around the Eastern Salt Ponds where good stands of dry limestone thicket and woodland exist. This is a regional rare and threatened biome and supports many key species including *Acacia anegadensis*, *Leptocereus quadricostatus*, *Malpighia woodburyana* and *Guaiaacum officianale*.
- **MAJOR THREATS:**
 - Future fragmentation and loss of habitat, and habitat modification
- **SPECIFIC ACTIONS NEEDED (but also see Section 6):**
 - Long-term habitat protection, especially key sites for endemics
 - Good land use planning to minimise habitat fragmentation
 - Control of invasive species

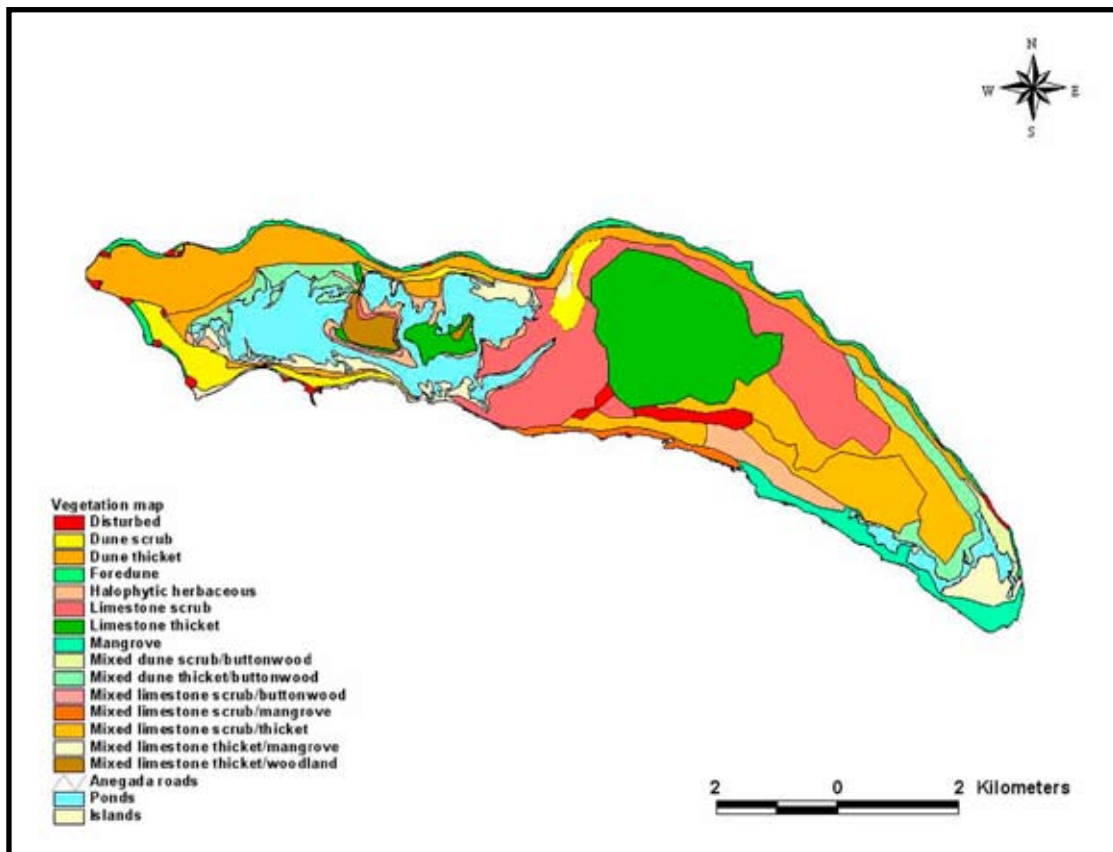


Figure 1. Main habitat types recorded on Anegada, 2003-2005.



Plate 1. Habitat types: From L to R: foredune community, mangrove, halophytic herbaceous and salt pond, dune thicket, *Casuarina* dominated foredune, dune scrub/thicket, aerial view of coastal zone and salt ponds, limestone thicket, limestone woodland edge.

3. Plants of Anegada

- 332 different types of plants have been recorded on Anegada
- Of these 288 (87%) are considered native to Anegada and 44 (13%) are non-native, having been introduced from elsewhere for food, as ornamentals or for shade
- Botanically Anegada is part of the Puerto Rican Bank floristic province. Some plants are endemic to this region (i.e. found nowhere else in the world) and of global conservation concern. A total of 11 (4%) of Anegada's plants are Puerto Rican Bank endemics and 3 of these are strict Anegada endemics. The key ones are:
 - *Acacia anegadensis* (poke-me-boy) – Anegada only
 - *Metastelma anegadense* (wire wist) – Anegada only
 - *Senna polyphylla* var. *neglecta* – Anegada only
 - *Cordia rupicola* (black sage) – Anegada & P. Rico only
 - *Leptocereus quadricostatus* (prickly web) - Anegada & P. Rico only
 - *Malpighia woodburyana* (bulldog) – Puerto Rican Bank only
- Based on IUCN Red List Criteria (www.iucnredlist.org) 16 taxa have a threatened status
 - 5 Critically Endangered (*Acacia anegadensis*, *Cordia rupicola*, *Leptocereus quadricostatus*, *Metastelma anegadense*, *Senna polyphylla* var. *neglecta*)
 - 3 Endangered (*Malpighia woodburyana*, *Guiaicum officianale* [lignum vitae], *Pictetia aculeata* [fustic])
 - 8 Vulnerable – candidate species needing more field data (*Heliotropium microphyllum*, *Hylocereus trigonus*, *Croton flavens* var. *rigidus*, *Galactia dubia*, *Forestiera eggarsiana*, *Agave missionum*, *Sabal causiarum*, *Argythamnia stahlia*)
- Of the 44 Introduced species 3 are considered invasive and pose a real threat to Anegada's biodiversity:
 - *Scaevola sericea* (a beach shrub originally from the Indo-Pacific and introduced as a landscaping plant)
 - *Casuarina equisetifolia* (whistling pine, originally from Australia and introduced as a shade tree)
 - *Cryptostegia madagascariensis* (rubber vine, originally from Madagascar and introduced as an ornamental)
- **MAJOR THREATS:**
 - Future loss of habitat and invasive species
- **SPECIFIC ACTIONS NEEDED (but also see Section 6):**
 - Long-term habitat protection, especially key sites for endemics
 - Control of invasive species
 - Continuation of seed collecting programme
 - Establishing key species into cultivation in the JR O'Neal Botanic Garden
 - Continued monitoring of key species

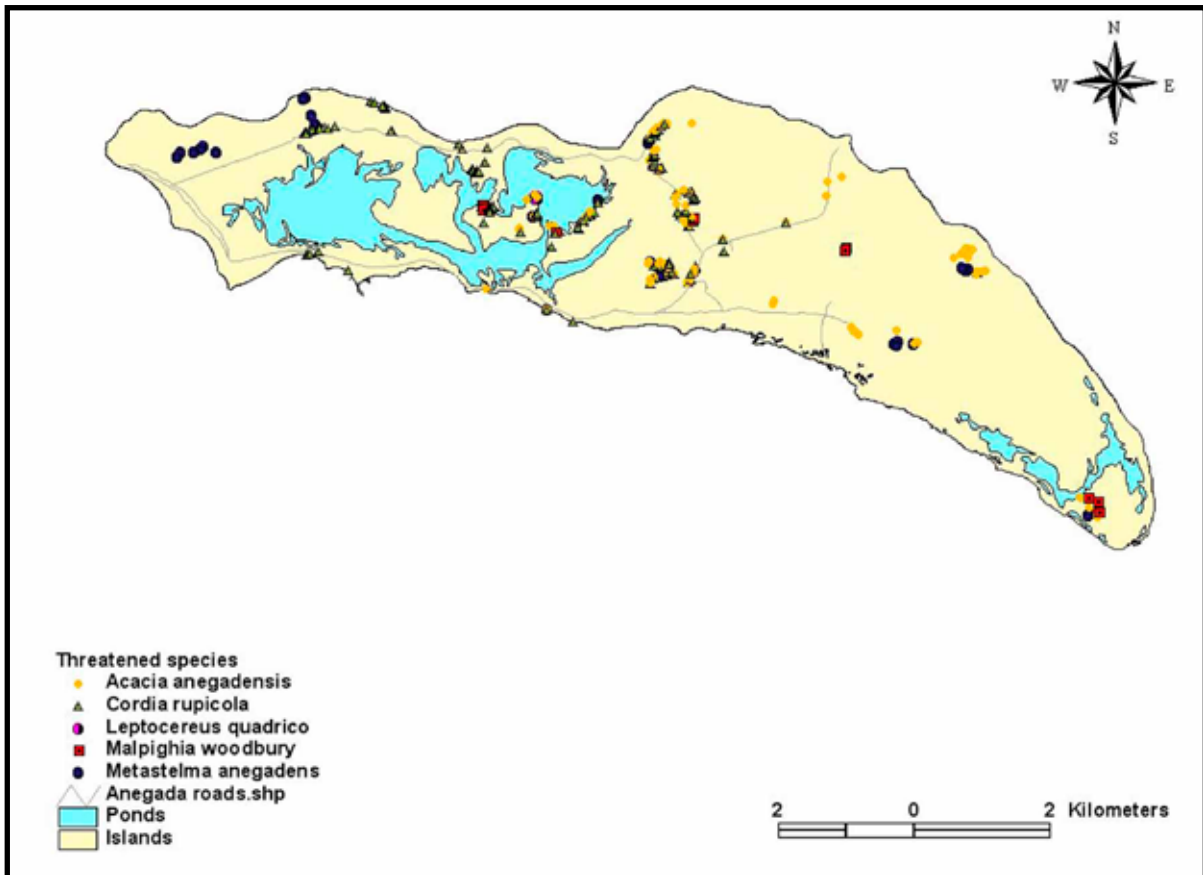


Figure 2. Locations of threatened plant species recorded on Anegada 2003 - 2005.



Plate 2. From L to R: *Acacia anegadensis* mature tree, *A. anegadensis* in flower, *Metastelma anegadense* in flower, *Senna polyphylla* var. *negelcta* in flower, *Cordia rupicola* in fruit, *Leptocereus quadricostatus* mature plant, *Malpighia woodburyana* in flower, *Guaiacum officinale* in fruit, *Scaevola sericea* in fruit.

4. Birds of Anegada

- 99 species of bird were recorded on Anegada
- 30 species were confirmed as breeding
- Anegada hosts 5 regionally important breeding seabird colonies that hold more than 1% of the total Caribbean population
 - 200-250 pairs of laughing gull (*Larus atricilla*)
 - 60-70 pairs of least tern (*Sterna antillarum*)
 - 20-25 pairs of sandwich tern (*Sterna sandvicensis*)
 - 2-4 pairs of gull-billed tern (*Sterna nilotica*)
 - 2-4 pairs of common tern (*Sterna hirundo*)
- The island's wetlands provide an important stop-over and over-wintering site for many species of shorebird and waterbirds.
- The land bird community holds healthy populations of two restricted range species; Green-throated Carib, (*Eulampis holosericeus*) and Antillean-crested Hummingbird (*Orthorhyncus cristatus*) which can be found widely and a biome restricted species, Antillean Nighthawk (*Chordeiles gundlachi*), which breed annually
- Eighteen greater flamingos (*Phoenicopterus ruber*) were reintroduced in 1992. The current estimate of the population is 102 birds, which includes 24 chicks reared in 2004.
- **MAJOR THREATS:**
 - Future loss of habitat and introduced predators such as feral cats and rats.
- **SPECIFIC ACTIONS NEEDED (but also see Section 6):**
 - Long-term habitat protection including salt ponds (especially Eastern Ponds)
 - Control of invasive species
 - Continued monitoring of key species

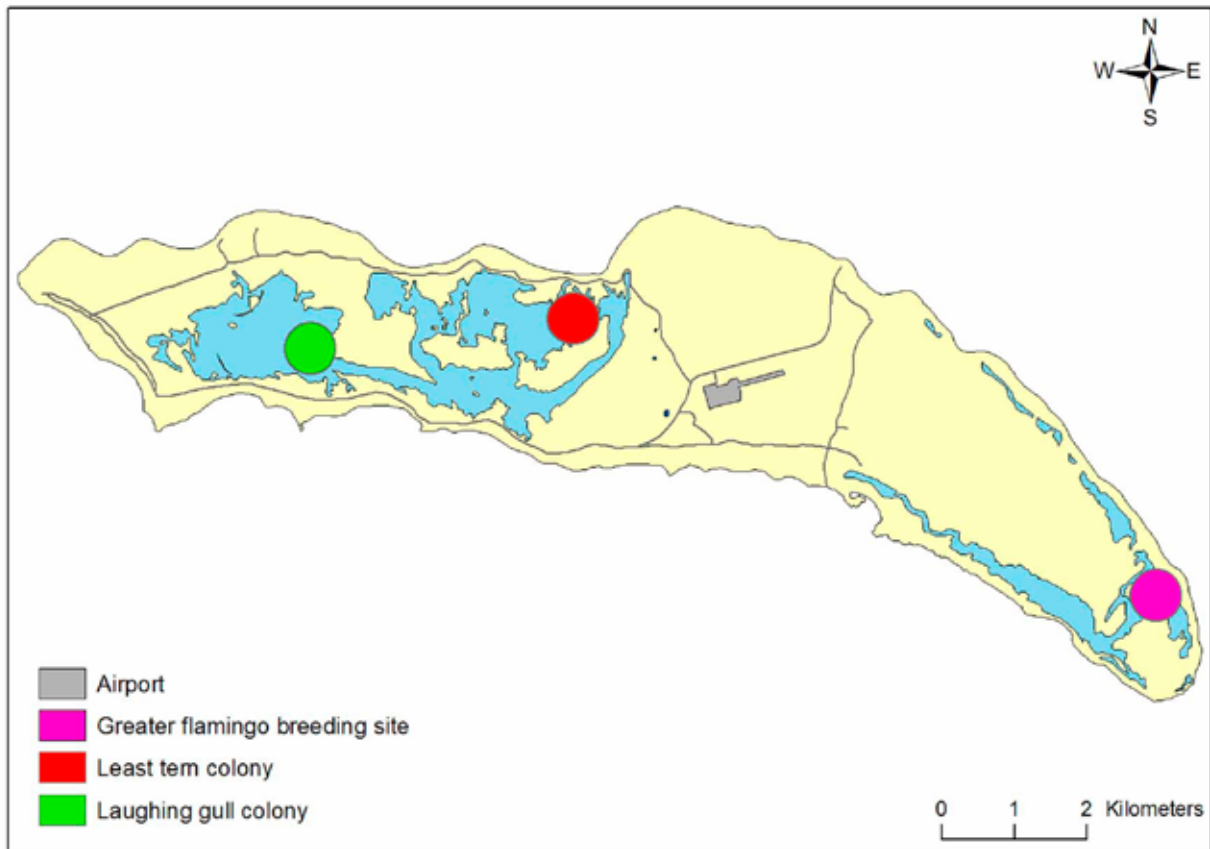


Figure 3. Main breeding sites of the greater flamingo, least tern and laughing gull on the salt ponds of Anegada, 2003-2005.



Plate 3: From L to R. least tern, laughing gull, magnificent frigatebird, Antillean nighthawk, mangrove cuckoo, bananaquit, ruddy turnstone, greater flamingo, white-rumped sandpiper,

5. Sea Turtles of Anegada

- Anegada is the most significant location for green (*Chelonia mydas*) and hawksbill (*Eretmochelys imbricata*) turtles in the entire BVI.
- Nesting numbers are critically small (<10 females per year) and it is likely that these individuals migrate from habitats hundreds or even thousands of kilometres away from Anegada.
- Although the main nesting sites for this species in the BVI are in Tortola, occasional leatherback turtle (*Dermochelys coriacea*) nests are also recorded on Anegada.
- Most nesting occurs on northern shores, particularly on the beaches on the eastern end of the island.
- There are important foraging populations of juvenile green and hawksbill sea turtles in the shallow waters surrounding Anegada with turtles utilising seagrass, reef and mangrove habitats.
- Turtles grow exceptionally quickly in these waters, despite being present in relatively high densities in comparison to elsewhere in the BVI.
- Genetics suggest that juvenile green turtles originate from nesting populations as far away as USA, South America and the South Atlantic.
- Juvenile hawksbills turtles originate from throughout the Caribbean and South America.
- A once significant turtle fishery in Anegada is very much reduced and animals are no longer taken from nesting beaches. During the course of this project the last commercial fishermen in Anegada ceased to target turtles because of a reduced demand in Tortola. A low level of harvest for local use does continue.
- **MAJOR THREATS:**
 - Unless a major turtle fishery resumed the only threat would be if development impacted nesting or foraging grounds.
- **SPECIFIC ACTIONS NEEDED (but also see Section 6):**
 - Long-term habitat protection including nesting beaches, seagrass beds and coral reefs.
 - Continued monitoring of nesting and foraging populations

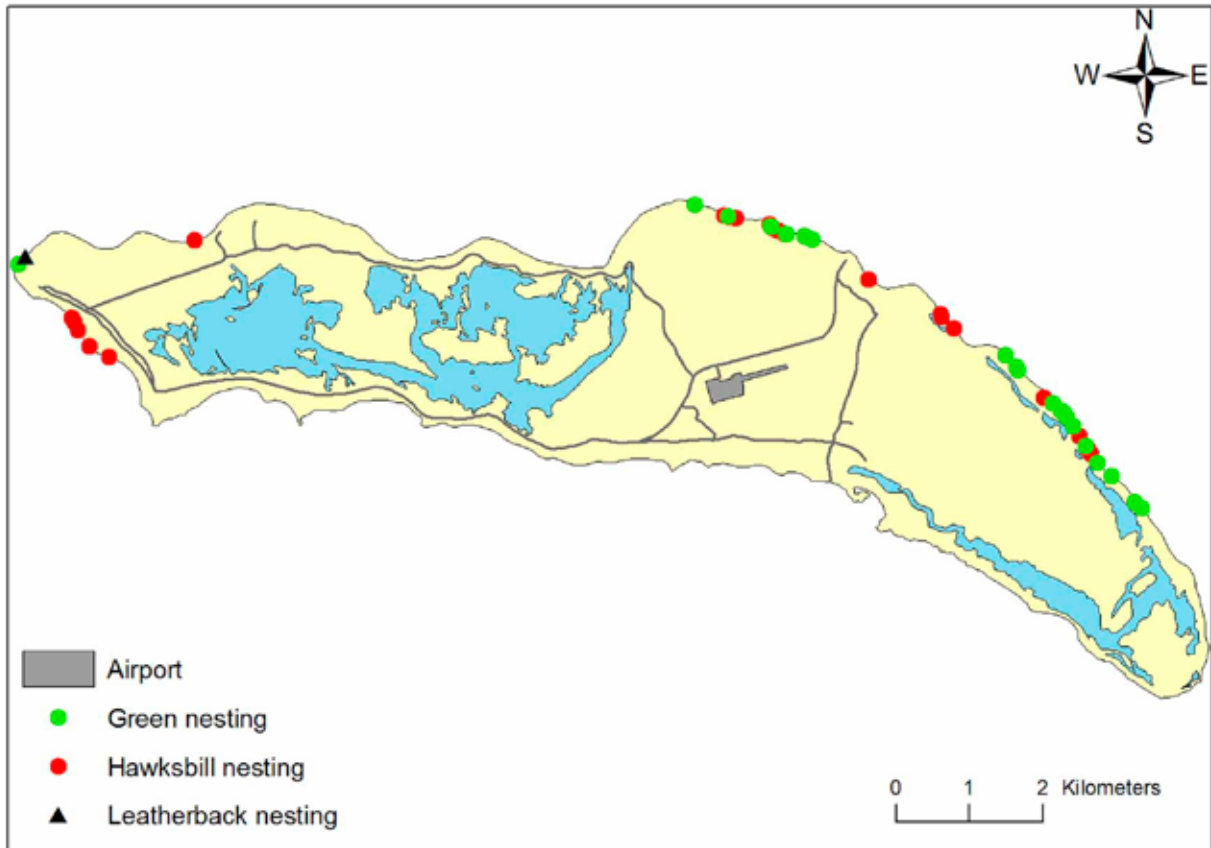


Figure 4. Locations of nests of the green, hawksbill and leatherback turtle recorded on Anegea, Nov 2003 - Sept 2005.



Plate 4: From L to R: Nesting green turtle, green turtle track, hatchling hawksbill turtle, juvenile hawksbill turtle, releasing juvenile green turtles, measuring juvenile hawksbill turtles, patch reef, seagrass beds, coral.

6. The Bigger Picture: An Overview with a Community Perspective

In September 2005, the Darwin Initiative Biodiversity Action Planning meeting was held in the Community Centre, Anegada, BVI. Members of the Anegada Community joined with representatives of all of the project partners from BVI and UK. It was essential that the community's perspective be included in suggested actions for the biodiversity of their island. Facilitated by Martin Davies of the RSPB, the workshop focused on identifying the issues faced by Anegada's biodiversity and solutions to any problems.

First, it was necessary that workshop participants put the biodiversity of Anegada into some perspective at a global, regional and local level and provide an assessment of its current condition. The majority of Anegada's biodiversity was considered to be in a mixed or poor state at all levels although it was agreed that for several areas i.e. coral reef, endemic butterflies, information is still lacking.

The meeting then focused on the creation of a problem tree, which represented all the issues/threats facing Anegada's biodiversity. Participants then turned all the problems into objectives, which represented the solutions to dealing with problems. Participants were then allocated five votes each and asked to vote on what objectives they regarded as being of the highest priority.



Plate 5. Identifying problems and their solutions at the BAP meeting on Anegada, September 2005.

The objectives that received the highest number of votes fell out into two major groupings:

A. Related to Governance/Land Use/Community Involvement:

- All decision making takes into consideration biodiversity needs in Anegada
- Land rights issues resolved so there is no constraint to natural resource management
- Biodiversity conservation has high ownership and commitment from local persons
- Awareness and understanding about the destruction/misuse of natural resources on Anegada is increased
- Decisions relating to natural resource management on Anegada are taken in collaboration with the community

B. Related to Specific Conservation Action:

- A Protected Area network is established that has sufficient representation of key habitats & species
- Land is zoned for appropriate uses, ensuring that critical habitats are protected
- A healthy population of endemic plants is maintained
- Habitat (nesting/feeding areas) for the iguanas and turtles is secured
- Populations of iguanas, birds and other species threatened by predation are increased
- Natural resources are sustainably managed
- Impacts of global climate change are monitored and areas of resilience (e.g. adaptability to coral reef bleaching) are identified

Workshop participants also identified that in order to deliver the actions, there is the obvious need for additional input from key stakeholders that did not attend the workshop that included BVI teachers, District Representative, Ministry of Natural Resources, Survey Department, Public Works and Land Registry.



Plate 6. Fieldwork training opportunities after the meeting; in the capturing and marking of sea turtles, birdwatching and removal of an invasive *Scaevola sericea*.

Following the workshop meetings, a series of fieldtrips on land and sea was mounted in order to showcase some of the important biodiversity of Anegada, highlighting those aspects that had been the focus of activity during the project.

A detailed report of the workshop and an electronic version of the problem tree are available at the Darwin Project Website at:

<http://www.seaturtle.org/mtrg/projects/anegada/outputs.shtml>

7 Acknowledgements

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8 Further Information

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