Thematic Review

Conservation of Biodiversity on Islands:

The contribution of the United Kingdom's Darwin Initiative for the Survival of Species 1993-2006

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Abbreviations

Abbreviation	Definition
CBD	Convention on Biological Diversity
CEPA	Communication, Education and Public Awareness
CI	Conservation International
COP	Conference of Parties (of the CBD)
DEFRA	Department for Environment, Food and Rural Affairs.
DFID	Department for International Development
DI	Darwin Initiative
FCO	Foreign and Commonwealth Office
GEF	Global Environment Fund
IBA	Important Bird Area
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-government organisation
OTEP	Overseas Territories Environment Programme
PICCC	Pacific Island Community Conservation Course
PoW	Programme of Work
UK OTs	UK Overseas Territories

Executive Summary

The CBD and Darwin Initiative: The CBD was established in 1992 to promote global conservation of biological diversity. The Darwin Initiative was launched at the same time as the UK Government mechanism to support achievement of CBD commitments in developing countries. The Darwin Initiative has so far supported over 460 projects in more than 100 countries.

About this Review: This report is the third in a series of Thematic Reviews commissioned by the Department for Environment Food and Rural Affairs (Defra) to examine the contribution of the UK Darwin Initiative (DI) to the Convention on Biological Diversity (CBD). This Thematic Review analyses and documents the contribution of the Darwin Initiative to the CBD, and in particular its Programme of Work on Island Biodiversity. The Initiative has funded 105 projects on Islands – making up 22% of the portfolio. This Review looks at the diverse range of Darwin Initiative projects on Islands and identifies conclusions and recommendations for the future.

About Islands: Islands display a remarkable diversity in terms of their geological, biophysical and socio-political characteristics, but there are usually strong links between island communities and biodiversity. Islands are brought together by their isolation and their similar constraints in financial, human and institutional capacities. What makes islands important is that island ecosystems present an amplified range of conservation challenges – so they are important to learn from as smaller models of reality elsewhere.

Darwin – successfully delivering the Programme of Work: Darwin Initiative projects on islands have made significant contributions to assist local stakeholders in meeting their CBD obligations, and demonstrate good value-for-money. Of particular value in the Darwin Initiative is sharing of expertise through partnerships. The project partnerships, synergies between projects and networking relationships often extend well beyond the geographic focus and the life of projects. Darwin Initiative projects have in particular contributed to the following Goals of the CBD's Programme of Work:

- *Goal 11 – Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention.* Darwin Initiative Grants are especially helpful in catalysing action on Islands, where capacity and resources are particularly constrained. Darwin promotes learning networks between islands to bridge this gap, as well as improving expertise directly. Experience from Darwin's island projects also holds important lessons for conservation elsewhere.
- *Goal 2 - Promote the conservation of island species diversity.* Around 70% of Darwin's island projects address this goal, by actions from developing biodiversity action plans through to protecting threatened endemic species. Darwin projects generate significant new scientific knowledge about key elements of biodiversity.
- *Goal 4 - Promote sustainable use and consumption.* A growing proportion of Darwin projects support this goal, building in trade and local enterprise.
- *Goal 1 - Promote the conservation of the biological diversity of island ecosystems, habitats and biomes*. Numerous Darwin projects work towards securing conservation areas, which can protect endemics and test conservation models.
- *Goal 8 - Maintain capacity of island ecosystems to deliver goods and services and support livelihoods.* Darwin projects increasingly recognise the importance of delivering benefits to local communities. This is important in reducing vulnerability.

Key challenges and opportunities for the future: Conservation is rarely a priority for Island Governments facing severe resource constraints, and mechanisms for securing sustained support are necessary. Conservation activities must always be linked into institutional realities to improve sustainability of actions. New threats, such as increasing invasive species and climate change, must be considered with some urgency.

This review makes numerous specific recommendations for improving practice relating to Island projects.

Summary of Recommendations

	Recommendation	page
	Programme Level	
1	The 2010 Target has proved very useful to analyse the way that DI projects empower local stakeholders to conserve biological diversity through implementation of the CBD. This analysis should be extended to all DI projects.	25
2	UK researchers need to be made aware of the needs and opportunities relating to research to promote the conservation of the [island] genetic diversity of crops and livestock.	26
3	Projects designed to address the threats to biodiversity on islands (Focal Area 3 of the Islands Programme of Work) should be encouraged by the Darwin Initiative.	29
4	Defra may wish to promote dialogue within government to consider the creation of a separate “knowledge into practice” fund for biodiversity conservation.	29
6	The Darwin Initiative should consider hosting or funding networking workshops for participants and partners from DI Islands projects as a mechanism to further empower conservation practice addressing the major constraint apparent on islands.	31
8	There is a need to develop mechanisms to fund implementation of conservation activities on islands, including specifically Overseas Territories. These should be seen as being distinct from the DI (and related research or capacity building) programme.	33
13	The Darwin Initiative should consider potential benefits that could be derived through enhanced impact and legacy through a more strategic approach to the commissioning and selection of projects based on analytical thematic reviews.	58
	Project Level	
5	DI projects should be encouraged to work more with indigenous knowledge and local communities and to explore the opportunities presented by taking a bio-cultural diversity approach to conservation.	30
7	The design of DI projects which have significant emphasis on the transfer of technology (2010 Target 11.2) need to address the issues of local absorptive capacity and sustainability after the project ends.	32
9	DI projects that are promoting the development of protected areas on islands should be encouraged to engage in comparative analysis and lesson learning within and between projects to produce guidelines to increase their effectiveness.	54
10	Recognition of the social dimension of conservation is important, and particularly on islands, where social issues are amplified. A better understanding of the social dynamics of island communities through collaboration with social scientists and anthropologists as well as using more process approaches to conservation are recommended.	54

1. Introduction

1.1 The Convention on Biological Diversity

The Convention on Biological Diversity (CBD) was signed by 150 world leaders at the 1992 Earth Summit in Rio de Janeiro; the CBD is part of a world strategy for sustainable development and sets out practical commitments for maintaining the earth's ecological underpinnings as economic development progresses. The three main Goals of the Convention are:

Box 1 The CBD's Goals

The CBD's Goals

- Conservation of biological diversity;
- Sustainable use of its components; and
- Fair and equitable sharing of the benefits from the use of genetic resources.

The CBD comprises 42 articles, governed by the Conference of the Parties (COP), and is advised by the Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA).

The 7th Conference of Parties (COP-7) held in Malaysia in 2004 adopted a multi-annual programme of work to deliver progress against the 2010 Biodiversity Target (Box 2). The programme of work is divided into seven focal areas with further subdivision with specific goals and targets.

Box 2 The CBD's 2010 Biodiversity Target. CBD Decision VI/26

2010 Biodiversity Target

"To achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth."

The CBD's COP has adopted seven thematic programmes of work (Box 3) linked to major biomes on the planet. Island biodiversity was highlighted at the 8th COP held in Brazil, 2006 and is the topic of this thematic review.

Box 3 The CBD's thematic programmes of work

The CBD's Thematic Programmes of Work

- Agricultural biodiversity
- Dry and sub-humid biodiversity
- Forest biodiversity
- Island biodiversity
- Inland waters biodiversity
- Marine and coastal biodiversity
- Mountain biodiversity

1.2 Overview of Islands

For the purposes of this review, islands have been defined using the definition contained within the Regime of Islands of United Nations Convention on the Law of the Sea which states that *"An island is a naturally formed area of land, surrounded by water, which is above water at high tide"* with the added clarification that excludes the continents. This means islands range is size from many with a total area of less than 1 km^2 to the world's largest island of Greenland with a total area[1] of 2,166,086 km^2. For this reason alone, islands display a remarkable diversity in terms of their geological, biophysical and socio-political characteristics as is clearly demonstrated in the selection of projects funded by the Darwin Initiative (Annex 1) which have provided the material for this review.

Participants in DI projects were asked to help define the characteristics of islands, or "what makes islands special". Their responses were illustrative in their diversity and reflected the characteristics of the places where they worked. There is no single set of biological, physical or environmental characteristics that defines a typical island. At best the defining physical characteristic is a degree of physical isolation from continental land masses, but even this varies, for example Sri Lanka is a continental remnant that shares many characteristics with the nearby Indian Continent. In contrast, some of the UK Overseas Territories in the South Atlantic are distinguished by being the most isolated territories on the planet.

In terms of biodiversity, islands range from being amongst the world's most extreme biodiversity "cold spots" through to amazingly diverse hotspots that are home to large numbers of endemic species, especially when expressed per unit of surface area. Islands are microcosms, that contain the capture most of the characteristics seen globally. The one advantage of islands in this context is that they represent a "closed" system which is often simpler to study and understand.

It is no coincidence that islands have provided some of the most important concepts that scientists and conservationists use today on a daily basis. It is from the scientific study of islands that the world has learnt about evolution and extinction. The portfolio of DI projects on islands also illustrate the range of challenges to biodiversity through factors including climate and land-use change, pollution, invasive species and most importantly the need to promote the sharing of benefits and sustainable use of resources. On many islands their biodiversity may represent the main source of economic activity and livelihoods for inhabitants, and some can even be termed 'biodiversity economies' eg Galápagos.

On nearly all of the islands which have been the subject of DI projects, there is strong evidence of human impact on a range of ecosystems. This can be observed in all the projects included in this review but was particularly severe on small islands where population growth can create unsustainable demands for essential resources such as water and land. The demand for these resources in turn leads to environmental impact through soil degradation and ground water depletion or pollution, a process which can be further exacerbated when the local population is swollen by the environmental impact of large numbers of tourists, who are ironically often attracted by their vision of the pristine environment of their selected island "paradise". Darwin projects are making major contributions by helping to document the state of the environment of islands, providing extreme contrasts such as between the relatively pristine Galápagos Islands and the highly degraded Seychelles.

1 CIA World Factbook, https://www.cia.gov/cia/publications/factbook/

It is the human dimension of islands where there is greater similarity. Islands are characterized by communities that have significant economic, social and cultural links to biodiversity. In many cases these links or dependency also contribute to their economic vulnerability. Cultural tradition promotes conservation efforts on many islands, but the efforts of communities and governments are often severely limited by the lack of technical capacity and financial resources. Within this context, Darwin Initiative projects which address these constraints are often very welcome.

Islands are also often characterized by distinctive cultural identity, social structures and political systems often linked to the combination of low population and isolation. A number of island states participating in DI projects illustrate this, for example six of the island groups[2] have total populations (Table 2) of less than 100,000 (three of these are 20,000 or less). With low populations the total financial resource available to support conservation is also very restricted. Similar problems exist for UK Overseas Territories.

Social structures in island systems including those for land tenure and customary rights for resource use, means that communities are often both interested and well placed to be able to promote sustainable use of biological resources. There is however, often resistance to new ideas if there is a perception that these are being imposed from outside. A consistent message coming from successful DI projects has been the need to support and work within local structures and cultural contexts.

Vulnerability to extreme events, environmental and social change is a characteristic of many islands, particularly those which are small or have unique or isolated ecosystems and large number of endemic species. In the past this has most definitely contributed to the risk of species extinction and lead to the large numbers of species considered to be vulnerable to change (see Table 5). In addition, invasive species add to the level of vulnerability seen on islands, either through driving out of local endemics or replacing them when they become highly endangered. In recent years, it has been recognized that the vulnerability of many island systems is increasing rapidly as a direct result of increased climatic variability and change. These factors are already having measurable and significant impact on island ecosystems and their biodiversity in systems which are already recognized as being prone to extreme events such as cyclones, hurricanes, tsunami and floods. Just as islands provided the first solid quantitative evidence of the evolution of species, it may well be islands that provide the most immediate and impelling evidence of the impact of climate change on the loss of species.

1.3 The Darwin Initiative

The Darwin Initiative was announced by the UK Government at the Rio Earth Summit in 1992. The aim of the Initiative is to assist those countries which are rich in biodiversity but poor in financial resources to implement the Convention on Biological Diversity (CBD) through the funding of collaborative projects which draw on UK biodiversity expertise. By the end of 2006, 450 projects have been supported through 14 funding rounds with a current annual budget of £7 million.

1.4 The Thematic Review

This thematic review has been designed to document how DI projects have empowered stakeholders in partner (host) countries on islands to conserve their own biodiversity. The CBD's Thematic Programme on Islands was used to provide a framework for the review, based on the discussions and decisions of the 8th Conference of Parties.

2 Commonwealth of Dominica, Cook Islands, Kiribati, Palau, Seychelles,Tuvalu

This is the third thematic review conducted by the DI, following an analysis of the DI's contribution to the CBD's Taxonomy Initiative and a review of Communication, Education and Public Awareness in Darwin projects. These reviews are conducted by the Edinburgh Centre for Tropical Forests (ECTF[3]) as part of their overall monitoring and evaluation (M&E) programme for the DI. The M&E process is designed to add value to the Initiative, through lesson-learning, impact analysis and knowledge extraction at the level of the whole programme and for specific thematic areas.

This review covers nearly one quarter of the portfolio of past and current DI projects. The quality, diversity and volume of information available are enormous as was the enthusiasm of people involved in these projects wishing to share their experiences. It is impossible for this review to do justice to what has been achieved by 105 projects and the many thousands of dedicated participants around the world. This review presents the most important lessons learnt from the portfolio and illustrates these with examples from specific projects.

It is unavoidable that the review cannot refer to every project that has made a contribution to a specific area or work, nor was it possible to record the most significant achievements of every project. The choice of examples used in this review does not infer any judgement on the quality and value of those projects compared to others which have not been mentioned specifically. The process of researching this review illustrated the growing need to make information from DI projects much more readily accessible. During 2007 the Darwin Initiative will be implementing a process to make information about all DI projects much more readily available through the Darwin Initiative website. Once completed, this process will help to demonstrate the huge contribution that DI projects have made to empower stakeholders in their host countries to act to conserve their national biodiversity.

1.5 The characteristics of islands

It is appropriate to conclude with a summary of some of the characteristics of islands that emerged from the initial review of the DI projects on islands and from the feedback obtained from participants in the DI's projects on islands. The following summary (Box 4) stresses again, that whilst there is no "typical" island, they do share a number of important characteristics that present distinctive needs, opportunities and challenges for the conservation of biodiversity.

Box 4 Significant characteristics of islands

Biophysical "*There is no typical island*"

- Size varies from very small (<1 km^2) up to over 2 million km^2 (Greenland). Small islands have a very high ratio of coastline to their land area.
- Geophysics varies from continental remnant to coral atoll or recent volcanic origin.
- Geological age of islands varies from very young (e.g. 100 years) to old (e.g. continental remnants)
- Climate varies from arctic to tropic. Usually oceanic characteristics.
- Islands are often considered to be *at risk* of climatic extreme events, variability and change. (eg Typhoons and hurricanes, temperature and sea level rise).
- Habitats or ecosystems can be small and isolated, increasing the vulnerability of dependent species if there is no refuge in times of environmental change.
- Small islands often demonstrate extreme environmental gradients (eg from coast to mountain) which again limits the availability of refuges for vulnerable species.

3 www.ectf.co.uk

Biodiversity *"Highly vulnerable, but real potential for conservation"*

- Biodiversity characteristics vary from cold spots (typically small islands which are either young or very isolated) to being in some of the world's most dynamic hotspots (e.g. the Indonesian archipelago).
- Islands typically have high degrees of endemism, species sometimes exhibit unusual adaptations.
- Islands have demonstrated some of the highest extinction rates.
- Island biodiversity is highly vulnerable to external shocks such as land-use change, pollution, invasive species (plants and animals), climatic variability (eg El Niño), extremes and change.
- Islands have provided some of the most encouraging examples of the conservation of biodiversity, including restoration, eradication of invasives and reintroductions.

Socio-economic "*Limited human and financial resources*"

- The livelihoods of communities are often highly dependent on island biodiversity.
- Lack of human, financial and information resources for conservation are a critical constraint.
- There are limited numbers of research and conservation organisations[4] on islands providing indigenous support for conservation activities.
- Individuals who have made a long-term commitment to conservation or environmental issues can have very significant impact and influence on islands, especially small islands. Such individuals can act as positive champions for change, but sometimes take on the role of a "gatekeeper" and unintentionally inhibit risk taking and innovation.
- There may be important differences and potential conflict between indigenous "island" communities and more recent immigrants (incomer communities).
- Tourism is often a significant source of income on islands, but large-scale developments may create conflicts relating to land use, pollution and demand for food, energy and water. It is difficult to balance potential benefits against the costs to the environment and social structures.
- Political structures and processes can be distinctive, especially on small islands where systems of governance are influenced by the low population. Island communities and governments can be resistant to the imposition of "off-island" solutions.
- Social structures, culture and customary rights may provide strong support for community-lead conservation efforts (e.g. through much of the South Pacific).
- Uninhabited islands provide a chance to test conservation theory and practice in the absence of significant direct human impact. (e.g. relocation of species).
- Islands provide some of the best opportunities to demonstrate conservation practices

4 This includes universities and national conservation NGOs. On many islands, their role is frequently taken by local offices of large international NGOs.

2. Darwin Initiative projects on Islands

2.1 Overview

Over the period 1993 – 2006, the Darwin Initiative has funded a total of 105 projects (Listed in Annex 1) in 44 islands, island groups or archipelagos (Table 1). The projects represent 23 percent of the overall portfolio both in terms of the number of projects and the funds allocated. This makes projects on islands one of the most significant thematic groupings in the programme. The geographic spread of projects (Figure 1) is also wide covering the Pacific, Atlantic and Indian Oceans.

Table 1 Summary of Darwin Initiative (DI) support for "island" projects

	"Island" projects	% of all Darwin Projects
Total number of projects	105	23 %
(regional)	6	
Number of island groups	44	
Darwin funding	£13,722,063	23%

(Data from Darwin Initiative Monitoring and Evaluation database)

Darwin's island projects have involved a remarkable range of topics and approaches, in effect touching on nearly all of the priority areas of the CBD. There is also a balance between projects which focus mainly on terrestrial ecosystems (64 %) and marine or coastal ecosystems (28 %) a fact that runs against a common perception in the conservation community that terrestrial ecosystems are often ignored on islands.

Six of the projects were of a strongly regional nature and could not be considered to be linked to specific island groups. The remaining 99 projects were distributed between 44 island groups. Some of these had clusters of projects, those with more than five included Borneo (12), Madagascar (8), Mauritius (8), Seychelles (5) Galápagos (7) and Fiji (6). Each of these groups (except Fiji) was examined in more detail for this review.

Basic socio-economic information for the islands is presented in Table 2. These data illustrate the vast differences between islands and may explain why researchers from the Darwin projects found it so difficult to generalise their experiences, with populations ranging from 0 (Gough Island) to 124 million (Java), per capita incomes from US$ 367 (East Timor) to US$ 63,222 (Bermuda) and land area from 26 km^2 (Tuvalu) to New Guinea (total area of over 850,000 km^2).

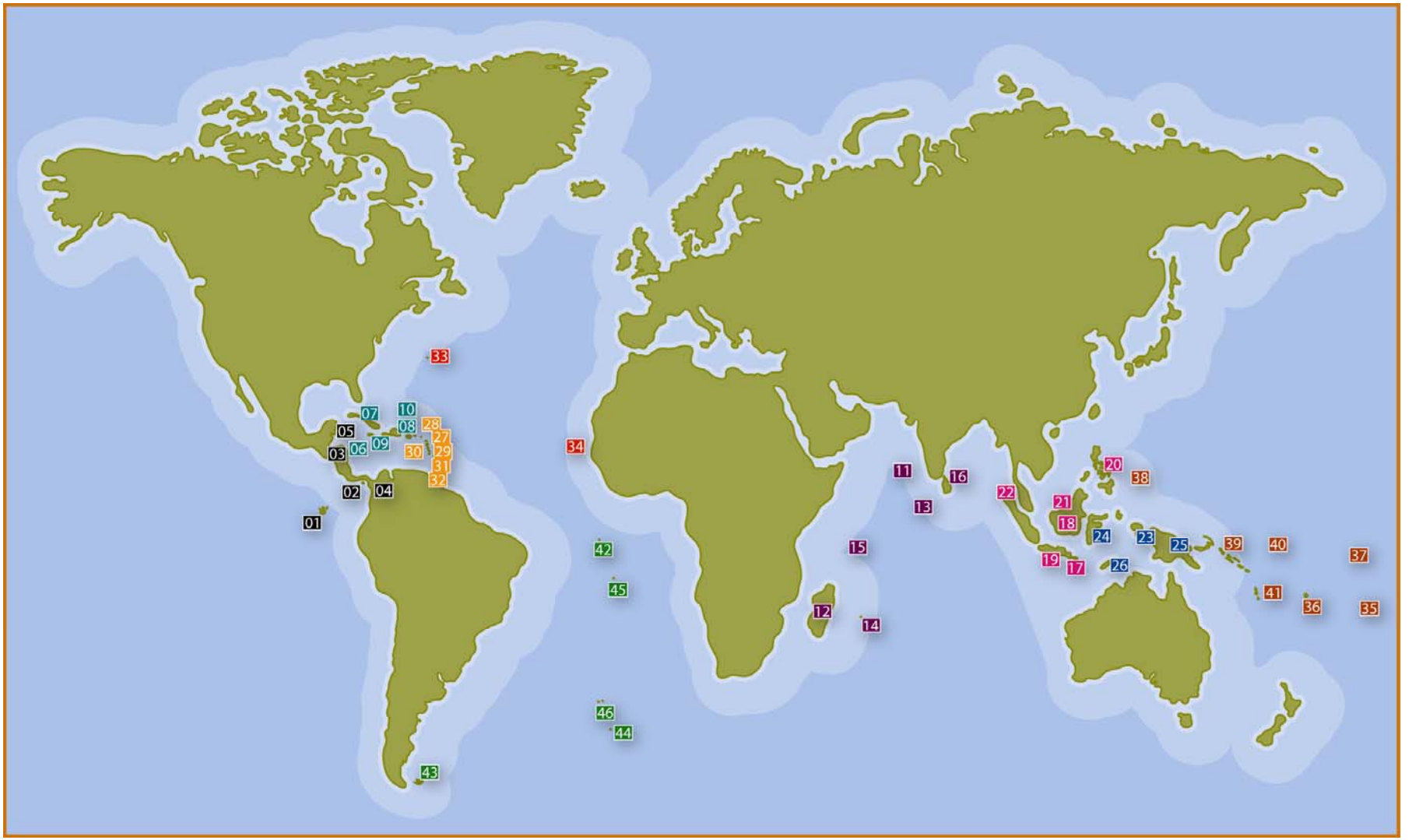

Figure 1 Map of the world showing the location of all DI island projects funded over the period 1993-2006

Eastern Pacific and C.America	No. of Projects
01 Galápagos (Ecuador)	7
02 Perlas Archipelago (Panama)	1
03 Roatán (Honduras)	1
04 San Andres Archipelago (Colombia)	1
05 Turneffe Atoll (Belize)	1

Greater Antilles (Caribbean)	No. of Projects
06 Cayman Islands	1
07 Cuba	2
08 Dominican Republic	1
09 Jamaica	1
10 Turks & Caicos Isles	1

Indian Ocean	No. of Projects
11 Lakshadweep Islands (India)	1
12 Madagascar	8
13 Maldives	1
14 Mauritius	8
15 Seychelles	5
16 Sri Lanka	5

Indo-Malaya, Philippines	No. of Projects
17 Bali (Indonesia)	1
18 Borneo (Indonesia)	1
19 Java (Indonesia)	1
20 Philippines	5
21 Borneo (Malaysia)	11
22 Penang (Malaysia)	1

Wallacea/New Guinea	No. of Projects
23 West Papua (Indonesia)	1
24 Sulawesi (Indonesia)	3
25 Papua New Guinea	5
26 Timor-Leste (East Timor)	1

Lesser Antilles (Caribbean)	No. of Projects
27 Anguilla	1
28 British Virgin Islands	2
29 Commonwealth of Dominica	1
30 Montserrat	1
31 St Lucia	1
32 Trinidad & Tobago	3

North Atlantic	No. of Projects
33 Bermuda	1
34 Cape Verde Islands	1

South Pacific	No. of Projects
35 Cook Islands	1
36 Fiji	6
37 Kiribati	1
38 Palau	2
39 Solomon Islands	2
40 Tuvalu	1
41 Vanuatu	1

South Atlantic	No. of Projects
42 Ascension Island	1
43 Falkland Islands	2
44 Gough Island	1
45 St Helena	1
46 Tristan da Cunha	1

The Darwin Initiative was established to assist countries in their implementation of the CBD when they were limited by financial or human resources. The relevance of Darwin to islands is very clearly seen from Table 2 which documents the nature of the constraint in virtually all of the locations hosting projects. A simple index has been developed to illustrate differences between islands for this review based on the expected GDP divided by the land area of the island[5]. This gives a standardised estimate of the size of the economy and hence an index of resources potentially available for conservation efforts. The variation is staggering, Bermuda, A UK Overseas Territory, with a population of only 68,500 has an economy equivalent to nearly US$ 82 million per square kilometre of land area. In Bermuda's case, the real constraints to conservation are almost completely modified terrestrial and severely damaged marine environments. Conservation is a low priority for government and human resources are consequently lacking. In contrast, the economic constraints for conservation are apparent in the economic activity of the lowest ranking islands of East Timor (23,000 $ km^{-2}), Galápagos (11,000 S km^{-2}), and the two UK Overseas Territories of Tristan da Cunha and the Falkland Islands (9000 and 6000 $ km^{-2} respectively). The lowest values were in two further UK Overseas Territories of Ascension and Gough islands both of which have no formal economy. The biodiversity remains high in these Territories, mainly because of low human populations, but the available human and financial resources for conservation are very limited.

Table 2 Summary of Darwin Initiative (DI) island projects. Number indicates the number of DI projects for each island (or group)

Island	Number	UK OT	SIDS	Area (km^2)	Population (,000)	GDP US$ (*per capita)*
Anguilla	1	•		102	12.2	7,736
Ascension Island	1	•		90	1.0	0
Bali (Indonesia)	1			5,633	3,151.0	*3,842*
Bermuda	1	•		53	68.5	63,222
Borneo (Indonesia)	1			743,330	11,000.0	*3,842*
Borneo (Malaysia)	11			743,330	2,449.4	*10,843*
British Virgin Islands	2	•		153	27.0	38,643
Cape Verde Islands	1		•	4033	495.2	6,523
Cayman Islands	1	•		260	44.0	36,271
Commonwealth of Dominica	1			751	68.9	3,466
Cook Islands	1		•	236	18.0	8,945
Cuba	2		•	109,820	11,245.0	3,059
Dominican Republic	1		•	48,442	8,870.0	7,579
Falkland Islands	2	•		12,173	3.0	24,000
Fiji	6		•	18,270	840.8	5,958
Galápagos (Ecuador)	7			7,850	20.0	*4,272*
Gough Island	1	•		65	0.0	0

5 This is calculated from the data in Table 2 by multiplying the per capita GDP and population and expressing the value on a unit area basis by dividing by total land area. i = GDP x Population / Area

Island	Number	UK OT	SIDS	Area (km^2)	Population (,000)	GDP US$ (*per capita*)
Jamaica	1		•	10,830	2,644.6	4,399
Java (Indonesia)	1			126,700	124,000.0	*3,842*
Kiribati	1		•	730	97.8	815
Lakshadweep Islands (India)	1			32	60.6	*3,486*
Madagascar	8			581,540	18,112.7	897
Maldives	1		•	298	289.0	2,345
Mauritius	8		•	2,030	1,234.2	12,456
Montserrat	1	•		102	4.5	10,690
Palau	2		•	458	20.0	6,717
Papua New Guinea	5		•	452,860	5,771.9	2,801
Penang (Malaysia)	1			1,046	1,470.0	*10,843*
Perlas Archipelago (Panama)	1			na	*3,175.4*	*7,884*
Philippines	5			*298,170*	*81,617.0*	*4,920*
Roatán (Honduras)	1			111,890	*7,048.3*	*2,788*
San Andres Archipelago (Colombia)	1			57	100.0	*7,769*
Seychelles	5		•	460	83.6	16,620
Solomon Islands	2		•	27,990	465.8	1,910
Sri Lanka	5			64,630	19,419.2	4,569
St Helena	1	•		122	4.0	2,291
St Lucia	1			610	163.7	6,375
Sulawesi (Indonesia)	3			174,600	14,946.5	*3,842*
Timor-Leste (East Timor)	1			14,870	924.6	367
Trinidad & Tobago	3		•	5,130	1,301.3	13,758
Tristan da Cunha	1	•		98	0.3	3,000
Turks & Caicos Isles	1	•		430	32.0	13,506
Turneffe Atoll (Belize)	1			*na*	*282.6*	*6,747*
Tuvalu	1		•	26	10.4	2,141
Vanuatu	1		•	12,189	211.0	3,276
West Papua (Indonesia)	1			420,540	2,600.0	*3,842*
Regional Projects	6					

UK OT = UK Overseas Territory.

SIDS = Small Island Developing State.

Data for the area, population and *per capita* Gross Domestic Product (GDP) are for 2003 or 2005 and are derived from the United Nations Common Database (United Nations, 2006), World Bank Development Indicators (World Bank, 2006) and CIA World Fact Book[6] and the UK Foreign and Commonwealth Office for UK Overseas Territories[7].

6 https://www.cia.gov/cia/publications/factbook/index.html

2.2 UK Overseas Territories

UK Overseas Territories (UK OTs) are explicitly included within the remit of the Darwin Initiative. As shown above, there have been a number of projects in UK OTs and these have helped to fill the gaps in financial and human resources available to the Territories. As shown in Table 3, Darwin projects have covered nearly all of the island territories.

The overseas territories do not have direct access to funding from the main UK government departments and also may have difficulty obtaining funding from sources such as the European Commission or the Global Environment Fund (GEF). The Darwin Initiative is one of only two sources of UK funding available to the UK Overseas Territories for conservation activities. DEFRA's Darwin Initiative complements, the Overseas Territories Environment Programme (OTEP) that is administered jointly by the Foreign of Commonwealth Office (FCO) and the Department for International Development (DFID).

A review of the OTEP scheme conducted in 2005[8] noted that a significant proportion of projects (75 %) were addressing themes relating to biodiversity or conservation. Whilst it was recognised that this was important, it was recommended that the scheme should adopt a broader focus and it is expected that the proportion of the scheme addressing biodiversity issues will drop to 50 %. The review noted that there is very good coordination between OTEP and the Darwin Initiative and concluded that the two programmes were highly complementary. The review of OTEP highlighted that a major constraint to biodiversity conservation in the territories is the absence of significant funding to implement conservation activities, effectively following-on from OTEP and DI projects.

Table 3 UK Overseas Territories and their Darwin Initiative Projects

Territory	Projects	Location
Anguilla	1	Caribbean
Ascension Island	1	Atlantic
Bermuda	1	Caribbean
British Antarctic Territory	0	
British Indian Ocean Territory	0	Indian Ocean
British Virgin Islands	2	Caribbean
Cayman Islands	1	Caribbean
Falkland Islands	2	Atlantic
Gibraltar	0	Mediterranean
Montserrat	1	Caribbean
Pitcairn Henderson Ducie & Oeno Islands	0	Pacific
St Helena	1	Atlantic
South Georgia & South Sandwich Islands	0	Atlantic
Tristan da Cunha	1	Caribbean
Turks & Caicos Islands	1	Caribbean

7 http://www.fco.gov.uk/

8 Bass, S., Roe, D., and Armitage, N. (2006) A review of the Overseas Territories Environment Programme (OTEP), IIED

3. The biodiversity of islands involved with DI projects

Islands are very appropriate hosts for Darwin Initiative projects with many displaying high levels of biodiversity and endemism whilst also being vulnerable to environmental change, habitat loss and invasive species. The high levels of biodiversity are evidenced by the fact that almost half of the Global Biodiversity Hotspots identified by Conservation International are on islands while 35 of the 44 island groups (80 %) covered in this review are associated with these Hotspots (Table 4). Island communities often face severe constraints limiting the financial and human resources available for conservation further emphasising their relevance as hosts for DI Projects. This good fit between island ecosystems and their human communities and the DI is explored as part of this review.

Island biodiversity is also highly vulnerable to extinction. The data from the IUCN Red List available for DI projects on islands are shown as Table 5. These data illustrate the importance of conservation efforts on these islands. This is illustrated by the record of animal extinctions for Mauritius, an island with a total land area of only 2,030 km^2 having the unfortunate distinction of having the highest number at 41 species. Whilst comparison of Red List extinctions cannot be considered to be completely objective, the data are compelling. High levels of recorded animal extinctions also exist in the UK Overseas Territory of St Helena (29) whilst Sri Lanka (19) and the Cook Islands (15) also have high levels.

The levels of plant extinctions are lower, but the levels of species listed as being critically endangered, endangered or vulnerable are very significant. One of the highest levels of vulnerability is observed on the archipelago of Indonesia where land use change, including forestry, is having very significant impact on plant communities.

The total numbers of threatened species are high in many of the islands. The highest levels are seen in Malaysia and Indonesia, but the data for Malaysia include the continental Peninsula Malaysia. Whilst large islands or island groups tend to have high numbers of threatened species, some of the smaller groups have proportionally more species at risk. For example, Fiji with a total land area of 18,270 km^2 has 102 threatened species and Jamaica 269 species for a land area of 10,830 km^2. The high level of extinction observed on Mauritius is mirrored in the current numbers of threatened species, a total of 157 from a land area of only 2,030 km^2.

The analysis presented here illustrates the importance of projects on islands in the overall portfolio of projects. Islands meet both criteria for DI projects. They tend to be high in biodiversity, or have biodiversity that is highly vulnerable. This combined with low levels of human and financial resources available for conservation on islands justify the high number of island projects that have been funded by the Initiative.

Table 4 Conservation International (CI) Biodiversity Hotspots covered by DI projects

Hotspot Details	Island Group	Project references
Caribbean	Anguilla	8-114
	British Virgin Islands	7-163, 12-023
	Commonwealth of Dominica	10-010
	Cuba	6-056, 10-001
	Dominican Republic	8-144
	Jamaica	3-064

	Montserrat	14-027
	St Lucia	5-164
	Trinidad & Tobago	6-056, 10-026, 14-004
	Turks & Caicos Isles	8-164
	Cayman Islands	14-051
Coral Reef Hotspot	Maldives	4-060
East Melanesian Islands	Solomon Islands	12-033, 14-020
	Vanuatu	13-010
Madagascar and the Indian Ocean Islands	Madagascar	4-104, 5-174, 7-027, 7-113, 9-006, 10-021, 10-024, 14-006
	Mauritius	5-199, 7-055, 8-064, 9-004, 12-005, 13-027, 15-035, 15-038
	Seychelles	7-055, 8-076, 9-004, 10-006, 15-009
Mediterranean Basin	Cape Verde Islands	10-020
Mesoamerica	Perlas Archipelago (Panama)	12-021
	Roatán (Honduras)	11-017
	Turneffe Atoll (Belize)	3-008
Philippines	Philippines	3-197, 5-106, 5-178, 7-149, 1-302
Polynesia and Micronesia	Cook Islands	14-042
	Fiji	8-176, 11-022, 12-033, 15-007, 15-019, 15-037
	Palau	14042, 15-030
	Tuvalu	13-010
	Kiribati	13-010
Sundaland	Bali	14-057
	Borneo	7-135, 4-059, 4-082, 7-040, 9-016, 10-025, 13-009, 14-007, 14-014, 14-016, 14-022, 15-026
	Java	14-031
	Penang (Malaysia)	5-056
Tumbes-Chocó-Magdalena	Galápagos	6-174, 7-078, 9-010, 12-017, 12-018, 14-048, 15-005
Wallacea	Sulawesi	5-127, 9-012, 13-028
	Timor-Leste (East Timor)	15-022
Western Ghats and Sri Lanka	Sri Lanka	4-156, 5-128, 8-214, 9-002, 15-010

(**www.biodiversityhotspots.org/**)

Table 5 IUCN Red List data for islands against major taxa

	Threatened Species									Plants					Animals				
Island	Mammals	Birds	Reptiles	Amphibians	Fishes	Molluscs	Other invertebrates	Plants	Total Threatened	Extinct	Extinct in wild	Critical	Endangered	Vulnerable	Extinct	Extinct in Wild	Critical	Endangered	Vulnerable
Anguilla	1		4		12			3	20				2	1					
Belize	5	3	5	6	19		1	30	69			1	11	18			6	11	22
Bermuda	2	3	2		13		25	4	49			1	1	2					
British Virgin Islands	1	1	6	2	11			10	31			6	4						
Cape Verde Islands	3	5	3		15			2	28					2	1		6	7	13
Cayman Islands		3	6		11	1		2	23				1	1					
Commonwealth of Dominica	2	5	4	2	13			11	37			1	4	6					
Cook Islands	1	15	2		6			1	25					1	15		2	4	18
Cuba	11	18	7	47	26		5	163	277	4	1	23	57	83					
Dominican Republic	5	14	10	31	12		6	30	108			2	8	20					
Falkland Islands	4	18			2			5	29				1	4	1		1	7	16
Fiji	5	12	6	1	9	3		66	102	1		21	13	32	1		6	6	24
Honduras	9	6	11	59	16		1	110	212		1	42	38	30	4		41	35	26
Indonesia	146	121	28	39	105	3	28	387	857	1	2	113	70	204	4		57	119	294
Jamaica	5	12	9	17	13		5	208	269	2		40	52	116					
Kiribati	0	6	2	0	4	1	0	0	13	0	0	0	0	0	0	0	1	6	6
Madagascar	48	36	18	55	72	24	8	277	538			61	98	118	8	1	36	86	139
Malaysia	51	43	22	47	45	19	2	688	917	1	1	186	99	403	1		40	58	131

	Threatened Species									Plants					Animals				
Island	Mammals	Birds	Reptiles	Amphibians	Fishes	Molluscs	Other invertebrates	Plants	Total Threatened	Extinct	Extinct in wild	Critical	Endangered	Vulnerable	Extinct	Extinct in Wild	Critical	Endangered	Vulnerable
Maldives	1	2	2		10				15								2	3	10
Mauritius	4	17	7		9	27	5	88	157	2		65	14	9	41		12	19	38
Montserrat	2	2	5	1	12			3	25				2	1					
Mozambique	15	24	5	7	39	4	2	47	143			2	6	39			8	28	60
Palau	3	2	2		7	5		4	23				1	3	1		4	6	9
Panama	18	20	7	60	19		2	196	322			19	71	106			27	39	60
Papua New Guinea	58	32	10	10	37	2	10	142	301			14	15	113	1		19	24	116
Philippines	51	74	9	48	58	3	17	215	475			46	35	134	1		49	57	154
Seychelles	4	13	10	6	12	2	3	45	95			7	4	34	4		8	15	27
Solomon Islands	20	20	4	2	7	2	4	16	75				1	15	5		8	8	43
Sri Lanka	21	17	8	52	29		52	280	459	1		78	73	129	19		59	74	46
St Helena	1	20	1		11		2	26	61	7	2	11	8	7	29		5	5	25
St Lucia	2	5	6		11			6	30				2	4					
Trinidad & Tobago	1	4	5	9	18			1	38				1						
Turks & Caicos Isles	1	2	5		11			2	21				2						
Tuvalu	0	1	2	0	6	2	0	0	11	0	0	0	0	0	0	0	1	2	8
Vanuatu	5	8	2	0	7	2	0	10	34	0	0	1	2	7	1	0	1	4	19

(http://www.iucnredlist.org/)

4. Systematic review of the DI's projects on islands

4.1 The Darwin Initiative and the Convention on Biological Diversity (CBD)

All DI projects are required to contribute to the CBD and should do so by empowering the actions of local stakeholder groups. In this comprehensive review of a wide subset of DI projects it is clear that virtually all projects are making significant contributions towards this goal. The way that they do this varies considerable, as does the likely long-term impact of individual projects.

Since the inception of the DI, all projects have been required to report their own assessment of relative contribution to a subset of articles in the CBD (Table 6) in their final report. These range from Article 6 (General measures for conservation and sustainable use) through to 19 (Handling of biotechnology and distribution of its benefits). Article 18 (Technical and scientific cooperation) is explicitly excluded from self reporting for the reason that all projects contribute to this article, as it is the means that DI projects operate.

Data provided by projects quantify their assessment of how the project has contributed to the CBD. The data provides an estimate of the percentage contribution to each article, such that the sum is 100. Data for all available final reports on islands (68 projects or 64 % of total) were analysed and the results are presented as Figure 2. Data were analysed in three ways: (a) a simple average of the percentage effort, (b) the percentage of projects reporting a contribution to each article and (c) the distribution of the two largest themes (articles) reported by projects. The final analysis was necessary to enable comparison between different styles of self-reporting. Some projects only reported contributions against two or three articles, whilst others would report against virtually every component of the CBD.

4.2 DI's main contributions to articles of the CBD relevant to Islands

DI projects are typically short-term (three years) and relatively low cost (currently averaging £68,000 *per annum*[9]) and this limits what projects can realistically be expected to achieve. The consistent message emerging from the analysis of closed projects is that the DI's most significant contributions came through four Articles, 7 (Identification and monitoring), 8 (*In-situ* conservation), 12 (Research and Training) and 18 (Technical and scientific cooperation).

The importance of research and training (Art 12) is stressed in both the CBD and the objectives of the CBD. Identification and monitoring (Art 7) would appear to be the main focus of research and training while *in situ* conservation (Art 8) is the main conservation approach stemming from this new knowledge.

9 The average of 41 projects funded through Round 14 of the Darwin Initiative for projects commencing in 2006

These activities reflect a response to the most important constraints on islands (Human capacity and knowledge, Box 4) and the constraints of what can be realistically achieved within the context of a DI project. DI projects have made very significant contributions to generating knowledge and skills development to support the conservation of biodiversity on islands. The analysis further suggests that this has been supported additionally through exchange of information (Art 17), education and awareness raising (Art 13) and general measures for conservation and sustainable use (Art 6). The most common approach to support conservation effort has been to promote *in-situ* conservation (Art 8).

General measures for conservation and sustainable use (Art 6) was reported as an outcome of around 50 % of projects, but total effort was relatively low. The CBD indicates that Article 6 relates to the policy environments supporting conservation and sustainable development. The type of activity reported by projects against Article 6 varied from projects which had assisted local stakeholders to produce or update National Biodiversity Strategies and Action Plans (NBSAPs) or other policies and strategies for sustainable development or environmental management. These include projects in Bermuda, Commonwealth of Dominica and Tristan da Cunha (Projects 9-009, 10-010 and 12-010). The rest of the projects reporting against Article 6 have emphasised providing information or training to local stakeholders so that these plans could be modified after completion of the DI project.

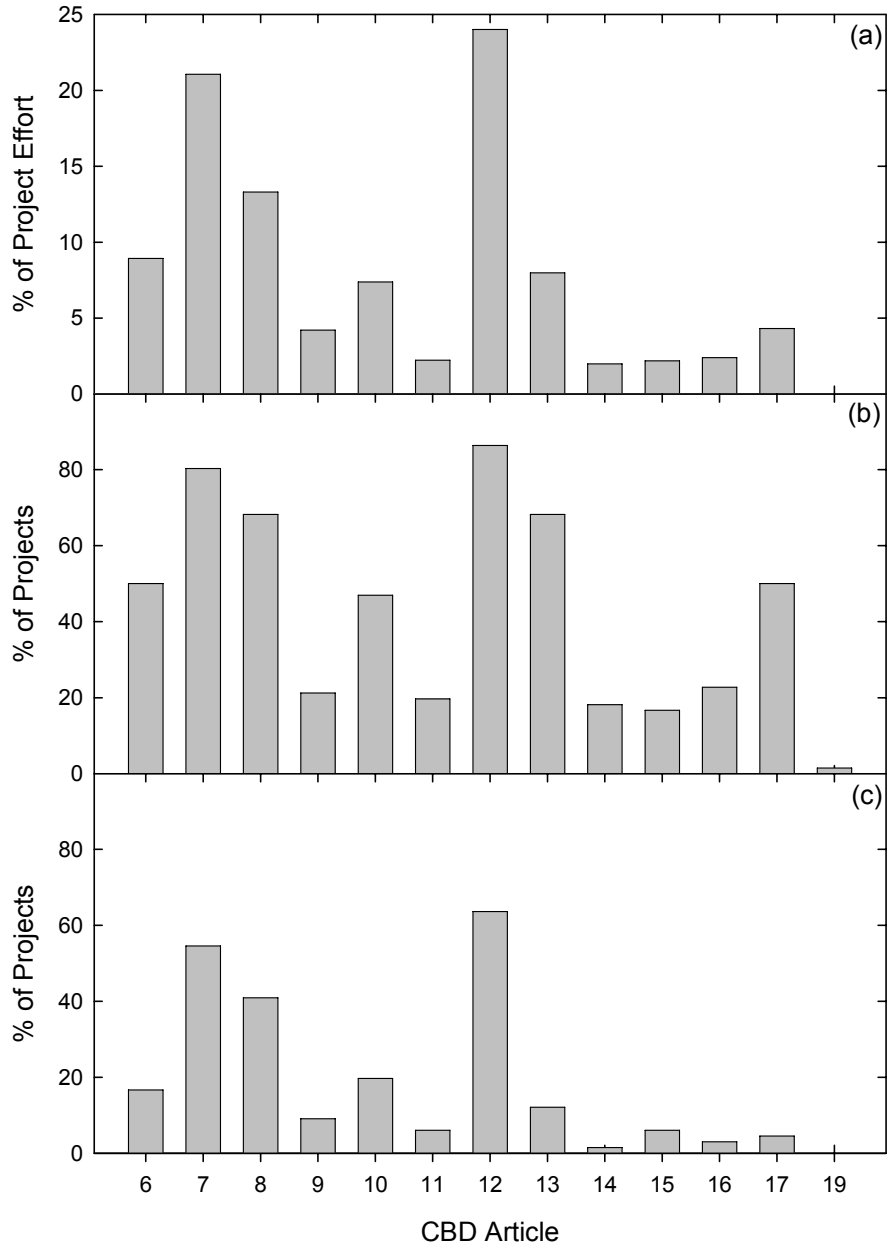

Figure 2 Contribution of DI projects on islands to selected CBD articles as reported by final reports of projects

See Table 6 for a description of the articles. All projects are required to contribute to Article 18
(a) Average percentage effort reported by projects
(b) Percentage of projects reporting a contribution to each article (≥ 1% effort).
(c) Distribution of two largest themes reported by projects.

Table 6 Summary of the CBD articles relevant to Darwin Initiative activities

CBD Article	Text	Comments
6	General measures for conservation and sustainable use	• Develop national strategies for conservation and sustainable use. • Integrate conservation and sustainable use into relevant sectoral and cross sectoral plans
7	Identification and monitoring	• Identify components of biodiversity important for conservation and sustainable use. • Monitor components of biodiversity important for conservation and sustainable use. • Identify processes and activities likely to have significant *adverse* effects on conservation and sustainable use.
8	*In-situ* conservation	• Establish a system of protected areas • Develop guidelines for the selection and management of protected areas • Regulate or manage biological resources (inside or outside protected areas) • Promote the protection of ecosystems • Promote environmental sound and sustainable development • Control of invasive species • Protect and utilise indigenous knowledge • Develop and maintain legislation to protect threatened species
9	*Ex-situ* conservation	• Adopt measures for *ex-situ* conservation
10	Sustainable use of components of biological diversity	• Integrate consideration of conservation and sustainable use into national decision making • Protect and encourage customary use of biological resources • Encourage cooperation between government authorities and the private sector for sustainable use of biological resources
11	Incentive measures	• Adopt sound measures that act as incentives for the conservation and sustainable use of biological resources
12	Research and training	• Establish and maintain programmes for scientific and technical education and training. • Promote and encourage research which contributes to the conservation and sustainable use of biological diversity

CBD Article	Text	Comments
13	Public education and awareness	• Promote public awareness of the importance of biological diversity and measures for the conservation and sustainable use of diversity
14	Impact assessment and minimising adverse impacts	• Introduce procedures for environmental impact assessment for activities likely to have significant adverse affects on biological diversity
15	Access to genetic resources	• Create conditions to facilitate access to genetic resources for environmentally sound uses
16	Access to and transfer of technology	• Promote access to and transfer of technology required to promote the conservation and sustainable use of biological diversity
17	Exchange of Information	• Facilitate the exchange of information between parties to the CBD, including the results of technical and scientific research. • Repatriation of information
18	Technical and scientific cooperation	• Promote international technical and scientific cooperation
19	Handling of biotechnology and distribution of its benefits	• Promote effective participation in biotechnological research activities

Education and awareness raising (Art. 13) was reported in over 60 % of projects but only as a secondary activity with a low percentage of total effort as less than 20 % of projects indicated that this was one of the main approaches applied. Awareness raising is the topic of another Thematic Review being conducted for the Darwin Initiative.

The pattern seen for contributions to Article 6 is repeated for other articles which appear as minor components of the programme (Art. 6, 9-11, 13-19). In each case, there are a limited number of projects which have made significant contributions, whilst for most of the others, the project team considered that the information generated or training provided had empowered local stakeholders such that they could make progress against these areas of the CBD after the completion of the project. This fits well with the overall goal of the programme which is to empower stakeholders to implement the CBD, but is dependent on the availability of human and financial resources, widely acknowledged as the main impediment on islands.

The pattern of activity shown in Figure 2 emphasises approaches which match some of the needs and opportunities highlighted through the analysis of island characteristics as summarised in Box 4. Comparison of these suggests potential gaps in the current portfolio of projects. The observation that island communities have high dependence on biodiversity for their livelihoods makes it surprising that relatively few projects have addressed Article 10 (Sustainable use of components of biological diversity) and Article 11 (Incentive measures).

When DI project staff were asked to define the characteristics of islands, one of the most common features they mentioned was that island environments are vulnerable. Islands were said to be vulnerable to environmental change and variability, to invasive species and extinction, to land use change and pollution. For this reason the lack of projects addressing Article 14 is unexpected. Only one completed project reported this as being a major component of work (5-128 Sri Lanka “Habitat and Diversity Mapping in Sri Lanka's Coastal and Marine Zone”).

More detailed analysis of completed projects identified others which were making significant contributions to impact assessment, but it was clear that much of the impact in this area was achieved after projects were completed. This, once again, highlights that whilst most DI projects contribute through research and training, identification and monitoring to achieve *in situ* conservation. (Articles 7, 8 and 13), the long-term impact of projects comes through using new skills and knowledge to influence nearly all areas of the CBD.

This was best illustrated by project 9-006 in Madagascar “Towards Sustainable Development of south-eastern Madagascar's biologically unique littoral forests”. The final report from this project stated that its main contribution to the CBD was through Articles 7 and 12, that is conduction research and training that identified and monitored components of biodiversity. The project reported, however, that one of the most significant impacts post-project was the application of the new knowledge generated by the project to assist local stakeholders to execute a comprehensive impact assessment for a proposed economic development which involved significant land-use change. A similar story can be told for the UK Overseas Territory of St Helena, where project 7-115 described the ecology and conservation of the endemic St Helena Wirebird. This project reported that its main contributions were to Articles 7 and 8 (Identification and monitoring being applied to promote *in situ* conservation. Knowledge generated by this project has been extremely important in the environmental impact assessment for the proposed airport on the island. These examples illustrate just how important it has been for DI projects on islands to address the lack of knowledge and skills on biodiversity issues that characterise many island systems.

4.3 The CBD's Island Programme of Work

The 8th Conference of Parties held in Brazil during 2006 hosted detailed discussions on the CBD's Programme of Work on the thematic issue of island biodiversity. Some of the main reasons for this Thematic Review of DI projects was to examine what lessons could be learnt from the extensive portfolio of projects working on islands and to see how the Initiative and its projects might better respond to the Programme of Work.

The Islands Programme of Work has a set of 7 Focal Areas, 11 Goals and 22 Targets (Table 7). Each of these in turn have been modified from equivalent levels of the CBD's 2010 Biodiversity Target which was derived from Decision VI/26 (2002) which adopted the Strategic Plan for the Convention on Biological Diversity. Parties committed themselves to a more effective and coherent implementation of the three objectives of the Convention, "**to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth"**[10].

To date, DI projects have not reported, or been evaluated against the 2010 Target. As part of this review DI projects on islands were asked to assess how they had or could contribute to the CBD's Programme of Work on islands and through that the 2010 Targets. The responses were even more diverse that the reported progress against CBD articles derived from final reports. Some projects providing compelling evidence of direct contributions to specific goals and targets, whilst others made a strong case that the CBD's Programme of Work was not relevant to "their" island. This diversity in reporting meant that these data could not be used in this review.

An independent review of all 105 projects was conducted by ECTF staff to overcome the limitations of self-reporting by projects. This meant that all of the projects were evaluated against a common standard of actual or potential contribution to the Goals of the Island Programme of Work (Table 7). The criteria used were that projects needed to demonstrate a direct contribution to a Target or produce an output that was of direct relevance and could be used immediately after the project was completed. The results of this analysis are presented as Figure 3.

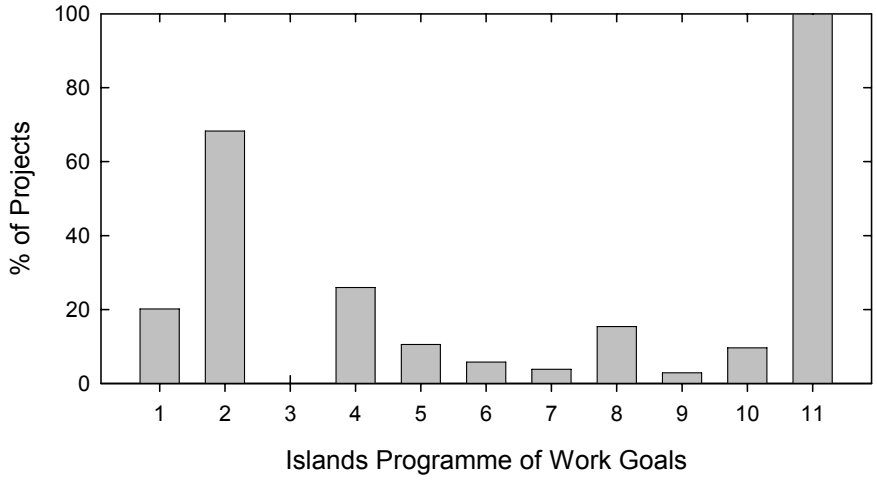

Figure 3 Assessment by ECTF staff of the contributions of all DI Island projects to the CBD's Islands Programme of Work Goals

10 http://www.biodiv.org/2010-target/default.shtml

Table 7 Summary of the Goals and Targets set out in the CBD's island Programme of Work

FOCAL AREA 1:	**PROTECT THE COMPONENTS OF BIODIVERSITY**
GOAL 1:	**Promote the conservation of the biological diversity of island ecosystems, habitats and biomes**
Target 1.1:	At least 10% of each of the island ecological regions effectively conserved
Target 1.2:	Areas of particular importance to island biodiversity are protected through comprehensive, effectively managed and ecologically representative national and regional protected area networks
GOAL 2:	**Promote the conservation of island species diversity**
Target 2.1:	Populations of island species of selected taxonomic groups restored, maintained, or their decline substantially reduced
Target 2.2:	Status of threatened island species significantly improved
GOAL 3:	**Promote the conservation of island genetic diversity**
Target 3.1:	Genetic diversity of crops, livestock, and other valuable island species conserved, and associated indigenous and local knowledge maintained
FOCAL AREA 2:	**PROMOTE SUSTAINABLE USE**
GOAL 4:	**Promote sustainable use and consumption**
Target 4.1:	Island biodiversity-based products are derived from sources that are sustainably managed, and production areas managed, consistent with the conservation of biological diversity
Target 4.2:	Unsustainable consumption of island biological resources and its impact upon biodiversity is reduced
Target 4.3:	No species of wild flora and fauna on islands is endangered by international trade
FOCAL AREA 3:	**ADDRESS THREATS TO BIODIVERSITY**
GOAL 5:	**Pressures from habitat loss, land-use change and degradation, and sustainable water use, reduced on islands**
Target 5.1:	Rate of loss and degradation of natural habitats in islands significantly decreased
GOAL 6:	**Control threats to island biological diversity from invasive alien species**
Target 6.1:	Pathways for major potential alien invasive species are identified and controlled on islands
Target 6.2:	Management plans in place and implemented for major alien species that threaten ecosystems, habitats or species
GOAL 7:	**Address challenges to island biodiversity from climate change, and pollution**
Target 7.1:	Resilience of the components of biodiversity to adapt to climate change in islands maintained and enhanced
Target 7.2:	Pollution and its impacts on island biological diversity significantly reduced
FOCAL AREA 4:	**MAINTAIN GOODS AND SERVICES FROM BIODIVERSITY TO SUPPORT HUMAN WELL-BEING**
GOAL 8:	**Maintain capacity of island ecosystems to deliver goods and services and support livelihoods**
Target 8.1:	Capacity of island ecosystems to deliver goods and services maintained or improved
Target 8.2:	Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people living on islands, maintained
FOCAL AREA 5:	**PROTECT TRADITIONAL KNOWLEDGE AND PRACTICES**
GOAL 9:	**Maintain socio-cultural diversity of indigenous and local communities on islands**
Target 9.1:	Measures to protect traditional knowledge, innovations and practices associated with island biological diversity implemented, and the participation of indigenous and local communities in activities aimed at this promoted and facilitated
Target 9.2:	Traditional knowledge, innovations and practices regarding island biodiversity respected, preserved and maintained, the wider application of such knowledge, innovations and practices promoted with the prior informed consent and involvement of the indigenous and local communities providing such traditional knowledge, innovations and practices, and the benefits arising from such knowledge, innovations and practices equitably shared

FOCAL AREA 6:	**ENSURE THE FAIR AND EQUITABLE SHARING OF BENEFITS ARISING OUT OF THE USE OF GENETIC RESOURCES**
GOAL 10:	**Ensure the fair and equitable sharing of benefits arising out of island genetic resources**
Target 10.1:	All access to genetic resources from islands is in line with the Convention on Biological Diversity and its relevant provisions and, as appropriate and wherever possible, with the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreement
Target 10.2:	Benefits arising from the commercial and other utilization of island biodiversity genetic resources shared in a fair and equitable way with the island countries providing such resources in line with the CBD and its relevant provisions
FOCAL AREA 7:	**ENSURE PROVISION OF ADEQUATE RESOURCES**
GOAL 11:	**Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention**
Target 11.1:	New and additional financial resources are allocated to all islands, in particular small islands developing States and for developing country Parties, to facilitate the effective implementation of this programme of work and, in general, their commitments under the Convention in accordance with Article 20
Target 11.2	Technologies are transferred to development country Parties, in particular small island developing states, to allow for the effective implementation of this programme of work and, in general, their commitments under the Convention in accordance with Article 20, paragraph 4
Target 11.3	Capacity of islands to implement this programme of work on island biological diversity and all its priority activities is significantly strengthened.

The general trends from the analysis provide similar results to that obtained from the self-reporting against articles of the Convention in the final reports. All projects are contributing to Goal 11 by assisting host countries to "have improved financial, human, scientific, technical and technological capacity to implement the Convention". The other areas where DI projects are making significant contributions include Goal 2 (Promote the conservation of selected island species diversity), Goal 4 (Promote sustainable use and consumption), Goal 1 (Promote the conservation of the biological diversity of island ecosystems, habitats and biomes) and Goal 8 (Maintain the capacity of island ecosystems to deliver goods and services and support livelihoods).

This analysis differs from that presented earlier relating to the CBD articles (ie Figure 2) in that it is more objective (one person undertook the categorisation) and that all projects on islands are included as opposed to those which have been completed and have produced final reports. These reasons may explain why there are some differences in the analysis. Firstly, activities linked to Goals 4 and 8 have greater prevalence, addressing issues of sustainable use and the capacity of islands to deliver goods and services to support local livelihoods. This reflects a gradual change in the types of activities supported by the Darwin Initiative with recent awards giving greater emphasis on biodiversity conservation needing to meet the needs of local communities. This is especially important on islands where it is recognised that biodiversity plays a very important role in local livelihoods.

The analysis also highlighted that the 2010 Targets and those articulated through the island programme of work, gave an improved framework to consider how DI projects can empower local stakeholders to conserve biological diversity through implementation of the CBD. It is recommended that this analysis should be applied to the rest of the DI portfolio, once again using standardised procedures rather than self-reporting.

Recommendation

1. The 2010 Target has proved very useful to analyse the way that DI projects empower local stakeholders to conserve biological diversity through implementation of the CBD. This analysis should be extended to all DI projects.

The next sections consider how DI projects have contributed to the 2010 Target and the island programme of work.

GOAL 1: Promote the conservation of the biological diversity of island ecosystems, habitats and biomes

A number of DI projects have contributed to this goal, either supporting the establishment of protected areas, or management areas. An example of work to support protected areas comes from projects 9-012 and 13-028 in Sulawesi in Indonesia which have contributed to the establishment and management of the Nantu National Park, the home of the endemic Babirusa pig. In Malaysia, project 14-016 contributed directly to the protection and management of the recently established Imbak Canyon Conservation Area, one of the last significant areas of primary lowland forest remaining on Sabah (Borneo). In the Galápagos islands, project 6-174 helped to revise the Galápagos Marine Management Plan and generated baseline data that has been used extensively by park authorities and a number of subsequent DI projects, and helped secure World Heritage Site status for Galápagos. Other projects involved in protected areas include 14-027 Montserrat, 12-021 Perlas Archipelago (Panama) and 12-010 in Tristan da Cunha.

Local management reserves have been supported by a number of projects, often working on marine resources. In the Solomon Islands, project 14-020 is helping local communities to establish a network of locally managed marine protected areas, using innovative approaches including drama to raise awareness of conservation issues. In Rodrigues, project 13-027 is helping to develop reserves for sustainable fisheries.

Birds have been used as indicator species to identify priority areas for conservation and protection through the Important Bird Areas programme[11] coordinated by Birdlife International. This has been applied to Fiji (11-022) and the Philippines (5-178). In Fiji, the DI is now supporting a new project (15-019) which aims to support communities in their efforts to conserve the areas identified in the earlier project.

Figure 4 A pair of Babirusa pigs (*Babyrousa babyrussa*) at a salt lick at Nantu National Park, Sulawesi, Indonesia
(Project 13-028, Photo P Hardcastle)

Figure 5 Louise Heaps (WWF-UK) officially declares the Nusatuva Marine Protected Area closed in the Solomon Islands
(Project 14-020, Photo P van Gardingen)

11 http://www.birdlife.org/action/science/sites/index.html

Goal 2: Promote the conservation of island species diversity

This is a goal that nearly 70 % of projects on islands are addressing. For this reason, the discussion here highlights some of the more notable aspects of the contributions. Projects range from those working on biodiversity action plans, through to species-level conservation efforts. In the Cayman Islands, project 14-051 is supporting local stakeholders to revise their biodiversity action plan in response to the impact of Hurricane Ivan in 2004, whilst in the very young state of East Timor, project 15-022 is helping to build partnerships to plan for protected areas.

In situ conservation is represented in a wide range of projects including charismatic species such as the Borneo Elephant (project 14-014), the Mangrove Finch of the Galápagos islands (project 15-005) and Fruit Bats in Madagascar (project 7-027). There are a smaller number of projects which have implemented *ex situ* conservation including rare plants of Mauritius (15-035) and an early project supporting the cultivation and conservation of threatened species from the UK Overseas Territories (4-148).

One of the recognised strengths of the Darwin Initiative is that projects are allowed to cover a wide range of topics and locations. This is seen within projects contributing to Goal 2, including two projects working with fungal diversity in Cuba (6-056, 10-001). These projects address a taxon that is frequently excluded from biodiversity studies, even though ecology recognises the importance of fungi to ecosystem functioning. They also provided a rare opportunity for Cuban scientists to interact with international colleagues. The importance of fungal diversity to terrestrial ecosystems is illustrated through the new logo for the National Botanic Garden.

Figure 6 The new public relations logo of the Jardín Botánico Nacional in Cuba

A further innovative approach is project 12-017 in Galápagos, Ecuador. The project has established the ability of researchers and managers of the Galápagos National Park to determine the nature and prevalence of disease threats to endemic fauna from new pathogens and vectors and their ongoing monitoring. The project has successfully established a laboratory on Galápagos, and has influenced changes in legislation regarding protocols for monitoring invasive insect arrivals by aeroplane.

Goal 3: Promote the conservation of island genetic diversity

This goal is interpreted to mainly refer to genetic diversity relating to agriculture, the crops, livestock and other valuable island species that are used both for basic subsistence and to generate the livelihoods of local communities. It is a theme that should be expected to be very important to island communities who are often critically dependent on these species for their survival and well being, especially with risks such as climatic change and variability, invasives and disease.

For this reason, it is concerning that no project was assessed as making a major contribution to this goal. It is however notable, that the same observation holds for the entire Darwin Initiative portfolio of projects. This is an area of deficiency, effectively a gap in provision, for which there is a clear need. The United Kingdom has many researchers who have expertise relevant to the goal, who need to be made aware of the needs and opportunities, especially in relation to biodiversity on islands.

Recommendation

2. UK researchers need to be made aware of the needs and opportunities relating to research to promote the conservation of [island] genetic diversity of crops and livestock.

Goal 4: Promote sustainable use and consumption

A growing proportion of DI projects on islands are supporting measures to promote sustainable use and consumption. There is also great diversity in the approaches being adopted. In Sulawesi in Indonesia, project 5-127 addressed the sustainability of the wildlife and rattan trades, a project which then led into two further projects to establish the Nantu National Park (see above). Two further highly innovative projects are taking place on other islands in the Indonesian archipelago. On Bali, project 14-057 is working to empower communities to build local enterprises to enhance the status of coral reefs through sustainable management. This project is working in conjunction with the Marine Aquarium Council to develop certified products. In Java, project 14-031 is also working on a certification scheme, this time in relation to the domestic trade in birds.

Goal 5: Pressures from habitat loss, land-use change and degradation and sustainable water use reduced on islands

The responses obtained from DI projects indicated that these themes were of critical importance to many islands, but only relatively few projects seem to be making specific contributions to address Goal 5.

Projects on the Seychelles (10-006, 15-009) and Sri Lanka (15-010) have considered the role of restoration on degraded land. In Borneo (Sabah) a recent project is considering how best to conserve biodiversity in managed tropical forests. In Fiji, project 8-176 worked with local communities and a large tourist resort to identify sources of pollution and environmental degradation and jointly implement mitigation measures.

Many islands experience very significant pressures on habitats and land use resulting in the degradation of key ecosystems and resources such as water. This is an area of research that has been identified by project teams as being of high importance, but is under-represented in the DI portfolio of projects on islands.

Goal 6: Control threats to island biodiversity from invasive alien species

Invasive species; plants, animals and diseases are seen as being a very significant threat to biodiversity on islands. Whilst this fact was reinforced by the participants in many DI projects on islands, only a limited number of projects appear to be making significant contributions to Goal 6 of the Programme of Work.

Three projects were designed specifically to address the threat of invasive species. On Jamaica, project 3-064 addressed the threat of invasive tree species on montane rainforests. On Gough Island, project 8-253 considered the threat of invasives on invertebrate communities. Most recently, project 15-010 is considering invasives on Sri Lanka within the context of buffer zone restoration in forest reserves.

Many more projects have components of their work programme that have identified the risk from invasives and developed or trialled plans for the eradication of invasives. Examples include two projects in the UK Overseas Territories of Tristan da Cunha (12-010) and the British Virgin Islands (12-023) which have developed biodiversity action plans that include specific actions on invasives and projects 11-022 and 15-019 in Fiji. On Galápagos, project 9-010 supported the establishment of an Invertebrate Department in the Charles Darwin Foundation, the proper identification and curation of specimens and training of personnel. Based on this DI supported foundation, the department has gone on to eradicate a number of invasive invertebrates and implemented a successful biological control programme of an invasive moth species which threatened endemic plants.

One of the suggested reasons that DI projects have not done more on invasives, is that specific actions require much greater resources, both in terms of time and finances than is possible with a standard DI grant. A few projects have helped to work around this constraint, by using the DI project to identify the problem and suggest solutions whilst also supporting local stakeholders to apply for funding from other sources to implement the measures to control invasive species. This has now been done successfully for a network of UK Overseas Territories with funding from the European Commission and in the Pacific with funding from the Invasive Alien Species Programme of the Critical Ecosystems Partnership Fund[12]. This approach builds on the strengths of the Darwin Initiative (empowering stakeholders through training and knowledge) and is considered an example of best practice.

Goal 7: Address challenges to island biodiversity from climate change and pollution

Only one DI project on islands was specifically designed to address the very real threat of climate change, and a small number consider pollution. Both of these issues are of critical importance and are severely underrepresented in the DI portfolio.

On the Galápagos Islands, project 12-018 is investigating the risks associated with climate change associated with the conservation of endemic bird species, the Galápagos Penguin (*Spheniscus mediculus*), Flightless Cormorant (*Phalacrocorax harrisi*) and Mangrove Finch (*Cactospiza heliobates*). The work is considering the role of the physical environment (temperature and rainfall) on these species and their interaction with invasive species (rats). The project links with another Galápagos project 14-048, which is mapping corals in the archipelago, both projects have levered NASA funding for the modelling of sea temperature and other parameters associated with the El Niño-Southern Oscillation (ENSO) events. Due to the relatively intact nature of the Galápagos marine ecosystems and their vulnerability to the El Niño the islands act as an early warning system for climate change.

Numerous other projects are collecting information that either documents the impact of climatic change and variability or would be relevant to such studies. There is a need to make this information more widely available and perhaps to promote additional research by the Darwin Initiative on the impact of climate change and pollution on islands.

Summary of Focal Area 3: Threats to biodiversity

The analysis of the characteristics of islands produced a list of issues which highlighted that islands are highly vulnerable systems. The CBD's programme of work on islands addresses these risks or vulnerabilities through Focal Area 3 which includes Goals 5-7, specifically:

- Goal 5: Pressures from habitat loss, land-use change and degradation and sustainable water use, reduced on islands.
- Goal 6: Control threats to island biological diversity from invasive species
- Goal 7: Address challenges to island biodiversity from climate change and pollution.

It is clear from the analysis in this thematic review, that this Focal Area is one that DI projects on islands have not yet covered adequately. Highlighting this deficiency in this review should encourage UK research institutions and their partners in potential host countries to propose projects addressing the threats to biodiversity through goals 5-7 of the islands programme of work.

12 http://www.cepf.net/

Addressing threats to biodiversity requires mobilisation of resources (human, financial and technical) that go beyond the remit of the Darwin Initiative. There are examples of success to securing further funding from a number of projects on islands. Their experience should be shared with other organisations and may form a suitable theme for a future review. It may also be appropriate to consider if the UK Government should consider creating a separate fund for conservation action that could put knowledge generated by DI projects into practice.

Recommendation

3. Projects designed to address the threats to biodiversity on islands (Focal Area 3 of the Islands Programme of Work) should be encouraged by the Darwin Initiative.
4. Defra may wish to promote dialogue within government to consider the creation of a separate "knowledge into practice" fund for biodiversity conservation

Goal 8: Maintain capacity of island ecosystems to deliver goods and services and support livelihoods

A number of projects are implementing activities designed to support livelihoods and enhance the provision of goods and services derived from biodiversity. It is a minor component of an increasing number of projects as participants recognise that it is important to deliver measurable benefits to local communities. In addition, there are several projects in which livelihoods or biodiversity goods and services are an important component of the work.

In Indonesia, three projects are relevant and provide innovative examples of approaches to support livelihoods. In Bali, project 14-057 is working to generate sustainable incomes linked to the conservation of coral reefs and certification of products. In Java, a similar approach is being examined by project 14-031 in relation to the domestic bird trade which aims to substitute wild-caught birds with captive-bred alternatives. In Sulawesi, a series of three projects (5-127, 9-012 and 13-028) have shifted conservation activities from identification (Goal 2) through to creating protected areas (Goal 1) and most recently livelihoods (Goal 8). This is a pattern that is seen in a few projects, but the linkage through protected areas has made continuity of funding a significant constraint.

The pattern of shifting activities from identification through to livelihoods is also seen in Fiji, where the Important Bird Area (IBA) process (project 11-022) led into a project more specifically designed to address the needs and livelihoods of local communities (project 15-019). The changing focus in sequential projects is good practice and illustrates a successful approach that covers a broader set of goals within the Island Programme of Work. The sequencing of projects in similar locations has been shown to be a very important mechanism to achieve legacy in DI projects when the experiences of projects from Madagascar, Galápagos, Malaysia, Seychelles and Mauritius are considered. Links between projects more geographically separated were also noted, with the coral reef project in Bali, adapting and applying techniques that were developed to conserve Giant Clams in the Lakshadweep Islands in India.

Goal 9: Maintain socio-cultural diversity of indigenous and local communities on islands

The targets associated with this goal mainly address the need to protect indigenous knowledge, but the text reflects an important characteristic of islands which is that in many islands, immigrant populations may represent a major component of the population. More explicitly, this means that not all of the local communities will be made up of indigenous peoples. This is a feature of islands that has had a very significant impact on the use of natural resources, for example in New Zealand, an Island nation that has experienced rapid land use change and associated extinctions. The same feature can be observed in many of the islands involved in DI projects, but this dimension of cultural diversity has been largely ignored by most projects.

Very few projects have made the traditional knowledge of island communities a major component of their work. In Borneo, project 13-009 is considering the Ethnobiology of traditional use zones for the proposed Crocket Range Park in Sabah. In Papua New Guinea, there is some emphasis on traditional knowledge in two projects that aim to produce the next generation of conservation biologists by training parataxonomists (projects 10-030 and 14-054).

It is recognised that island communities have a great wealth of cultural experience in the use and management of their own biological diversity. It is also recognised that these communities must play a central role in the conservation of the biological diversity. It is surprising that there are so few projects in the DI portfolio that have addressed this goal and this must be considered a research theme that deserves greater effort. Again the UK possesses institutions with strengths in this area and partnerships between biodiversity and anthropology institutions could be productive.

Recommendation

5. DI projects should be encouraged to work more with indigenous knowledge and local communities and to explore the opportunities presented by taking a bio-cultural diversity approach to conservation.

Goal 10: Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

Goal 10 of the 2010 Target and associated Island Programme of Work relate to the concept of benefit sharing, often linked to larger-scale commercial activities or exports. The experience from most DI projects on islands is that this theme of work is possibly premature within the human and institutional constraints currently characterising most islands. This does not mean that this goal and focal area are unimportant, rather that other activities such as protecting the components of biodiversity (Focal Area 1), promoting sustainable use (Focal Area 2) and the provision of adequate human and financial resources (Focal Area 7) are essential prerequisites.

There are a limited number of DI projects which have started to address the issue of benefit sharing. These include an early regional project that specifically addressed capacity building for legal frameworks to support benefit sharing for island genetic resources (Project 8-186). More recently the concept of benefit sharing has appeared in the biodiversity action plans developed for Tristan da Cunha (12-010) and those linked to turtle conservation in Trinidad & Tobago (10-026) and Ascension Island (7-006). Both of the projects on Turtles illustrate the importance of promoting benefit sharing when developing plans for ecotourism based on biodiversity. The most recent example comes from one of the largest islands on earth, with a DI project in Papua New Guinea aiming to develop approaches to support sustainable management of the commercial market for insects through collection and farming (Project 14-003).

It should be expected that this area of the Islands Programme of Work will expand as local capacity to implement the CBD is built.

Goal 11: Parties have improved financial, human, scientific and technological capacity to implement the Convention

All projects have contributed to this Goal. For this reason the analysis presented here will examine the nature of the contribution at the level of specific targets (Table 7). The three targets relevant to this Goal are: Target 11.1 (Financial resources); Target 11.2 (Technology Transfer) and Target 11.3 (Capacity of islands to implement the programme of work). The most significant contribution of DI projects has been towards Target 11.3, with progressively less contribution being made towards Targets 11.2 and 11.1.

Target 11.3: Capacity of islands to implement this programme of work on island biological diversity and all its priority activities is significantly strengthened

Lack of human and technical resources to implement the CBD is a major constraint for islands that is discussed in Section 1.5. All of the DI projects on islands have contributed to address this need. The overall aim of the Darwin Initiative is to empower local stakeholders to implement the CBD and the projects on islands have provided important support to overcome this constraint. This is achieved through training and capacity building activities (Art. 12 of the CBD) and other activities designed to generate and share knowledge and skills in support of the CBD.

One of the positive approaches adopted by projects on islands to overcome the capacity limitations has been to promote networking and lesson learning between island communities. This has been promoted using a number of approaches.

Regional or multi-country projects seem to have been effective in the context of islands, albeit that this comes at a cost associated with inter-island travel which is often very expensive. Regional projects, 8-009 and 15-037, have included the Pacific Island Community Conservation Course (PICCC); the later project is now developing distance-based learning materials to support conservation. These courses are particularly innovative as students were required to implement their own case studies which then became available as background material for students in later years of the course. A Mid-Term Review of Project 14-020 in the Solomon Islands illustrated the value of the PICCC. The local manager had been a participant on the PICCC and noted that this course had been fundamental in developing the innovative community-based conservation approaches to develop Marine Protected Areas in their project.

Other regional projects have been designed to support the capacity of NGOs (3-032 and 14-042 and 15-030). These projects were significant because they built upon the results of earlier activities including other DI projects. Within the UK Overseas Territories, an early project (3-032) also sought to build capacity of NGOs.

A number of examples of effective networking involve the same UK partner being involved in different island contexts. For example, results from Las Perlas Archipelago in Panama (12-021) are now being applied in the Galápagos (14-048). Creating new opportunities for conservation researchers and practitioners to network on and between islands was identified as an opportunity for the Darwin Initiative by numerous projects. They stressed that islands lack the opportunities to share knowledge and best practice that countries on continents already have. In the case of islands which have a significant number of projects (eg Malaysia (Borneo), Fiji, Galápagos, Madagascar and Mauritius) there would seem to already be justification for the DI to host country-level events. For other islands, this may be best served through regional events, though it is recognised that the travel costs could be significant.

Recommendation

6. The Darwin Initiative should consider hosting or funding networking workshops for participants and partners from DI Islands projects as a mechanism to further empower conservation practice addressing the major constraint apparent on islands.

Target 11.2 Technologies are transferred to developing country parties

There are several good examples of transfer of technology to host country partners through DI projects. It is, however, important to consider the need to define appropriate technology within the human and financial constraints which are typical of most islands. How often is the technology which is transferred beyond the current capacity of island institutions to ensure sustainability? Can these local institutions apply the technology in the absence of the UK partner, or are projects building dependencies rather than capacity? These are questions that should be considered during the design of projects on islands (and probably for all DI projects). These issues are sometimes captured through the concept of absorptive capacity which describes the ability of local institutions to ensure that advances delivered by projects become sustainable in the absence of external support. There are examples in the portfolio of projects where institutions on islands have been introduced to new analytical techniques (and equipment) but did not have the ability to maintain or run these after completion.

Recommendation

7. The design of DI projects which have significant emphasis on the transfer of technology (2010 Target 11.2) need to address the issues of local absorptive capacity and sustainability after the project ends.

The concept of the importance of transfer of technology also runs the risk of lessening the perceived value of indigenous knowledge (a theme that this review concludes in underrepresented in the DI portfolio on islands). One approach that may be an opportunity particularly relevant to the context of islands may be to link indigenous knowledge with modern approaches or technology. Taxonomy is one area where this has been used to good effect in DI projects.

Target 11.1

The discussion above has illustrated that DI projects on islands have had considerable impact at the level of empowering local stakeholders so that they can act to conserve biological diversity on islands. This is a major aim of the Darwin Initiative, and as such the projects should be considered to be highly successful. This is, however, a simplistic view. A number of people interviewed for this review made similar comments that led to a statement of a risk associated with the Darwin Initiative's approach. This is, that a programme that has such great emphasis on generating new knowledge and skills relating to biodiversity research (e.g. training and biodiversity surveys), increasingly runs the risk of only empowering local stakeholders to the point that they have new skills and knowledge that allow them to document the continued loss of biodiversity from their island. It is for this reason that Target 11.1 of the Island Programme of Work becomes essential for conserving biological diversity on islands.

The analysis of characteristics on islands (Box 4) records the critical limitation of financing to support conservation efforts. This is most important on islands with small economies in comparison to the level of biodiversity or even total land area. It is also a very significant issue for the UK's Overseas Territories which have few options to fund conservation, for example the Overseas Territories are ineligible for funding under the Global Environment Fund (GEF). The design of the Darwin Initiative and the total funds available for the programme means that it should not be used to fill the gap. There is a need for new ways to meet the very distinctive needs of island communities (including Overseas Territories) to fund implementation of conservation activities.

A number of DI projects have been successful in raising significant new resources to implement conservation activities on islands building upon the research and capacity building activities in their original projects. Sources of funding include the Global Environment Fund (small and medium projects), the European Development Fund of the European Commission and the Critical Ecosystems Partnership Fund. These successes have helped local partners to move from theory or pilot study into more extensive practice, but have often come at great cost in

terms of the effort required to obtain funding. Whilst it is often acknowledged that this is a burden on developing countries, it must be even more so in very small island communities and institutions.

Major conservation activities on islands need to be planned carefully, within the acknowledged constraints imposed by existing human and institutional resources and their absorptive capacity. Ironically, success in mobilising additional funding can create problems just as easily as the funds may help to solve others. For this reason it is important that DI projects which produce plans for conservation actions do so in such a way that recognises existing capacity by designing a local sequence of activities. If priority conservation activities on islands require the employment of expatriate workers, it is important that this is done in a way that is sensitive to the culture of local communities.

Recommendation

8. There is a need to develop mechanisms to fund implementation of conservation activities on islands, including specifically Overseas Territories. These should be seen as being distinct from the DI (and related research or capacity building) programme.

4.4 Strengths, gaps and opportunities in the DI portfolio to empower island stakeholders

Strengths

The most significant strength of DI projects on islands is that they tend to be addressing the most important constraints to the conservation of biodiversity by providing knowledge and skills to local stakeholders. The 2010 Targets as encapsulated in the CBD's Island Programme of Work is providing a very useful framework to focus effort.

It is increasingly apparent from the monitoring and evaluation of DI projects that these should not try to cover all aspects of the CBD, but should focus on activities which are best suited to a programme of its scale and approach. These are capacity building, knowledge generation and the development of strategies and plans for the conservation of biodiversity.

Gaps

The analysis of DI contributions to the CBD's Island Programme of Work helps to identify gaps in the current portfolio of projects. The most significant gaps relate to Focal Area 3: "*Address threats to biodiversity*". These include land-use change, invasive species, climate change and pollution. Work on indigenous knowledge (Goal 9) is also poorly represented in existing projects.

The provision of new and additional financial resources to support putting conservation into action will be important, but it must be recognised that this needs to go far further than obtaining funding for the "next" DI project. Successful projects should address the needs for sustainable funding for host country institutions and processes rather than their UK partner.

Opportunities

In addition to research that addresses the gaps above, there are two major opportunities that emerge from this review:

- New opportunities for biodiversity practitioners networking on and between islands.
- Meeting the needs for stakeholders on islands to have enhanced access to funding to support the conservation of biodiversity.

5. DI Case Studies on Islands

5.1 Introduction

As part of the ongoing monitoring and evaluation programme ECTF reviewers made field visits to both ongoing and closed projects. These field reviews were selected based on established criteria and additionally clustered around the CBD theme selected for review, in this case 'islands biodiversity'. During 2006 and 2007 field visits were made to 18 projects in 6 island groups (Annex 1). The Reviewers working in host countries assessed projects locally, interviewing project staff and visiting selected sites.

The areas included in this section were, Malaysia (Sabah-Borneo), Indonesia (Kalimantan-Borneo, Java & Sulawesi), Madagascar, Seychelles, Mauritius, Solomon Islands and Galápagos. The in depth project reviews looked at two of the world's largest islands which are considered as 'island continents', Borneo (Malaysia and Indonesia) and Madagascar, as well as smaller Indonesian 'continental islands' on the Borneo continental shelf. Projects were visited on the 'oceanic islands' of the Western Pacific – Solomon Islands, Eastern Pacific – Galápagos, and of the Indian Ocean – the Seychelles, Mauritius, and Rodrigues.

5.2 Malaysia – Sabah (Borneo)

Background & conservation context

Borneo is the world's third largest island with a total land area of c. 745,000 km2. It is shared by three states: Indonesia, Malaysia and Brunei. Until the mid-20th century the island was almost completely forest-covered including extensive lowland rainforests in Sabah, Sarawak and northeast and southwest Kalimantan. Upland, hill and sub-montane forests dominated in the mountainous spine with extensive swamp forests extending inland from the coastal plains (MacKinnon *et al.,* 1997).

Over the past 40 years the forests of Borneo have been severely degraded and fragmented by industrial-scale logging operations and shifting cultivation and cleared for agricultural and exotic timber plantations (Mayaux *et al.,* 2005; Rautner *et al.,* 2005). Protected areas have not escaped this general degradation and recent research has shown that Kalimantan's designated lowland forest conservation areas declined by over 50 % from 1985 to 2001, mainly as a result of illegal logging and shifting cultivation (Curran *et al.,* 2003).

Projections for future forest conversion on Borneo are alarming and predict almost complete loss of the island's lowland forests by 2020 (Rautner *et al.,* 2005). This will have a dramatic impact on Borneo's biodiversity, including the likely extinction of many endemic species (Brook *et al.,* 2003; Sodhi *et al.,* 2004).

Evidence also suggests that the now largely degraded and fragmented forests of Borneo, particularly the island's lowland forests, are being increasingly impacted by El Niño droughts which, as a result of climate change, appear to be becoming more frequent and severe (Whitmore, 1998; Walsh and Newbery, 1999; Curran *et al.,* 2003; Kohler and Huth, 2004). This may have serious implications for the long-term viability of Borneo's forests and the biodiversity they support.

Impact and legacy towards Islands Programme of Work, Sabah

Thirteen Darwin Initiative projects have been based either partly or wholly in Sabah. These have made a significant contribution towards the goals of the CBD Islands Programme of work – particularly Goal 1 'To promote the conservation of the biological diversity of island ecosystems, habitats and biomes', Goal 2 'To promote the conservation of island species diversity' and Goal 4 'To promote sustainable use and consumption'. Perhaps the most important, collective, impact has been their key (and ongoing) contribution to the protection and management of the c. 1 million hectare Yayasan Sabah Forest Management Area (YSFMA).

Nine of the Sabah-based Darwin Initiative projects have involved research in the YSFMA, mostly in the Danum Valley Conservation Area and adjacent Ulu Segama and Malua Forest Reserves, but also the Maliau Basin and Imbak Canyon Conservation Areas (see Figure 7).

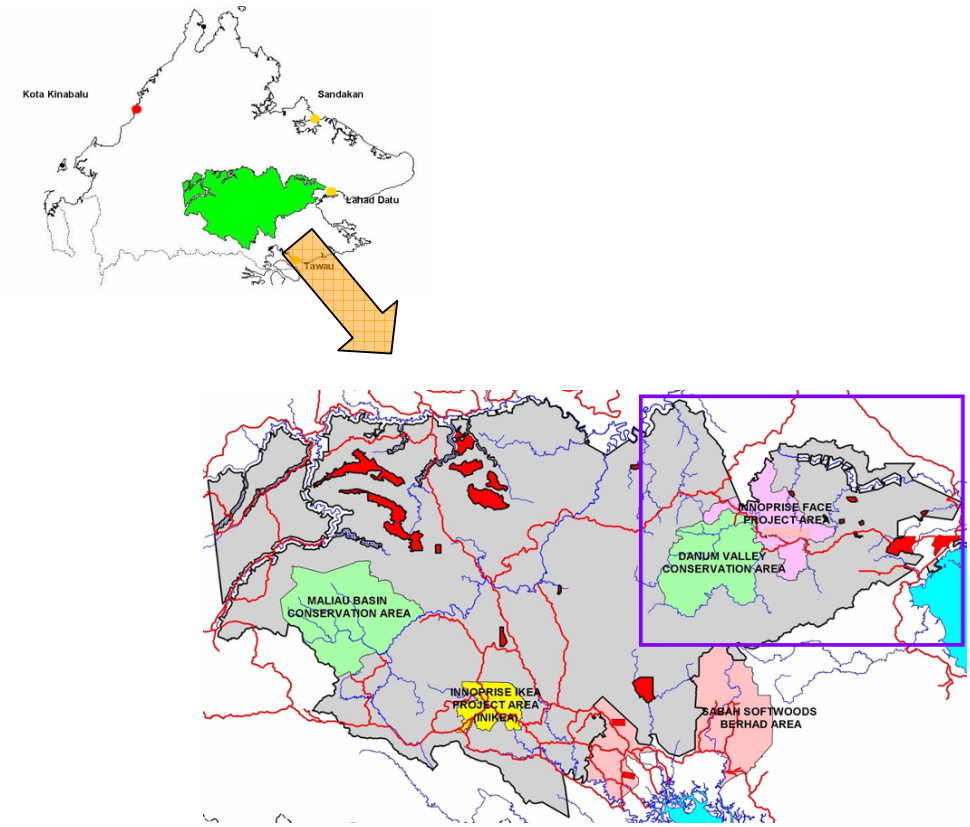

Figure 7 Sabah (with the Yayasan Sabah Forest Management Area (YSFMA) highlighted) and a detailed map of the YSFMA – the area indicated by the purple bordered box are the ±237,000 ha Ulu Segama & Malua Forest Reserves

These projects have demonstrated the critical importance of retaining this contiguous expanse of forest to the maintenance of biodiversity in Sabah, particularly in the context of global environmental change.

The forests of the YSFMA form the last intact gradation from coastal forests through lowland to inland higher-elevation rainforest remaining in Sabah, and one of the only examples on the entire island of Borneo. This broad forest corridor, which runs for over 200 km, also constitutes a gradation from more drought-prone (and hence drought-resistant) east-coast rainforest to less drought-prone interior rainforest. In view of the prospect of increasingly frequent El Niño droughts on Borneo, such a corridor could provide a biodiversity 'refuge' by preserving, on an extensive scale, a range of critically important forest habitats – including an exceptionally large area of lowland forest. The relatively intact forests of the YSFMA could prove particularly important if, as in 1982-83 and 1997-98, future El Nino droughts were to result in widespread fires(Leighton and Wirawan, 1986; Sodhi *et al.,* 2004; Mayaux *et al.,* 2005). Such fires would likely have a much greater impact on the generally more degraded and fragmented forests outside the YSFMA.

Darwin Initiative projects continue to make an important contribution to management planning in the Danum Valley and Maliau Basin Conservation Areas, the Ulu Segama and Malua Forest Reserves and to the formalisation of the protection status of the Imbak Canyon Conservation Area.

Four projects have made a particular contribution to the protection and management of the YSFMA and hence Island Programme Goals; Project 7-040 'Biodiversity of Butterflies in Tropical Rainforests of Sabah, Borneo', Project 9-016 'Conservation of the Orang-utan in the Kinabatangan Wildlife Sanctuary, Sabah', Project 14-016 'Assessing and Conserving Plant Diversity in Commercially Managed Tropical Rainforests, Sabah' and Project 14-022 'Predictive Tools for Targeting Conservation Effort in Bornean Forest Reserves, Sabah.

Significant contributions of DI projects to the Island PoW are documented in Table 8 with more detailed narrative information given for four of the DI projects in Sabah is provided as Box 5.

Table 8 Summary of significant contributions to the Island PoW from DI Projects in Sabah (Malaysia)

WP Goal	WP Target	Sub-target	DI Project	Impact / Legacy
1. Promote conservation of island ecosystems biodiversity	1.1 10% of islands' ecoregions conserved	1.1.1 Integrated measures to conserve ecosystems	7-040, 9-003, 9-016, 10-014, 14-022	Protected area management plans and other contribution to two areas of global conservation biodiversity value
		1.1.2 Re-establish lost components	7-040, 9-016, 10-025	Research into biodiversity value of forest fragments. Value of rehabilitation of small fragments of forest
	1.2 Areas of particular importance in protected areas	1.2.1 Identify & establish protected areas	7-040, 9-016	Protected area management plans
2. Conservation of islands species diversity	2.2 Status of threatened species improved	2.1.2 Species inventories, assessments & taxonomy	9-016, 7-040, 10-025	Influential documentation on catastrophic loss of Orang-utan populations. Significant work on butterfly populations.
4. Promote sustainable use & consumption	4.2 Unsustainable use reduced	4.2.4. Forest Biodiversity	7-040	Guidelines towards FSC certification,
11. Improved financial, human & technical capacities to implement CBD	11.2 Technologies are transferred	11.2.1 transfer knowledge, science & technology	7-040, 9-016	Several Malaysian M.Sc. & Ph.D. students supported.

Box 5 Contributions of four Sabah projects to the CBD's Island Programme of Work

Project 7-040 'Biodiversity of Butterflies in Tropical Rainforests of Sabah'

This project has made a particular contribution to Goal 1 (Targets 1.1 and 1.2) through:

- Demonstrating the biodiversity value of even highly degraded logged forest. These findings and subsequent studies (particularly Darwin Initiative Project 9-016) have been largely responsible for the decision to retain the Ulu Segama and Malua Forest Reserves under natural forest cover; and
- Making a direct contribution to the 25 year Danum Valley Management Plan and management planning for the Ulu Segama and Malua Forest Reserves – both currently in preparation.

Project 9-016 'Conservation of the Orang-utan in the Kinabatangan Wildlife Sanctuary, Sabah'

The main contribution of this project has been to Goal 2 (Targets 2.1 and 2.2) and, by extension, Goal 1 (particularly Target 1.2) through:

- demonstrating the catastrophic decline in the orang-utan population of Sabah during recent decades and that the Ulu Segama and Malua Forest Reserves represented by far the most important habitat for orang-utan remaining on the island of Borneo;
- Highlighting the pressing need to conserve and restore the lowland forest habitats which are essential for the survival of this species, a major factor underlying the Sabah State Government's decision to conserve this area under natural forest cover –reversing an earlier decision to convert the Ulu Segama and Malua Forest Reserves to exotic timber and agricultural plantations.

Project 14-016 'Assessing & Conserving Plant Diversity in Commercially Managed Tropical Rainforests, Sabah'

This project is making a major contribution to Goal 4 and Goal 1, Target 1.2 through:

- The development of criteria for the identification and management of High Conservation Value Forests (HCVFs) within Yayasan Sabah's 1 million hectare timber concession. These criteria may be adopted by the Sabah Forestry Department for the identification, protection and management of HCVFs in all of Sabah's commercial forest reserves (covering a total of over 2.6 million hectares)
- Contributing evidence that supported the decision to formalise the protection of the c. 30,000 hectare Imbak Canyon Conservation Area – one of the last remaining areas of pristine lowland forest on the island of Borneo.

Project 14-022 'Predictive Tools for Targeting Conservation Effort in Bornean Forest Reserves, Sabah'

This project contributed to Goal 1 (Target 1.2), Goal 2 and also to Goal 3 through:

- Demonstrating that even small, isolated forest fragments retained considerable biodiversity value – but indicated that rehabilitation may be necessary, or connectivity re-established if forest fragments are to retain their conservation values in the long term
- Highlighting the crucial importance of retaining large, contiguous areas under natural forest cover.

5.3 Indonesia – Kalimantan (Borneo), Sulawesi and Java

Background & conservation context

Indonesia has a land area of 1,811,570 Km² and 93,000 Km² of inland water, lying between latitudes 6°N and 11°S and longitudes 95° and 141°E. Altitude ranges from sea level to over 5,000 metres in Papua. There are over 13,000 islands and islets with a total coastline of some 55,000 Km. and forest cover is just under 50%.

The population is 218 million, but population density varies widely with islands such as Java being very highly populated compared with the less fertile islands of Sumatra and Sulawesi. Despite its diversity and substantial land and forest area, there is considerable threat to some biodiversity from land use changes and from logging, especially in lowland tropical forests and on vulnerable tropical peat.

The sheer size and complexity of the country means that large numbers of people and institutions are involved in activities that directly or indirectly impinge on biodiversity conservation. This leads to a complicated institutional landscape and challenges for communication, consequently, local project partners tend to be dispersed in geographical and institutional terms.

Contribution to the Islands Programme of Work, Indonesia

Five projects were reviewed in Indonesia these were projects: 4-068 “Indonesian Botanic Garden Biodiversity Database”; 6-166 “Forestry Curriculum Towards Sustainable Forestry and Conservation of Biodiversity in Indonesia”; 7-135 “Biodiversity of peatswamp forest in Central Kalimantan, Indonesia”; 9-106 “Conservation of the Paguyaman forest in North Sulawesi, Indonesia”; and 13-028 “Establishment & Management of Nantu National Park, Gorontalo Province, Sulawesi”. A summary of their significant contributions to the CBD PoW is presented as Table 9.

Of the five projects reviewed, two (4-068 and 6-166) were in essence capacity building projects although the latter also included a substantial element of awareness raising (both Goal 11). The two projects relating to the Nantu area (5-127 and 9-012) although initially based on field research on wildlife populations (Goal 2) and illegal trade in rattan and bush meat, have developed into an effective protection system for the remaining population of Babirusa (Goal 1). In the absence of a system of national control at the level required, further funding will be required to continue to secure the protected area. An example of value for money derived from the DI investments in Sulawesi is highlighted in Box 6.

Box 6 DI investments in protecting the last remaining wild population of Babirusa pigs

Value for Money

The series of DI projects around Nantu have resulted in more than 15 years of conservation of what is thought to be the last remaining wild population of Babirusa. In terms of value for money, Darwin funding has protected 50,000 ha for 10 years at a cost of less than £ 1.00 per ha per annum. Capitalised, this gives a value of just under £ 29 per hectare for the reserve, which is obviously well below its true value by any measure, and therefore represents considerable value for money. The situation is similar to many DI projects that the resources provided under Goal 11 have produced significant biodiversity impacts and outcomes.

Capacity building has been an important component of all Indonesian projects, meeting Goal 11 of the PoW. An early project introduced an ecology component to the national University level training for Forest management. Since the project closed it has evolved into a forest conservation unit offered by the University which is regularly oversubscribed. Significant training has been undertaken by most projects and a local NGO, YANI has been formed in Sulawesi.

Project 7-135 had the highest scientific content of the Indonesian projects reviewed and generated publications of a very high standard recording its counter–intuitive and seminal findings. Although the Darwin funding provided a basis from which the research could continue, the lack of a viable and effective policy framework within which the findings could be applied has limited the wider impact of the research and the potential legacy has not been capitalised. Therefore technology transfer itself is not sufficient in meeting the PoW. The policy and policy implementation context has major impact on the legacy of projects.

The public awareness raising activities undertaken in Sulawesi appear to have been innovative and successful. An example of this is the conservation-based children's book produced by project 9-012 which was based on a story written by a BBC cameraman whilst he was filming the Babirusa for a wildlife documentary. Copies of this story (translated into Indonesian) were given to all local primary schools and very made available nationally. These actions were combined to promote awareness at local, national and international levels. The livelihoods alternatives (Goal 8), however, were less so. This is perhaps due to an underestimate of the level of inputs required for the work combined with the unforeseen demands for continued conservation protection by the project. It does however, raise the issue of how wide ranging a Darwin project should be.

Figure 8 Content of a children's story developed to raise awareness of the need to conserve the habitat of the threatened Babirusa pig in Sulawesi (9-012, M Colbeck & L Clayton)

Table 9 Significant contributions of DI projects in Kalimantan (Borneo), Sulawesi and Java in Indonesia to the Islands PoW

WP Goal	WP Target	Sub-target	DI Project	Impact / Legacy
1. Promote conservation of island ecosystems biodiversity	1.2 Areas of particular importance in protected areas	1.2.1 Identify & establish protected areas	9-012	Establishment of the Paguyaman Nature Reserve, 31,000ha.
2. Conservation of islands species diversity	2.1 Populations of selected taxonomic groups maintained	2.1.1 Policies & measures	5-127, 9-012	Protection of Endangered Babirusa Pig.
11. Improved financial, human & technical capacities to implement CBD	11.2 Technologies are transferred	11.2.1 Transfer knowledge, science & technology	4-068	Herbarium electronic data base system
			6-166	Introduction of conservation and sustainable use to University Curriculum, Now 'Forest Conservation' is most popular course
			7-135	Increased scientific understanding of importance of forests on peat, peat hydrology and carbon storage in relation to recent land use changes highlighting their unsustainability.
	11.3 Capacities developed to implement CBD	11.3.1 Strengthen capacity for legal & other mechanisms	9-012	YANI a local NGO established
		11.3.3. Communication education an public awareness	9-012	Significant raising of awareness of Babirusa pig and its conservation status.

5.4 Madagascar

Background & conservation context

Madagascar is the world's 4th largest island and, like Borneo, is considered an 'island continent'. Isolated in geological time it has very high levels of endemic biodiversity (80% of most taxa at species level). Madagascar additionally, has over 250 islands or islets, where opportunities and challenges for conservation are more typical of small islands.

There have been eight DI projects in Madagascar since 1995. The main focus of the project has been training and applied research for biodiversity conservation. The projects have largely met those CBD elements that are a priority within Madagascar. Given that the task of inventorying Madagascar's biodiversity is vast compared with smaller islands, DI project have made a significant contribution to these surveys.

Contributions to the Islands Programme of Work, Madagascar

DI Madagascar project impacts in relation to CBD Programme of Work on Islands are summarised in Table 10. Project impacts concern primarily Focal Areas 1 (Protect the components of biodiversity), 3 (Address threats to biodiversity) and 7 (Ensure provision of adequate resources). Comparatively few impacts concern Focal Area 2 (Promote sustainable use) and no impacts are reported for Focal Area 6 (Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources). This reflects directly the conservation and research orientations of most of the DI Madagascar projects to date.

The reported impact on target 2.2.1 (inventories & species status assessments) is consistent with Madagascar's status as a megadiversity country and the high priority accorded to species inventories as many taxonomic groups and important biodiversity areas remain poorly known. DI projects have undertaken species inventories & status assessments and published findings.

Biologists trained through the DI projects have made significant contributions to conservation efforts for small mammals, through production of National Action Plans (eg DI 10-024 Microchiroptera). Herpetologists trained under DI project 5-174 contributed to the National Action Plan for Amphibians and in designating priority areas for reptile and amphibian conservation under the Durban Vision initiative.

Contributions made to the Madagascar biodiversity database REBIOMA by DI projects (4-104, 5-174, 7-027, 7-113, 10-024, 14-006) and by biologists trained through DI projects are acknowledged to be of major importance. REBIOMA has become the primary database facility used by the national administration in the identification and prioritisation of new protected areas to be established under the 'Durban Vision' process.[13]

Impacts in relation to Target 11.3 (capacity strengthening) are particularly significant and reflect that several of the implementing organisations and their national partners are themselves training institutions, and developing national scientific capacity is a critical need for biodiversity conservation. The cohesive network of trained & experienced biologists created under the suite of DI projects is a major legacy of DI in Madagascar (see Box 1) which has in turn had considerable impact. For example, nationals trained in the DI projects have gone on to make significant contributions to the development of new biodiversity conservation projects, the identification and development of new protected areas in Madagascar and other important conservation actions.

13 In September 2003 at the IUCN World Parks Congress, President Ravolomanana of Madagascar declared his government's intention to triple the coverage of protected areas from 2 to 6 million ha (10% of the land surface) – this presidential policy is known as the 'Durban Vision', supported significantly by DI projects.

Box 7 Trained conservation biologists are a major legacy of DI projects in Madagascar

Competent national biologists are a major legacy of the Darwin Initiative in Madagascar

DI projects in Madagascar have made a major contribution to developing capacity in biodiversity conservation in Madagascar. Between the various projects (4-104, 5-174, 7-027, 10-024) a total of 25 Malagasy biologists were trained to Masters level. Projects 7-113 and 10-021 provided substantial thematic training (over 1 month per trainee). All DI projects provided at least some technical training to nationals over and above masters level training.

Under project 4-104, four Malagasy biologists were fully supported to attend the MSc in Biodiversity Conservation at the Durrell Institute of Conservation & Ecology, University of Kent, Canterbury between 1995 and 1997. Three of these are working actively in conservation in Madagascar today.

Under DI project 5-174, six students were accepted for training leading to a DEA (Diplome d'Etudes Approfondies or taught Master degree level). Subsequent DI projects (Project 7-027, 10-024 and currently 14-006) maintained support for these six initial students and these together with others, were employed as trainees. While employed under these subsequent DI projects all 6 initial students as well as approximately 15 other students were able to complete their thesis presentation for DEA degrees. These students form part of a cohesive network of highly motivated biologists, employed by national institutions, commercial enterprises and NGOs working on conservation issues in Madagascar. **They are a valuable legacy of the Darwin Initiative.**

A significant long-term impact has been made towards Target 11.3 (capacity strengthening) by the creation out of DI Projects 10-024 and 14-006 of the national conservation NGO *Madagasikara Voakaji* (Box 8). *Madagasikara Voakaji* today represents a significant component of national capacity in biodiversity conservation for small vertebrates. *Madagasikara Voakaji* provides species status assessment services on small vertebrates to larger projects and raises funds for conservation projects. DI projects 5-174 and 7-027 also contributed indirectly to the genesis of *Madagasikara Voakaji* which may thus be considered a major part of the legacy of the DI projects in Madagascar.

Box 8 Establishment of the NGO *Madagasikara Voakajy* in Madagascar

Enhancing legacy in Madagascar: Establishment of a conservation NGO

The need for a national organisation working on biodiversity was determined under Darwin Initiative projects working in Madagascar between 1996 and 1999 (5-174 & 7-027). It was perceived that the short funding term of many projects, the poor employment prospects of motivated national biologists and a gap in the research focus of international organisations threatened to undermine the legacy of Darwin Initiative projects.

DI Project 10-024 listed the creation of a national organisation working on biodiversity research as a project output, and led to the creation of the organisation *Madagasikara Voakajy* in May 2005 in Antananarivo, Madagascar. Amongst the aims of the organization are:

- to conserve the endemic vertebrates of Madagascar using an integrated approach based around strong principles of conservation science, applied ecology and environmental education;
- to undertaking multi-disciplinary species-based conservation projects that involve scientific study, training, participatory monitoring and environmental education;
- to provide Malagasy biologists with employment, institutional support and research opportunities.

While DI projects have *de facto* contributed significantly to national programmes on biodiversity, the formal linkages have been limited so far. Thus, DI project activities and outputs have not featured in national reports to the Biodiversity Convention.

Due to the large area of the island and relatively small number of projects there has been limited direct synergy between concurrent projects. The clearest technical lesson relevant to achieving CBD goals has, however, been the immense value Madagascar has gained from the continuity of several interrelated DI projects. DI projects (5-174, 7-027, 7-113, 10-024 and 14-006) funded between 1996 and 2008 have had the time to ensure in-depth training of a substantial group of students, to influence the national and international legal status of various taxa, to contribute to protected areas management and location and to assist with increasing capacity in national training institutions.

Table 10 Significant contributions of DI projects to the Island PoW in Madagascar

WP Goal	WP Target	Sub-target	DI Project	Impact / Legacy
1. Promote conservation of island ecosystems biodiversity	1.2 Areas of particular importance in protected areas	1.2.1 Identify & establish protected areas	4-104, 5-174, 7-027, 7-113, 10-024, 14-006	DI projects contributed data and expertise to identification & design of protected areas
2. Conservation of islands species diversity	2.1 Populations of selected taxonomic groups maintained	2.1.2 Species inventories & assessments	4-104, 5-174, 7-027, 9-006, 10-021, 10-024, 14-006	Inventories on tiger beetles, chameleons, fruit bats & food plants, littoral forest species, marine sites (SW), microchiroptera & small vertebrates
	2.2 Status of threatened species improved	2.2.1 Sustainable management of biodiversity	7-027, 10-024, 14-006	Ending pest status of all bats, protection of 8 species and imposing a permit system for 4 others. Improved zoning of protected areas (Bemaraha)
4. Promote sustainable use & consumption	4.2 Unsustainable use reduced	4.2.1 Coastal & marine biodiversity	10-021	Develop capacity for M&E of coastal marine resources
		4.2.4 Forest ecosystems	7-027	Reduced unsustainable use of certain bat species in certain areas
	4.3 No species endangered by international trade	4.3.2 Measures to regulate harvesting	7-027, 10-024	DI projects contributed to ending pest status of all bats, protection of 8 species and regulated hunting of 4 others
5. Reduced pressures from habitat loss	5.1 Rate of habitat loss reduced	5.1.1 Integrated land-water use plans	7-113	Hydrological regime for wetland (proposed Ramsar site)
11. Improved financial, human & technical capacities to implement CBD	11.2 Technologies are transferred	11.2.1 Transfer knowledge, science & technology	4-104	UK-based Masters training in biodiversity conservation (5 students)
	11.3 Capacities developed to implement CBD	11.3.1 Strengthen capacity for legal & other mechanisms	7-027, 10-024	DI projects helped Madagascar wildlife authorities to revise legal status of bats (see above)
		11.3.2 Share best practices, enhance learning opportunities	4-104, 5-174, 7-027, 10-024, 14-006	Creation of a corps of motivated conservation biologists now supporting a range of conservation projects

Overall contribution of Madagascar DI projects

All DI projects in Madagascar (4-104, 5-174, 7-027, 7-113, 9-006, 10-021, 10-024 & 14-006) have made substantial contributions to biodiversity conservation through a principal focus on capacity building and biodiversity-related research.

The most substantial and measurable impacts and legacy arising from the Madagascar DI projects have been:

- the creation of a cohesive corps of trained Malagasy biologists, most of whom have pursued active careers in conservation; and,
- the establishment of the NGO *Madagasikara Voakajy* that is helping to further consolidate the DI legacy by providing Malagasy biologists with the career opportunity to use their training and experience to participate in the national biodiversity arena and help Madagascar to meet its CBD commitments.

5.5 Galápagos, Ecuador

Background & conservation context

Located in the Eastern Pacific the Galápagos Islands are probably the most biologically intact island archipelago anywhere on Earth. Additionally, like other islands, they have influenced human thought, being the inspiration behind Darwin's ideas on evolution. Despite being relatively pristine the islands face considerable challenges. For example the number of introduced plant species currently exceeds those of native species.

There have been a total of seven DI project in the Galápagos: 6-174 "Revision of the Galápagos Marine Management Plan"; 7-078, "Threatened flora of Galápagos: a scientific basis for conservation"; 9-010 "Terrestrial invertebrate biodiversity in Galápagos: training and collection rehabilitation"; 12-017 "Building capacity and determining disease threats to endemic Galápagos fauna"; 12-018 "Climate change and conservation of Galápagos endemic bird species"; 14-048 "Galápagos Coral Conservation: Impact Mitigation, Mapping and Monitoring"; and 15-005 "Conservation of the Mangrove Finch (*Cactospiza heliobates*)". See Figure 9 below.

Impact and legacy towards Islands Programme of Work, Galápagos

DI Projects in the Galápagos Islands have covered a wide range of habitats and taxa. There has been strong emphasis on generating new knowledge and skills which have then subsequently been utilised to promote conservation actions. The analysis of broad impact shown in Table 11 is focused on the main impact that can be directly attributed to the DI project. In addition to this the very great legacy of new knowledge and skills means that the projects have contributed in many other areas. For example in relation to the control of alien invasive species, project 9-010 left a legacy of invertebrate inventory work which eventually led to the development of a community based system of rapid response to alien invertebrates. Similarly, the basic inventory and taxonomic work of projects 7-078 and 9-010 helped to develop measures to control alien invasive invertebrates and plants.

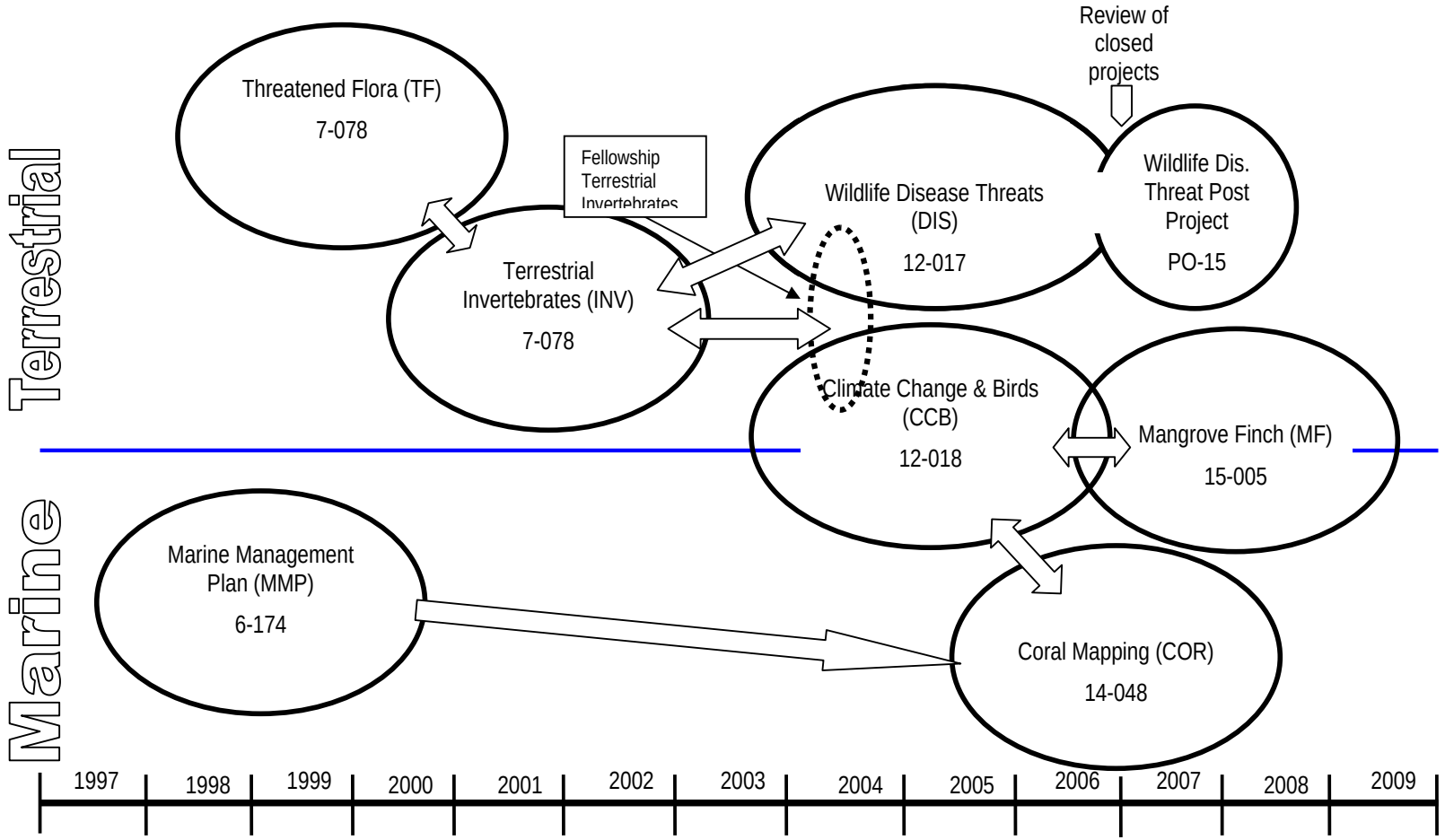

Figure 9 Darwin Initiative Project in Galapagos, Ecuador - Showing some of the inter project links

Table 11 Significant contributions of DI projects in Galápagos to the Island Biodiversity PoW

WP Goal	WP Target	Sub-target	DI Project	Impact / Legacy
1. Promote conservation of island ecosystems biodiversity	1.1 10% of islands' ecoregions conserved	1.1.1 Integrated measures to conserve ecosystems	6-174	Survey and zoning of marine habitats
		1.1.2 Re-establish lost components	7-078,	Support and recovery of rare vegetation types
	1.2 Areas of particular importance in protected areas	1.2.1 Identify & establish protected areas	6-174,	Support to Marine Management Plan & WHS.
2. Conservation of islands species diversity	2.2 Status of threatened species improved	2.1.2 Species inventories, assessments & taxonomy	6-174, 7-078, 9-010, 12-017 12-018,14-048, 15-005	Surveys of corals, endemic flora surveys and taxonomy, invertebrates, research into endemic and threatened birds
4. Promote sustainable use & consumption	4.2 Unsustainable use reduced	4.2.1 & 5 Coastal & marine biodiversity	6-174,	Zoning of Marine park for tourism and fishing.
6. Control threats from invasive species	6.1 Pathways for potential alien invasive species identified and controlled.	6.1.2 identify and address pathways	12-017	Identified pathways of disease vectors and developed protocols for fumigation of planes carrying vectors of threatening avian diseases legislated
7. Address challenges to Island Biodiversity form climate change and pollution	7.1 Enhanced resilience of components of biodiversity to climate change	7.1.1 Research into mitigation measures	12-018, 14-048	Complete population census of endemic lagoon birds, and research into the foraging behaviour linked to monitoring of sea temperature and with of surveys of temperature sensitive coral species.
11. Improved financial, human & technical capacities to implement CBD	11.2 Technologies are transferred	11.2.1 transfer knowledge, science & technology	6-174, 7-078, 9-010, 12-017 12-018,14-048, 15-005	Transfer of a wide range of conservation methodologies and knowledge as well as collaborative innovation
	11.3 Capacities developed to implement CBD	11.3.2 Share best practices, enhance learning opportunities	6-174, 7-078, 9-010, 12-017 12-018,14-048, 15-005	Extensive network of partners established see below,

More detailed examples of the way that DI Projects have contributed to the conservation of biodiversity and the Islands PoW in the Galápagos Islands is illustrated in the following examples.

Related to Focal Area 1, Goal 1, DI project 6-174 carried out basic marine surveys which led to a zoning plan for the Marine reserve, and contributed to Galápagos achieving World Heritage Status. Galápagos, with 96% of the land area conserved within the Galápagos National Park, and all the area of the territorial waters within the Marine reserve far exceeds the 10% target.

A number of projects have promoted the conservation of island species diversity (Goal 2). Basic research on selected taxonomic groups has been initiated. These include detailed surveys of the endemic flora (7-078), as well as collection, identification and curation of invertebrates (9-010). These provided invaluable information upon which further work was developed.

The work of project 9-010 which developed invertebrate collections led on to the identification and eradication of invasive invertebrate species from selected islands contributing to Goal 6. In one case there was a successful biological control of an insect pest that was threatening endemic plants. Also relevant to Goal 6, Project 12-017 has focused less on invasive species but on wildlife disease and their vectors. The arrival of bird diseases into the islands could be catastrophic on bird populations. The pathway for the arrival of West Nile Fever, for example has been determined with the greatest risk being from the introduction of mosquitoes in the holds of commercial aircraft. As a direct result of the project the legal framework and protocols for spraying aircraft holds has been modified.

Project 12-018 focused on understanding the impacts of climate change on critical endemic birds (Goal 7). These charismatic species include the Galápagos Flightless Cormorant, the Galápagos Penguin, and the Mangrove Finch. These projects carried out full census of the total populations of these birds as well as collecting foraging data. These were linked with biophysical data including sea temperature.

Galápagos, like many island groups, is a biodiversity-based economy with almost all people engaged in either tourism, conservation or fishing. A number of projects have contributed to maintaining or protecting the resources upon which fishing and tourism is based, for example 6-174, 12-017, 12-018 and 14-048. This has contributed to Focal Area 4 and Goal 8, related to maintaining goods and services from biodiversity to support human well-being. The comparative success of the Galápagos biodiversity economy with rapidly increasing tourism has had significant drawbacks. It is the driver for much illegal immigration and the rapid population growth of the islands. Conflicts between users and park authorities have been severe.

Darwin Initiative projects can have a positive role in promoting more responsible tourism. One example has been the installation of mooring buoys for dive operations by project 14-048, an activity that further raises the profile of the Darwin Initiative through the high visibility of the DI Logo on each buoy.

Figure 10 A mooring buoy installed by project 14-048 in the Galápagos Islands to minimise the environmental impact of tourist dive operations

Focal Area 7, the provision of adequate resources has been, as is often the case with DI projects one of their main strengths. These contributions have covered the financial, human, scientific, technical and technological capacity to implement the Convention.

In terms of financial contributions as at January 2007, the DI's past and ongoing financial commitments to 2009 for the five closed projects, two ongoing projects, one post project award and one fellowship award, amounts to £1,175,034 (US$ 2,332,983[14]). Whilst this level of investment seems substantial, on an annual basis it represents 5% and usually less (1-2%) of annual funding to the whole Charles Darwin Foundation (CDF) programme (the organisation which is the largest single recipient of Darwin Initiative funds).

All of the closed Galápagos Darwin Initiative projects appear to have been remarkably successful and have had positive impacts on the Islands' biodiversity to a disproportionately greater extent than the low percentage of financial contribution would indicate. This success has been achieved through building and supporting partnerships that generate new knowledge and through investing in people (target 11.3), technology transfer (target 11.2), and networking and long-term relationship development.

The reasons given by host country partners for this disproportionately high impact for the percentage of conservation funding would suggest the following:

- The size of a Darwin Initiative grant is institutionally valuable: it is large enough to carry out effective pieces of work, but small enough not to destabilise the institution[15].
- Support has gone to types of work which are not normally easy to access funding for, such as taxonomy of endemic species.
- Human resources capacity building has been very important in supporting long and short-term training of key local staff and providing tools to do the work. Personnel stability has also allowed benefits to accrue.
- The development of key contacts and networks, some of which are active several years after the project had closed.

Figure 11 Hernán Vargas reading PIT number (with scanner) of a marked Flightless Cormorant, Fernandina Island. March 2006
Photo. Glyn Young

Human resource Capacity Building

Human resources capacity building has been one of the strong legacies of Darwin Initiative Projects, and plays a significant role in the careers of both UK and Host country personnel. Hernán Vargas represents one of a number of Galápagos examples of this, including training, gaining experience and then leadership. Hernán was involved in the surveys of the first marine survey project (6-174) and received GIS training in UK.

He was the Galápagos leader of the climate change and birds project (12-018) and through this project gained a PhD, the first by a Galápaganian. He played a key role in the close collaboration with the wildlife disease project (12-017). Now based in Panama, he plays a leadership role in regional bird conservation efforts, and remains and advisor to the mangrove finch project (15-005), as well as other similar work in Ecuador and beyond.

14 January 2007 exchange rates

15 CDF is a relatively large institution for a small tropical island archipelago – Darwin Initiative funding could itself have boom-bust implications for smaller institutions.

Some of the success on Galápagos has also stemmed from the intrinsic strength of the host country institutions. In terms of small island research institutions and protected area authorities both CFS and GNPS command unusual levels of human, financial and technical resources.

Despite the Darwin Initiative overall objective to support host country implementation of the CBD, awareness of the CBD was relatively low at the project level. The programme of work on island biodiversity was not actually guiding Galápagos activities, this may not be surprising given it is a relatively recent articulation. Likewise the awareness of the Darwin Initiatives contribution to biodiversity conservation within Galápagos was also low with the CBD focal point. The greatest level of awareness of the overall contribution to CBD of Galápagos activities resided within National Park staff. Here it was recognised that Galápagos is meeting, if not exceeding, many CBD provisions.

The Darwin Initiative has a made a substantial contribution to the conservation of the Galápagos Archipelago. The funds available have been well used to develop human capacity, conservation infrastructure, methodologies and protocol and influence decision making, policy and law. UK expertise has been mobilised and strengthened, and long-term relationships and networks built. The Case Study of Galápagos illustrates the value of the Initiative, and the benefits that can be derived from a group or cluster of projects, especially in locations with low population and land areas.

The future of Galápagos and its iconic wildlife is not, however, secured and much work needs to be done. Within the context of Ecuador, the economic successes of Galápagos' biodiversity economy are driving a tourist boom and high levels of arrivals of both tourists and immigrants from the mainland. This not only makes the arrival of new invasive species a regular occurrence, but means a new Galapaganian community that is looking for short term economic gains. In the recent past, conflicts have been high. The future challenge for Galápagos is to create a long term sustainable social, cultural, environmental and economic model. There will continue to be a need for external support from programmes such as the Darwin Initiative

5.6 Seychelles and Mauritius

Background & conservation context

The Mascarene plateau is located in the Western Indian Ocean. It is an extensive sea area with small exposed land surfaces comprising the Seychelles Archipelago (120 islands, islets, atolls, etc) and Mauritius (including Rodrigues).

Both islands have significant biodiversity and charismatic bird and reptile populations. Mauritius contributed to the human learning about extinction, being the home of the flightless giant pigeon the Dodo. The name Dodo has become synonymous with extinction in many languages.

Mauritius has been extremely heavily impacted by human activities and the main thrust of conservation activities is the recovery of species often at the brink of extinction and the recovery, restoration and even reconstruction of habitat fragments.

Both countries have been building their conservation efforts but there is a severe lack of trained personnel and institutions.

Contribution towards the Islands PoW, Seychelles and Mauritius

The contribution of the Darwin Initiative projects in Seychelles and Mauritius to the CBD programme of work on island biodiversity is summarised as Table 12.

Table 12 Significant contribution of DI projects on Seychelles and Mauritius DI to the Island PoW

WP Goal	WP Target	Sub-target	DI Project	Impact / Legacy
1. Promote conservation of island ecosystems biodiversity	1.2 Areas of particular importance in protected areas	1.2.1 Identify & establish protected areas	13-027	Baseline for the establishment of marine protected areas.
2. Conservation of islands species diversity	2.2 Status of threatened species improved	2.1.2 Species inventories, assessments & taxonomy	5-199, 10-066, 12-005	Endangered Mauritius Ferns *ex-situ* conservation and reintroduction. Training and protocols for propagation of Seychelles endemic plants. Work on the insect fauna of Mauritius
11. Improved financial, human & technical capacities to implement CBD	11.1 New financial resources	11.1.3 conservation finance mechanisms	10-006	50% of UK sales of hybrid Seychelles endemic plant channelled to the botanic garden.
	11.2 Technologies are transferred	11.2.1 transfer knowledge, science & technology	7-055, 8-064, 10-006	Training in marine conservation. Biodiversity database for Mauritius wildlife. Training of wide range of biodiversity professionals

As in other islands reviewed DI project team members agreed on the validity of the priority actions and other elements of the Island Biodiversity PoW. Also in common with other island groups, most projects actually predate the PoW, and despite the congruence with the Island Biodiversity PoW awareness of the PoW and CBD processes in general was low.

As in most of the other island groups the main contribution to the programme of work was through Focal Areas 1 protecting biodiversity (Goals 1, 2 promoting conservation and conserving biodiversity) and Focal Area 7 the provision of resources (Goal 11 improving capacity).

Both countries have high levels of endemism, fragile ecosystems and a long history of human impacts. Mauritius, for example, has a high endemism (over 65%) of plants, reptiles and birds and is also part of the Madagascar biodiversity hotspot. As a result of the high endemism the focus of much conservation effort has been towards Goal 2 promoting the conservation of island species diversity. Examples include the *in-situ* and *ex-situ* conservation of plants and animals including a focus on ferns, endemic birds and reptiles.

It was recognised by project partner organisations that DI projects were involved in neglected areas of conservation such as invertebrates and ferns, and that the DI has been the catalyst for a number of new programmes, for example reptile translocation.

Steps have taken to support the restoration of small ecosystems with high concentrations of endemic species. For example, Round Island, Mauritius, a location used for nesting by numbers of endangered Indian Ocean seabird species nest on Round Island, Mauritius, including the Mauritius Kestrel (*Falco punctatus*), Round Island Petrel (*Pterodoma arminojoniana*), and Bulwers Petrel (*Bulweria bulweii*).

The restoration of Round Island is likely to have a high biodiversity impact. The same logic applies for Gunner's Quoin, currently the focus of a reptile translocation project (Project 15-038).

As with nearly all of the islands covered in this review, DI has strongly supported the provision of resources (Focal Area 7) and supported the financial, human, scientific, technical and technological capacity (target 11). Funding, for example, was identified as the biggest challenges to conservation activities, and DI projects have made some contribution. Other issues include supporting the ability of the conservation community in the respective countries to prioritise and mobilise resources for conservation action.

The importance of institutional support in terms of human resources and technology transfer were reiterated. The impact of DI training on the host country conservation cadre was noted. Within the Seychelles, for example, there is strong involvement in the Darwin Initiative at the highest government and civil society levels. This is partly as the result of a former Darwin scholar now holding a senior government post. The Government maintains a close relationship with members of a highly organized network of civil society focused on conservation, the group includes; Plant Conservation Action Group (PCA), Nature Seychelles (Seychellois member organisation of Birdlife International) and the Marine Conservation Society of the Seychelles, amongst others. The importance of conservation networks being once more highlighted.

The Darwin Initiative has also contributed through Institutional support to the main Mauritian conservation NGO, the Mauritian Wildlife Foundation (MWF). In Rodrigues, support has been critical to the formation of Shoals Rodrigues, a marine education NGO, now taking a project forward to support the establishment of marine protected areas (13-027).

6. The Darwin Initiative's contribution to the CBD's Island Biodiversity Programme of Work

Islands have provided the location for some major developments in human thought and understanding in our relation to the natural world including key concepts of evolution and extinction. In terms of biodiversity conservation, lessons include species recovery, the eradication of invasive species and the restoration of habitats. Islands also look set to help our understanding of current issues such as climate change. As well as learning lessons they present the opportunity to demonstrate and disseminate these lessons.

Islands present both challenges and opportunities. The smaller islands are also of a manageable size, are bounded systems and the oceans can be barriers to the arrival of invasive species. Their remote nature means conservation projects are expensive. The open nature of island ecosystems means that invasive species can more easily take hold once they arrive. Mass transport and increasing population means that even the most remote islands are more accessible.

Regarding social systems, islands often face significant financial and human resource capacity constraints. Islands often have high levels of social capital, but at the same time can sometimes suffer from 'island politics' which become blocks to various activities.

The 105 Darwin Initiative projects on islands have covered a very wide range of programme areas that range geographically from the marine to the mountain tops. Darwin is important as a programme because it is one of the very few funding sources dedicated to biodiversity conservation, and covers areas often neglected by other funding agencies.

Islands are particularly good candidates for DI projects as demonstrated by this review, and the significant proportion of DI projects (nearly one quarter of all projects up to 2006) that have been based on Islands. The theme of island biodiversity is highly relevant to the Darwin Initiative for the following reasons:

- Islands often have high levels of biodiversity and overall high proportion of endemic species.
- Biodiversity on many islands is considered "at risk" from over exploitation and vulnerable to factors including extreme events (storms, tsunami) as well as land-use and climatic change.
- The economies of many islands and livelihoods of their communities are often highly dependent on biodiversity (e.g. fisheries, forests and tourism). Some, for example the Galápagos, are considered to be mainly "biodiversity economies".
- Island communities, institutions and governments often face extreme constraints limiting the human and financial resources required to undertake conservation actions.

All of these features that define the challenges presented by islands are illustrated in this review. The remainder of this discussion will consider how DI projects have responded to these challenges and empowered individuals and institutions on islands to conserve and manage their biodiversity.

6.1 Empowering institutions and individuals for conservation, sustainable use and equitable sharing of benefits derived from island biodiversity

Darwin Initiative projects on islands have made significant contributions that have assisted local stakeholders to meet their obligations under the CBD. This can be seen from the analytical data presented in Section 4 and is further illustrated in the five case studies in Section 5. Using the terminology of monitoring and evaluation, the majority of DI projects on islands have made a necessary contribution (in many cases essential), but these alone are normally not sufficient to achieve long-term significant impact on the conservation of biodiversity. In virtually all cases the DI projects on islands have needed to link with other processes or activities in order to deliver sustained impact.

For this reason, this discussion now considers the direct impact and legacy of DI projects; how DI projects need to link or lead into full-scale conservation activities and finally how the design, implementation and coordination of DI projects could be improved to further increase both impact and legacy on the CBD's Island Biodiversity Programme of Work.

6.2 Impact and legacy that can be *directly* attributed to DI projects

The systematic analysis of the contributions to the Islands PoW (Section 4) demonstrated that DI projects were making more significant contributions to a limited number of Focal Areas and their associated Goals. All projects helped to provide resources to implement the CBD (Focal Area 7 & Goal 11), but it was notable that projects were concentrating on the provision of human, scientific, technical and technological capacity, with only a very small number of projects making significant progress to provide sustainable financial resources for implementation of the convention. As such, the major contributions of DI projects on islands to date have been generating scientific knowledge and building human and institutional capacity to implement the CBD.

Scientific knowledge to support implementation of the CBD

The CBD places a very strong emphasis on the development of evidence-based approaches to support the conservation of biodiversity. In many islands institutional capacity and existing knowledge for biodiversity conservation has traditionally been low. DI projects have played a very important role in supporting local institutions to establish such a knowledge and skill base. This is reflected in the activities of projects which have concentrated on Focal Area 1 "Protect the components of biodiversity" working at either the level of ecosystems (Goal 1) or species (Goal 2). It is notable, however, that no project made significant effort to work with the genetic diversity of crops and livestock (Goal 3).

The work in support of Focal Area 1 has been pursued through the identification and monitoring of biodiversity (Art 7), via basic research and training (Art. 12). Projects have for example, supported the establishment and curation of herbarium or invertebrate collections. Other have undertaken very base-line surveys or inventories of biodiversity. One of the strengths of DI projects has been their ability to provide a 'jump start' to specific programmes of this nature which have then been maintained by local resources or other conservation funds.

The UK has some of the leaders in the field of taxonomy and institutions such as the UK Natural History Museum, the Royal Botanic Gardens at Kew and Edinburgh, the National Museums of Wales, universities and others. These institutions have supported, through DI projects, islands biodiversity actions by helping local partners to acquire the information, knowledge and tools for conservation and management.

Significant effort has been directed through a wide range of conservation interventions including *ex-situ* and *in-situ* conservation, protected area establishment, species rescue, recovery and management, habitat restoration, planning policy and legislation.

Protected areas. A number of projects have supported the establishment of protected areas, both terrestrial and marine. (eg Fiji, Galápagos, Mauritius, Sabah, Solomon Islands). Projects have provided the survey information which has helped government decision making. These protected areas have been both terrestrial and marine.

Marine protected areas. Approaches to marine protected areas have varied from a biodiversity centred approach (Mauritius) to a more community process centred approach (Solomon Islands). Ultimately, any protected area must have the support of neighbouring communities and resource users if it is to gain long term acceptability, so taking the latter approach is more likely to be effective. Given the international emphasis on increasing the coverage of Marine Protected Areas, this is an area in which the DI could play a greater support role through comparative analysis and lesson learning within and between projects.

Recommendation

9. DI projects that are promoting the development of protected areas on islands should be encouraged to engage in comparative analysis and lesson learning within and between projects to produce guidelines to increase their effectiveness.

Endemics, extinction and rare species. The high levels of endemism and extinction on islands have influenced Darwin project efforts. For example 111 out of 127 bird extinctions since 1500 were island endemics (Sarah Saunders data). A number of projects have worked and continue to work to recover species that are close to extinction (Galápagos, Mauritius, Seychelles) using both *in-situ* and *ex-situ* techniques. Projects dealing with specific species, have also worked in the area of wildlife diseases (Galápagos, Ecuador and Sabah, Malaysia), in species such as giant tortoises and orang-utan. Sophisticated exploration of the pathways for wildlife diseases has led to policies that have influenced quarantine and aviation fumigation policies (Galápagos).

Eradication and restoration. The recovery of rare species goes hand in hand with the restoration of habitats. Often eradication of introduced mammals is the prerequisite for the reintroduction of species. Small off shore islets have been one of the targets for this (Mauritius). DI projects have been less directly involved in the eradication activities themselves which are often beyond the scope of DI project budgets but also not within the expertise of UK institutions (C. Jones *pers. Comm.*). DI projects have however, assisted with other parts of the restoration process as in Mauritius.

Social science and conservation. Most DI projects have a biodiversity science focus. Conservation action is however, focused on social change, and therefore requires a greater focus on social science. This is particularly important as conservation is a process of dialogue, negotiation and participation. It is particularly important for communication, education and public awareness.

Recommendation

10. Recognition of the social dimension of conservation is important, and particularly on islands, where social issues are amplified. A better understanding of the social dynamics of island communities through collaboration with social scientists and anthropologists as well as using more process approaches to conservation are recommended.

Market approaches. A number of projects have been working with biodiversity markets and looking at certification, including certification of timber, aquarium fish and birds. In Java efforts are in train to increase the captive breeding of song birds. Song bird competitions are very popular amongst a wide range of people in Java, and wild collections has led to extirpation of wild populations.

Policy and legislation. A number of projects have contributed to policy and legislation, especially, as noted earlier, regarding protected area establishment but also regarding control of invasive diseases. Whilst it was apparent that a number of projects had engaged with policy and decision makers the case study reviews all suggested that this was one area where DI projects could potentially enhance their impact. It was noted that in many islands, the government's CBD representative was not aware of relevant outcomes from DI projects or that information produced by projects was not being used within the policy process.

The Darwin Initiative does not expect all projects to engage directly in policy processes, but would expect that relevant information should be readily available for this. This could be addressed by projects becoming more aware of relevant policy processes (including the CBD itself) and developing approaches to promote awareness in the policy community.

Recommendation

11. DI projects on islands need to become more aware of conservation-relevant policy and legislative processes and implement appropriate strategies to ensure that policy-makers are aware of the DI projects and their outcomes. Where possible, projects should become more explicitly linked into relevant national plans and priorities.

Communication, education and public awareness – The new view of communication, education and public awareness (CEPA) as a process of social change towards conservation requires the use of non traditional approaches (Edwards et al. 2007). Two-way dialogue, leaning rather than teaching, emphasising awareness processes over products mean that approaches such as drama, festivals and participatory citizen science are receiving more attention. Drama projects in the Solomon Isles (Figure 12) and citizen science in Galápagos are two examples of projects which are using these approaches.

Figure 12 The WWoofers Theatre Group performing an environmental play to a community in the Western Province of the Solomon Islands
(Photo: B Manele, WWF Solomon Islands).

Neglected Areas in the DI portfolio on islands

DI projects have made very significant contributions to Focal Areas 1,2 and 7 of the CBD's Island Biodiversity PoW, but much less in the remaining four areas. This is partly to be expected because of the characteristics of islands and those of the Darwin Initiative. Whilst this is partly supported by this review there are a number of notable areas where DI projects have not fully responded to the needs of islands. This is most notable in relation to Focal Area 3 "**Address Threats to Biodiversity**". This review has made a specific recommendation that further work in this area should be encouraged within the Darwin Initiative.

The discussion of the characteristics of islands (see Box 4, pg 5-4) highlighted the importance of extreme events, environment and land-use change, and invasive alien species on islands. It is surprising that so few DI projects have addressed these issues on islands, perhaps more so when it is noted that it was participants from DI projects that were stating the importance of these issues. A few projects have demonstrated the valuable contribution that DI projects can make in these areas.

Climate change. Two projects in Galápagos have been working together to understand climate change effects both on coral species but also on coastal and marine birds. Levering funds from NASA these projects have been able to measure in a detailed way the physical parameters, such as ocean temperature, with patterns of distribution and behaviour of organisms sensitive to changes in the physical environment. They have been teasing out the complexities revolving around the El Niño-Southern Oscillation (ENSO) events and impacts of these on biodiversity.

Invasive Alien Species. Relatively little DI effort has been expended on tackling invasive alien species, yet these present one the major threats to biodiversity in island ecosystems. Greater efforts could be made to include these in project activities. DI projects, for example in Fiji and the UK Overseas Territories have been able to quantify the risk and present options or develop plans to control invasives. It is recognised that the Darwin Initiative does not have the resources to fund control programmes for invasive species, but in both of the examples given here, the DI projects provided the knowledge that was essential to develop control programmes that have subsequently been funded by other agencies.

Extreme events and resilience of ecosystems. A number of DI projects on islands are illustrating the impacts of extreme events such as hurricanes (Cayman Islands, 14-051) and volcanic eruptions (Montserrat 14-027). The direct effect of a Tsunami on local communities and a DI team was dramatically demonstrated on the Solomon Islands (Project 14-020) during this review when the Western Province was hit by a magnitude 8.1 earthquake on 2 April 2007 followed by waves of over 3 m. This project had been supporting local communities to develop marine protected areas. One of the four communities found that their village had been uplifted by 3 m exposing and destroying large extents of their coral reef (Figure 9). It is important that DI projects recognise that extreme events such as these are one of many factors that characterise islands (see Box 4) and ensure that their approaches help to increase the resilience of ecosystems and livelihood systems based on biodiversity.

Figure 9 Villagers on the island of Ranongga, Solomon Islands survey the areas of coral reef that became exposed as a result of the earthquake of 2 April 2007
Photo: B Manele, WWF Solomon Islands

Focal Areas 4 (Maintain goods and services from biodiversity to support human well being), 5 (Protect traditional knowledge and practices) and 6 (Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources) are also poorly represented in the Darwin portfolio on islands. Of these the low emphasis on understanding and using traditional knowledge is also unexpected as many islands have maintained high levels of social capital within communities. The design process for DI projects on islands might wish to place greater value on valuing and utilising traditional knowledge and practices.

Recommendation

12. DI projects on islands should consider placing greater value on protecting and utilising traditional knowledge and practices where these are still important for local communities.

Human Capacity

Darwin projects have been responsible for training large numbers of staff on islands. The previous lack of capacity means that the DI has very significant impact on some islands. DI has been important for supporting cadres of local staff that have made significant contributions to national biodiversity leadership. This has helped to develop a "community" of conservation professionals in countries including Malaysia (Sabah), Madagascar, Mauritius, Galápagos and Fiji. The Fiji example is further accentuated through the Pacific Island Community Conservation Course (project 8-009) which has created a network of professionals across numerous Pacific Island States.

Continuity of support is important to overcome human and financial resource limitations. Islands need specific help to network; distance and isolation is a problem as funding is required to share experiences between projects. For this reason, it is recommended elsewhere in this review, that the Darwin Initiative considers funding networking events for DI projects to further enhance impact through building partnerships at a national and regional level.

Institutional Capacity and networking

Darwin Initiative projects are partnerships between a UK institution(s) and host country institution(s). This section examines a number of institutional elements important for project implementation.

Partnerships and networking. A major lesson coming out of this, and similar reviews, is the importance of partnerships and networking in DI projects. Each project represents a partnership of at least one and increasingly multiple UK and host country institutions. The partnerships and networks often last well after the project has closed.

A number of countries (islands) have benefited from having a group of projects over a long period of time.

Regional networking. The concept of regional networks and regional human resource pools is important for islands as very few, especially the SIDS and OT's, have the population sizes to provide the levels of expertise required. The increased use, sharing and further building of regional expertise presents a good strategy for island groups such as in the Caribbean, Indian Ocean, Pacific and elsewhere. DI projects are starting to network regionally and this component could be further promoted. A Darwin Network on marine-related biodiversity has been suggested.

Institutional capacity building. Strong institutions have lead to successful projects. In some cases projects have worked within significant institutional constraints. In some cases DI projects have led to the direct formation of new local NGOs (Madagascar, Mauritius, Fiji). It is recognised that the clustering of projects (see following discussion) had led to project synergy. Projects isolated from each other or from institutional support networks can have difficulty in securing project outcomes and impact.

6.3 Programme considerations

Financial considerations. DI projects have exhibited remarkable value for money, and have achieved considerable biodiversity outcomes for modest investments. Within smaller island communities DI funds can be substantial. Although Darwin funds are not huge, they can probably have a disproportionate influence in the small scale of island communities. Even with a small proportion of programme funding, the projects have been shown to have disproportionately high benefits. This is due to the partnering of institutions, leverage of additional funds. A number of host country participants commented on the very high value that they placed on the value DI projects.

Evolution from basic to sophisticated. Some concerns have been raised that DI projects are merely documenting biodiversity before it disappears. While that might seem to be the case in some instances, many projects have used the information gathered in basic studies as a foundation to move on sophisticated conservation activities, including biological control of invasive invertebrates, quarantine mechanisms, climate linked population monitoring. Where this has happened, it is often because the DI project has been placed at an appropriate place within a sequence of activities and the Darwin funded intervention was clearly targeted. A common message is emerging that it is important for Darwin projects to focus on a limited and clearly defined set of outcomes that fall within the remit of the programme.

Types of project in relation to impact. This and other reviews have led to the identification of three types of project described as 1) discrete, 2) stepwise, and 3) contiguous. '*Discrete'* projects are self-contained projects with clear objectives usually with a science focus, such as the implementation of a training course or the establishment of a data base or herbarium. Outputs, outcomes and impact are self contained but may not be very extensive. '*Stepwise'* projects are those that are a step towards a larger goal, and can be built upon by future activities. The outcomes and impacts of these projects can be maintained into the future even if further funding is not immediately forthcoming. Progress can continue once funding restarts. '*Contiguous'* projects however, depend on ongoing funding to capture outcomes and impacts. Should funding cease projects are in danger of losing the investments. Successful projects address the issues of continuity (for example through exit strategies) concentrating on delivering sustainable conservation outcomes.

Clustering and serial projects. Clustering projects in the same location and sequencing them in time enhances the stepwise nature of projects and increases the chance of impact and legacy. This can provide added benefits in terms of building human and institutional capacity. A good example of this emerged from the review of projects in the Galápagos Islands. Here, the Charles Darwin Research Station provided a focal point for most projects leading to a degree of coherence and continuity that most definitely has enhanced impact and legacy. It is the nature of the Darwin Initiative, that this outcome is not related to any strategic decision or direction. The question must be raised, however, if the overall impact of the Initiative could be enhanced by the DI adopting a more strategic approach (see below) to the commissioning and selection of at least a proportion of projects.

Strategic directions for the DI. Within the overall framework of the CBD and the general guidance given to applicants the Darwin Initiative does not favour any particular project above another. The main criteria for selection are the quality of the project applications submitted for review. A thematic analysis of this nature however, raises the question at to whether the DI should be more strategic in calling for and selecting proposals.

Recommendation

13. The Darwin Initiative should consider potential benefits that could be derived through enhanced impact and legacy through a more strategic approach to the commissioning and selection of projects based on analytical thematic reviews.

7. Conclusions

The Darwin Initiative has funded a total of 105 projects in 44 islands, island groups or archipelagos over the period of 1993-2006, representing 23 percent of all projects and funds allocated over that period. This review represents the largest systematic review of a CBD theme within the Darwin Initiative to date.

Islands are very good subjects for support under the Darwin Initiative. They easily fulfil the eligibility criteria as most have high degrees of biodiversity, and often at risk whilst the local populations are severely constrained by human, technical and financial resources to implement the CBD and through this conserve biodiversity.

Islands, as defined by the United Nations have a very wide range of physical, biological and socio-economic characteristics. In size they can range from "continental" islands such as Borneo, Madagascar and New Guinea through to small islands with a land area of less than 1 km^2.

Island biodiversity is also variable. Whilst many of the islands are readily recognised as being biodiversity "hotspots", many others are effectively "coldspots", especially those which are geologically very young or extremely isolated. The common biodiversity characteristics of islands include high levels of endemism and extinctions and risk often expressed as the high vulnerability to external shocks including climatic change, extreme events (storms, volcanic activity, earthquakes and tsunami) and human-induced land-use change.

The socio-economic dimension of islands is equally interesting and relevant to the Darwin Initiative. The livelihoods of communities on islands are often highly dependent on biodiversity, indeed some islands such as the Galápagos may be considered to have "biodiversity economies". The importance of biodiversity to the economy and human well being is, however, not matched by availability of human, technical and financial resources to ensure the equitable use and conservation of biodiversity resources. This review has highlighted the extremely important and sometimes essential contribution that DI projects have made to address the need to improve human and technical resources that are required to implement the CBD. The review also finds that lack of financial resources continues to severely limit the ability of island communities and their governments to make real progress in operational conservation activities. This issue merits further consideration below.

Darwin projects on islands have largely delivered very high value for money. This is seen both in projects working in isolation and those which form parts of networks, either through a sequence of DI projects or with activities funded from other sources. The reasons for the value of DI projects on islands can be attributed to a number of factors:

- Nearly all projects have benefited from the skills, enthusiasm and dedication of team members from both the host country and UK institutions. The ability for DI projects to build teams in partnership is the feature that so often contributes to the success of DI projects. It is also notable that projects which make specific efforts to invest in the partnership process tend to develop greater long-term legacy.
- This review provides a quantitative analysis of how the 105 projects on islands supported the CBD. The emphasis on generating technical information through research and surveys links with a very strong process designed to build human and institutional capacity. This again is a very real strength that underlies the success of the DI in supporting the CBD.

- A number of islands have benefited from the contribution of DI projects to building national "communities of practice" in support of conservation and the CBD. This is most obvious where there have been clusters or a sequence of related projects. In addition to building research capacity, a number of DI projects have encouraged the establishment of conservation-focused NGOs.

The systematic review of the DI's projects on islands has illustrated the relevance of the CBD's 2010 Biodiversity Target and its associated Focal Area, Goals and Targets. It has proved very useful in terms of measuring the overall contribution of DI projects to the CBD and in highlighting areas which are currently underrepresented.

DI projects have made very significant contributions to:

- **Focal Area 1: Protect the Components of Biodiversity:**
  Projects have made significant contributions to goals 1 and 2 conserving species and their habitats, but there has been no contribution to Goal 3 which addresses the genetic diversity of crops and livestock.
- **Focal Area 2: Promote Sustainable Use:**
  Many projects have engaged in activities to promote sustainable use and consumption, through the provision of knowledge, and development of appropriate management plans or regulatory regimes.
- **Focal Area 7: Ensure Provision of Adequate Resources**
  All projects contributed to this area and its sole goal which aimed to ensure that "parties have improved financial, human, scientific, technical and technological capacity to implement the Convention". The major contributions in this area have been to technical aspects and the development of human capacity.

The review does identify areas that are currently under-represented such as the 2010 Target Focal Area 3 (Address Threats to Biodiversity") and Focal Area 4 (Maintain goods and services from biodiversity to support human well-being) which would benefit from being linked into the activities supporting research and capacity building.

The Darwin Initiative has been very successful in supporting the process to conserve biodiversity on islands, but this review suggests that this real impact could be further enhanced through action at the level of the programme. Of particular relevance to island communities who tend to be isolated, is the suggestion that the DI considers hosting networking events within countries or regions to promote the sharing of information and enhance the capacity DI communities. The review also suggests that the Darwin Initiative should consider whether potential benefits may be derived through a more strategic approach to the commissioning and selection of projects based on analytical thematic reviews.

It is clear from this review, that island communities and governments have notable constraints in mobilising the financial resources required to put new conservation knowledge or plans into practice. It is important that DI projects remain focused and do not move into these areas which typically require financial resources and time that exceed what the programme if designed to do. The need remains, and it is clear that current funding mechanisms are not necessary adequate or in some cases available to islands (eg UK Overseas Territories). This review makes a specific recommendation that DEFRA should engage in dialogue internally and with other agencies to consider how this need might be addressed, for example through a "knowledge into practice" fund for conservation.

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Annex 1 Darwin Initiative projects on islands 1993-2006 (Sorted by location)

Island	Country	Project Ref	Further Info	Project title	Status	Start year
Anguilla	UK	8-114		Capacity building for biodiversity conservation in Anguilla	Completed	1999
Ascension Island	UK	7-006		Assessing the status of Ascension Island green turtles	Completed	1998
Bali	Indonesia	14-057		Conserving Coral Reefs Through Community Ownership and Enterprise in Indonesia	Current	2005
Bermuda	UK	9-009		Development of a Biodiversity Strategy and Action Plan for Bermuda	Completed	2000
Borneo (Kalimantan)	Indonesia	7-135	ECP	Biodiversity of peatswamp forest in Central Kalimantan, Indonesia	Completed	1998
Borneo (Sabah)	Malaysia	4-059		Termite Biodiversity and Greenhouse Gas Production in southeast Asian Rainforest	Completed	1995
Borneo (Sabah)	Malaysia	4-082		Elasmobranch Biodiversity Project	Completed	1995
Borneo (Sabah)	Malaysia	7-040	ECP	Biodiversity of butterflies in tropical rainforests of Sabah, Borneo	Completed	1998
Borneo (Sabah)	Malaysia	9-016	ECP	Conservation of the orang-utan in Kinbatangan Wildlife Sanctuary, Sabah	Completed	2000
Borneo (Sabah)	Malaysia	10-025		Molecular tools for promoting biodiversity in rainforest fragments of Borneo	Completed	2001
Borneo (Sabah)	Malaysia	13-009		Ethnobiology of proposed traditional use zones of Crocker Range Park	Current	2004
Borneo (Sabah)	Malaysia	14-007		Community Action for Sustainable use and Conservation of Coral Reefs, Malaysia	Current	2005
Borneo (Sabah)	Malaysia	14-014		Conservation of the Bornean Elephant	Current	2005
Borneo (Sabah)	Malaysia	14-016		Assessing and Conserving Plant Diversity in Commercially Managed Tropical Rainforests, Sabah	Current	2005
Borneo (Sabah)	Malaysia	14-022		Predictive Tools for Targeting Conservation Effort in Bornean Forest Reserves, Sabah	Current	2005
Borneo (Sabah)	Malaysia	15-026		Bornean Wild Cat and Clouded Leopard Project	Current	2006

Island	Country	Project Ref	Further Info	Project title	Status	Start year
British Virgin Islands	UK	7-163		Integrating national parks, education and community development, British Virgin Islands	Completed	1998
British Virgin Islands	UK	12-023		Darwin Biodiversity Action Plan for Anegada, British Virgin Islands	Current	2003
Cape Verde Islands	Republic of Cape Verde	10-020		Phyllosoma larvae of the Cape Verde Islands	Completed	2001
Cayman Islands	UK	14-051		In Ivan's Wake: Darwin Initiative BAP for the Cayman Islands	Current	2005
Dominica	Commonwealth of Dominica	10-010		A National Strategy for Sustainable Wildlife Use in the Commonwealth of Dominica	Completed	2001
Cook Islands	Cook Islands	14-042		Supporting Southern Conservation NGOs to Work with the CBD: Uganda, Kenya, Paraguay, Brazil, Malaysia, Palau and Cook Islands	Current	2005
Cuba	Cuba	6-056		The Darwin Project on Caribbean Fungi	Completed	1997
Cuba	Cuba	10-001		Darwin Initiative Biodiversity Conservation in Cuba	Completed	2001
Hispaniola	Dominican Republic	8-144		River invertebrate biodiversity and water quality in the Dominican Republic	Completed	1999
Falkland Islands	Falkland Islands	8-024		Status and distribution of the flora of the Falkland Islands	Completed	1999
Falkland Islands	Falkland Islands	13-022		Falkland Islands Invertebrates Conservation Project	Current	2004
Fiji	Fiji	8-176		Coral Reef Conservation in Fiji	Completed	1999
Fiji	Fiji	11-022		Identifying sites of global biodiversity conservation importance for the Fiji BS Action Plan	Completed	2002
Fiji	Fiji	12-033		Blue Forests: Sustainable Farming of Coral Reefs, Fiji, Solomon Islands	Cancelled	2003
Fiji	Fiji	15-007		Focus for Fiji: Insect Inventories for Biodiversity Assessment	Current	2006
Fiji	Fiji	15-019		Community-based Conservation Groups at Fiji's Key Conservation Sites	Current	/2006
Fiji	Fiji	15-037		Distance Learning for Biodiversity Conservation in Small Island Developing States	Current	2006
Galápagos	Ecuador	6-174	ECP	Revision of the Galápagos Marine Management Plan	Completed	1997
Galápagos	Ecuador	7-078	ECP	Threatened flora of Galápagos : a scientific basis for conservation	Completed	1998

Island	Country	Project Ref	Further Info	Project title	Status	Start year
Galápagos	Ecuador	9-010	ECP	Terrestrial invertebrate biodiversity in Galápagos : training and collection rehabilitation	Completed	2000
Galápagos	Ecuador	12-017	ECP	Building capacity and determining disease threats to endemic Galápagos fauna/POST - Integrating Disease Surveillance with Conservation Management for Galpagos Fauna	Ongoing Post Project Award	2003
Galápagos	Ecuador	12-018	ECP	Climate change and conservation of Galápagos endemic bird species	Current	2003
Galápagos	Ecuador	14-048	ECP	Galápagos Coral Conservation: Impact Mitigation, Mapping and Monitoring	Current	2005
Galápagos	Ecuador	15-005	ECP	Conservation of the Mangrove Finch (Cactospiza heliobates)	Current	2006
Gough Island	UK	8-253		Invertebrate Diversity and Endemism at Gough Island and Threats from Introduced Species	Completed	1999
Jamaica	Jamaica	3-064		The Effect of an Invasive Tree Species on Biodiversity in Primary Montane Rainforests in Jamaica	Completed	1993
Java	Java	14-031	MTR	A Market-Led Conservation Response to the Domestic Bird-Trade in Indonesia	Current	2005
Kiribati	Kiribati	13-010		Living reefs: Community-based coral reef management in the Pacific	Cancelled	2004
Lakshadweep Islands	India	13-029	WS	Conserving Giant Clams Through Community Reserves in Lakshadweep Islands, India	Current	2005
Madagascar	Madagascar	4-104	TR	Biodiversity Management Training	Completed	1995
Madagascar	Madagascar	5-174	TR	Chameleons, Conservation and Local Communities in Madagascar	Completed	1996
Madagascar	Madagascar	7-027	TR	The role of fruit bats in maintaining biodiversity in Madagascar	Completed	1999
Madagascar	Madagascar	7-113	TR	Darwin Madagascar Wetlands Project	Completed	1998
Madagascar	Madagascar	9-006	TR	Towards Sustainable Development of southeastern Madagascar's biologically unique littoral forests	Completed	2000
Madagascar	Madagascar	10-021	TR	Madagascar Marine Biodiversity Training Project	Completed	2001

Island	Country	Project Ref	Further Info	Project title	Status	Start year
Madagascar	Madagascar	10-024	TR	Conservation and management of Malagasy microchiroptera and their habitats in Madagascar	Current - Post	2001
Madagascar	Madagascar	14-006	TR	Conservation of Small Vertebrates in the Tsingy Bemaraha National Park, Madagascar	Current	2005
Maldives	Maldives	4-060		Deep Demersal Fishes of the Maldives	Completed	1995
Mauritius	Mauritius	5-199	ECP	Mauritius Ferns	Completed	1996
Mauritius	Mauritius	7-055	ECP	Marine environmental training in Seychelles and Mauritius	Completed	1998
Mauritius	Mauritius	8-064	ECP	Information System for biodiversity and conservation management in Mauritius	Completed	1999
Mauritius	Mauritius	9-004	ECP	Plankton biodiversity: training, sampling, taxonomy and data evaluation in Seychelles & Mauritius	Completed	2000
Mauritius	Mauritius	12-005	ECP	Rediscovering the neglected insects of Mauritius	Current	2003
Mauritius	Mauritius	13-027	MTR	Developing reserves for biodiversity conservation & sustainable fisheries in Rodrigues	Current	2005
Mauritius	Mauritius	15-035		Ex-situ Conservation of the Rare and Threatened Plants of Mauritius	Current	2006
Mauritius	Mauritius	15-038	TR	Restoring Island Biodiversity: the Reintroduction of Endemic Mauritian Reptile Communities	Current	2006
Montserrat	UK	14-027	WS	Enabling the People of Montserrat to Conserve the Centre Hills	Current	2005
Palau	Palau	14-042		Supporting Southern Conservation NGOs to Work with the CBD: Uganda, Kenya, Paraguay, Brazil, Malaysia, Palau and Cook Islands	Current	2005
Palau	Palau	15-030		Strengthening Scientific Capacity of Conservation NGOs working with the CBD	Current	2006
Papua New Guinea	Papua New Guinea	10-030		Developing local capacity for biodiversity surveys in Papua New Guinea	Current - Post	2001
Papua New Guinea	Papua New Guinea	13-012		Integrated River Basin Management (IRBM) in the Sepik River	Current	2004
Papua New Guinea	Papua New Guinea	14-003		Sustainable insect collecting and farming in Papua New Guinea	Current	2005

Island	Country	Project Ref	Further Info	Project title	Status	Start year
Papua New Guinea	Papua New Guinea	14-054		Training the next generation of Papua New Guinea conservation biologists	Current	2005
Papua New Guinea	Papua New Guinea	15-041		The Waria Valley Community Conservation and Sustainable Livelihoods Programme	Current	2006
Penang	Malaysia	5-056		Taxonomy, Life History and Conservation of Malaysian Holothurians	Completed	1996
Las Perlas Archipelago	(Panama)	12-021		Marine biodiversity assessment and development in Perlas Archipelago, Panama/ POST - Conservation Management Zoning Implementation and Facilitation in Perlas Archipelago, Panama	Ongoing Post Project Award	2003
Philippines	Philippines	3-197		Seahorse Ecology Study	Completed	1994
Philippines	Philippines	5-106		Strengthening Biodiversity Capacity in the Forestry Curriculum, Viasayas (Philippines)	Completed	1996
Philippines	Philippines	5-178		Key Sites for the Conservation of Philippine Birds	Completed	1996
Philippines	Philippines	7-149		Tabunan Forest Biodiversity Conservation	Completed	1998
Philippines	Philippines	13-025		Pioneering Community-based Conservation Sites in the Polillo Islands, Philippines	Current	2005
Regional UK Overseas Territories	UK	3-032		Core Development of the Forum and Support for NGOs in UK Dependent Territories	Completed	1993
Regional UK Overseas Territories	UK	4-148		Cultivation and Conservation of Threatened Plant Species for UK Overseas Territories	Completed	1995
Regional Central America & Caribbean	Regional Central America & Caribbean	7-104		Coral reef biodiversity in the Caribbean - schools project and resources	Completed	1998
Regional Pacific	Regional Pacific	6-124		Building Capacity for Implementing the Convention on Biological Diversity in the South Pacific Region	Completed	1997
Regional Pacific	Regional Pacific	8-009		Biodiversity Conservation Training - Pacific Island States	Completed	1999
Regional Pacific	Regional Pacific	8-186		Access to genetic resources and benefit sharing in the Pacific Islands region	Completed	1999
Roatán	Honduras	11-017		The Effect of Macroalgal Overgrowth on the Growth Rate and Survival of Coral Recruits in Honduras	Completed	2002
San Andres Archipelago	Colombia	7-147		Marine habitat mapping development in San Andres Archipelago, Colombia	Completed	1998

Island	Country	Project Ref	Further Info	Project title	Status	Start year
Seychelles	Seychelles	7-055	ECP	Marine environmental training in Seychelles and Mauritius	Completed	1998
Seychelles	Seychelles	8-076	ECP	Training courses for the staff of the Seychelles Natural History Museum	Completed	1999
Seychelles	Seychelles	9-004	ECP	Plankton biodiversity: training, sampling, taxonomy and data evaluation in Seychelles & Mauritius	Completed	2000
Seychelles	Seychelles	10-006	ECP	Propagation, nursery and establishment protocols for Seychelles endemic plants	Completed	2001
Seychelles	Seychelles	15-009		Investing in Island Biodiversity: Restoring the Seychelles Paradise Flycatcher	Current	2006
Solomon Islands	Solomon Islands	12-033		Blue Forests: Sustainable Farming of Coral Reefs, Fiji, Solomon Islands	Cancelled	2003
Solomon Islands	Solomon Islands	14-020		Network of Locally Managed Marine Protected Areas in Solomon Islands	Current	2005
Sri Lanka	Sri Lanka	4-156		Conservation of Coral Reef Biodiversity in Sri Lanka	Completed	1995
Sri Lanka	Sri Lanka	5-128		Habitat and Diversity Mapping in Sri Lanka's Coastal and Marine Zone	Completed	1996
Sri Lanka	Sri Lanka	8-214		Land snail biodiversity in Sri Lanka	Completed	1999
Sri Lanka	Sri Lanka	9-002		Effective management for biodiversity conservation in coastal Wetlands, Sri Lanka	Completed	2000
Sri Lanka	Sri Lanka	15-010		Buffer Zone Restoration and Development in Knuckles Forest Reserve	Current	2006
St Helena	UK	7-115		Ecology and conservation of the endemic St Helena wirebird	Completed	1998
St Lucia	St Lucia	5-164		Do Marine Reserves Promote Biodiversity Conservation and Fishery Sustainability?	Completed	1996
Sulawesi	Indonesia	5-127	ECP	Sustainability of Wildlife and Rattan Trades in North Sulawesi	Completed	1996
Sulawesi	Indonesia	9-012	ECP	Conservation of the Paguyaman forest in North Sulawesi, Indonesia	Completed	2000
Sulawesi	Indonesia	13-028		Establishment & Management of Nantu National Park, Gorontalo Province, Sulawesi	Current	2004
Timor-Leste	East Timor	15-022		Government-Civil Society Partnerships for Protected Areas in Timor-Leste	Current	2006
Trinidad & Tobago	Trinidad & Tobago	6-056		The Darwin Project on Caribbean Fungi	Completed	1997

Island	Country	Project Ref	Further Info	Project title	Status	Start year
Trinidad & Tobago	Trinidad & Tobago	10-026		Marine Turtle conservation and ecotourism on Trinidad's North Coast	Completed	2002
Trinidad & Tobago	Trinidad & Tobago	14-004		A Biodiversity monitoring system for Trinidad and Tobago	Current	2005
Tristan da Cunha	Tristan da Cunha	12-010		Empowering the people of Tristan da Cunha to implement the CBD	Current	2003
Turks & Caicos Islands	UK	8-164		Developing biodiversity management capacity around the Ramsar site in Turks and Caicos Islands	Completed	1999
Turneffe Atoll	Belize	3-008		Marine Research Programme at Turneffe Atoll, Belize	Completed	1993
Tuvalu	Tuvalu	13-010		Living reefs: Community-based coral reef management in the Pacific	Cancelled	2004
Vanuatu	Vanuatu	13-010		Living reefs: Community-based coral reef management in the Pacific	Cancelled	2004
West Papua	Indonesia	10-018		UK Darwin Initiative Papuan Plant Diversity Project	Completed	2001

Sources on in-depth information; ECP= Evaluation of Closed Projects, MTR= Mid-Term Review, TR = Thematic Review, WS = Workshop

Annex 2 Darwin Initiative projects on islands 1993-2006 (Sorted by Project Reference Number)

Project Ref	Island	Country	Project title	Status	Start year
3-008	Turneffe Atoll	Belize	Marine Research Programme at Turneffe Atoll, Belize	Completed	1993
3-032	Regional UK Overseas Territories	UK	Core Development of the Forum and Support for NGOs in UK Dependent Territories	Completed	1993
3-064	Jamaica	Jamaica	The Effect of an Invasive Tree Species on Biodiversity in Primary Montane Rainforests in Jamaica	Completed	1993
3-197	Philippines	Philippines	Seahorse Ecology Study	Completed	1994
4-059	Borneo (Sabah)	Malaysia	Termite Biodiversity and Greenhouse Gas Production in southeast Asian Rainforest	Completed	1995
4-060	Maldives	Maldives	Deep Demersal Fishes of the Maldives	Completed	1995
4-082	Borneo (Sabah)	Malaysia	Elasmobranch Biodiversity Project	Completed	1995
4-104	Madagascar	Madagascar	Biodiversity Management Training	Completed	1995
4-148	Regional UK Overseas Territories	UK	Cultivation and Conservation of Threatened Plant Species for UK Overseas Territories	Completed	1995
4-156	Sri Lanka	Sri Lanka	Conservation of Coral Reef Biodiversity in Sri Lanka	Completed	1995
5-056	Penang	Malaysia	Taxonomy, Life History and Conservation of Malaysian Holothurians	Completed	1996
5-106	Philippines	Philippines	Strengthening Biodiversity Capacity in the Forestry Curriculum, Viasayas (Philippines)	Completed	1996
5-127	Sulawesi	Indonesia	Sustainability of Wildlife and Rattan Trades in North Sulawesi	Completed	1996
5-128	Sri Lanka	Sri Lanka	Habitat and Diversity Mapping in Sri Lanka's Coastal and Marine Zone	Completed	1996
5-164	St Lucia	St Lucia	Do Marine Reserves Promote Biodiversity Conservation and Fishery Sustainability?	Completed	1996
5-174	Madagascar	Madagascar	Chameleons, Conservation and Local Communities in Madagascar	Completed	1996
5-178	Philippines	Philippines	Key Sites for the Conservation of Philippine Birds	Completed	1996
5-199	Mauritius	Mauritius	Mauritius Ferns	Completed	1996
6-056	Cuba	Cuba	The Darwin Project on Caribbean Fungi	Completed	1997
6-056	Trinidad & Tobago	Trinidad & Tobago	The Darwin Project on Caribbean Fungi	Completed	1997
6-124	Regional Pacific	Regional Pacific	Building Capacity for Implementing the Convention on Biological Diversity in the South Pacific Region	Completed	1997

Project Ref	Island	Country	Project title	Status	Start year
6-174	Galápagos	Ecuador	Revision of the Galápagos Marine Management Plan	Completed	1997
7-006	Ascension Island	UK	Assessing the status of Ascension Island green turtles	Completed	1998
7-027	Madagascar	Madagascar	The role of fruit bats in maintaining biodiversity in Madagascar	Completed	1999
7-040	Borneo (Sabah)	Malaysia	Biodiversity of butterflies in tropical rainforests of Sabah, Borneo	Completed	1998
7-055	Mauritius	Mauritius	Marine environmental training in Seychelles and Mauritius	Completed	1998
7-055	Seychelles	Seychelles	Marine environmental training in Seychelles and Mauritius	Completed	1998
7-078	Galápagos	Ecuador	Threatened flora of Galápagos : a scientific basis for conservation	Completed	1998
7-104	Regional Central America & Caribbean	Regional Central America & Caribbean	Coral reef biodiversity in the Caribbean - schools project and resources	Completed	1998
7-113	Madagascar	Madagascar	Darwin Madagascar Wetlands Project	Completed	1998
7-115	St Helena	UK	Ecology and conservation of the endemic St Helena wirebird	Completed	1998
7-135	Borneo (Kalimantan)	Indonesia	Biodiversity of peatswamp forest in Central Kalimantan, Indonesia	Completed	1998
7-147	San Andres Archipelago	Colombia	Marine habitat mapping development in San Andres Archipelago, Colombia	Completed	1998
7-149	Philippines	Philippines	Tabunan Forest Biodiversity Conservation	Completed	1998
7-163	British Virgin Islands	UK	Integrating national parks, education and community development, British Virgin Islands	Completed	1998
8-009	Regional Pacific	Regional Pacific	Biodiversity Conservation Training - Pacific Island States	Completed	1999
8-024	Falkland Islands	Falkland Islands	Status and distribution of the flora of the Falkland Islands	Completed	1999
8-064	Mauritius	Mauritius	Information System for biodiversity and conservation management in Mauritius	Completed	1999
8-076	Seychelles	Seychelles	Training courses for the staff of the Seychelles Natural History Museum	Completed	1999
8-114	Anguilla	UK	Capacity building for biodiversity conservation in Anguilla	Completed	1999
8-144	Hispaniola	Dominican Republic	River invertebrate biodiversity and water quality in the Dominican Republic	Completed	1999
8-164	Turks & Caicos Isles	UK	Developing biodiversity management capacity around the Ramsar site in Turks and Caicos Islands	Completed	1999
8-176	Fiji	Fiji	Coral Reef Conservation in Fiji	Completed	1999
8-186	Regional Pacific	Regional Pacific	Access to genetic resources and benefit sharing in the Pacific Islands region	Completed	1999
8-214	Sri Lanka	Sri Lanka	Land snail biodiversity in Sri Lanka	Completed	1999

Project Ref	Island	Country	Project title	Status	Start year
8-253	Gough Island	UK	Invertebrate Diversity and Endemism at Gough Island and Threats from Introduced Species	Completed	1999
9-002	Sri Lanka	Sri Lanka	Effective management for biodiversity conservation in coastal Wetlands, Sri Lanka	Completed	2000
9-004	Mauritius	Mauritius	Plankton biodiversity: training, sampling, taxonomy and data evaluation in Seychelles & Mauritius	Completed	2000
9-004	Seychelles	Seychelles	Plankton biodiversity: training, sampling, taxonomy and data evaluation in Seychelles & Mauritius	Completed	2000
9-006	Madagascar	Madagascar	Towards Sustainable Development of southeastern Madagascar's biologically unique littoral forests	Completed	2000
9-009	Bermuda	UK	Development of a Biodiversity Strategy and Action Plan for Bermuda	Completed	2000
9-010	Galápagos	Ecuador	Terrestrial invertebrate biodiversity in Galápagos : training and collection rehabilitation	Completed	2000
9-012	Sulawesi	Indonesia	Conservation of the Paguyaman forest in North Sulawesi, Indonesia	Completed	2000
9-016	Borneo (Sabah)	Malaysia	Conservation of the orang-utan in Kinbatangan Wildlife Sanctuary, Sabah	Completed	2000
10-001	Cuba	Cuba	Darwin Initiative Biodiversity Conservation in Cuba	Completed	2001
10-006	Seychelles	Seychelles	Propagation, nursery and establishment protocols for Seychelles endemic plants	Completed	2001
10-010	Dominica	Commonwealth of Dominica	A National Strategy for Sustainable Wildlife Use in the Commonwealth of Dominica	Completed	2001
10-018	West Papua	Indonesia	UK Darwin Initiative Papuan Plant Diversity Project	Completed	2001
10-020	Cape Verde Islands	Republic of Cape Verde	Phyllosoma larvae of the Cape Verde Islands	Completed	2001
10-021	Madagascar	Madagascar	Madagascar Marine Biodiversity Training Project	Completed	2001
10-024	Madagascar	Madagascar	Conservation and management of Malagasy microchiroptera and their habitats in Madagascar	Current - Post	2001
10-025	Borneo (Sabah)	Malaysia	Molecular tools for promoting biodiversity in rainforest fragments of Borneo	Completed	2001
10-026	Trinidad & Tobago	Trinidad & Tobago	Marine Turtle conservation and ecotourism on Trinidad's North Coast	Completed	2002
10-030	Papua New Guinea	Papua New Guinea	Developing local capacity for biodiversity surveys in Papua New Guinea	Current - Post	2001
11-017	Roatán	Honduras	The Effect of Macroalgal Overgrowth on the Growth Rate and Survival of Coral Recruits in Honduras	Completed	2002

Project Ref	Island	Country	Project title	Status	Start year
11-022	Fiji	Fiji	Identifying sites of global biodiversity conservation importance for the Fiji BS Action Plan	Completed	2002
12-005	Mauritius	Mauritius	Rediscovering the neglected insects of Mauritius	Current	2003
12-010	Tristan da Cunha	Tristan da Cunha	Empowering the people of Tristan da Cunha to implement the CBD	Current	2003
12-017	Galápagos	Ecuador	Building capacity and determining disease threats to endemic Galápagos fauna/POST - Integrating Disease Surveillance with Conservation Management forGalpagos Fauna	Ongoing Post Project Award	2003
12-018	Galápagos	Ecuador	Climate change and conservation of Galápagos endemic bird species	Current	2003
12-021	Las Perlas Archipelago	(Panama)	Marine biodiversity assessment and development in Perlas Archipelago, Panama/ POST - Conservation Management Zoning Implementation and Facilitation in Perlas Archipelago, Panama	Ongoing Post Project Award	2003
12-023	British Virgin Islands	UK	Darwin Biodiversity Action Plan for Anegada, British Virgin Islands	Current	2003
12-033	Fiji	Fiji	Blue Forests: Sustainable Farming of Coral Reefs, Fiji, Solomon Islands	Cancelled	2003
12-033	Solomon Islands	Solomon Islands	Blue Forests: Sustainable Farming of Coral Reefs, Fiji, Solomon Islands	Cancelled	2003
13-009	Borneo (Sabah)	Malaysia	Ethnobiology of proposed traditional use zones of Crocker Range Park	Current	2004
13-010	Kiribati	Kiribati	Living reefs: Community-based coral reef management in the Pacific	Cancelled	2004
13-010	Tuvalu	Tuvalu	Living reefs: Community-based coral reef management in the Pacific	Cancelled	2004
13-010	Vanuatu	Vanuatu	Living reefs: Community-based coral reef management in the Pacific	Cancelled	2004
13-012	Papua New Guinea	Papua New Guinea	Integrated River Basin Management (IRBM) in the Sepik River	Current	2004
13-022	Falkland Islands	Falkland Islands	Falkland Islands Invertebrates Conservation Project	Current	2004
13-025	Philippines	Philippines	Pioneering Community-based Conservation Sites in the Polillo Islands, Philippines	Current	2005
13-027	Mauritius	Mauritius	Developing reserves for biodiversity conservation & sustainable fisheries in Rodrigues	Current	2005
13-028	Sulawesi	Indonesia	Establishment & Management of Nantu National Park, Gorontalo Province, Sulawesi	Current	2004
13-029	Lakshadweep Islands	India	Conserving Giant Clams Through Community Reserves in Lakshadweep Islands, India	Current	2005
14-003	Papua New Guinea	Papua New Guinea	Sustainable insect collecting and farming in Papua New Guinea	Current	2005

Project Ref	Island	Country	Project title	Status	Start year
14-004	Trinidad & Tobago	Trinidad & Tobago	A Biodiversity monitoring system for Trinidad and Tobago	Current	2005
14-006	Madagascar	Madagascar	Conservation of Small Vertebrates in the Tsingy Bemaraha National Park, Madagascar	Current	2005
14-007	Borneo (Sabah)	Malaysia	Community Action for Sustainable use and Conservation of Coral Reefs, Malaysia	Current	2005
14-014	Borneo (Sabah)	Malaysia	Conservation of the Bornean Elephant	Current	2005
14-016	Borneo (Sabah)	Malaysia	Assessing and Conserving Plant Diversity in Commercially Managed Tropical Rainforests, Sabah	Current	2005
14-020	Solomon Islands	Solomon Islands	Network of Locally Managed Marine Protected Areas in Solomon Islands	Current	2005
14-022	Borneo (Sabah)	Malaysia	Predictive Tools for Targeting Conservation Effort in Bornean Forest Reserves, Sabah	Current	2005
14-027	Montserrat	UK	Enabling the People of Montserrat to Conserve the Centre Hills	Current	2005
14-031	Java	Java	A Market-Led Conservation Response to the Domestic Bird-Trade in Indonesia	Current	2005
14-042	Cook Islands	Cook Islands	Supporting Southern Conservation NGOs to Work with the CBD: Uganda, Kenya, Paraguay, Brazil, Malaysia, Palau and Cook Islands	Current	2005
14-042	Palau	Palau	Supporting Southern Conservation NGOs to Work with the CBD: Uganda, Kenya, Paraguay, Brazil, Malaysia, Palau and Cook Islands	Current	2005
14-048	Galápagos	Ecuador	Galápagos Coral Conservation: Impact Mitigation, Mapping and Monitoring	Current	2005
14-051	Cayman Islands	UK	In Ivan's Wake: Darwin Initiative BAP for the Cayman Islands	Current	2005
14-054	Papua New Guinea	Papua New Guinea	Training the next generation of Papua New Guinea conservation biologists	Current	2005
14-057	Bali	Indonesia	Conserving Coral Reefs Through Community Ownership and Enterprise in Indonesia	Current	2005
15-005	Galápagos	Ecuador	Conservation of the Mangrove Finch (Cactospiza heliobates)	Current	2006
15-007	Fiji	Fiji	Focus for Fiji: Insect Inventories for Biodiversity Assessment	Current	2006
15-009	Seychelles	Seychelles	Investing in Island Biodiversity: Restoring the Seychelles Paradise Flycatcher	Current	2006
15-010	Sri Lanka	Sri Lanka	Buffer Zone Restoration and Development in Knuckles Forest Reserve	Current	2006

Project Ref	Island	Country	Project title	Status	Start year
15-019	Fiji	Fiji	Community-based Conservation Groups at Fiji's Key Conservation Sites	Current	/2006
15-022	Timor-Leste	East Timor	Government-Civil Society Partnerships for Protected Areas in Timor-Leste	Current	2006
15-026	Borneo (Sabah)	Malaysia	Bornean Wild Cat and Clouded Leopard Project	Current	2006
15-030	Palau	Palau	Strengthening Scientific Capacity of Conservation NGOs working with the CBD	Current	2006
15-035	Mauritius	Mauritius	Ex-situ Conservation of the Rare and Threatened Plants of Mauritius	Current	2006
15-037	Fiji	Fiji	Distance Learning for Biodiversity Conservation in Small Island Developing States	Current	2006
15-038	Mauritius	Mauritius	Restoring Island Biodiversity: the Reintroduction of Endemic Mauritian Reptile Communities	Current	2006
15-041	Papua New Guinea	Papua New Guinea	The Waria Valley Community Conservation and Sustainable Livelihoods Programme	Current	2006

Sources on in-depth information; ECP= Evaluation of Closed Projects, MTR= Mid-Term Review, TR = Thematic Review, WS = Workshop