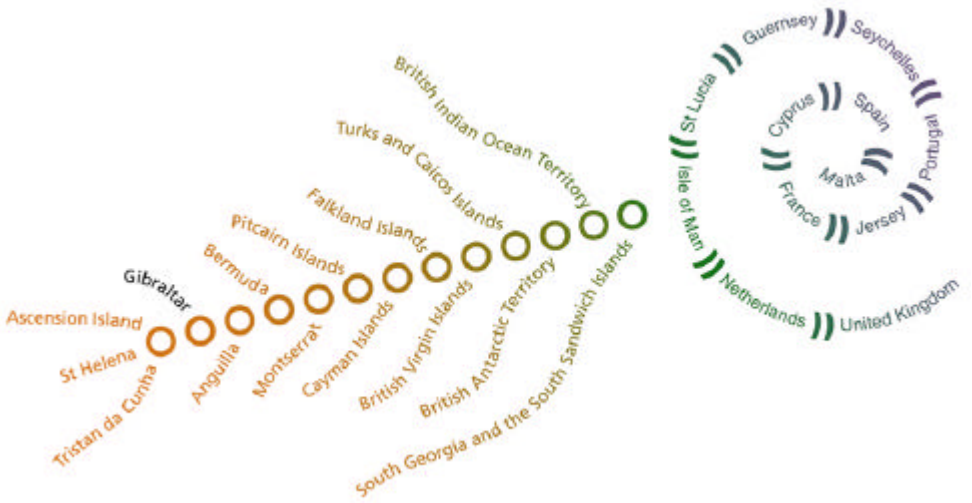
CALPE 2000: LINKING THE FRAGMENTS OF PARADISE
An international conference on environmental conservation in small territories



28th September to 1st October 2000, John Mackintosh Hall, Gibraltar

Sponsored by the Government of Gibraltar; organised by the Gibraltar Ornithological & Natural History Society, with the support of the UK Overseas Territories Conservation Forum

Proceedings edited by Mike Pienkowski
UK Overseas Territories Conservation Forum

September 2001

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BACKGROUND

This conference formed one of a new series sponsored by the Government of Gibraltar, under the series title "Calpe", which is the old Roman name for Gibraltar. This particular conference addressed the very topical issue of environmental conservation. Its title reflects one of the first publications (*Fragments of Paradise: A Guide for Conservation Action in the U.K. Dependent Territories*, 1987) highlighting the immense biodiversity value of the UK Overseas Territories, and the need to provide for increased exchange of knowledge between them and other areas.

The fundamental role that this plays in the economic and social well-being of people, as well as its inherent importance, is being recognised increasingly. Throughout the world, countries are preparing action plans for the environment. Indeed, those which are party to the Convention on Biological Diversity have committed themselves to integrate planning for the environment into all planning processes. This need is at least as true of small territories as elsewhere; in fact, it may be more so, because such territories are often very closely dependent on their natural environments.

The conference was intended as a working meeting, to help Territories take forward work, particularly in a range of areas that have been identified as priorities by workers in the small territories:

1. Environmental awareness and education
2. Information networking
3. Tourism and funding for the environment
4. Making protected areas effective
5. Biodiversity action planning

Emphasis was placed on sharing knowledge and experience between workers from the various UK Overseas Territories, but also with other Overseas Territories, such as those of France, Spain and the Netherlands, as well as relevant small independent states.

EDITOR'S PREFACE

We have tried to bring these contributions together with a reasonably consistent appearance, but without imposing too standard a style on the contributions, which covered a diverse range of approaches to issues. We have used UK English, except in direct quotes or proper names.

Where views are expressed, these are those of the authors and do not necessarily reflect those of the editor, the conference organising bodies nor the funding organisations.

Whilst a great deal of time and effort has been put into checking and correcting the material, mistakes undoubtedly remain, and we apologise for missing these.

The contributions are grouped into the subjects which were the basic structure of the programme, with minor adjustments to fit the published format. (The conference programme in its final published form, subject only to changes made during the conference itself, is at Appendix 1.) The texts of any poster displays received have been incorporated in the most appropriate section.

Despite our best efforts, a small number of contributions have not been received in either electronic (preferred) or paper form. We would consider adding these as a supplement to these Proceedings on the Forum's web-site if they are received.

The Editor would like to thank all contributors for their help, co-operation and tolerance of pestering – and Frances Marks for undertaking much of the pestering on his behalf! We are grateful too to John Wheeler for the help we shall have received from him by the time you read this, in making this very large document as small as possible to download.

ACKNOWLEDGEMENTS

The conference was sponsored by the Government of Gibraltar in their *Calpe* series. The organisers (and participants) are grateful to them for this initiative and their substantial support. We would like to thank also the Environment Policy Department of the UK Foreign & Commonwealth Office for major support, particularly to allow many of the participants from UK Overseas Territories and other small countries to attend, as well as funding some of the organisational work. We thank too several member organisations of the Forum for aiding the attendance of other such participants.

In addition to the support noted above, the organisers would like to thank several Gibraltar Ministers for finding time to attend parts of the meeting, despite major issues which were demanding their attention at the time. The Deputy Chief Minister made several visits, and we were pleased to see that one included his infant, in what was clearly a visit in off-duty time!

The conference depended on much time freely given by many participants, whether speakers, those preparing or presenting displays, workshop and field-study leaders, chair-persons, participants in discussions and assorted behind-the-scenes roles. We thank them all. The Forum would like to thank its partners in GONHS; the commitment by its many volunteers was noted by many participants as one of the major strengths leading to the smooth running, effectiveness and enjoyment of the conference.

GONHS and the Forum would like to thank also the management and staff of the conference hotels, of the John Mackintosh Hall and of all those involved in organising the Conference Dinner and music in St Michael's Cave, the audio and projection technicians, and, of course, the local organiser, Patricia Johnson, and the Forum organiser, Frances Marks.

We thank Tim Heath, of the House of William Blake, for modifying the "Breath of Fresh Air" logo for this conference, and Iain Orr and the Environment Policy Department of the UK Foreign & Commonwealth Office for support for this.

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Falklands Conservation: page 106
Fred Burton: pages 54, 119
Steven De Silver/David Wingate: page 7
Michael Gore: pages 69, 81(lower)
Frances Marks: pages 25, 51, 52, 105, 165
Mike Pienkowski: pages 3, 15, 16 (first), 72, 73, 137(top), 145.

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Conservation and education: bluebird nestbox construction by students at a school in Bermuda

THE CONVENT,
GIBRALTAR.

Message from the Governor, HE The Hon David Durie CMG to participants in the Calpe 2000 Conference

As Governor and also as Patron of the conference organisers, the Gibraltar Ornithological and Natural History Society, it gives me great pleasure to welcome the participants in the *Calpe 2000 Conference: Linking the Fragments of Paradise* to Gibraltar.

The importance of conservation of the environment and of ensuring the continuation of the earth's biological diversity is one that is being increasingly recognised around the world, not least in the small territories where the possible dangers faced by this biodiversity can sometimes be greatest as the aspirations of the inhabitants to progress socially and economically put pressure on the natural resources.

But the fundamentals of biological conservation in social and economic development are also being recognised more and more, and many countries are now committed to integrating environmental and biodiversity considerations in the planning process.

The small territories represented in Calpe 2000 vary greatly in geographical location, in size, in population and in character. They all have their problems, their successes and their experiences to share. By sharing this experience, by learning from each other, we will all be better able to cope with the challenge of preserving the Fragments of Paradise entrusted to us.

I would like to take this opportunity of wishing all the participants in Calpe 2000 a productive and rewarding Conference, and I hope that you all enjoy, what I am sure for many, will be your first visit to Gibraltar.

26 September 2000

Opening of the Conference by the Deputy Chief Minister, Keith Azopardi

The annual *Calpe* heritage conference has now become consolidated in the calendar of Gibraltar events. The rationale behind the organisation was to heighten research, awareness and participation in our heritage and to celebrate our identity as a people.

Our assertion of our separate identity depends on our knowledge of our roots and that in turn means that we must encourage analytical sessions on aspects of our history, culture and natural heritage. Understanding our past and our environment we will be able to better plan for our future.

We already have settled plans for next year's conference and will be taking a decision soon on the theme for *Calpe 2002*. The *Calpe* series of conferences have now become a focus for annual reflection on our history and heritage. Some times the sessions will be mo re technical than others. Some times the themes will be broader and of wider appeal. Whatever the topic our aim is that it should provide an opportunity to highlight an aspect of our heritage that will lead to greater local and international understanding of Gibraltar.

This year's conference is about conservation and concentrates on the natural heritage of small territories. Delegates have come from many small countries and island states to discuss environmental issues. These countries are very rich in heritage. Many are small in geographical dimension or in population terms and many are also seeking to maximise the benefits of eco-tourism to ensure economic self-sufficiency. These factors create the need for sensitive heritage and tourism management polic ies. A balance needs to be struck to ensure a partnership between economic development and the use of heritage assets which does not detrimentally affect the integrity of the sites or the quality of our environment. A comprehensive approach requires policies on transport, land use, access to visitor sites, education, training and funding. On occasions hard choices need to be made on the issues arising under any of those areas if we are to achieve the final goal of economic and environmental sustainability.

The reality is that many of the needs of and pressures on small countries are similar. This makes a sharing of experiences about the management of our cultural heritage and environment very useful. The *Calpe 2000* conference will assist in this exchange of experiences and information which will no doubt help small territories in understanding and perhaps applying models in existence in other countries.

Heritage should not be seen as the province of an elitist few. Instead we must foster a feeling of common ownership of our heritage. There is no mystery to heritage. It affects us all on a daily basis. Gibraltar is, almost in its entirety, a unique heritage site. A natural fortress that has evolved over the centuries surrounded by man-made fortifications. A population that has emerged as an inseparable part of the territory and which, together with the natural and cultural structures, forms the living fortress that Gibraltar is today.

We are justifiably proud of Gibraltar. When we assert our separate identify (as we most recently did in our National Day celebrations) we should not lose sight that it is inextricably linked to a holistic understanding of our heritage.

Several pieces of legislation protect Gibraltar heritage assets. The Nature Protection Ordinance and Endangered Species Ordinance protect the natural heritage. The Heritage Trust Ordinance addresses the urban and cultural heritage. The planning process that supervis es works in sensitive areas and oversees applications is the Town Planning Ordinance in which there now is a large measure of public participation. We are in the process of reviewing the legislative protection of buildings, conservation areas and the landscape.

Our position in the European Union means that our House of Assembly must transpose all relevant European legislation in this area. The provisions on freedom of information on the environment, on designation of habitats, and environmental impact assessments have all made significant changes and transformed the legislative culture.

Gibraltar is not only reviewing its legislation and structures but is also investing substantial Government and EU funds in the environment and heritage. Through direct funding or the provision of tax concessions we are encouraging key urban renewal works and giving citizens a sense of participation and stake in their environment.

In a place the size of Gibraltar it is sometimes difficult and always challenging to try to maintain the necessary balance between essential redevelopment and protection of the environment. Scarcity of land and density of population are key factors in that calculation.

The Government's general heritage policy is reflected in the Mission Statement that was agreed earlier this year to govern the drive to achieve sustainability.

Gibraltar aspires to World Heritage Status. The entire philosophy of the 1972 UNESCO Convention on the Protection of World Heritage lays emphasis on the importance of globality (in the sense of world significance) of the proposed site. This has been reiterated in recent declarations issued by meetings hosted by UNESCO in Suzhou, China; Nara, Japan; Phuket, Thailand; and Suwon, Korea. Indeed latterly there has been a concerted move to ensure that new sites are representative of the entire world and are seen (not in isolation) but in the context of their surroundings.

We feel confident that, if Gibraltar's application is judged purely on its heritage merits, it will clearly be seen that the natural and cultural living fortress is a fine and unique example worthy of the accolade and prestige of the endorsement by UNESCO.

The organisation of fora such as this can help us all to understand our respective country's heritage and help us co-operate on such matters. Co-operation on matters of the environment is important on a local, national, regional and international basis. The environment knows no frontiers and, if we are to try to safeguard our local and international environment and our quality of life, we must work together without regard for political prejudices.

I feel sure that this conference will allow a useful exchange of ideas and experiences and am delighted to declare this fourth *Calpe* conference open.

Welcoming Address: Conservation as viewed from a Gibraltar perspective

John Cortes, Gibraltar Ornithological & Natural History Society

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Hi. It's good to be here. Yesterday we had an opportunity to meet, get to know each other and see a little of what Gibraltar has to offer wildlife - and to see some of the problems we face. So I don't have to spend time now going over why the Rock is important for migrating birds, or its territorial waters - with or without Spain's acknowledgement - for marine life, or even its habitats for endemic plants and snails. That was going to be my slide show. Instead, I'm just going to talk from a Gibraltar perspective. Later on tell me how many of these points seem familiar to you in all those other small lands across our fragile earth.

From a Gibraltar perspective: you see, what's important to us in Gibraltar might not be important to anybody else. An endemic plant just saved from extinction *Silene tomentosa* is our example of that, our equivalent of a certain Bermudan seabird [see following paper]. Or a small population of a globally threatened taxon, like our western Mediterranean shags, is important to all – or even our healthy population of peregrine falcons. These things are of interest and importance on a global scale. And imagine, just imagine, if we allowed the shooting of migrating honey buzzards or the trapping of passage warblers. Or the quarrying of the landscape and botanical features - and *potential* botanical features that are our Great Sand Slopes.

But from a Gibraltar perspective, even a patch of wild olive scrub, a stretch of open grassy ground, a small colony of ten house martins nests, or a roof full of nesting pallid swifts is important. And we fight for their survival. Because we are looking at a matter of scale, and a matter of identity. One basic fact about a small territory is that things take on a dimension perhaps not clearly recognised or even appreciated by people from the bigger nations. And we have the right to determine what is important to us.

And so we must start from here. Our aim in the organisation I belong to is that we need to protect, manage and improve *all* our natural assets because, in Gibraltar, we are so small, and almost by definition, everything is rare.

There are disadvantages of small size. The greatest one is shortage of resources. We are few, and we are busy, and no matter how seriously we take our work, our often unpaid, voluntary, our because-it-comes-from-the-heart work, there is always a lot more to do. We haven't got the time, the money, or perhaps even the patience to commission a five year study of the possible environmental impact of the reclamation of a one kilometre stretch of coastline from the sea on the east side of the Rock. Because by the time we have reached a scientific conclusion, we've lost the stretch to a sewage plant. Often, very often, because of the constraints upon us, we have to protect, or at least campaign to protect, before the scientific study has even been considered. Experience tells me that if we had not done this here, on many occasions, much more would have been lost than has been lost. For one thing the east sand slopes, for another much of our remaining natural shoreline.

Should we feel bad about this? Does that mean that conservation here is haphazard, and not based on sound scientific fact? Haphazard, maybe a little, more like reacting to problems, perhaps, not through our fault, but that of planning authorities through the decades. But based on scientific fact yes. The facts are there, and we know them, we just haven't had the time to extract them and to write them up yet.

For once I've jumped into the thick of it. No structured gentle introduction. And no apologies for this. We have problems in our small bits of land. There are pressures, big pressures, on our lands – often just/ified – often just/inspired by the monetary desires of a few. Problems from pressures to build, to progress, to develop. The last thing we need is destructive questioning and undermining by those – the would-be scientists from within and without – who should be on the side of conservation. We can do without these conflicts.

I have been involved in the conservation movement in Gibraltar since its infancy. I have seen it grow to the point today where we can welcome all of you to share a little bit in it. In 1974, as a keen Queens Scout, my late father, Pepe Cortes, who was the Commissioner at the time, had just returned from the World Scout Congress in Nairobi, with a wealth of literature on how scouting could promote conservation. He was enthused at the diversity of people whom he had met, all sharing a common aim. He allowed me to organise, with my colleagues, a campaign to encourage wildlife conservation and he told me to look forward to the day when we could bring people from all over the world to see what Gibraltar had achieved. Sadly he passed away a year, to the day, before this conference. Happily it was the day after a year ago to the day, following Mike and Sara's first visit to Gibraltar, we had decided that this conference would go ahead. I'm sorry to bring this up, but you will realise it has served as an inspiration to me. Much has been achieved since the 1970s, certainly we have not lost as much as in the preceding 25 years, but much, much more still needs to be done.

Gibraltar is in a curious situation in that it is part of the European Union, through the member State, the United Kingdom, and claimed, sometimes aggressively claimed, by another Member State, Spain. And so European Directives and Regulations apply or should apply in Gibraltar, and the UK enters into international treaties and conventions on behalf of Gibraltar. But Spain offers the proverbial spanner in the works by choosing, according to convenience, whether it supports or acknowledges Gibraltar's status under any or all of these. In addition there are the various administrative levels in our neighbouring Spain, often with overlapping jurisdiction, ranging from town councils to districts - the so called mancomunidades - provincial governments, autonomous governments, and agencies, such as the Port of Algeciras, that work directly under the national Government of Madrid. And often the politicians at all these levels are from different parties. Within Gibraltar itself, there is the Government of Gibraltar and there is the Ministry of Defence, but then there is also a Foreign Office presence. There is a Governor and a locally elected Government who, depending on very many factors, may or may not see eye to eye or even trust each other. And then there is nature, the environment, and those of us trying to work for it.

And through all this, GONHS has been able to score considerable successes. Probably the most important was the spate of wildlife legislation carried through a decade ago, with the Endangered Species Ordinance updating CITES in 1990 and, most significant, the 1991 Nature Protection Ordinance. This Ordinance protects all terrestrial and much marine wildlife, reverse-lists plants, provides for the setting up of protected areas and limits the activities that are permitted which may impinge on the plants and animals. But we have the usual problem of the need for effective implementation, and the frustration that only the Upper Rock is a declared Nature Reserve and the seas around Gibraltar, while nature reserve under Regulation, have never been officially declared such. Instead we race speedboats on them. As the Gibraltar Chronicle reported yesterday, "spectators watched with pleasure as the speedboats tore up the Bay." Neither of these reserves as yet has proper management.

Being in a small territory can have its advantages, as we saw yesterday in the fascinating talk on Bermuda [following paper]. One advantage is that it can make it easy for a group such as ours to draft a law and get it through the legislative body, in our case the House of Assembly. But first it has to have a certain level of priority with the Government, and to keep on doing this again and again is not easy. Next, once on the statute books, it must be put into effect. And so, while our wildlife laws are in fact very thorough, we have a draft bill to control import of some pet animals pending for nearly three years.

Another milestone achievement was that of GONHS achieving membership of the Development & Planning Commission, within which it exerts a considerable influence. It has in practical terms prevented a considerable amount of reclamation of natural rocky shoreline, prevented the quarrying of the sand slopes, and is achieving the restoration of the vegetation there. Other sites of importance, like at Europa Point and on the lower slopes of the Rock, once designated for the building of a new road, have also been saved.

One reason for this is that in Gibraltar conservation is largely NGO-led. Our keen band of observers rapidly reports anything untoward and this is taken up. Surprisingly, despite any impression you may be getting, it has led to an excellent working relationship between GONHS and Government. It is our willingness to hold our views and state them frankly, while continuing to work constructively, that has led to what is an extraordinarily open but strong and successful working relationship, between GONHS and Government and between GONHS and MOD – a

relationship in which we are respected as sound scientific advisers. Over the past few years, we have been contracted to take on some aspects of vital wildlife management work. This could serve as a model for those territories without a fully-fledged environmental department in Government. It is a model that can work well, although there is still room for improvement in Gibraltar. The role needs to be formally recognised by resources being given to GONHS to employ a core of staff to run effectively the Government-related work.

This shortage of Government/civil service resources to the environment has meant that, despite the work of the NGO, Gibraltar is lagging behind in the implementation of international commitments. Thus the European Habitats Directive, although now incorporated in Gibraltar law, and the Birds Directive, have not been fully implemented in that Special Areas of Conservation have not yet been designated under the Natura 2000 programme. The relevant papers, prepared by GONHS, left my desk years ago but must have fallen on to a pile somewhere between the seat of Gibraltar Government at 6 Convent Place, the Governor's offices at the Convent, the HQ British Forces at the Tower, and some office in London – or maybe Brussels. Another problem concerning an Overseas Territory - how many desks do its papers have to travel over, how many in-trays and out-trays, or to use civil service jargon, BUs and, hopefully, not too many PAs.

The important thing though is that our habitats and species do not have the protection that they need and deserve from a European perspective. There seems to be a similar problem with declaring Gibraltar waters a Ramsar site for which it clearly qualifies. Fears of offending sensitivities – or lack of understanding of the real benefits – may all be playing a part in this.

In contrast, designations that do not require involvement by Governments are achieved. Gibraltar has two sites recognised as BirdLife International Important Bird Areas, the Rock and the Strait. Significantly the latter is one of only a few international IBAs.

True, some of these Directives and similar have financial implications. The money might not be there, or the Government may have other priorities. And here environmental protection has to compete for funds with the restoration of Main Street, the National Day Fireworks Display, the building of pensioners' houses, or the Miss Gibraltar Contest. But funds required for projects in these small territories are often small in relation to funds for other projects elsewhere, because of the size of the territory. So an international source, such as the EU, can be identified. Or, dare I suggest the Administrative Power, in our case the UK? But then the local Government will get suspicious of the motives, or fear that someone else is going to steal the credit for their work, or just be too proud to even ask for help. And who loses out?

Mind you, the problem can be in the other direction too. Little Gibraltar is often forgotten by international legislators, and by some of the big national and international conservation organisations. For example, we have long been an active member of BirdLife International, even though our status as a full Partner was at a time threatened by Spanish objections, which were resolved thanks to extraordinary diplomatic ability and persuasive powers, if I say so myself. The move to set up a Plantlife equivalent within Planta Europa almost forgot Gibraltar, and would have if we hadn't barged in. And so the Gibraltar campion, one of the rarest plants in Europe, once extinct in the wild and now conservation-dependent thanks to the work of GONHS and of the Gibraltar Botanic Garden, does not appear on the schedule of the EU Habitats Directive. We even have to worry about things like that.

And where our legislation is up to it, something else fails. Under our CITES laws, Gibraltar has regularly confiscated animals in illegal trade. It is part of Gibraltar's responsibilities under the UK as a signatory to the Convention. And yet these animals are looked after and fed by GONHS volunteers, using up our short funds.

And that is surely significant. GONHS has always recognised that nature does not have political frontiers. Our relationship with NGOs and institutions in Spain have always been excellent, and the presence here of my friend Puri Canals, President of the Iberian Council for the Defence of Nature of which we are full members is proof enough of that. But politically the climate changes constantly, and our work in this is consequently undermined. There have been countless declarations of intent on environmental co-operation between Gibraltar and the surrounding Spanish municipalities. But they have all come to nothing. And there is a vital need to co-operate at Government level on such matters as protection of that great asset we have in common, the Bay, as well as in energy production, disposal of wastes, and many more. But it just does not happen.

But relationships with Spain can serve to illustrate most clearly that in small territories we are often at the whim of political expediency. When in 1998 small time Spanish fishermen insisted on fishing in Gibraltar waters in breach of the Nature Protection Ordinance, we insisted on upholding our law. They blocked the frontier and began to create anti-Gibraltar feeling in the surrounding area. There was ample justification for this law in conservation terms and in international law. We went to London and made a case in which we convinced the Foreign Office - whether they'll admit it

or not - that we were right. And yet the Gibraltar Government allowed them limited fishing rights (regularly abused) in order to avoid the blockages at the frontier. (In fact, this seems a very similar situation to the one some of us heard about in the sovereign bases in Cyprus with bird trapping.) In the meantime our seabed and our fish stocks have been devastated.

And yet in neighbouring Spain the sea is increasingly protected, and more and more resources are being put into conservation. We are being left behind, but at the same time we have considerable specialist knowledge we can offer. We are often called in by NGOs, like the Spanish Ornithological Society SEO, to help in their work, and I sit on the Board of the largest nature reserve in the region. But the political unwillingness to co-operate on the environment, and on anything else, is obvious, and not good for the wildlife.

So where are we in Gibraltar with regards to nature conservation? Relations between GONHS and the authorities – Government and MOD – are good. There is a great deal more consultation than there has ever been. We would like the environment – not just nature conservation, but alternative energy, the promotion of carbon credits, etc – to feature more prominently in the Government's priorities for legislation, enforcement and funding. Noticeably the environment did not feature in any party's electoral manifesto earlier this year. Our concern is that opportunities are being lost – opportunities to conserve, opportunities to create jobs, opportunities to achieve potential, which only a little more money could achieve. I shall mention the Botanic Gardens where I work (or used to) as an example of something that could do much more and look much better with just a little more investment.

Investment would allow us to MAKE OUR PROTECTED AREAS EFFECTIVE, and stop the drop in biodiversity which, particularly in plants, but also probably but less noticeably in invertebrates has been considerable in the past century. For this we need to plan for BIODIVERSITY CONSERVATION, and be able to put these plans into effect.

And where is the public in all this? Well, it's there. GONHS membership is about 1.5% of the population – and would be a lot more if we dedicated more of our work to recruitment – but at the expense of what? There is a great deal of awareness, but we certainly need to move in the fields of PUBLIC AWARENESS AND EDUCATION.

Funding for all this needs to be found. I have alluded to overseas sources, but what of TOURISM, that resource of so many small exotic lands. So much money our wildlife brings in – in our case especially the monkeys and increasingly so the dolphins – and they are just abused by the operators and the money goes nowhere near them nor the rest of the wildlife.

And what is the situation in other small territories – well, I don't really know. One of the reasons why we in Gibraltar have wanted all of us to get together is simply that – to find out what the situation is elsewhere, to learn, and to share our own experiences and successes – and we have quite a few – with others who can benefit from them. And those of you from the larger lands, you can teach us too. You can provide resources which we may be lacking. But you must also learn from us. Learn how much conservation can be on the cutting edge in our situation, how the smallness which can make a City a Nation can in fact be an effective tool. And please do not make the mistake of just coming here and telling us what to do. Some of us have had enough of the old colonialism. Colonialism has many faces and those of us who feel the maturity to stand on our own do have the modesty and the ambition to turn to others for help, for advice, but not for patronage. We want to receive the respect we in turn offer. We need support, not control.

We in GONHS have learnt that, in order to achieve the most we must work with a purpose, avoid duplication in effort, avoid competing within and without, avoid revisiting old ground, but keep moving on, conserving now, as later will be too late.

So what do we want to achieve here on this famous Rock, over the next few days? Rock has long been held to be the medium on which to dig strong foundations. Let this be the foundation for a proper network and exchange of information, one that works in practice and is not just established in theory. Electronic communications mean that basically we can all sit on the same committee, if it is a committee we want, and contribute to joint decisions, even if we are half a world apart. They can certainly ensure that we keep abreast of each others' problems, possibilities, failures and successes. Let us use this meeting to learn, reach decisions on what we can do, and then go and do it.

Calpe is the old Roman name for Gibraltar, this Pillar of Hercules that signalled the end of the earth. Beyond that lay an abyss, an unknown, another world. But beyond the pillar, beyond the Strait, was a paradise. There are many of you who come from fragments of that paradise. But on the inland side of that pillar lay a paradise too. Compared to the present day the Mediterranean Basin was teeming with wildlife. Gibraltar was evidence of this and the Neanderthals who inhabited our lands and used our caves knew it well, judging from the remains of many wild animals found in our archaeological sites. Now the Mediterranean too contains only fragments.

How easy it would be for us in these small lands to relinquish our responsibilities. To claim impotence due to our size, or to give up through sheer frustration. But we don't. We battle on, stretching ourselves at the expense of a great deal in order to preserve what we have had the privilege to inherit. For the sake of our children, in memory of our fathers, and frankly, because we have to.

How good it is to see you all here. How good it is to know, in truth, after so many years that no, we are not alone.

Strategies for successful biodiversity conservation and restoration on small oceanic islands: some examples from Bermuda

David Wingate

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(David Wingate at Spittal Pond Nature Reserve)

I do not need to remind this audience that small remote oceanic islands are the most vulnerable to ecological disruption and have suffered the highest extinction rates on the planet. This is mainly because they have never been connected to the continents and typically lack all those portions of the continental floras and faunas which are incapable of dispersing across the ocean on their own without man's aid.

Satellite view

The extremely recent colonization of most of the world's remote islands by man broke down this barrier of isolation so that now it is possible for any species from anywhere in the world to be introduced via ships or now aircraft.

Apart from man himself, other mammals in particular have had a catastrophic effect.

In Bermuda it began with the pig about 1560, followed by rats, cats, dogs and ungulate herbivores after British settlement in 1612.

As this 1616 map showing the subdivision by the Bermuda Company into settlement shares shows, no part of Bermuda was spared from immediate exploitation, and the result was immediate catastrophe. There are two classic examples of man's catastrophic impact on oceanic islands from Bermuda.

Cahow *Pterodroma cahow*

The cahow or Bermuda petrel is a gadfly petrel with no inherent defences against mammal predators. It nested in superabundance throughout the island, digging its nesting burrows in soil under the forest.


Cahow fledgling

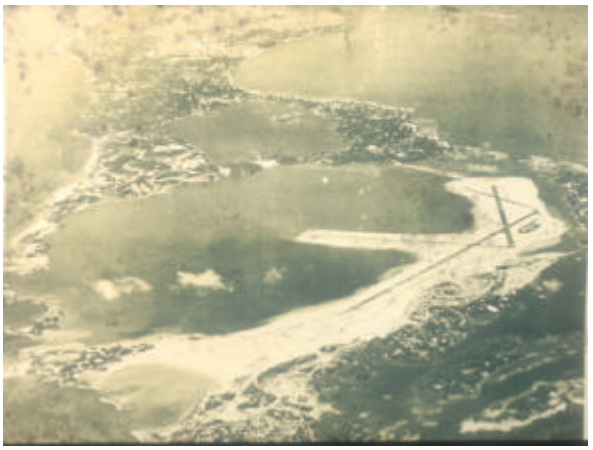
Despite a proclamation to protect it as early as 1616, the Cahow was considered to have become extinct as early as 1630, a mere 20 years after settlement!


Scattered feathers of slaughtered seabirds (tropicbird killed by cat)

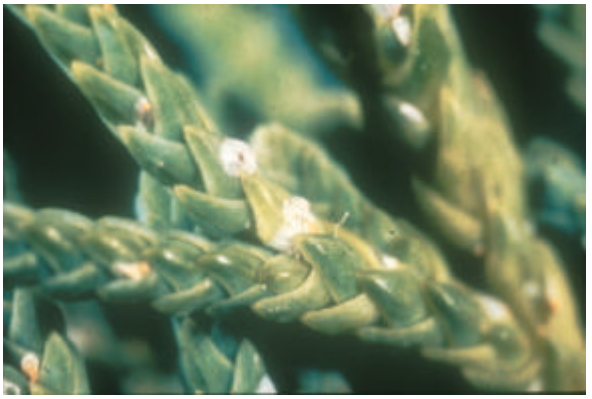
Bermuda cedar *Juniperus bermudiana*

The other classic example, which interestingly was much more recent in time, was the demise of the Bermuda cedar, an endemic juniper.

This probably resulted from the construction of an airport on Bermuda in 1941-43, which greatly accelerated the introduction of invasive species to Bermuda.



Up until 1945, this endemic juniper thrived on man's influence in Bermuda, because it is an "r-selected" early successional tree and valued for its timber, which sustained a thriving ship building industry. Indeed, it had become a virtual monoculture forest by the 20th century!


Close up of cedar scale

But a scale insect pest *Carulaspis minima* accidentally imported by aircraft on ornamental juniper from California about 1946 found it a perfect host with no biochemical defences and no native biological controls.


Dead cedars

Within 10 years 96% of the trees were dead, leaving Bermuda virtually unforested! The broadleaf

woodlands which have since replaced it are now 95% introduced species by biomass!

The loss of the cedar starkly revealed another frightening truth. Bermuda is today probably the most densely populated isolated oceanic island in the world!

Bermuda aerial view showing white roofed houses

The issue now is more whether any vegetation will be able to survive in our urban future, let alone any of the native species!

Bulldozer and endemic palmetto

Our largest remaining open spaces are like small islands completely surrounded by development!

Paget Marsh from the air

A third of Bermuda is now totally urban, and the mean density of houses is two per acre for the island, with a mean human population density of five per acre!

Prospects

In the face of such facts it seems reasonable to wonder how any native biodiversity is going to be able to survive at all. It is also easy for conservationists to become pessimistic and to feel like giving up in despair.

I have recently read two highly relevant essays on this issue in *Biological Conservation*, and their message to conservationists and restorationists is very important. The first essay by Eric Beever is on the importance of maintaining realistic optimism in our work in order to be effective. He makes the point that the worst enemy of conservation is negativism, pessimism or scare tactics. It simply causes our potential allies to turn off.

The second essay by David Erhenfeld makes the other important point that merely conducting endless surveys or carrying out sophisticated scientific research on the problems is not enough. His appraisal of all of the published papers in the first three issues of *Conservation Biology* indicated that the majority yielded more descriptions of problems than actual conservation achievements. We must not permit our surveys and research to become ends in themselves, with the selfish goal of keeping us employed with endless grants. Rather it should be a means to an end by revealing how to develop workable strategies and then actually to implement them.

I have devoted most of my career on Bermuda to the researching and implementation of workable strategies, and in the process I am pleased to report that nature's extraordinary resilience, if we will only stop beating on it and work with it instead, has turned me back into an optimist – even in the seemingly hopeless case of Bermuda!

So how is any restoration possible on small oceanic islands? The frank answer is not much and not easily, for they truly are only "fragments of the paradise" that they were. So much has been completely lost to extinction and so many of the invasive introductions on to them are hopelessly irreversible. Nevertheless, restoration ecology has been aptly described as "the art of the possible" and some amazing things are indeed still possible!

The key to success is clearly understanding the root causes of problems and looking for exploitable options for reversing the causes rather than merely trying to treat the symptoms.

In the case of small oceanic islands we can actually capitalize on the circumstances that made them vulnerable to disruption in the first place by turning them to our advantage:

- Small size means that we can exert a more intense and total control. Eliminating undesirable invasives like rats is more feasible on small islands for example.

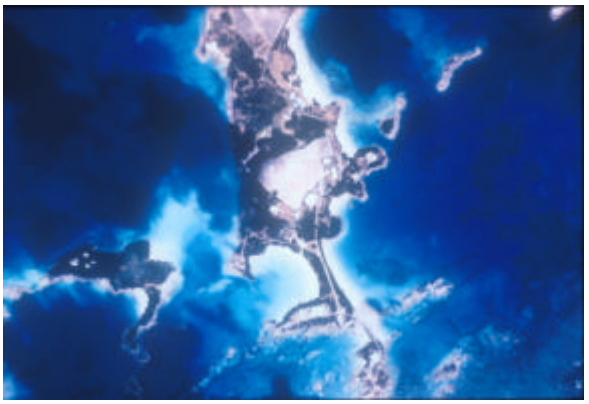
- Isolation means that we can exert better control against unwanted invasives by implementing quarantine measures against re-introductions and new introductions

Fortuitously, islands often have satellite islands where the foregoing advantages can be applied even better. Restoration may be possible on a satellite island where it is impossible on the main island if, for example, the satellite island does not have a resident human population with a conflicting agenda, so that it becomes possible to manage it exclusively for conservation or restoration. Also, an islet which lacks certain introduced species already present on the main island may have enabled a threatened endemic species to cling on in that smaller fragment of its former range.

Examples of oceanic islands with important satellite islets like this are Round Island off Mauritius, Cousine Island and others off the Seychelles, Bosun Bird Island off Ascension, numerous islands off New Zealand, and the Castle Harbour Islets off Bermuda.

Rediscovery and conservation of the cahow

The cahow is a classic example of an endemic species which managed to cling on because the mammal predators which exterminated it on the main island did not reach the offshore islets. It was rediscovered in 1951 by Dr Robert C. Murphy and Louis S. Mowbray (picture above), surviving on five of the tiniest Castle Harbour islets shown on the aerial view (following). Their combined area totalled less than three acres.



But the breeding habitat was so marginal that the islets lacked soil cover sufficient for burrowing, forcing the birds to use deep natural erosion crevices in the cliffs for the deep dark burrows that they require.

But these were the obligate nesting places for the still common white-tailed tropicbird *Phaeton lepturus*, or longtail as Bermudians call it.

When first surveyed in the 1950s, two-thirds of the 18 surviving pairs were subject to nest-site competition with longtails. This resulted in the death of the cahow chicks every year! The population was still declining after three centuries of presumed extinction but we were in the nick of time to help.

Because the only significant problems facing the cahow were on its breeding grounds and not on its vast ocean range, once we understood the sequence of causes causing its decline we were able to devise a strategy to reverse the situation.

First we developed an artificial doorway or baffler for the crevice entrances which took advantage of the size differences between the two species by excluding the larger tropicbird.

By this simple device installed at all nests we were able to treble the breeding success and turn the population decline around in 10 years.

Next we created artificial burrows for the birds on the level tops of the islets where tropicbirds would not nest and cahows could not for lack of soil cover for burrowing. This recreated in part, the original breeding niche separation between the two species.

Digging artificial burrow.

Partly completed concrete burrow

Completed burrow

The beauty of the artificial burrow was that it could be placed in optimal sites for discovery and colonization by the cahows, closely adjacent to already occupied sites. Also, they could be built as closely together as possible in order to maximize the very limited space on the tiny islets. By this second step we created the potential for about 300 pairs eventually to be housed on the existing nesting islet. The breeding population has already trebled to 55 nesting pairs in the 50 years since rediscovery - remarkable progress considering the slow maturation rate and extremely low reproduction potential of procellariiform birds in general.

Next, we persuaded government to declare the larger adjacent island of Nonsuch (15 acres) as a nature reserve in 1961. We eliminated rats from it and made sure by quarantine that it would remain free of potential predators in future. Although not yet colonized by cahows, Nonsuch has deep soil cover where the birds could excavate their own burrows. I estimate that it would be capable of supporting 10,000 pairs!

Nonsuch Island and Cahow Islet

But there is a 'Catch-22' in persuading cahows to colonize, because new pairs normally settle on islets where cahows are already nesting. We will have to trick them into believing Nonsuch is the hottest nightclub in town by putting out models and playing tapes of their aerial courtship calls via 'ghetto blasters' set up on the island. The technique has already been proven with petrels elsewhere. And the need to go ahead with this soon is urgent because of global warming and sea-level rise.

Erosion by Hurricane Felix on one of the cahow islets

Before Hurricane Dean in 1989 I never had a serious sea-flooding incident on the nesting islets, but in 1995 and again last year (1999), two of the four islets were completely over-washed and the others seriously reduced by erosion. This was caused by groundswell from hurricanes Felix and Gert. Luckily the cahows were not nesting at those seasons. 40% of the nest-sites were trashed both times, and we really had to scramble to repair the damage before the birds returned for their next nesting season.

An holistic approach

Preparing Nonsuch for the cahows was the beginning of a much more ambitious "living museum " project, an attempt to restore holistically all that remains of Bermuda's original precolonial heritage.

Three things made Nonsuch absolutely ideal for such a project:

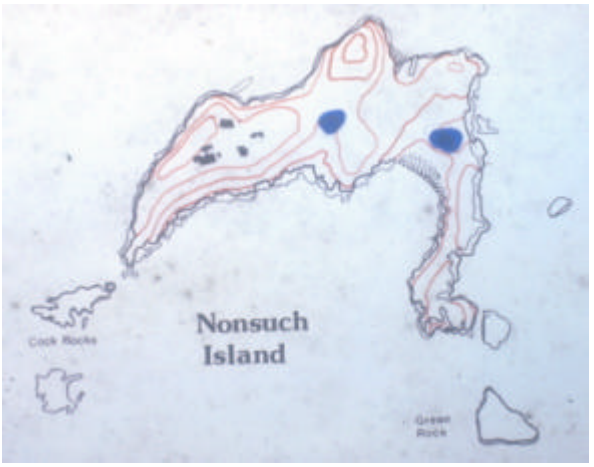
- Its relative isolation made it possible to quarantine against most of the invasive species already on Bermuda.
- Its relatively large size for a Bermuda satellite islet (one thousandth of Bermuda's total area), and topographical diversity, enabled it to represent most of the habitats that occur on the main island
- and yet it was small enough to be totally manageable, for the most part by one person.

It even proved possible to create the missing wetland habitats artificially!

Freshwater pond excavation

Placing liner

Finished marsh



Nonsuch map showing ponds

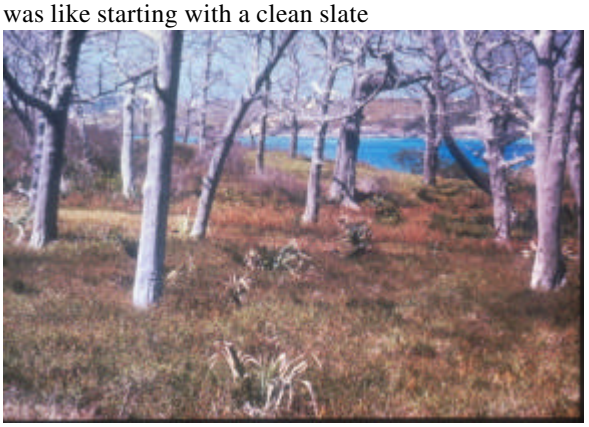
Small as these ponds are, they are very important in Bermuda's diminutive wetland context. Both now support healthy populations of an endangered endemic brackish-water killifish *Fundulus bermudianus*, threatened by pollution on mainland Bermuda.

The species which most inspired my holistic approach to restoration was the endemic Bermuda skink which had a population on Nonsuch (lacking in predators) that was 40 times as dense as on the mainland when I began the project.

But my holistic approach was not limited to fauna alone.

Unfortunately the dominant cedar forest and other flora on Nonsuch had been devastated (picture

following) by the cedar scale epidemic and a herd of goats, so that when I moved to the island in 1962 it was like starting with a clean slate



The goats and rats were easily removed, setting the stage for restoring the flora in its original context of no mammal herbivores

My strategy was to restore only with known endemics and natives, while culling out as thoroughly as possible all those introduced invasive plant species that were already established on the island, keeping them off by quarantine, and on-going culling in the case of bird-dispersed species.

Guidelines for planting and sources of seedlings were provided by small relict stands of native forest which survived almost intact in a few remote or inaccessible corners of mainland Bermuda. On Abbots Cliff, for example, now a protected nature reserve, the flora was still 70% native in the 1960s (picture below) before the establishment of the pernicious Brazil pepper *Schinus terebinthefolius*.

Planting began in earnest in 1963. By 1974 more than 8000 seedlings of canopy species had been established (following picture). Growth was slow at first because of extreme exposure to wind and salt spray occasioned by the loss of the cedar as a windbreak.

By 1974, however, it was becoming apparent that the 4% of cedars that survived the cedar scale (due evidently to some genetic trait for resistance that barely survived in the population), with help from

selectively introduced biological controls specific to the scale, were beginning to reproduce and re-populate Bermuda again under the intense new selective pressure resulting from the pest. I began planting cedars in earnest on Nonsuch in that year, in the belief that the species was becoming viable again.

It is worth pointing out here the context in which I made that decision. At that time all of my colleagues in the Government were convinced that my project would never work. The native flora and fauna were finished, they said: one only had to consider what had happened to the Cahow and the cedar to see that it was hopeless! The emphasis for reforestation on the main island of Bermuda, therefore, was on exotic trees and shrubs from all over the world, a decision which was ultimately to result in even more invasive species problems like the Brazil pepper and the Indian laurel *Ficus microcarpa* and new problems for my own project on Nonsuch!

My rationale for the eventual success of my project was as follows. Even though the native and endemic flora was sickly and declining on the main island due to weakening by a host of new introduced insect pests and diseases, and by competition from other invasive plant introductions, the problem of insect pests and diseases alone should not be the decisive factor in their ultimate extermination. Parasites and diseases need their hosts and must eventually reach an accommodation with them in order to survive themselves. Indeed, we could already see this happening with the cedar's rapidly evolving resistance to the scale. The real enemy of my project were the introduced competitors, because they do not have any need for the natives and are in fact much better off without them!

Extirpation of the native flora had been a double-whammy process. The introduced (and native) predators, parasites and diseases can only weaken their hosts, but the introduced competitors (which man usually introduces without their co-evolved predators, parasites and diseases) do much better as a consequence and perform the *coup de grâce* by shading the natives out and replacing them.

Fortunately, it did prove possible to keep the plant competitors at bay on Nonsuch. The long-term result after 38 years has been nothing short of spectacular. I currently estimate that we have been able to restore the native flora on Nonsuch to within 90% of the precolonial, within the limits of what we know about it from early records and palynological work on fossil pollen. Indeed in the absence of rodents, the forest (picture below) is restoring itself so vigorously that I have almost had to leap out of the way.

There have been many unanticipated surprises too. On mainland, the endemic olive wood no longer self-seeds due to competition from introduced Surinam cherry and rats eating the seed. On Nonsuch, however, seeding is superabundant (picture below), again illustrating the advantages of the holistic approach – restoring everything within its original context as far as possible.

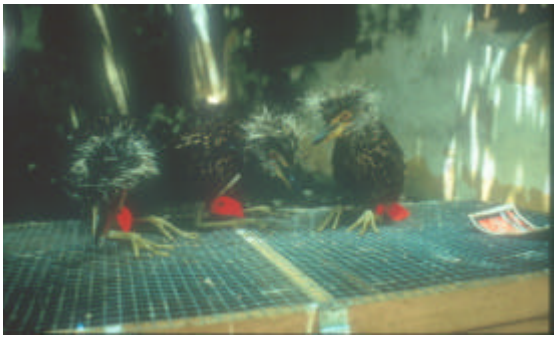
But this was just a beginning. I now want to describe a couple of other successful restorations, both of which have had wholly unanticipated ecological and economic spin-off benefits. And both involve species which had been exterminated completely from Bermuda during early settlement, but survive elsewhere in their native range.

The first was a crustacean-eating heron *Nyctanassa violacea* which, I concluded, would establish on Bermuda again if introduced. This is because circumstances have changed, with good bird protection law, as at present, and because its main prey is still abundant (the common land crab *Gecarcinus lateralis*).

Indeed, the land crab is so abundant as to be a pest, particularly on golf courses, lawns and agricultural land, by riddling the ground with burrows and stripping the ground vegetation.

In fact, the original Bermuda night heron was an endemic derived from the yellow-crowned night heron, as revealed in our fossil record, so I settled on the nominate species which is a migrant in Bermuda, and eats land crabs in transit. If you believe in punctuated evolution, a re-introduced population might rapidly evolve into an endemic again like the first, which had short legs and a heavy bill.

But the migrants leave again. To get around this, we introduced hatchlings from a non-migratory population in Florida, and weaned them into the wild on a diet of land crabs in Bermuda.



The project was funded by government on the basis that they might effect some biological control, desperately needed on golf courses which represent about 8 percent of Bermuda's land area. It was the easiest and most successful restoration project I ever did. 44 chicks were hand-reared and weaned between 1976 and 1978.

Nesting began in 1980 in a main-island nature reserve. But the main nesting rookery is now on Nonsuch, in trees that I planted out of gallon cans 25 years before. And that's not all. It turns out that they do achieve virtually 100 percent control of crabs on golf courses and lawns where the crabs have no hiding places, and where control is most desired. Elsewhere the necessary predator-prey balance is beautifully maintained.

Crab remains eaten by heron

This project provided an interesting retrospective insight as well. The Bermuda sedge *Carex bermudiana* (above) is our rarest endemic, barely replacing itself on a few relict locations on the mainland. It is now thriving on Nonsuch in the absence of rodents. However, had we introduced it there before we re-introduced the heron, a crab-predator, our transplants were eaten off by crabs on the very first night after their planting. I would like to know of any ecologist who could have predicted that the survival of this sedge would depend on a heron that eats land crabs – yet another illustration of the benefits of a holistic approach to restoration.

My final example of a successful restoration with both ecological and economic benefits is the West Indian topshell *Cittarium pica* that was harvested to extinction for food by the early settlers under the tough circumstances of a subsistence existence. Again I rationalised that circumstances are very different today, with our higher standard of living and better conservation laws. So we tried it in 1982, and it worked. From 86 shells released into the inter-tidal of Nonsuch, I found my first evidence of reproduction in 1986 and, as of a thorough survey conducted in 2000, the topshell is now island-wide in appropriate habitat and already abundant again.

West Indian topshell

Land hermit crab

The economic significance of this success is that the species is second in importance to the conch as a shellfish resource, with future harvestable potential if carefully regulated. Interestingly, however, there have been some local incidents of illegal harvesting since the re-introduction. This decimated it in some areas, thus confirming the hypothesis of its original extirpation. A potential ecological spin-off benefit of this successful restoration is that it may eventually lead to a like recovery of the land hermit crab which depends on the empty topshell for its home and is presently in danger of extinction because of its increasing dependence on empty topshells from the pre-colonial population.

I have been the architect of several other equally successful restoration projects, specifically on Bermuda's main island. The most notable of these is the eastern bluebird *Sialia sialis* recovery project, using nest-boxes (below) and involving school parties, and several other native forest restoration projects – but there is no time left to detail them here.

I hope these examples are enough to restore your faith in the resilience of nature, and the restoration successes that await us if we only work with, rather than against, it.

Section 2: Environmental Awareness and Education

Children from the Workshop present their work to the Conference

Conservation education campaign: *Promoting Protection Through Pride*

Paul Butler

RARE Centre, 46 Hillside, Whitstable, Kent CT5 3EX, UK. Email: jacquot56@compuserve.com

"It is better to light one candle than to curse the darkness" Anon

RARE Center for Tropical Conservation has developed a successful and reproducible approach for promoting conservation awareness in a unique programme: *Promoting Protection through Pride.* This approach uses social marketing techniques, colourful flagship species (usually birds), and national or local pride to generate grassroots support for conservation. Over the past twelve years RARE Center's pride campaigns have reached out to more than 1.5 million people in 23 countries and territories throughout the Caribbean, Latin America and Pacific. This program´s accomplishments have been significant and tangible. Campaigns have led to the establishment of wildlife reserves, the creation or strengthening of wildlife legislation, a rebounding of endangered wildlife populations, the training of local personnel in environmental education, and an increase in local appreciation for natural resource conservation. Dominica's Chief Forest Officer, Arlington James noted:

"The project touched a wide cross section of people, schools, musicians – everybody became familiar with the Sisserou [the endemic and endangered Imperial Parrot]. Long after the project people still use its symbolic status and are aware of its existence and status".

RARE Center believes that national self-esteem can be a powerful force for advancing the conservation message and that widespread support for conservation can be generated using proven marketing techniques, with colourful wild animals as flagship species and pride as the emotive key.

RARE Center assisted the Bahamas National Trust in conducting a Promoting Protection Through Pride campaign on New Providence, Grand Bahama, Great Inagua and Abaco in 1992. This campaign resulted in the establishment of a 20,300 acre National Park on Abaco, thereby helping to conserve a vital area of feeding and nesting habitat for the Bahama Parrot. In April 1994, the Assistant Executive Director of the Bahamas National Trust wrote:

"The Abaco National park comprises 20,300 acres and includes all of the area originally requested. The creation of the Park is a major breakthrough - it is the first major park created by the Bahamas government in twenty years. The Bahamas National Trust is indebted to RARE Center for its assistance in carrying out the Bahama Parrot Conservation Education Campaign. The Trust considers the program to be key in making the Abaco Park a reality".

RARE Center also believes that, for conservation to be a reality, environmental education programs must be implemented by local people, having a knowledge, understanding and concern for the ecological, social, political and economic realities of their homeland. Based on this, *RARE* Center's programs are always implemented in partnership with government agencies and/or local organizations in host countries.

Writing on the programme implemented in Saint Lucia (Eastern Caribbean) the IUCN Red Data Book observes:

"The recent history of conservation in Saint Lucia has become a model for other Caribbean countries and reveals an achievement unparalleled elsewhere in the world". The population of the endemic Saint Lucia Parrot, has increased from about 100 to 500 birds over the past two decades.

A critical first step and pre-requisite in implementing RARE Center's Conservation Education Campaign (CEC) is the development of a clear and attainable campaign objective, as well as the selection of a suitable target species and a capable counterpart to carry out the manual's 26 tasks. These tasks are undertaken over the course of twelve months and are fully described in RARE Center's manual: *Promoting Protection Through Pride*. Some of these tasks includes fact sheets, community and church visits, songs, puppet theatres, costumes, badges and pre - and post-questionnaire surveys. The role of the local counterpart is to coordinate and implement these tasks, and to see them through successfully. He or she is assisted by a Coordinating Committee comprised of various stakeholders, as well as many volunteers.

WHAT IS MARKETING, WHAT IS EDUCATION?

Of course RARE Center's approach to building community awareness is NOT the only successful approach to environmental education. Indeed, it is less

to do with "education", than it is to do with marketing. It recognizes that new approaches are needed to change people's attitudes and behaviour. Conservation is not about endangered animals, or even about their threatened habitats. Conservation is about people. Whether it is rain forest destruction, cyanide poisoning or illegal wildlife trade, it is people who are undertaking these detrimental activities, and it is only through changing their behaviour that they will be stopped.

Public education and community outreach are pivotal in providing information upon which sound decisions can be made, as well as for communicating the choices and alternatives available. Too often, however, environmental education is dry, impersonal and has little effect. Environmentalists tend to preach to the converted and fail to inspire the common man. Their messages are too technical [using terms such as "bio-diversity", "habitats", "erosion", "siltation"], and leave the audience with a sense of helplessness, believing that the situation is so serious that any action on their part is probably futile. The effect, of adopting or not adopting conservation measures are usually medium- to long-term and often occur far from the individual initiating the activity. The effects of poor land use in the highlands may be experienced more immediately by people living along the coast who face threats of flooding, reduced water quality and siltation.

Compounding the problems of misunderstanding, the individual is often depicted as the guilty party and "assaulted" with a barrage of negative messages – posters telling him or her not to clear forests or dynamite reefs; community meetings that describe the laws and penalties for transgression; radio programs that are so technical that they are uninteresting and re-enforce a feeling of ignorance and alienation. The individual comes to view conservation and conservationists in a "them and us" situation. Feeling excluded, they lack a real desire to become part of the process and become more and more receptive to the opponents of conservation exacerbating the situation.

Farmers who attend meetings tend to be those who are already converted, radio listeners are those who are already "informed". While those that need to be targeted the most remain apathetic – for them conservation remains a difficult concept to grapple with. Even for people who may wholeheartedly agree with your message, they often feel that it does not apply to them. For conservation to be really successful the public must connect with the cause and genuinely want to rally around it. They must feel an emotive bond to it. Too often outreach and education programs target the mind, when perhaps targeting the heart and people's emotions may be more effective. Let us look at how businesses sell or promote "difficult" products and see if we can draw any conclusions from the corporate world that is so successful in persuading people to buy useless products that they do not want, and do not need.

When a car company wants to persuade a customer to purchase one of its vehicles it leaves the selling to its marketing division. If the engineer who designed and built the car were assigned the task of selling it, none would be sold. The engineer would highlight the quality of its paint or the innovative design of its piston rings. The public is uninterested in these details. The marketing specialist will sell you the car by telling you how thrilling it is to drive, and how it's luxurious appointments will enhance the driver's image. It's sex appeal. The company is not interested whether you understand or appreciate the car's mechanics, it is only interested in seeing you purchase it. As conservationists, we should spend less time worrying about whether the public really understands the intricacies of the hydrological cycle or the adverse effects of siltation, and focus on getting them to stop cutting down the trees and to be proud of their environment, as well as vocally supportive of its preservation. And, remember, advertisements do not just change knowledge; they change attitudes and behaviour too, as is evidenced by new people buying cars or even taking up smoking every day. Behaviour is also influenced by peer pressure; mass advertising gives the impression that an activity – like smoking – is a "cool" and "popular" thing to do.

RARE Center believes that if pride is a powerful emotion that can be used to create a passion for conservation, that can be translated into public concern and action. The following steps show ONE approach to setting up an effective outreach campaign, that can launch a RARE Center-style CEC outreach program. A copy of RARE Center's manual is available for viewing and additional information on the programme can be gathered from:

RARE Center for Tropical Conservation
1840 Wilson Blvd Suite 402
Arlington, VA 22201-300
Washington DC, USA
Email: rare@rarecenter.org

RARE Center for Tropical Conservation
UK Office
46 Hillside Rd
Whitstable CT5 3EX
Phone: 01 227 281696

GETTING STARTED

1: Selecting your target area

This should be an obvious first step. It will usually be the region that you are currently working in and should include the residential areas of those who impact your target area. For example, if you are trying to build an awareness and appreciation for a newly established protected area, try to include all those who interact with it – not just the farmers who live and tend the land adjoining it, but also those who visit there from neighboring villages. If this is your first campaign and you are implementing it alone, start small and focused. Try to take on communities or groups of communities that have less than 250,000 people. The more homogenous they are the better. In many smaller islands entire populations can be tackled.

2: Identify a campaign objective

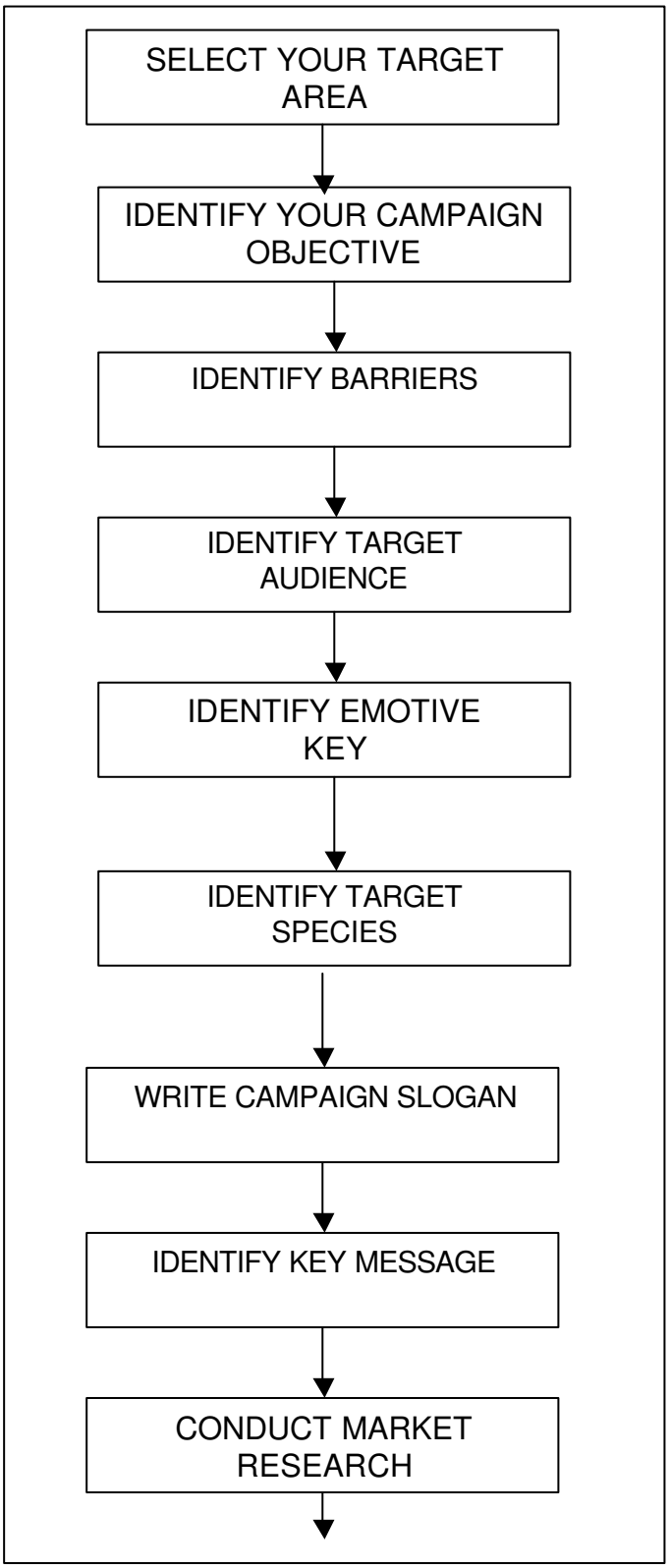
Again, your campaign objective might be obvious, being the same as your organization's overall goal. Alternatively you might want to identify a new objective specifically for this outreach campaign. Conservation marketing campaigns have proven useful in achieving the following objectives in other regions:

- ☆ To build pride and awareness for a specific bird or animal, thereby assisting with its conservation.
- ☆ To promote the establishment of specific protected areas, national parks or forest reserves, which benefit not only the target species, but the host of other plant and animals that share its habitat.
- ☆ To promote a knowledge of, and appreciation for, existing protected areas, national parks and forest reserves.
- ☆ To build constituent support for initiatives such as the passage of legislation and other land use/wildlife regulations.

Ideally you should have a "SMART" objective:

SMART Objective: Specific **+ M**easurable **+ A**ccountable **+ R**ealistic **+ T**ime bound

Involve your colleagues and potential collaborators from other organizations working on conservation issues and other key stakeholders in your target area. In the selection of a campaign objective, you might do this by means of a "focused discussion" or in a workshop context. Consider following the steps below to determine your SMART campaign objective.



Step 1: Getting started with a focused discussion

With you (or an independent moderator) standing in front of the assembled group, start off by asking each participant to highlight the one thing he or she is proud of. You might want to write these down for later reference. By asking everyone to speak you will ensure that every participant's voice is heard from the

start and thereby improving participation. Thank each person for coming and offer praise: "That's great Mike, thanks for coming, I hope that by working together we can come up with a strategy for promoting conservation in our area."

Step 2: Expectations

After an opening round of introductions and getting to know one another, you or the moderator should begin by carefully reviewing expectations for the workshop/meeting. Be very clear about what you hope that the gathering will achieve. For example it is not to discuss building an interpretive centre, nor to talk about alternative fishing techniques. No, it is to… Focus people's discussion on the purpose of the meeting that will guide the group towards setting up a community awareness campaign objective and strategy.

Below is a Statement of Context. Normally the person calling the meeting or workshop will provide this Statement of Context. This should be pinned or pasted onto the wall or written on top of your chalkboard. Make sure all the participants can see/read this statement which should be brief and to the point. You should also be very clear about the time frame. For example, that by the end of a fixed period a draft objective and action plan will have been drafted.

Step 3: Developing a shared vision of your campaign objective

After you have introduced the subject context of the session and the participants have been introduced to one another, you can proceed to the "Developing a shared vision of your campaign objective" phase of the proceedings.

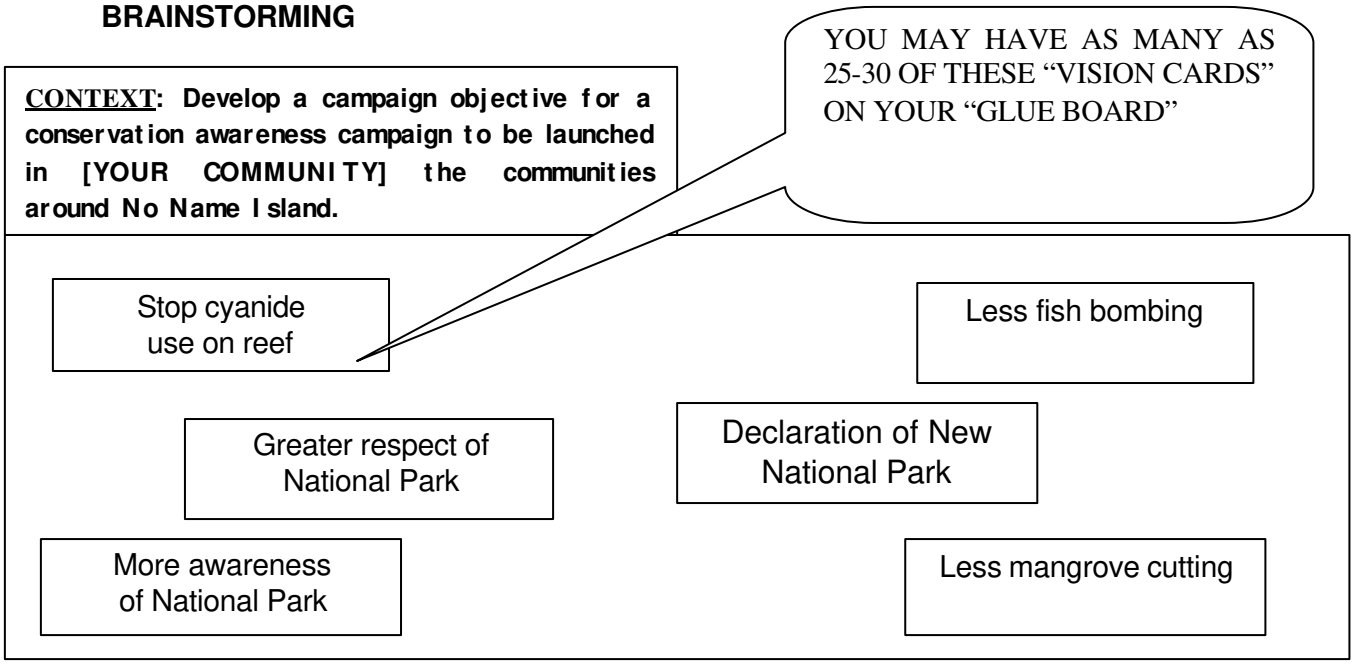
You or the moderator should begin by asking participants to imagine where they would like to see conservation of your target area in one, two or five years. The purpose of this is to get as many ideas out on the table as possible. The greater number of people you have representing different viewpoints, the more data you will collect. Get the participants to define <u>their own</u> "vision" in relation to the workshop's statement of context.

To facilitate this approach you or the moderator should ask everyone to write down <u>several</u> answers on <u>different</u> sheets of paper. Participants should not use long sentences, but rather should be concise and clear. Use marker pens that produce bright, clear and easy-to see text. If participants cannot write, then have others help them to relate their ideas and to put them on paper. Paper should be about A4 (or letter size for those using the American sizing system) so that everyone can clearly see what is written.

Having each written two or three "visions", you or the moderator should ask participants to pass the sheets forward – one at a time. You should ask for the one they feel most passionately about first, then the next.

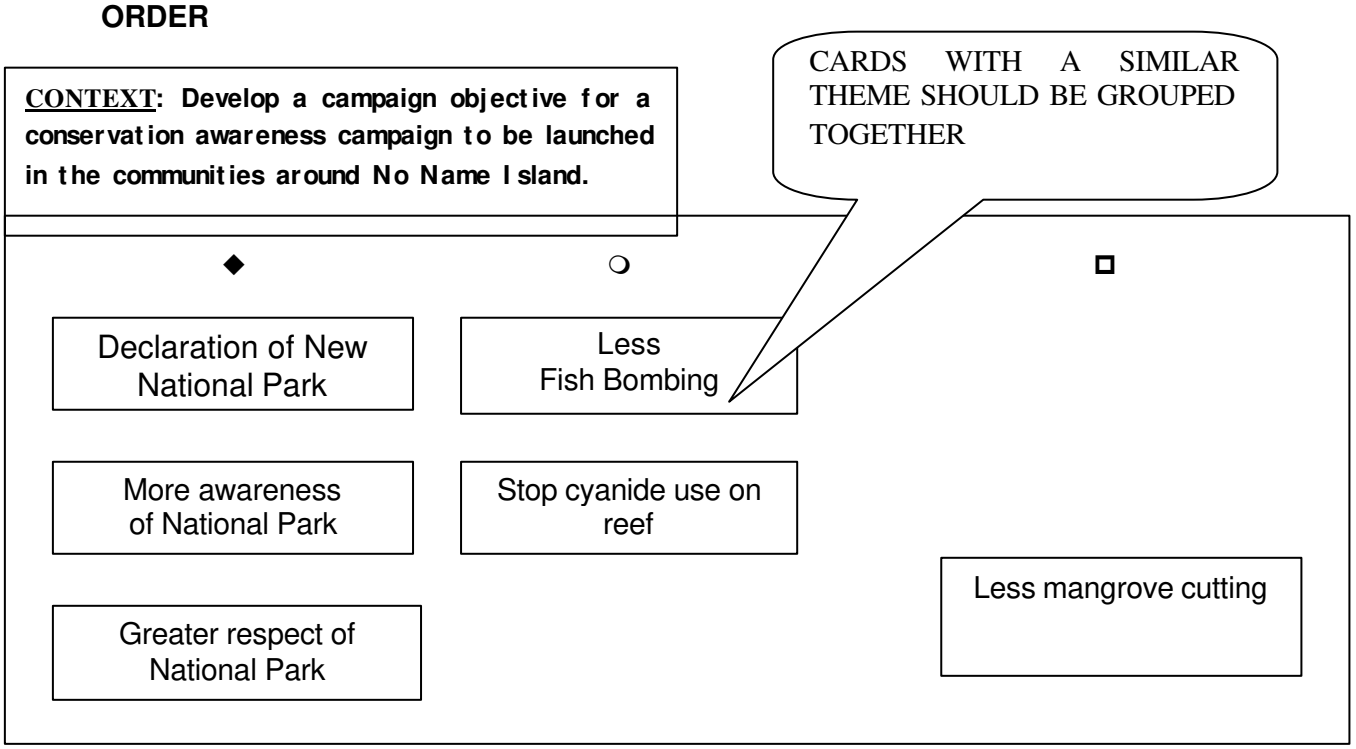
As each card is passed forward the moderator should put the response up on the board/wall where everyone can see it, as well as read it out to the assembled group. The result will be a mosaic of cards/sheets of paper – each with a concise comment, word or simple phrase on it.

BRAINSTORMING



As the sheets are pasted or pinned to the wall/board the group must order them into similar categories. This ordering process tries to link ideas. You or the moderator should ask participants to view the paper sheets and, pointing to the first one – for example "stop cyanide fishing" – ask, "What other responses on the board are similar to this one?" As the group responds, you should mo ve the cards around such that all the similar ideas are grouped together. To make this process easier you can group related "cards" under a common symbol, such as a circle or star. You should continue until all the cards are grouped, with any odd ones mo ved to one side.

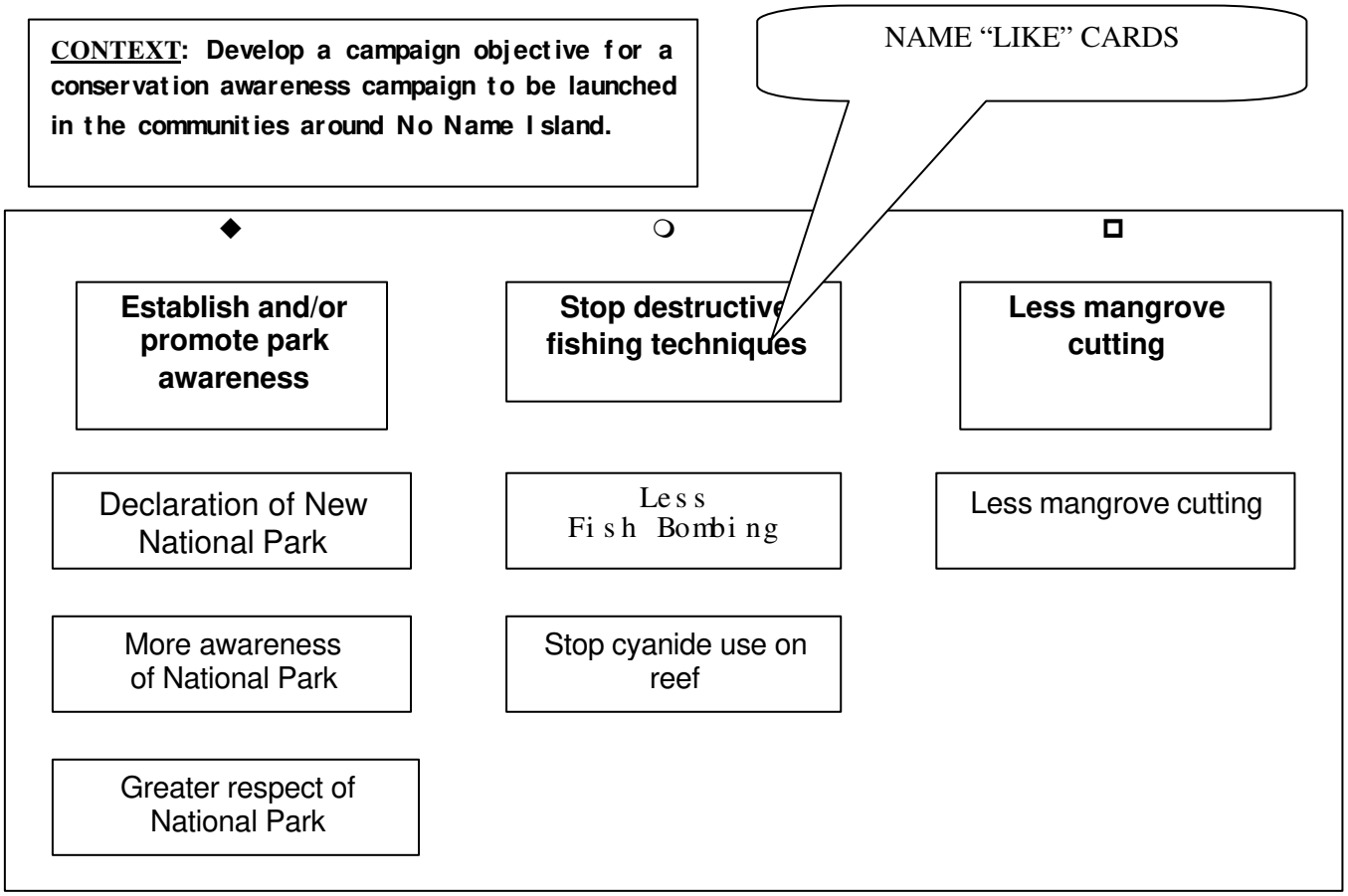
ORDER



When all the sheets are in groups, participants should reflect on the categories and look at the relationships between them. Each category should then be named, with the "name" chosen to reflect a key component of the "vision". Do this by looking at each group in turn. For example, all the ❍ cards.

Ask what the cards have in common, and then ask for a few words that summarize the "common thread", for example "Stop destructive fishing techniques". Once each category or group of symbols have been named, see if you can place the few stragglers or one-off suggestions into one or other of the named groups. If not, think of a title for each of these as well.

NAME



This process will tease out some of the perceived threats facing your target area, as well as some of the key needs. For example, vision statements like "less bombing" and "less mangrove cutting" identify activities that are perceived as threats to the area used in this example, while statements such as "more awareness of the National Park", highlight some of the key needs. **If you have NOT succeeded in identifying key threats and needs during the vision process, then have another round of participant card writing to do so now**. Keep a note of the threats highlighted and the results of the "naming stage" of the discussion process, as you will need this information later.

With all the grouped cards categorized, participants can reflect/evaluate on the whole picture and use this to try and come up with a shared vision of the campaign objective. You will not be able to include everything in your objective, but this process will help to narrow down an objective that has the support of your key collaborators. Remember your objective should be SMART [*see earlier*]. Using the worked example, the campaign objective might be:

EVALUATE

Suggested SMART campaign objective

To promote an awareness of the Bunaken National Park and the problems of destructive fishing techniques, as measured by a decline in the number of reports of bombing and/or increased enforcement by Park Rangers over a twenty-four month period.

You will note that this example is **S**pecific [Bunaken National Park]; **M**easurable [indicators such as the decline in reports of bombing]; **A**ccountable [Park Rangers]; **R**ealistic [a goal that is within the realms of feasibility]; **T**ime bound [24 months].

In this example, the objective targets several of the key threats identified during the vision process [destructive fishing techniques], as well as a key activity [awareness raising].

Examples of other SMART objectives might include:

1: Over one year, reduce trash and pollution in and around the park, as evidenced by a cleaner environment and members of the public becoming actively involved in clean-ups.

2: Over two years, reduce the harvesting of mangrove, as measured by the number of mangrove poles used in the seaweed industry and more sustained harvesting techniques.

3: Identify barriers to achieving your objective

With your colleagues and key collaborators still in a group or workshop setting, now is also a good time to use the participatory approach to look at some of the barriers to achieving your campaign's objective. These are the obstacles standing in the way of achieving your objective. We will continue to use the worked example, from above.

Step 1: Look at your objective and write the key components on the board.

Use the participatory methodology outlined above: **Context – Brainstorming – Order – Name – Evaluate**. Here the group needs to refer back to the campaign objective and the components that it comprises, in the worked example they were – 1) Promote an awareness of the National Park; and 2) Reduce/stop destructive fishing techniques.

Step 2: Work into groups

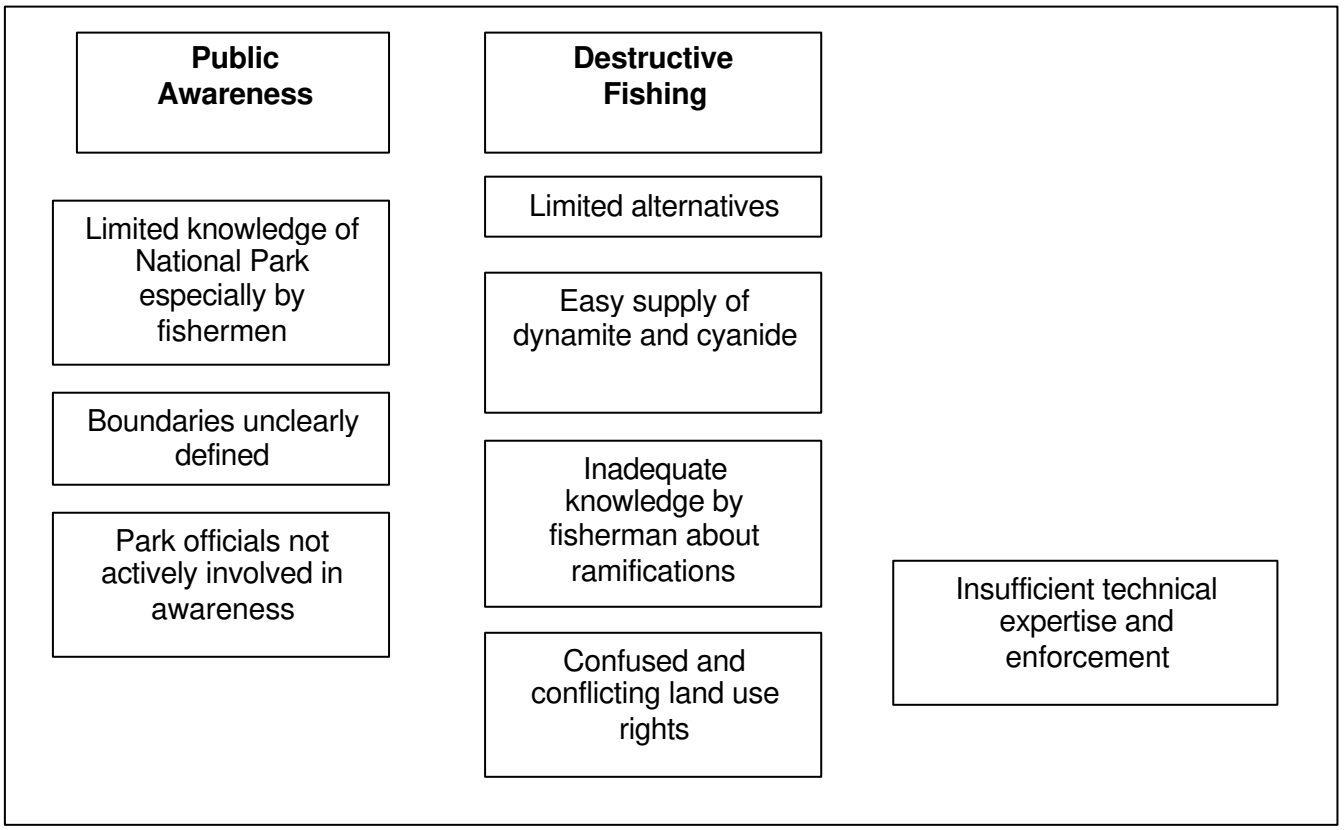
Randomly assign participants to work in groups and ask each group to come up with any barriers to that "vision group", so that Group A might review "Awareness of a National Park", while Group B reviews "Destructive Fishing Techniques". Barriers should be written in a positive, rather than negative format. Participants should not use "Lack of…" or "There is no...".

Rather they should use an adjective like "inaccessible funds", so as not to make the barrier appear hopeless. They should also be specific, so instead of "Limited knowledge of National Park", the response is specific "Limited knowledge of National Park by Fishermen". Each participant should list his or her barriers on different cards or sheets of paper.

Step 3: Paste them on the wall

When they have finished they should select the two or three most critical barriers and pass them forward one at a time. These are then read out and pinned/pasted to the wall.

1: Public Awareness
2: Destructive fishing techniques



IMPORTANT NOTE!!!!

Some of the barriers that the participants may identify lie outside your group's ability to tackle as environmental educators while others will have an educational origin. For example, "Insufficient knowledge of ramifications", or "Limited knowledge of National Park", are educational while others will be economic like "confused or conflicting land use rights" or "limited alternatives". This emphasizes the need for an integrated approach to problem solving.

Don't be surprised if the majority of your barriers are economic rather than educational. This will be more evident when your objective is rooted in livelihood issues for example "fish bombing" as compared to something that does not directly affect their wallet, such as "littering". For a first campaign, you will find it easier to tackle a topic like littering rather than "fish bombing". The latter should generally only be considered when your outreach campaign works in tandem with economic alternatives. No matter how much someone wants a Mercedes, if he has no money he can't buy it. Divide the barriers to your goal into two groups, one of which environmental education CAN play a key role in removing and one in which education has a more secondary role. Focus your attention on the former, while building partnerships and working with other groups better able to tackle community development and other issues.

EDUCATION HAS KEY ROLE	**EDUCATION HAS SECONDARY ROLE**
Limited knowledge of National Park	Confused/conflicting land use rights
Limited knowledge of ramifications	Limited alternatives

4: Identify target audience

The last step will help you to begin identifying key target groups to focus on. For example, participants identified "Limited knowledge of National Park by fishermen". In the worked example, key target groups would include fishermen and teachers. These will be the PRIMARY targets for your campaign. But remember they do not live in isolation. In their day to day lives they interact and are influenced by others. The fisherman may go to the Church; he will sell his produce to stores or middlemen; he may have children, favourite musicians or sports personalities.

These peers often influence what he thinks, and how he behaves. As such they must be targeted too! Thinking about your primary target audience, list those that might influence them. Make a list of the groups and individuals that your campaign will need to target to influence your key group.

FISHERMEN [Primary]

Religious leaders
Store owners

TEACHERS [Secondary]

Parents
Children

5: Identify emotive key

Just as a perfume company might "use" an attractive, scantily clad man or woman to sell its product (where sex is being used to attract the consumer), or an advertisement might use "ego", you will need an emotive key to grab the public's attention and to make them want to listen to your message. Pride can be just such a key. While some cultures show their pride very visibly and others are more reserved, it is an emotion we all feel inside. Pride can be a powerful ally in your battle to promote a conservation ethic.

6. Identify target species

You will now need to look for a "vehicle" to carry your message, an equivalent of a scantily clad model used in the perfume advertisement, or the well-dressed man that portrays wealth and success in the cigarette promotion. Something that "shouts" pride when a person sees or hears it. Something that has not been used so many times before that it has become cliché, something that is attractive, non-political, and that can stir the interest of a variety of target groups.

A national hero, or sports star, would be great but you probably lack the access or money to involve them – at least in the early stages of your campaign. You will need another symbol of pride, one that costs little or nothing to use, and which while less well-known can be crafted to carry your message. RARE Center has shown that national or state birds and endemic wildlife can fit that bill. Using wildlife, besides being free, are a direct link to the natural environment. Using them to promote environmental conservation builds knowledge and concern for them as living symbols, as well as promotes your core message

Ideally, the target species should be endemic *(symbolizing the uniqueness of the host country or target area)*; reside in a critical habitat *(providing a focus for the project)*; and be "marketable". It should not carry any "negative baggage" – be ugly, fearsome, a pest or a widely harvested species. Using an existing national symbol has proven to be especially effective as this provides a strong linkage to nationalism and pride – pride for oneself, one's country, and one's environment. You might find something that ties positively into a local legend or a species that is believed to carry good omens, be wise or be a "special friend" of the primary target group, such as a bird that fishermen follow to find fish. You might make a couple of initial choices and then use your questionnaire survey [see Task 1 in RARE Center's manual] to make the final selection. In your survey you might ask respondents questions such as:

"Which species of wild bird/animal that you can see locally best symbolizes the beauty, uniqueness and freedom of our area?" Or, "Which species of wild bird/animal that you can see locally best symbolizes your pride for the area?" You might also want to ask "why?" to learn how best to use the target species and in what way it appeals to the target audience.

7. Campaign Slogan

Your slogan should be brief and imaginative. Its message should catch the viewer's attention and spark a feeling of pride. Some titles used in past CEC campaigns/workshops include: " "Don't Hide Your National Pride" or "I Love My Dove".

Again, you can make a couple of initial choices and then use your questionnaire survey [*see Task 1*] to make the final selection.

Using this simplified process of campaign design, you will have used a participatory approach to identifying a common campaign objective, analyzing the barriers to achieving the same, identified your target audience and the emotive keys that they might respond to, as well as a vehicle to deliver your key messages and a campaign slogan. This process will have conducted through one or several workshop sessions.

Now take the time to look back at the results of your work. With a list of the threats and key activities (gained from the vision process outlined in step 2, as

well as the list of barriers you identified in step 3), BEGIN to think of the key messages that your campaign will want to include.

8: Begin to identify key messages

With your colleagues and key collaborators still in a group or workshop setting now is a good time to use the participatory approach to BEGIN to elicit some core messages. These will be revised once the questionnaire survey and/or focus group meetings have been analysed (see TASK 1). For the purposes of this exercise we will continue to use the earlier worked example, where the campaign objective identified was "To promote and awareness of the national park and the problems of destructive fishing techniques, as measured by a decline in the number of reports of bombing and/or increased enforcement over a twenty-four month period".

Step 1: Replace statement of context with campaign objective

Use the participatory methodology outlined above: **Context – Brainstorming – Order – Name – Evaluate**. Begin by replacing the statement of context at the top of your chalk or pin board with your objective.

Step 2: Write three most important reasons for that objective

Then ask each participant to write (on separate sheets of paper) the three most important reasons for that objective. They should rank them 1st, 2nd 3rd and include the ranking on the paper. Again participants should not use long sentences, but rather should be concise and clear.

Step 3: Brainstorm, Order and Name key messages

Have each participant pass forward their third choice first, pin or paste these to your wall/board, order them putting similar concepts in the same group. Then have the group pass forward their second choice and finally their first choice. As these are all pinned to the wall/board read out the contents of each sheet. Have the entire group help with ordering and naming the various groupings. In the end your wall might look something like this:

OBJECTIVE: To promote an awareness of the National Park & the problems of destructive fishing techniques, as measured by a decline in bombing and/or increased enforcement over a 24 month period.

◆	❍	◻
Unique Beauty	**Rich Biodiversity**	**Source of sustainable income**
Scenic landscape [3rd]	Pristine reefs [1st]	Refuge for food fish [2nd]
Beautiful beaches [3rd]	Coelacanth [2nd]	Tourism [1st]
Unique [1st]	Dugong [1st]	

Step 4: Evaluate the group's work.

Using this greatly simplified example, the group sees the campaign having some key themes or messages; namely that the National Park is important as:

- A place of unique beauty
- A place rich in biodiversity
- A source of income for local people

Further, by looking at how many 1st, 2nd and 3rd ranked cards are in each grouping will indicate what the group thinks are the areas of greatest importance to THEM. So that the grouping "Rich Bio-diversity", has two 1st ranked cards, while "Unique Beauty" has only one. These key messages will form an integral part of the campaign and a questionnaire survey will help you to determine if the people share your views both before and after your campaign. Use a similar process to determine what ACTIVITIES you want to target audiences to DO.

9. Conduct Market Research

Step 1: Write a list of your actions and activities that you would like your target audience to do

Again, working with your group using the participatory approach come up with a list of actions and activities that you would like your target audience to do as a result of your campaign.

Where possible try to use positive or neutral statements, rather than negative ones. So for a housewife who purchases fish rather than saying, "Don't buy fish known to have been caught by bombing", write, "Buy fish caught by net or line". For a fisherman say "Adopt sustainable fishing techniques" or "Use nets and lines", rather than "Stop destructive fishing" or "Stop fish bombing". At this stage don't worry about the precise language of your statements, but try to come up with ones that can be measured. For example, while not easy it is possible to quantify the number of fish being sold in a local market that have been caught using "bombing techniques" as they often show scarring and lesions on their underside. By counting the fish prior to your campaign and again periodically during and after it, a decline in the number of bombed fish sold and a rise in those caught by less damaging techniques, is one indicator of the success of your work.

You have however made a number of important assumptions including who are your primary/secondary audiences; emotive keys; perceptions towards your target species and receptiveness to your campaign slogan. You MUST NOT take these assumptions as a given, rather before you commence your campaign you should conduct a market analysis/market research. This might include quantitative research in the form of a questionnaire survey of your target population, as well as a qualitative survey using focus groups.

RARE Center's manual *Promoting Protection Through Pride* recommends the use of Survey Pro, and includes demo disks. *Survey Pro* is the leading all-in-one survey software currently available. It can help you and the counterpart to design the questionnaire, analyse the data collected, and report on the survey's results.

SURVEY PRO 2.0 for Windows Personal License can be purchased from Apian Software, PO Box 1224, Menlo Park, CA, 94026. Or by calling (in US) Toll Free 800 237 4565, (fax +1 415 694 2904), for US$ 795 plus shipping and handing. [Price correct as of 1998]

The results of your questionnaire and or focus group meeting surveys will help you to design your precise campaign strategy, hone the identification of target groups, key messages, target species and slogans.

Your campaign strategy, the tasks you use and the materials you produce, will also depend in part on your objective, and in part, on your target group and where they live. Clearly in a site with very limited television access, focusing time and effort on this medium would be pointless; while in a site with high illiteracy the print media, and posters relying on extensive text will have little effect. In marketing, one size does not fit all, and you will have to tailor your campaign to fit your specific needs. Having said this there are some broad generalizations that we can make:

1: Rarely will marketing campaigns change deep-seated attitudes. It is difficult to imagine that an advertisement for alcohol is going to change the negative attitudes a mother may have if she has lost a child to a drunk driver. Marketing changes apathy. If you have not heard of a product, an advertisement can bring it to "centre-stage" and make you believe that you must try it. While it may appear that all around you people are negative towards the environment, think again. While the subsistence farmer and logger clearing your forests might have a negative view of conservation, the chances are that the "ordinary" people living in neighbouring town – teachers, nurses, sales clerks, taxi drivers, government employees -- may not have such rigid attitudes. They are more likely to be apathetic. In a democracy, elected officials are expected to represent the majority. If the majority of a population is apathetic toward the environment and the elected official appears to be so too, perhaps he/she should be commended, for they ARE representing the majority. Just because WE don't agree, does not make them wrong. In some countries, politician's decisions may be swayed by a rich

minority. For some, this is simply a way to get rich, but most also want to stay in power and to do this they use money to "buy votes" – to buy popularity. Either way, if many in the central "apathetic" group can be made to shift more towards conservation, politicians will likely follow. Marketing can effect such a movement.

2: It is easier to change knowledge than behaviour. No matter how good your conservation campaign you will never change everyone's behaviour (even apathetic people's behaviour). You will always change more people's knowledge than attitudes, and more people's attitudes than behaviour. Think about it; virtually everyone knows about smoking, yet not everyone has a positive attitude towards it, and even those that do have a positive attitude toward it, don't all smoke. Changing knowledge does not always change day-to-day behaviour. However, sometimes you don't need to modify everyone's behaviour to effect real change.

3: Sometimes perceptions are as important as reality. As we have mentioned, two of the reasons why marketing and advertising work so well are that they play on human emotions and generate real or apparent peer pressure. Mass advertising makes a product appear to be popular, even if it is not. A re-packaged brand (even with the same contents) will appear to be better. When perceptions and reality collide they re-enforce one another. If you see a new brand being advertised everywhere and then see a few people actually using it, you are left with the impression that you must be the only one not doing so – peer pressure kicks in. If a politician receives a sack-load of correspondence on a specific issue and then sees that same issue in the papers, on posters, being discussed in the public forum, he/she is left with the "perception" that it is a "hot button" issue, and what politician does not want to ride the wave of public support? Laws can be written that stop a specific behaviour that might otherwise continue. The US trade laws that prohibit the sale of tuna caught using nets which harm dolphins led to major changes in many of the world's tuna fishing operations. Politicians believed that there was massive support for taking this action.

4: It is far easier to change purely "social" issues than "economic" ones that are rooted in a person's livelihood. For example, unless there are alternatives, rigidly enforced laws or economic alternatives, a fisherman is unlikely to stop "fish bombing" as he relies on it to survive financially. His stopping littering on the other hand is unlikely to have dire economic consequences. Advertising will work best, when your "consumer" can afford to buy your "product".

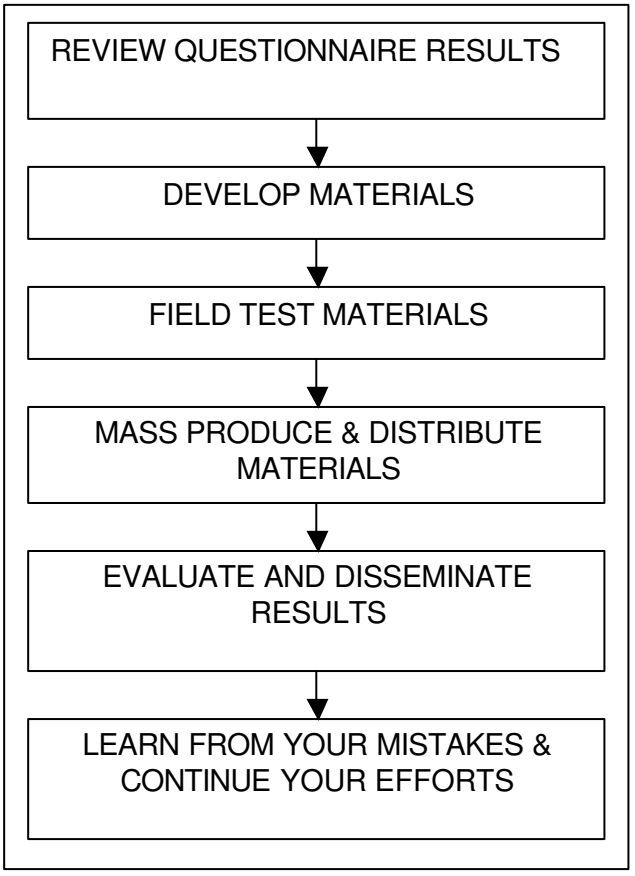
5: Nobody will hear you if you whisper. It's a noisy world out there. People have short attention spans and they are bombarded with calls for their time, resources, interest and support. If you stand at the back of the crowd whispering, you will not be heard. A marketing campaign can shout out your message so that it will be heard.

6: A campaign's success is proportional to the care that is taken in its development and implementation, and the resources that it has at its disposal. With moderate resources you must moderate your expectations of success.

To help you to begin to develop an effective strategy, follow these guidelines:

CONTEMPLATE:

Don't rush into material production and dissemination. Think about all the information that you have gathered and how it can be used effectively. Refer back to the results of your workshop/meetings that you might have held. Have in front of you a summary of your campaign objective, its key messages, the underlying barriers and a list of your target audience (primary and secondary). Also have on hand the results of your questionnaire analysis. Work with all of these to develop your strategy and the materials that you will use to communicate with.



Revise your key messages to reflect your findings. For example, you might find that respondents don't know the status of the protected area you are focusing on, and that this should be a priority key message. Or, they may already know about an issue that can then be deleted from your list, or given a lower priority. You can use your Survey Pro software to cross-tabulate responses, to hone your messages further. Your questionnaire results should also help you to confirm your campaign objective and target species, as well as target radio listening times, media preferences etc.

CAPTIVATE

Produce interesting materials that are going to be attractive and relevant to your target audience. Materials that will "captivate" them. If fishermen get most of their information from religious leaders, then produce a "sermon sheet". If kids are your target audience then produce a comic or puppet show instead. Here are a few examples of materials you might wish to consider. Note: This is not an exhaustive list:

🕮 School Song: [TARGET: SCHOOL KIDS] Simple songs reinforce lesson plans and make school visits more lively and interesting.

🕮 Posters: [TARGET: VARIED DEPENDING UPON CONTENT] Colourful posters can be widely distributed in communities throughout your target area – being placed in prominent sites such as supermarkets, bars, schools, health centres and government buildings. Here they can advertise your conservation message and its goal.

🕮 Puppet Show: [TARGET: SCHOOL KIDS] Puppets are a way of encouraging younger kids to participate in your campaign and are fun to make and use.

🕮 Costume: [TARGET: SCHOOL KIDS] In order to make any elementary school visit more lively and entertaining consider using costumes and theatre. Street theatre is also a good way to reach adults too.

🕮 School Visits: [TARGET: SCHOOL KIDS] Visit every primary and secondary school in your target area and to speak to as many children as possible. These talks serve to introduce local kids to your conservation issues.

🕮 Bumper Stickers: [TARGET: ADULTS] Bumper stickers serve as a visible means of promoting the conservation message and a way of attracting local corporate support thorough sponsorship. Distributed free to vehicles throughout the target area they are tangible evidence of community participation.

🕮 Art/Essay Competition: [TARGET: SCHOOL KIDS] Competitions serve to reinforce and build upon the activities of a school visit. The sponsorship of prizes serves to further involve local businesses in the conservation campaign.

🕮 Songs: [TARGET: YOUTH] Work with local musicians to produce at least one popular song for airing on the radio. This strives to take your message to young people who may have already left school.

🕮 Community Outreach: [TARGET: VARIED DEPENDING UPON CONTENT & GROUP] This might include a mix of talks and lectures to community groups, issuing press releases and preparing articles, and/or interviews for the radio and TV. The task's objective is to carry the conservation message to the wider community.

🕮 Environmental News Sheet or Comic: [TARGET: SCHOOL KIDS] Produce a monthly or quarterly news sheet or comic to furnish school children with follow up activities. This task also provides scope for corporate sponsorship and may be used to continue outreach activities into the future.

🕮 Sermon: [TARGET: ADULTS] Solicit the assistance of religious leaders, requesting that they present environmental sermons to their congregations.

🕮 Billboards: [TARGET: ADULTS] Billboards are a colourful, eye-catching way of attracting attention. Placed at prominent road junctions they can be seen by a wide cross-section of the local community, and also afford an additional opportunity for corporate sponsorship.

🕮 Legislation Leaflet: [TARGET: ENFORCEMENT OFFICERS] Produce a leaflet/booklet summarizing conservation laws, and distribute this to police officers throughout your target area.

🕮 Music Video: [TARGET: YOUTH] After recording a "conservation song" try making it into a music video for airing on local TV.

🕮 Farmers' Visitation: [TARGET: FRAMERS] Host meetings with pertinent farmers' groups and to use this time to emphasize the benefits of wise land husbandry, the need for sustainable development, the plight of the target species and promote the goal of your campaign.

🕮 Wildlife/Environmental Booklet: [TARGET: SCHOOL KIDS] The production of a booklet of your target area's wildlife provides schools and school children with supplementary materials and resources to reinforce their interest in conservation.

NOTE: Each of these are described in detail, in a step by step format in RARE Center's manual: *Promoting Protection Through Pride*.

ESTIMATE

Before you "jump" into material design and production, estimate the costs of producing them. It is no good going to a huge amount of time and effort to produce a comic if you don't have the funds to print it, or to print enough of them to be effective. Keep costs low and solicit funds from interested individuals, corporate sponsors, NGOs and government departments; as well as from foundations and international charities. Get help in writing a clear proposal – or use the one provided in RARE Center's manual.

RECIPROCATE

If a corporation, business, individual or foundation gives you help then reciprocate by recognizing their assistance. Write them thank you letters, include their logos on materials produced, and keep them informed about the progress of your campaign.

DELEGATE

You can't do everything yourself. Solicit the assistance (paid or volunteer) of others and delegate responsibility to them. Have musicians help you with a song, religious leaders with a sermon sheet, teachers and artists with a comic. If they donate their time, this can be given a "dollar value" and used as a "match" in your funding solicitations. Again remember to thank all those who help you.

INTEGRATE

Your materials should be linked by a common slogan and the use of your target species.

MOTIVATE

Your materials should be positive, inspirational and motivating using pride as the "emotive key".

CIRCULATE

Before going to press or distributing your materials, have them checked by people most actively involved with the task or your target group. Have teachers review and comment on your comic before it is published; have a preacher or Imam look over your "sermon sheet" before it is given out to the religious community. Take their comments seriously. Immediately prior to your campaign's launch field-test the final drafts with the target audience – have kids use the draft comic, have one church/mosque use the "sermon". Make any last minute changes.

INITIATE

Produce your materials and have them all ready to go at the same time. Launch your campaign amidst a barrage of media publicity. Hold a press conference or some other function – invite business leaders, community representatives, local politicians.

SATURATE

Remember that actually completing a task – say producing a comic – is only half the battle. Songs are no good if the CD remains in your office – they must be on the air; comics are no good on the shelf – they must be in use in the classrooms; sermon sheets are no use in this manual – they need to be in the preacher's hands; a billboard is no use if it is erected on a remote country lane.

A few posters, or a one-off comic, will be of far less use than thousands of posters or a regularly appearing publication. If you have to choose between a few issues of glossy magazine, or thousands of copies of a simple but attractive black and white pamphlet, go for the latter. Don't put up your posters now and then wait months before the next task happens, saturate the public with your messages. On posters in shops, on the air waves, in the churches and discothèques, in schools and communities throughout your target area.

REPLICATE

While the target audience is being pummeled by one round, begin developing the next. While your first set of billboards are fresh, use the time to solicit sponsorship of more. Photographs of the first series should help you in your cause. While the first set of puppets or comics make their round of classrooms, begin thinking about a second set. Within three months of launching your program, your message should be everywhere. Your target audience needs to be "hit" by a series of waves that target him/her and his/her peers. Each wave should re-enforce your key messages and use new innovative approaches. Try bumper stickers, costumes, posters, radio jingles etc.

NOTE: RARE Center's new Follow- Up manual, is available to all FORMER CEC sites and is accompanied by a small grants programme, for those interested please contact Paul Butler

EVALUATE

Evaluate your campaign, regularly. Use Survey Pro to conduct follow up questionnaire surveys. Compare the results and back-fill gaps. If children show a dramatic increase in knowledge over time, but farmers don't

then focus on the latter for a while with community meetings, etc.

DISSEMINATE

Disseminate the results of your surveys widely, to the press, your sponsors and local decision makers.

Success Is Hard To Prove

Note to Reader: Be warned that it is often difficult to "prove" that your outreach programme was the key to changing attitudes and behaviour, as your programme will not operate in isolation. For example if another group is promoting sustainable fishing technology by giving away nets and lines; or if enforcement is strengthened, then declines in the sale of "bombed fish" may be because of these initiatives rather than yours. Often it will be the case of "the straw breaking the camel's back" when everything comes together to effect changes in attitude and behaviour – the problem is quantifying which straw is the one that broke the back, the first or last? You can use a post-project questionnaire or focus group meetings to help answer this.

For example, you might ask the market owner why he or she thinks that less bombed fish are for sale and see what they say. If the answer "is because the police arrested the boat I usually buy from" enforcement will have been key; if the answer is "because I'm refusing to buy any as I saw a poster telling me it is wrong", then your education programme probably played a significant part. Even here it is difficult to be precise – was enforcement stepped up because the police saw your poster? Again you need to use surveys to evaluate your work.

INTERESTED IN LEARNING MORE OR ADAPTING THIS APPROACH TO SUIT YOUR OWN NEEDS

RARE Center, in collaboration with the University of Kent at Canterbury, is in the process of developing a Diploma course linked with RARE Center's work. The Diploma will initially be exclusively for leaders of RARE Center-approved Conservation Education. Eligibility criteria will be broad and flexible, but prospective students will normally be over 21 years of age and be at least at the level equivalent to students who have successfully completed Part 1 of a UKC undergraduate degree. However, they will have attained level 6 or more in the IELTS test (http//www.ielts.org) (International English Language Testing System co-coordinated by the University of Cambridge and the British Council) or equivalent, be computer literate, and hold a full, current driving licence. They will work for a relevant governmental or non-governmental environment or education agency in the country where their CEC will be based, and will have a suitable person (usually a senior member of their organisation) contracted to act as their 'mentor' during the placement period.

The programme aims to enable students to:

- Undertake the role of leader in successful conservation education campaigns
- Benefit substantially from higher level studies in the field of conservation education
- Become 'opinion formers' with the ability effectively to influence environmental conservation in their future careers

Diplomates should be able to:

- Select, and use effectively the skills and understanding developed during the Diploma programme, especially when dealing with real-life conservation projects.
- Evaluate the effectiveness of a programme of conservation education in achieving its predetermined objectives.
- Communicate effectively, in writing and in person, with:
  - individuals and groups who are the subjects of environmental education campaigns
  - bodies and groups of individuals involved in funding environmental education programmes
  - individuals and groups involved in government and other decision making processes of environmental protection significance
- Achieve an academic level, and a familiarity with academic study methods, that enables them to progress to study at a degree or master's level.

The programme will run full-time over 14½ months and will include two residential periods in the UK. The first of these will last ten weeks (at the start of the programme) comprising the six modules and non-assessed. This will be followed by an 11.5 month home-based project (5-day, 40 hour week with three week holiday). During this placement students will implement a Conservation Education Campaign in their own country and, while so doing, will complete a series of assessed tasks each forming part of, and linked to, one of the six formally taught modules. The second residential period held in the United Kingdom will be of two weeks at the end of the programme and will include the UK phase of the seventh and final module. It will include two assessed tasks and group workshops reviewing the course, campaigns and future possibilities. This period will also provide an opportunity for students to meet with representatives of international conservation organizations and donor agencies. The reason for the unusual length of the programme is to permit students sufficient time to complete the home-based conservation education project with its assessed tasks; and to allow an overlap

between the second period in the UK and the first period of the following cohort of students. During the 11½-month home-country based placement students will be trained and supervised by electronic conferencing and e-mail, supplemented by at least one, one-week tutor visit for one-to-one, face-to-face supervision.

The ten week period at the start of the programme (Trinity Term) will be an intensive period of university-based tuition covering six modules, plus induction studies and workshops in preparation for the placement. The two weeks at the end, will be a period of student presentations, assessments and project follow-up that comprise the final module. This second period will coincide with the last two weeks of the ten-week university-based period at the start of the following year's cohort, thereby enabling experiences to be shared and links made the two groups of students. A series of non-assessed workshops, not directly related to any of the modules, is timetabled during weeks 2-10 of the course. Their purpose is to help students acquire and practice transferable skills that they will need to carry out their CEC work while on placement.

During the 11½-month period that follows the ten-week UK-based tuition, each student will be placed as the local project co-ordinator for a RARE Center-approved Conservation Education Campaign in the student's home country. Using the RARE Center's manual '*Promoting Protection Through Pride*', students will work through a series of tasks, putting into practice skills developed in the 10-week university-based phase of the course. During the home-based project, each student will maintain frequent contact with their RARE Center tutor using e-mail and internet conferencing; and will be visited by a tutor at least once for a minimum of 5 days when student and tutor will work together on a one-to-one basis. This will normally be during the first three months of the placement. In terms of the credit structure, each of the 6 modules which run in the first UKC-based period, together with their associated placement tasks, will be worth a total of 15 credits. The final report and assessment module will be worth 30 credits. The overall Diploma programme will therefore be worth (15 x 6) + 30 = 120 credits and will comprise a total of 1,200 hours of study.

The ten-week taught component will concentrate on developing a knowledge and understanding of the module subject areas, together with training in those transferable skills appropriate to the successful completion of the CEC placement, as well as to the student's subsequent employment in tropical conservation education projects. University-based tuition will be by lectures, seminars, small-group practical assignments, workshops and visits to UK-based conservation organisations. Each module will involve at least 20 staff contact hours plus individual and group assignment work. Because a substantial emphasis will be placed upon students developing a range of transferable skills, the type of module assignments and associated student evaluations will vary considerably. Each module includes specific activities to be conducted during the CEC placement.

Additional seminars will be provided to help students with particular needs (e.g. use of English if not their mother tongue). Dedicated periods will also be allocated for individual supervision and tutoring during the taught period.

The Diploma will be graded as follows:

Diploma Pass. A candidate will be awarded a Diploma (pass) if s/he obtains an average mark of at least 40% AND a mark of 40% or more in at least 6 modules including the double weighted module (7).
Diploma Merit. A candidate will be awarded a Diploma (merit) if s/he obtains an average mark of at least 60% OR marks of 60% or more in at least 5 modules including the double weighted module (7) and not less than 50% in the remaining modules.
Diploma Distinction. A candidate will be awarded a Diploma (distinction) if s/he obtains an average mark of at least 70% OR marks of 70% or more in at least 5 modules including the double weighted module (7) and not less than 60% in the remaining modules.

Distinction level will be an acceptable entry qualification for progression to the UKC one-year MSc programmes offered by DICE at UKC.

Again, for further information on this course, which is scheduled to commence in April 2001, contact Paul Butler.

Environmental awareness and education in the Turks & Caicos Islands

Ethlyn Gibbs-Williams

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The concept of environmental education in the Turks and Caicos Islands began taking root just over twenty yeas ago. Spanning two decades, attempts at developing environmental awareness projects were sporadic, initiated and implemented through organisations such as the Turks and Caicos Development Trust, the Foundation for the Protection of Reefs and Islands from Degradation and Exploitation and the Department of Environment and Coastal Resources.

It was not until the inception of the Turks and Caicos National Trust that the development of a systematic environmental education programme proved to be a focal point. In 1996 the Trust re-established its Environmental Awareness/Education Programme with the launch of the Turks & Caicos rock iguana conservation project. Implementation of the project was based on a programme developed by RARE Centre – *Promoting Protection through Pride*.

It was through this project, and previous knowledge of the education system, that we came to the realisation of the limited resources on the natural environment available to teachers and students.

This assessment led on to the development of the National Trust's most recent environmental education project entitled *Our Land, Our Sea, Our People*. The objective of this project was to develop a programme using an integrated approach to offer school children of all ages in the Turks and Caicos Islands the opportunity to learn about their natural environment.

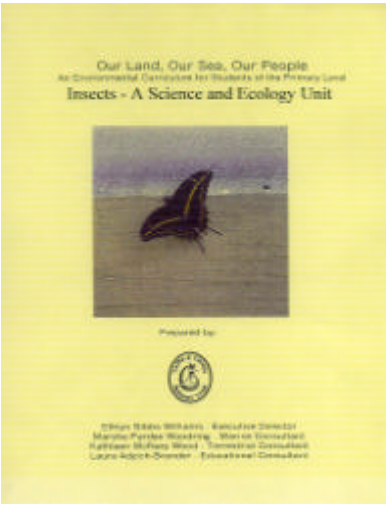
Preliminaries in the development of the project included a survey to assess the level of environmental awareness and the quantity and quality of resource materials available. The Trust was fortunate at the time, being short staffed, to enlist the help of students from the School for Field Studies Centre in South Caicos, who volunteered to conduct the exercise as a term assignment. Funding for the project was obtained with the help of UKOTCF through the Foreign & Commonwealth Office.

A review of the Social Studies and Science curricula for the primary schools in TCI was undertaken. Topics were selected and subsequently condensed into themes, which formed the bases for the modules.

A pilot study was conducted using one of the private schools in Providenciales. Teachers and students of the Providenciales Primary School tested materials and activities developed by the project.

Production of the modules began with the Our Land component. At that particular time, we had two projects running simultaneously, the other being the Public Awareness Campaign for the threatened species, the West Indian Whistling Duck. This project was supported by the the British Ornithologists' Union, RSPB, the Wildfowl & Wetlands Trust, and the West Indian Whistling Duck-Working Group. Hence the first module produced was Introduction to Birds.

The first three modules completed were distributed to schools. This we followed up with a teachers workshop. Teachers now have the use of all eleven modules, Introduction to Birds, Coral Reefs, Wetlands, National Parks, Sea Grass Beds, Mammals, Reptiles and Amphibians, Plants & Plant Communities, Insects, Sandy Shores to the Deep Blue Sea, Culture People and the Environment. (See below for a picture of the cover of one module.) Future plans are to review and update modules on a regular basis. The Trust of course will strive to maintain the good relationship that has developed with the Education Department, and we hope that at least two workshops per year focusing on the natural environment, protected areas and cultural heritage, could be organised in collaboration with the Department.



Environmental education and awareness on St Helena

Authors: Rebecca Cairns-Wicks & Isabel Peters
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On St Helena, Government and non-Government organisations recognise that there is a need to educate Islanders of all ages, about the environment and sustainable development issues. In the last five years or so there has been real change in attitude towards the environment, the result of local and external factors.

This talk will describe how environmental education and awareness on St Helena has evolved in recent years, and about developing environmental education in the future.

On such an isolated island of only 47 sq. miles, it is perhaps a little odd that many inhabitants know very little about their own environment. The environment was taken for granted, and there was no thought about sustainable management of resources. Conservation efforts lacked continuity.

Today, fewer young people are taking up professions in the fields of agriculture and natural sciences, and most of the island districts are becoming increasingly urbanised largely funded with money raised from overseas employment. However, people are beginning to turn to the countryside and sea for recreation rather than subsistence as leisure time increases.

Consequently, interest in the Island's environment has been stimulated by external concern for the conservation of the Island's biodiversity. As a result we have received technical information and advice, financial assistance and practical help from groups and individuals from abroad. Over time this has become the impulse for locally driven initiatives.

Events such as recent island-wide water shortage have raised awareness of the water relationships of the catchment areas. Other factors include:

- Increasing efforts needed to catch inshore fish leading to commercial fishermen being more willing to establish quotas
- The development of an integrated pest management project, which encourages farmers to reduce the dependence on chemicals for pest and disease control.

All have contributed to influencing the public's attitude to the environment.

Access to television and the Internet has increased Islanders' awareness about environmental issues in a global context.

Education is at the heart of influencing attitudes towards the environment. Our education system is based on the National Curriculum for England and Wales. This meant that examples to illustrate the physical environment and social history were based on the UK. The Education department is now addressing this so that wherever possible local examples have been included. Support for the teachers to achieve this is extremely important and the Environment Co-ordinator can provide this.

A recent visit by a WWF consultant highlighted the importance of providing support to teachers so that their experience and confidence to develop environmental education teaching practices can grow. Another benefit, which resulted from the consultant's visit, was the establishing of a website for the Prince Andrew School, which will provide an opportunity for pupils from the secondary school to share information and learn about environmental issues facing other parts of the world. This will also include taking part in the WWF's international *fish on the line* project.

In 1996 the government established the Advisory Committee on the Environment, which would be responsible for co-ordinating environmental affairs. Its purpose was to promote the use of sustainable policies and environmental practices island-wide through education, participation and planning, including the implications of policy and planning decisions. One of the key projects led by the

Advisory Committee has been the Millennium Gumwood Forest project, which has raised awareness of the environment and conservation of endemic species (see elsewhere in these Proceedings).

The Agriculture and Natural Resources Department is responsible for most of the practical conservation on the island. Visits to the nurseries and natural sites are popular amongst the schools.

Non-Government Organisations provide an excellent opportunity to promote awareness amongst the public. The four main organisations that are concerned with environmental conservation and associated issues are:

- The St Helena Nature Conservation Group
- The Heritage Society
- The Sandy Bay Environmental Centre
- The St Helena Dive Club.

These bodies are responsible for organising events such as environmental walks, increased access to information, and exhibitions, all of which are aimed at enhancing the public's awareness of environmental issues. For example, the Dive Club aims to encourage a spirit of conservation with respect to the underwater environment. The Heritage Society is managing a new museum project, which will be an excellent tool for both local people and visitors to the island. It is scheduled to open in 2002.

Finally, we have a responsibility for raising awareness on environmental issues. I have personally been actively involved for the past 18 years. Since my involvement we have been able to identify the existence of two endemic species which were originally believed to be extinct. They were one of the Gumwood tree family, which I found in 1983, and more recently the St Helena Boxwood. Both of these species have now been successfully cultivated locally and at Kew Gardens in London.

So… What about the future?

The continued development of the Prince Andrews School web site and the involvement of the WWF Fish on the Line project will provide excellent learning tools for everyone concerned. The ever increasing access to the Internet and developments in Information Technology will provide us all with a global view on environmental issues.

Non-governmental organisations are made up of committed and experienced individuals. However, their efforts would be greatly enhanced with better co-ordination and planning.

The establishment of a St Helena National Trust that can bring together the voluntary groups offers an exciting opportunity to achieve effective conservation. This is partly through joint working with Government and others, and consequently supporting environmental awareness and education. There is a need for non-government organisations to be more proactive, providing stimulating and innovative ways of educating people particularly the young. The establishment of a Trust office and employment of a Director could provide an important breakthrough in having the time to dedicate to action.

Developing partnerships between Non-Government Organisations, both here on St Helena and abroad, including sharing ideas on environmental issues on a global basis are all needed if we are to become more successful in educating people for tomorrow's world.

Raising awareness on wetlands of international importance in Cayman

Fred Burton

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Grand Cayman has a large mangrove wetland basin.

It is locally and internationally significant, and easily meets the criteria to be designated a Ramsar site. Environmental workers have been seeking to have it protected for a quarter of a century, at least.

The debate on this is rooted back in 1975, when our first development plan was drafted for Grand Cayman.

That plan proposed our Central Mangrove Wetland (CMW) be set aside, in a "protected mangrove" zone.

The government of the time put that draft plan out for public comment, at a time when ownership of mangrove areas was still unresolved. There was little attempt to secure acceptance from the people who felt that they might actually have some ownership rights in mangrove wetlands.

It proved politically explosive. Aspiring landowners marched, the government fell, and in 1977 a drastically revised development plan was adopted. It zoned the CMW for agricultural / residential development .

The vast majority of the wetland areas of Grand Cayman were subsequently registered in private ownership. It was a classic example of how environmental policy proposals, pushed forward without regard to public and stakeholder opinion, can backfire catastrophically.

Our Development Plan is supposed to be revised every 5 years. But for 15 years after that controversy politicians shied away from every attempt to review it. One government had fallen on land issues; nobody wanted to follow their steps.

Eventually, in 1992, our Planning Department began the first successful revision of our Development Plan. It was an admirable effort, on their part.

This time, public involvement was an integral part of the entire process. Committees were set up in districts throughout Grand Cayman, a central review committee set up with a broad range of stakeholders, the process was transparent and input sought at every level.

It was a two-year process, at the end of which a substantial document was presented to the Central

Planning Authority as the draft Development Plan 1994.

That draft included proposals to zone the CMW environmentally sensitive and environmentally protected.

But other, less transparent, forces were evidently at work. The draft plan disappeared from public view for many months, after which a massively reduced version appeared with environmental provisions systematically stripped from the text and maps. This was then presented to the public, as the culmination of the two-year development plan review.

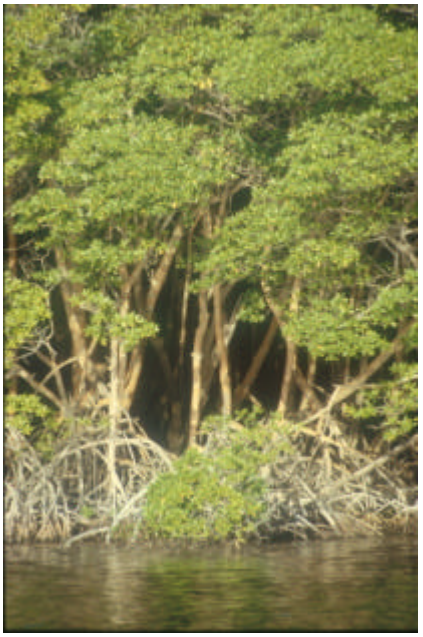
The National Trust for the Cayman Islands saw this as an undemocratic dismissal of two years' worth of public input on the environment. We decided to challenge it, and we launched a major public awareness campaign to that end.

We worked on the principle that given adequate information, people can and will make up their own minds about important issues. We felt that if we let the facts speak for themselves, the injustice of what had happened would be self-evident. So we presented lots of information, encouraged people to make up their own minds, and showed them exactly how to make their opinions count by writing to the appropriate authority.

We held district meetings; we made presentations to service clubs. We talked to every club, society, youth group, association or whoever would hear us, and most did. We went into schools. We did mass mail-outs. We wrote in the newspaper; we debated on radio; we appeared on television. We also met intensively with government at all levels, suggesting practical steps to fund the protection of the wetland in a way that would be fair to landowners. It was a bit like a RARE PRIDE campaign telescoped into a couple of months.

The entire staff of our Trust participated, nights, weekends, whenever we got the opportunity to speak. It was a mammoth undertaking for such a tiny group, and it stretched our human resources to the limit.

But as I said, we didn't aggressively advocate our particular point of view. We told people what the development plan review committee had originally recommended. We carefully compared that to the government's most recent version. We presented the scientific evidence on the importance of the CMW. We explained the process by which any member of the public could make formal representations on the matter. And we encouraged people to act, regardless of whether they agreed or disagreed with our point of view.



This strategy proved remarkably effective. We managed to galvanize a small but influential group of about 250 to write letters to the CPA protesting the removal of the environmental zones. Now 250 doesn't sound like very many, but at the time it was unprecedented.

We could have got many more people, if we had aggressively campaigned to get signatures on a form letter, for example. But the way we did it, the people who acted did not do so casually. We had a significant number of ordinary citizens who were prepared to stand up before the Development Plan Tribunal a year later, still saying they were outraged that the environmental zones had been stripped from the plan. When they spoke, they spoke as independent people with the conviction of their own opinions.

The Tribunal heard them, and heard the Trust at length. The Tribunal recommended the zones be reinstated.

With hindsight, that was a high point, after which the impetus, in public policy terms, faltered. We still don't have environmental zones in our development plan. So in that specific sense the campaign has still not reached its objective.

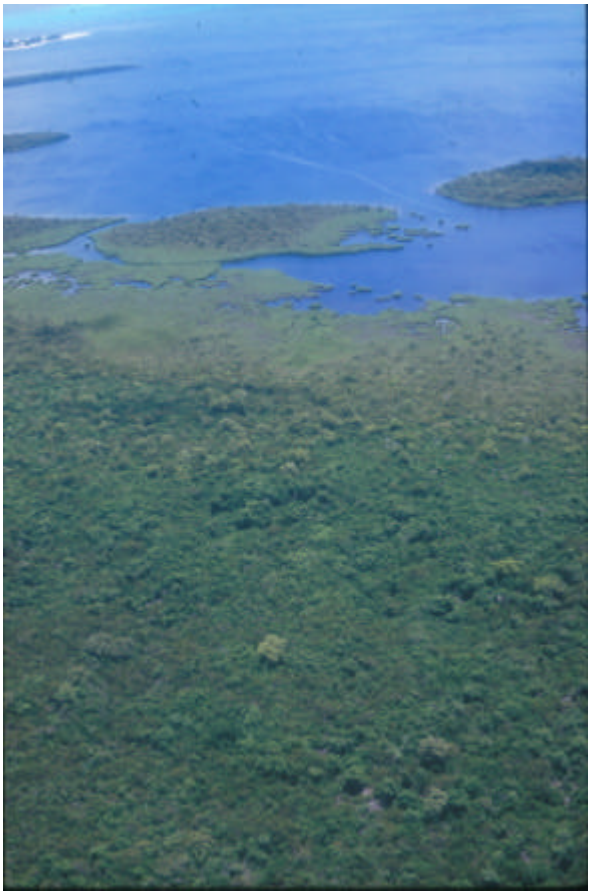
There is not time to go into that whole story, but part of the problem has been that the slow machinations of government policy change brought the issue back to the public long after the awareness campaign had faded in people's memories. We did not have the resources to do it all over again.

The delay also gave vested interests the time to organize and take the offensive, and interaction with this year's (2000) election campaigning has turned the whole issue into a political football.

One major underlying problem is that no acceptable mechanism has been established to pay landowners for loss of development rights in wetlands which are to be protected (see also elsewhere in these Proceedings).

But we are still much, much further ahead in public awareness than we were 5 years ago. The need to protect our Central Mangrove Wetland is now explicitly in the political arena. It is formalized in our National Strategic Plan, Vision 2008. It is taught in primary schools throughout the islands. All that might seem quite intangible, but it may yet have a powerful influence on the future. Awareness pays dividends in all kinds of unexpected ways!

We have learned the importance of staying close to the facts, and presenting the National Trust as a responsible organization, which takes carefully considered positions in the best interests of the people of the Cayman Islands. As this issue has become politicised, we have had our integrity put under a microscope. Our credibility and our motives attacked. But one thing really strikes me when reviewing this story so far: it really pays to get it right first time! We are still dealing with a legacy of mistrust and antagonism which started with the first attempt to protect the CMW in 1975.



Raising awareness: the experience of a large organisation

Martin Drury

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When the National Trust for England, Wales and Northern Ireland was founded in 1895 it was charged with the *promotion* of the preservation of places of historic interest and natural beauty, but it was also given the power to acquire such places and to declare them inalienable, a difficult word which means that we can never dispose of them or mortgage them and no one can take them from us unless, having invoked a special procedure, Parliament decides it is in the public interest that they do so.

From the beginning, therefore, we concentrated on acquisition rather than advocacy. We have conducted a few successful campaigns, such as that to protect Petworth Park from a potentially disastrous proposal for a four-lane by pass, but in general we have been practitioners rather than advocates, 'doers' rather than campaigners.

Until recently, therefore, our practice was to make our voice heard only when our properties came under threat. But, for an organisation with 2.7 million members, we have come to realise that this is no longer a tenable position. We cannot ring-fence our properties from the now recognised effects of climate change and pollution in its many forms. Over the last five years we have developed a research function to inform public statements on matters of environmental concern, but we take care to root all we say in our long experience of managing places in a way that strikes a balance between the conflicting interests of conservation, production, wild life and public access.

For example, we have developed and published an Agricultural Policy. We have published a number of leaflets on environmental issues, such as *The Management of Freshwater Fisheries, Nature Conservation in a Living Countryside*, which comprises four case studies about farming in ways that improve habitats, and *Valuing Our Environment.* The latter was a report which produced some impressive statistics demonstrating the value our conservation work adds to the economy of the south-western counties of England. The report showed, for example, that the National Trust is responsible for 43% of all tourism-related jobs in the region and that each of these jobs supports 9.5 jobs in other sectors.

We have used these statistics to influence the strategy plans of the eight Regional Development Agencies that have been set up by the present government. All but two now acknowledge that a responsible environmental strategy is an essential foundation for economic development.

We have used television, though far less than we would like, to publicise particular environmental projects, such as a long-term project to flood 15000 acres of the Cambridgeshire fens to recreate the wetland habitat they provided before they were drained for agriculture. The Dutch environmental charity, *Natuurmonumentum*, has been particularly successful in raising awareness through television.

We lobby ministers on environmental and heritage issues, for example, to prevent the closure of the small local abattoirs on which so many hill-farmers depend and whose survival is threatened by the cost of implementing new EU regulations.

In conclusion, I would like to mention some other ways in which we raise awareness of our work and its value to society.

West Wales and on the Norfolk coast we have adapted redundant old buildings to accommodate groups of children from the inner cities for a week at a time, during which they learn about wild-life and conservation and have a great deal of energetic fun.

We use incidents with an underlying environmental message to capture the interest of the media, for example, at Birling Gap on the south coast where are applying the principal of managed retreat to coastal erosion.

We publish a magazine which goes out to all our members three times a year and we publish *Trust Tracks,* a broadsheet for children.

In the summer months we organise Working Holidays for people of all ages and from all over the world to spend a week in the open air on tasks such as repairing footpaths, making fences, repairing dry-stone walls and clearing undergrowth in woodland.

We run a number of programmes for schools, such as the *Guardianship* scheme, under which a school or a class adopts a hedgerow or the bank of a stream or an old quarry and visits it regularly to study and maintain it. The *Arts in Trust* scheme brings groups of school children to a Trust property where they engage in creative activity with a professional artist. In South

Our commercial arm, National Trust Enterprises, uses its products and its commercial activities to raise awareness in a variety of ways. It markets our farm tenants' produce in our restaurants. It sells organically produced food in our shops and other items which carry an environmental message. Some of the cottages we let for holidays are powered by renewable sources of energy and are equipped with dry-compost toilets.

Walkers on the land in our care will come upon signs which explain the reasons for work that they encounter, such as erosion caused by the passage of feet or the restoration of lowland heath as a habitat for threatened species.

And finally, whenever we can, we deploy knowledgeable and enthusiastic people on the ground to talk to those who walk on or visit our properties and, with luck, persuade them to sign up as members of the National Trust.

Workshop on Producing Educational, Curricular and Awareness Material

led by Ethlyn Gibbs-Williams & Rachel Sharp

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The aim of the workshop was to lead people through the process and pitfalls of producing a wide range of educational materials.

What we mean by educational, curricular and awareness material – discussion of the many different forms that these materials can take, eg posters, tapes, glove puppets etc.

Participants' introduction – each participant said what they do and what experience or involvement they have had in producing educational materials

Key Points in developing programmes and resources

- Identify need for the materials / resource
- Clarify objectives and main message of the resource – what do you want to achieve?
- Identify target audiences – this will change the tone / feel, language and cultural acceptability or hooks to make it locally relevant
- Identify funding source – this will limit what you are able to do

Activity: participants chose from a range of resources and decided who the target audience was, what tone had been adopted (Thames Water Big Book, Farming and Wildlife Calendar, Litter posters, Wildlife Clubs of the Seycelles booklet, Ascension Island Wideawake Terns leaflet, Environment Agency Pollution Detective Children's Magazine and RSPB CD roms conservation issues in Wales). These resources were aimed at a range of audiences from young children with a curriculum focus to information for farmers; some resources aimed to shock and disgust while others were supportive and fun.

Discussion: The group discussed the following issues:

- the integrity of data using examples of bird decline and herbicide use, the need to include source and date, and to differentiate between opinion or fact.
- Balance – a range of views should be covered on controversial subjects; a good example of this is the website www.foodandfarming.org.uk that helps young people to think about issues both local and global by representing the views of many varied organisations on a single topic such as genetic modification of food.
- Use of images – inappropriate images can undermine text; care should be taken to represent all sectors of society
- Values and attitudes – good educational materials stimulate students to think about their own values and opinions on a particular matter; students think about their role; they can also promote communication skills, critical thinking and problem solving.

Process of producing a resource:
Ethlyn Gibbs-Williams stressed the need for participation of teachers / end-users in the production of resources. Ethlyn used the Turks and Caicos National Trust '*Eco-Echoes*' children's magazine to illustrate how teachers and parents had helped to evaluate and promote the magazine. This was integral to the success of the resource.

Activity:
Each group was given a scenario and had to produce a creative brief for a resource that would meet the need outlined.
Eg Fishermen are harming the delicate marine environment through illegal fishing practises. Budget: $15,000.
The groups fed back their ideas and discussed the pros and cons of different types of resource, how they would distribute them, monitor and evaluate them.

Useful materials: A voluntary code of Practice – supporting sustainable development through educational resources. Published by DETR [since renamed DEFRA]. Available free on their web site www.environment.detr.gov.uk/sustainable/educpanel/index.htm

Children's workshop on "Animal Adaptations"

led by Paul Linares, Jim Stevenson & Ijahnya Christian

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The purpose of this Workshop was dual: to provide a workshop for some of the local schoolchildren, and to give conference participants the chance to try running workshops for schoolchildren, in this case of about 10/11 years old.

Paul Linares, who is an active volunteer with GONHS, organised a whole day session for a local school party in the Botanical Gardens. Most of the morning was spent recording the children's own observations of the plants, birds and animals in the park. In the afternoon they were joined by Ijahnya Christian from the Anguilla National Trust and Jim Stevenson from the Royal Society for the Protection of Birds (RSPB). Both had bravely volunteered to help in leading the afternoon session, which would culminate in a stage performance by the children at the conference venue in the evening.

By lunchtime, Jim Stevenson, who is used to working with large audiences, was beginning to hyperventilate at the prospect of working with children he had never met; with adults he hardly knew; in a place he had never been; with a view to putting on an un-rehearsed stage performance, all in one afternoon. On the other hand, Ijahnya, as always, was perfectly calm and assured.

Jim Stevenson reported: "All worries were soon dispelled when we met the children who were absolutely delightful. We introduced ourselves, and the children were fascinated to learn about Ijahnya's home in Anguilla. I did a couple of activities about birds which use glove puppets and other props. Then we played a succession of short games, including a migration game and a food-pyramid game, before going into the little environmental park that is based around a rescue centre for animals confiscated from the pet trade. Paul and his colleagues have built this entirely in their own time, and raised the funds."

The advantage of using a "mini-zoo" was that the children could see a selection of birds, mammals and reptiles up-close and study their adaptations. The children were split into 3 groups, led by Paul, Ijahnya and Jim. All three groups toured the zoo to look at the physical and behavioural adaptations exhibited by each animal and then each group was allocated a specific task.

Ijahnya's group wrote and rehearsed their own calypso about the iguanas in the zoo and in their wild home.

Jim's group used clay, sticks, stones, feathers and leaves to build their own animals that they had to design according to where they live, what they eat and who their enemies are, while Paul's group worked on posters and banners.

Delegates from the conference who visited the project in the afternoon found a happy and enthralled group of children, covered in paint and clay, working with almost no supervision. It was quite apparent that this was very much a mixed ability group, with some excellent writers, and some good artists – and they worked together in such a way that everyone contributed fully. This was partly due to the fact that the activities were quite open-ended and could be carried out on any level.

At the evening performance to the full conference, the children excelled themselves by repeating some of the early activities on birds, performing the calypso and introducing the animals that they had designed. Each pair of children held up their "beastie" and explained its colouration, its courtship, its defence mechanisms, its diet and its habitat.

IGUANA CALYPSO
(to the tune of Caribbean folk song Mathilda)

(Chorus)

Iguana, iguana
Iguana come from Venezuela
To Gibraltar
(repeat)

One day I'm sitting in the sun
Like a nice iguana gentleman
Next day I'm inside a knapsack
Across the ocean

(Chorus)

Well 1 survived a hurricane
Lighting, thunder, wind and rain
Floated on logs 'cross the water
To reach Anguilla

(Chorus)

1 want to be left alone
In my warm tropical home
Please don't buy me for plenty money
Or you'll be sorry

(Chorus)

The exercise demonstrated that an extremely successful and enjoyable learning experience could be had outdoors in an unfamiliar place providing:

- The leaders are well prepared or very experienced.
- There is a range of prepared activities on offer, some of which can be abandoned if they do not work.
- The activities allow for all ability levels, involving creativity and play as well as writing and numeracy.

The games and exercises used were adapted from the following sources.

The RSPB Wildlife Explorers kit includes *"Design a bird", "Migration game", "Big bird, Little bird"*. It is available to club leaders in the UK only, but it can easily be replicated and the RSPB and Wildlife Explorers have a range of materials for teachers and leaders on their website: www.rspb.org.uk/education/default.htm and www.rspb.org.uk/youth/

Joseph Cornell's first book, *Sharing Nature with Children*, has been published in over fifteen foreign languages and is used by parents and teachers all over the globe. Sharing Nature Worldwide is an international association worth a visit. www.sharingnature.com

Project WILD is one of the most widely-used conservation and environmental education programmes among educators of students in kindergarten through high school in Canada and the USA. They have some excellent field activities and games. Visit www.projectwild.org

Look out for a new guide on Wetlands from the West Indian Whistling Duck Working Group, to be published in August 2001. This has a huge amount of useful material culled from a wide variety of sources (www.whistlingduck.org).

Update on the "West Indian Whistling-duck (WIWD) and Wetlands Conservation Project"

Patricia E. Bradley & Lisa Sorenson

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The West Indian Whistling-Duck Working Group

(WIWD-WG) is a group of the Society of Caribbean Ornithology. For the past 4 years, the group has been working to reverse the decline of the endangered West Indian Whistling-Duck, a Caribbean endemic, and to make it a "flagship" for wetlands conservation in the region. As part of our region-wide Public Education and Awareness Programme we have developed and distributed a number of educational tools on the WIWD and the importance of wetlands in general. We have Island committees throughout the ducks' range in the Bahamas, Turks and Caicos Islands, Cuba, Cayman Islands, Jamaica, Dominican Republic, Puerto Rico and Antigua and Barbuda. We conduct workshops for natural resource agencies and schoolteachers on the use of our materials and are now at the final editorial stage of preparing a wetlands education teacher's manual for schoolchildren of all ages, to be produced in English and Spanish. The WG also provides training to regional biologists in waterfowl population survey and monitoring techniques, and has awarded funds to individuals in several islands for surveys of WIWD populations and identification of important wetland habitats for protection.

Grants have been received from U.S. Fish and Wildlife Service Western Hemisphere Program, Ducks Unlimited Canada, Conservation International Bahamas and the American Bird Conservancy. And Royal Society for the Protection of Birds (RSPB) has provided travel funds for all the UK Overseas Territories delegates (Anguilla, British Virgin Islands, Turks and Caicos Islands, Cayman Islands, and Montserrat) to attend an SCO meeting, contributed to the WIWD and Wetlands Education Workshop, and given editorial time to the production of the workbook.

Public Education and Awareness Programme Productions

"*Ducks of the West Indies" Hunter Identification Card*.—Using illustrations from Herb Raffaele's new Birds of the West Indies book, graphic artists at Ducks Unlimited's Oak Hammock Marsh assisted us in the design of this durable plastic identification card for hunters and birders. Two thousand cards were published and WIWDWG Island Representatives distributed them to be used in hunter education programmes.

WIWD Conservation Button.—Both English and Spanish versions (1000 each) of a WIWD conservation button were produced with an WI Whistling-Duck and "Keep the Whistlers whistling!" (English version) and "Yo (heart symbol) Yaguaza!" (Spanish version).

Wondrous Wetlands of the West Indies.—Wetlands education resource book for teachers and educators is nearing completion with the Royal Society for the Protection of Birds (RSPB) giving design, layout and final editing expertise. USFWS Partners-in-Flight Program will fund the translation into Spanish and contribute towards publication costs of the Spanish version of the workbook. The workbook will be the only resource on Caribbean wetland ecology and the many values and functions of local wetlands. Each chapter contains background information and a number of classroom activities designed to reinforce learning of the concepts presented in the chapter.

Other materials.—Other educational tools we have distributed include a slide show for the general public, hunters, and secondary-age students, a puppet show ("Wetlands are Wild") and WIWD colouring book for primary-age students, coloured posters promoting the conservation of the WIWD (for more information on these materials please see *El Pitirre* 11[1]: 19-22 and *El Pitirre* 11[3]: 126-131), and binoculars. We conduct workshops for natural resource agencies and schoolteachers on the use of our materials. Please contact Lisa Sorenson or Patricia Bradley for information on holding a workshop in your country or to receive copies of our materials.

The WG is planning to publish a *Fauna and Flora of the Wetlands* field guide through a USFWS small project in 2001. This will serve as a reference for the workbook but will also stand alone. Our long-range aim is to see that a Wetlands Education Unit (comprised of the materials we have developed)

becomes a permanent part of every school's science curriculum in each of our target islands. Island Representatives are working with their Education Department personnel to reach this goal.

Research and Monitoring, Legislation

Our second objective is to continue assisting local biologists with surveys and monitoring of WIWD populations and in the establishment of a long-term monitoring programme in Cuba, Jamaica and Antigua/Barbuda. Knowledge of WIWD population levels and habitat use are crucial in making management plans, setting priorities for habitat conservation, and ensuring that areas providing the WIWD with quality habitat year-round are protected. We also work with NGOs in the host countries advising Governments on local conservation and hunting legislation and in encouraging Ramsar site declarations. Cayman Islands, Jamaica, Turks and Caicos Islands and the Bahamas now have internationally protected wetland sites.

Section 3: Information & Networking

Part of the screen resulting from a search in the Conservation Priorities module of the UKOTCF web-database

The Forum's web database project

Mike Pienkowski & John Wheeler

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In this combination of presentations, we hope to do several things:

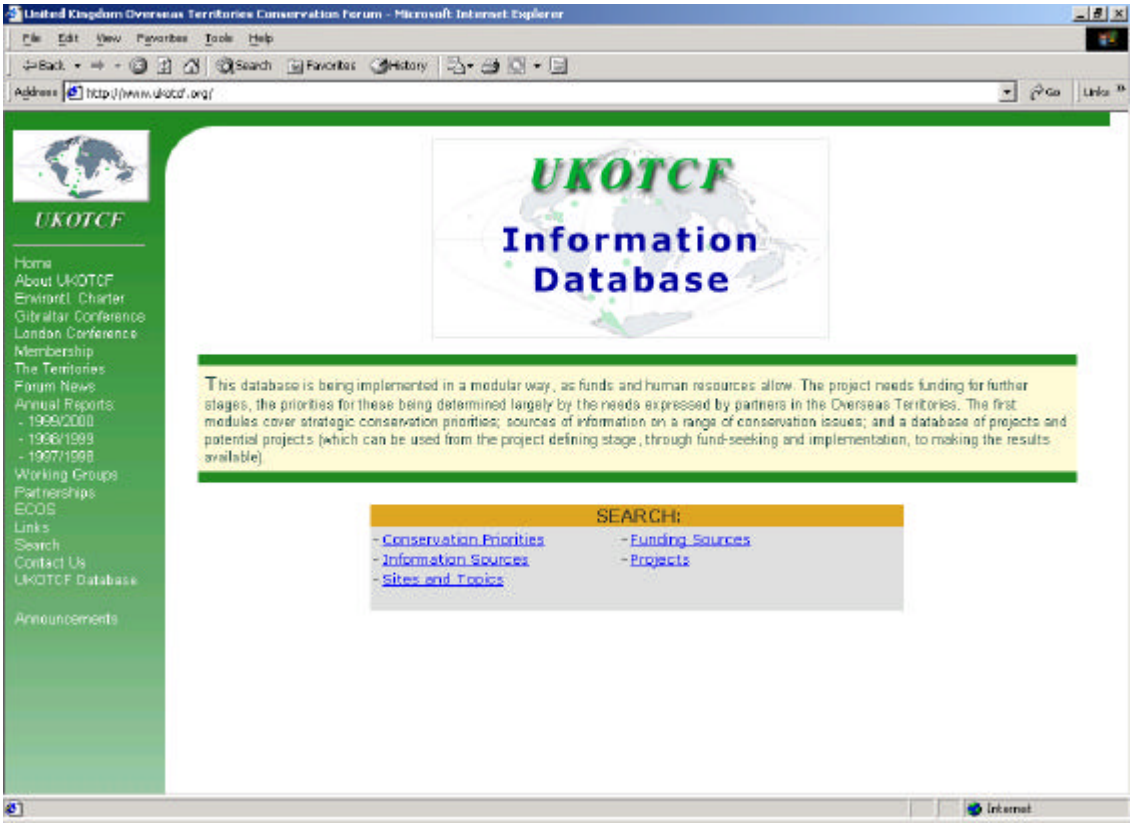
- introduction the Forum's database and explain its purpose
- demonstrate a few aspects of the database and how it may be useful;
- invite comments on future priorities (and sources of funding)
- train those partners who are interested in adding information to the database.

In the published version, it is not really practicable to demonstrate the database. However, readers should look themselves; the information included is accessible by the public. Go to **www.ukotcf.org** and click UKOTCF database on the side-menu – then explore.

Neither are we able to include here the workshop on adding information. However, a main feature of the design of the database is to enable Forum partners to share information and experience with each other. This means that we want partners to learn how to do this; the wider the involvement, the greater the value. For those Forum partners wanting to arrange training, please contact pienkowski@cix.co.uk

Why have a web-based database?

Overseas Territories generally have limited local resources to support environmental work. Distance makes visits (inward or outward) expensive. An increasing amount of essential information and advice could be made available electronically. Proper systems minimise the calls on over-worked people. An effectively designed database can spread best practice and share experience on issues that different OTs have in common.



Some examples issues

- tourist and other developments affecting the environment;
- local planning procedures and using EIAs;
- damage to coral reefs;
- invasive species;
- preparing local environmental educational material;
- the effectiveness of local environmental NGOs;
- developing sponsors for projects;
- raising the profile of environmental issues in the local media and with politicians;
- preparing project proposals;
- carrying out species and habitat surveys.

Some potential users

- OT environmental NGOs
- OT Governments
- OT schools and education departments
- UK conservation NGOs
- UK Government
- International organisations
- Researchers
- Potential developers
- Funding bodies
- News media

Implementation choices

The database is integrated with the Forum's existing "static" web-site (www.ukotcf.org), because some information is handled better as static pages and some as a database which can be interrogated.

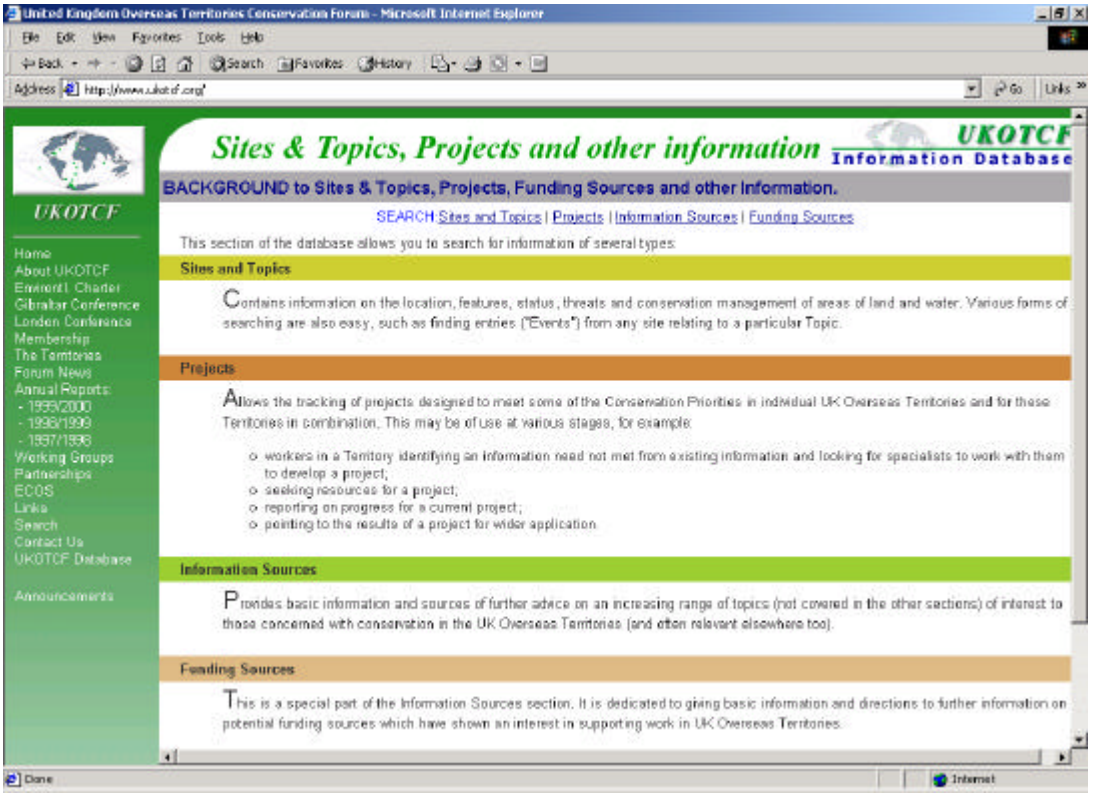
We are implementing the database in a modular way, as funds and human resources allow. This means that some modules are working without having to wait for the entire system – thereby avoiding a problem which has plagued computerisation in many governmental systems.

Priorities are determined largely by the needs expressed by partners in the Overseas Territories The Foreign and Commonwealth Office and the donation of major voluntary time have supported the initial development phase. A very widely drawn consultative group was involved by email in the planning.

An inclusive approach has been taken to content. Data-entry by partners in the OTs and elsewhere is encouraged, once they have received guidance or training. The database design allows for checking of the entries from partners before they are accessible on the public site.

Existing modules

The first modules to be implemented are outlined below.



Conservation Priorities

Priorities identified by conservation bodies in each UK Overseas Territory. These are based on a study originally undertaken by the Forum in 1994-5 and published in 1996 as *UK Dependent Territories: a Conservation Review* (a study supported by UK Government's Darwin Initiative). The database provides an opportunity to review these priorities more regularly. Several UKOTs have already taken this opportunity, and updates are marked as such in the database. Updates for other OTs would be welcome. Because data-entry into this section of the database is slightly more complicated than for the others, amendments can be submitted as annotations on printouts, if easier.

These identified priorities give a starting point for the identification of key project activities (see below).

Information Sources

provides basic information and sources of further advice on an increasing range of topics of interest to those concerned with conservation in the UK Overseas Territories (and often relevant elsewhere too).

The screens copied as illustrations to this article give an example of a simple enquiry using this module of the database. These screens were generated by the following actions:

1. Browse to www.ukotcf.org and click "UKOTCF Database" on the side menu when the site is reached.

2. Click "Information Sources" at the bottom of the main screen.

3. Click "Information Sources" on the SEARCH line at the top or bottom of the Background Information screen.

4. Select "International Conventions" in the Subject Category. Do not select or enter anything in the other search options. Click Submit.

5. On the results screen generated, click on the title or summary of interest, to generate the details of that record.

Other modules can be interrogated in similar ways.

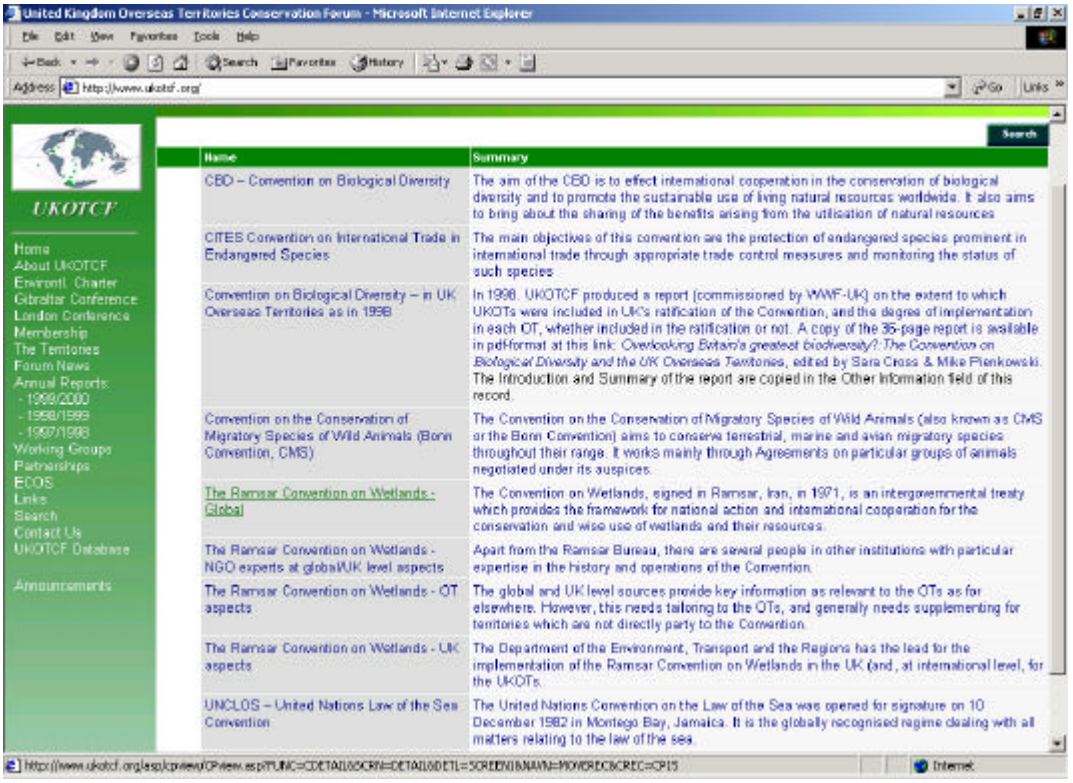
Projects

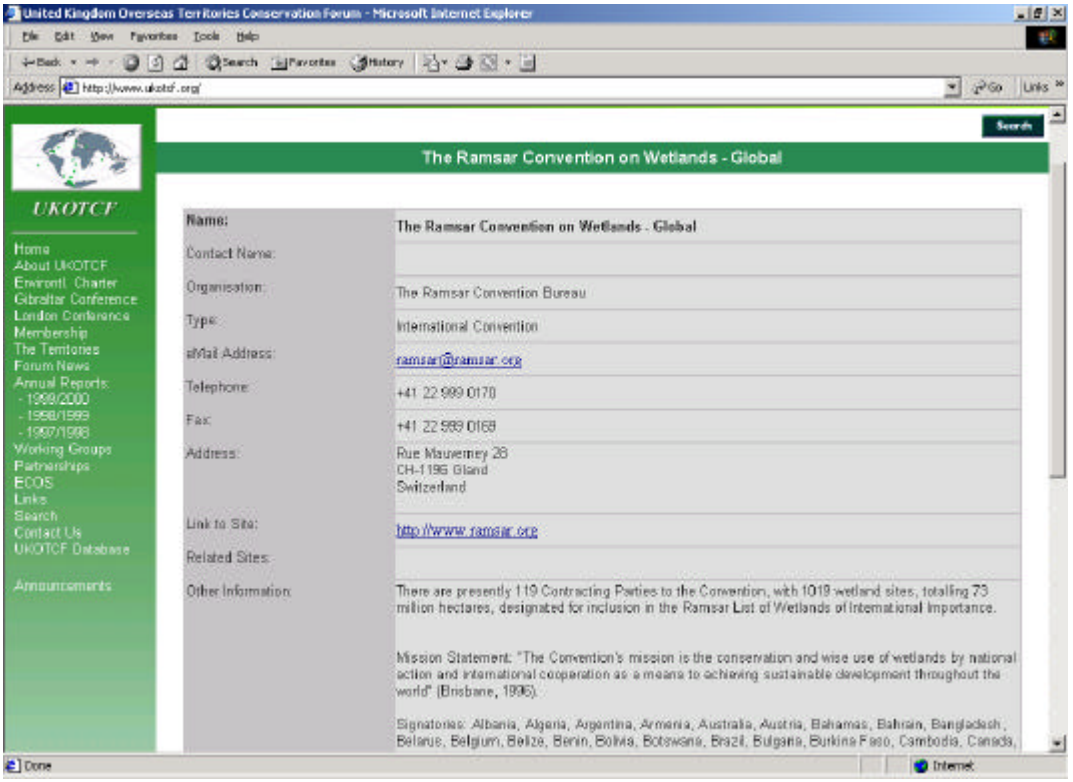
allows the tracking of projects designed to meet some of the Conservation Priorities in individual UK Overseas Territories and for these Territories in combination. This may be of use at various stages, for example:

- workers in a Territory identifying an information need not met from existing information and looking for specialists to work with them to develop a project;
- seeking resources for a project;
- reporting on progress for a current project;
- pointing to the results of a project for wider application.

Funding Sources

a special part of the Information Sources section. It is dedicated to giving basic information and directions to further information on potential funding sources which have shown an interest in supporting work in UK Overseas Territories.





Next priorities

UKOT workers have indicated a number of priorities they would like to see included in the database. These include the following.

Sites database, to monitor site-related issues, aiding information decision-making, public participation and reporting for international commitments etc. (FCO have since announced support for this module, and its development is in progress. The Sites and Topics module will:

- record areas of conservation interest to raise awareness of their value and facilitate protection measures
- encourage open consideration of development proposals by planning authorities and the participation of local people by making information readily available
- assist in compiling the reports required under international conventions
- help in management of important areas
- help exchange information on best practice between UKOTs (and elsewhere)

Literature. Most of the studies made in OTs are not available to OTs. This could provide a means of tracking the available published and 'grey' literature.

Basic ***contacts information*** on organisation and responsible officials in each OT.

Biodiversity database. Where the OTs do not have capacity to house such data themselves; data could be repatriated at a later stage.

A major part of the Forum's fund-raising need is to seek sponsorship for the funding of the use and maintenance of these and other modules.

A web in the real world – and one of the things that our web-database is designed to help conserve

GIS and mapping

Fred Burton

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Biodiversity data is inherently geographic. It is not much use having a database of all your endangered creatures that you need to protect, if you do not know what habitats they occupy and exactly where these habitats occur.

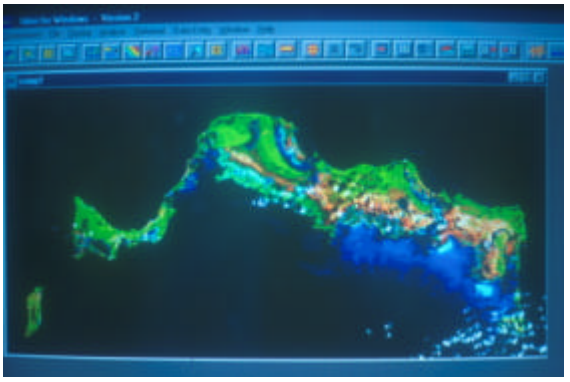
If you are trying to plan protected areas, you need your biodiversity on a map. If you want to sample biodiversity, the better the habitat map you have, the better you can plan your sampling strategy.

In short, anyone working in biodiversity conservation needs maps. And map-making is going through a revolution, thanks to the advent of digital technology.

What I am going to talk about today is a process I have gone through in the Cayman Islands, and am now working on again for the Turks & Caicos. In both cases, while there are paper maps of various kinds, some of very high quality, there were no maps showing terrestrial habitats with the kind of detail we need for planning biodiversity conservation.

There is rather a bewildering array of images available these days, which theoretically can be used for this purpose. There are aerial photographs which can be digitised, and there are quite a lot of satellite systems imaging the earth, including Landsat, SPOT and some Russian sources. For mapping dry forests and mangrove wetland communities, the most cost-effective option in my opinion is currently still Landsat. An up-to-date Landsat image with 7 spectral bands and another higher resolution monochrome image, now costs under 1,000 US dollars. Here is a monochrome Landsat image of the Caicos Bank…

And here is a false colour composite from the same image, based on the visible red, near infra-red and far infra-red bands:



You can see lots of lovely data here, different vegetation communities and so on, and there's also information on the shallow marine environment. If we wanted to look at the marine environment, we would probably be better off using a different combination of spectral bands, or better still a SPOT satellite image.

But you can also see the number one problem for this kind of imagery, and that is cloud. You loose information not just from the cloud, but also from the shadow the cloud casts on the ground or sea. It is worth going to a lot of effort to identify an image with least cloud over the area you wish to study! NRSC in the UK is one good place to go for images, they can help you search for what is available and give you advice.

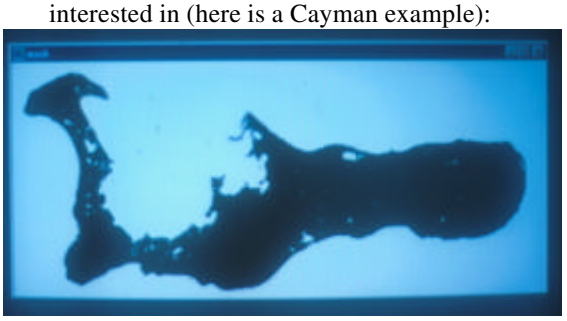
So what do you do with an image like this, to turn it into a useful map? There are 4 elements: you need to process the image to yield the information you need, and you need to georeference the image, so that it fits on to the coordinate system your local maps use. Then the most important and time consuming step of all, you have to get out there on the ground, to find out what those coloured patches on the map really represent! Finally, you take the field data back to the map, and fine tune the map so that it matches useful habitat distinctions you can identify on the ground. Ideally, you go on to a 5th step, and check the map against new sites on the ground to systematically assess how accurate it is.

There are several options for satellite image processing, depending on how much money you have, whether you have expertise available, and so on. Software ranges from the state of the art stuff from ESRI which runs at tens of thousands of dollars, to the lowly but remarkably effective package known as IDRISI, which sells for under $1,000.

I have been using IDRISI. It is not really difficult, but you do need to learn the tricks of the trade, or else send the image off to someone else who already does.

Some of the steps involved are:

- creating masks to exclude the areas you are not interested in (here is a Cayman example):



- creating a colour composite from the unmasked portion of the image, and running that through a classification routine, which in this example splits the image into several major habitat types:

- making new masks to show only one major habitat at a time
- classifying each major habitat independently to tease out as much apparently meaningful detail as you can from the image:

What you end up with is a DRAFT habitat map, but unless you already know the area very well, the map has no key!

Georeferencing the image is a heavily technical subject, but if you want you maps to be compatible with you local mapping system, it has to be done. At its simplest, you need your local Land & Survey Department to give you local map coordinates for about 10 points which can be clearly identified on your satellite image. They need to be well spread around the image area. Road junctions and sharp coastal points are good.

Read off the corresponding row and column numbers for the same points on you image. Feed them all into the software, and it will "rubber sheet" transform the image to register in the local coordinate system.

Now you can stick your cursor in the middle of that mystery habitat patch, read off the coordinates, and you're set to go out there on the ground. Or maybe, not quite… you need some way of knowing your position in local coordinates. Enter the GPS.

Now the best news for a long time is the fact that the US military has removed what it calls "selective availability" from the GPS system, so a simple handheld GPS is all you need to fix yourself within a single pixel [perhaps 30m x 30m] of that satellite image. Before that, we used to have to hulk around a heavy and very expensive kit like this:

GPS systems can be set up to read in all sorts of coordinate systems, but chances are they will not have

your particular system, especially if it is a small island that we are talking about. So in that case, go visit several of those same road junctions, coastal points or whatever with the GPS, set up in UTM (Universal Transverse Mercator) projection say, with the default WGS datum. It will not read right, but it will read wrong in a consistent manner. You can average the "error" in northings and eastings, and most decent GPS systems will let you use this to programme a "custom datum" so that you machine will read directly in local coordinates.

Now you're really set: you can use the GPS to go systematically into each habitat zone identified in your draft map, and record what is actually there.

Remember the satellite sees vegetation and sometimes the ground, not animals. So to interpret the image you need to be looking at vegetation communities. What I did in the Cayman Islands was a thorough, semi-quantitative record of ALL the vascular plants present at each of several hundred sites throughout the three islands. It took a stalwart assistant and I three months in the field. The level of detail you go for has to be constrained by the time, human resources and funding you have available, but you need access to enough plant identification skill to at least record the dominant canopy trees or shrubs present at each site.

As you work through the fieldwork, you will start to see discrepancies with the satellite map. Maybe areas that seem different on the satellite map prove not to be significantly different on the ground. In that case it's easy to combine the areas on the map. Maybe you notice different habitats, which the satellite image has failed to distinguish. In that case you need to go back to the classification and try to extract the extra information.

At the end of the process you should have a map that tells you a great deal about what is there on the ground, in vegetation terms. And of course, lots of endangered species, both plant and animal, will turn out to be restricted to certain habitats, so the maps then provide a framework for mapping the distribution of priority species.

If your local government has digital land ownership maps, road maps and so on, then you now have the chance to put your map into a Geographic Information System, or GIS. The Cayman Islands Government has a nice digital Land Information System, which is run in ArcView. Because the satellite map is georeferenced in local coordinates, I can now combine it with other digital maps to show land ownership, roads, coastlines, houses and so on (here are some examples).

The implications for protected area planning are obvious.

Cayman's National Trust did all this with a substantial grant from the British Government through WWF-UK. TCI's National Trust along with the UKOTCF is doing something a bit like this as part of a Darwin Initiative project on Middle Caicos. This sort of baseline work is so important for biodiversity conservation planning, it should always be possible to find international funding for islands which still lack adequate habitat maps.

The potential spin-offs are many. In Cayman, we expect to use this data to plan our national protected areas system plan. We will use it to assess the status of all our indigenous flora. We are already using the maps as a framework for studying the distribution of parrot nesting on Cayman Brac. They provide our first baseline for measuring rates of deforestation, and are valuable in management planning for our existing protected areas.

When I started conservation work in Cayman, I found myself manually tracing, scaling and subjectively interpreting habitat maps, from prints of aerial photographs. It was the only way available at the time to map our proposed protected areas. It was slow, inaccurate, and limited. The difference satellite imagery and GIS has made to the quality, scope and efficiency of our work, is substantial.

Biodiversity Recording and Planning: Bermuda

Anne F. Glasspool, Wolfgang Sterrer, Jack Ward, Heather De Silva and Joseph Furbert

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Introduction

The isolated island chain of Bermuda, the oldest of the UK Overseas Territories, is located in the Western North Atlantic, 965km S.E. of Cape Hatteras. The islands are situated on the southern rim of the largest of three steep-sided mounts. Originating through volcanic activity 110 million years ago, these mounts rise from depths of about 4,000 m to form a total platform area of approximately 1,000 km^2.

Of great biological interest is the northerly extension of subtropical systems to this latitude, a direct result of the transport of the warm waters of the Gulf Stream. Boasting the northern-most coral reef system in the world Bermuda is biotically linked with the islands of the Caribbean and the south-eastern United States. However, it does support a much reduced species assemblage, with only about one third of the shallow-water coral species recorded from Jamaica and a relatively depauperate terrestrial fauna.

Like many of the islands in the Caribbean, Bermuda's economy, through tourism, recreational activities and international business, is nowadays intrinsically dependent on the health of its natural habitats. However, with a resident population of 60,000 inhabiting a total land mass of 50km^2, and entertaining 500,000 visitors a year, Bermuda is one of the most densely populated places on earth. Fuelled by strong economic growth, the pressure for further development poses an escalating threat to the fragile ecology of the island.

Bermuda's attractiveness as a natural laboratory explains the wealth of scientific research conducted on the island, particularly over the last century. Over 3,400 scientific documents have described the island's natural history, and over 8,000 species have been recorded. However, with no central clearing house, most of this information is widely scattered and of little use to resource managers, land-planners, conservationists, educators and scientists. In a concerted effort to promote the conservation of Bermuda's natural resources, the Bermuda Aquarium, Natural History Museum and Zoo (BAMZ) and its support agency, the Bermuda Zoological Society (BZS) have taken the lead in co-ordinating the Bermuda Biodiversity Project (BBP). Launched in 1997, the BBP represents the first attempt to create a comprehensive information management system for Bermuda's natural resources. With this underlying goal, the project is focused on the collation and dissemination of information, promotion of its importance and encouragement of its use.

Partnerships, the vehicle to success!

Conceived and initiated on a shoestring ($25,000), the BBP has been dependent upon partnerships from the outset. The longstanding, and very successful partnership between the Government Aquarium, established in 1926, and its supporting charity, the Bermuda Zoological Society (established in 1978 to support education, conservation and exhibit development at BAMZ), provided a strong foundation from which to attract other partners. Appeals were made to prospective collaborators highlighting the benefits of working together and sharing information and resources, and, with a shared vision of the value of collaborating, numerous critical partnerships were cemented. These fall into three broad categories:

Information Sources - A series of informal gatherings were held to which the local government and non-governmental organisations were invited to join with local librarians, scientists, naturalists, and photographers in discussing the objectives of the project. This led to many expressions of interest and several commitments for the production of papers to be published as contributions to the BBP. Overseas scientists with a history of local research were also contacted to assist in providing references to literature on Bermuda and experts were invited to collaborate with the production of reviews of the local biota. Museums known to hold Bermuda specimens were solicited for information on their holdings.

Human Resources - Several of the local government departments readily recognised the value of the project to their areas of responsibility and hence committed to

provide manpower to assist. Notable amongst these were those departments responsible for: conservation and parks, agriculture and fisheries, mapping and forward planning. They have all provided significant technical advice and support. Non-governmental sources of manpower have included overseas researchers who agreed to collaborate (often in return for logistic support along with spartan housing and lab space), as well as local experts, amateur naturalists, local dive operators, and students. With a membership comprising almost 17% of the population, the BZS also has a large pool of enthusiastic volunteers, who have assisted with many aspects of the BBP.

Financial - Financial partners include both the Bermuda and the U.K. Governments, local and overseas NGO's, overseas environmental funding agencies, the local business community, as well as individual donors.

Establishing the Framework

The backbone of the BBP is the development of a GIS-interactive, relational, event-centred database, pooling information on Bermuda's flora and fauna. The primary function of the database is to record the occurrence in time and distribution of species (and higher taxa) in Bermuda. The secondary function of the database is to manage four "collections", which themselves serve as the data sources for biodiversity events. These are: Museum lots (biological and geological specimens and artefacts); the Bermuda Natural History Bibliography (a collection of over 3,400 scientific documents describing the Islands' natural history); Images (comprising over 12,000 slides and photographic images); and Field Logs (data collected but not published). A "biodiversity event" is minimally defined by a person (collector, photographer, author) documenting the occurrence, at a specified locality and on a given date, of a species. Additional information about the environment in which it was found, and about the actual specimen itself, may accompany the record.

Additional databases serve as "dictionaries", and include Species, People, Institutions and Localities, the latter being represented in nested levels of accuracy to allow for less precise locality information available in historical records.

We have chosen a Microsoft SQL Server as the backend of this database, with a web-enabled front end, which will allow users to update and retrieve data using a custom-built web-interface. The SQL Server offers a robust database environment, capable of handling large numbers of records, a large amount of data, as well as colour images, sounds and video. The web front end will allow historical data to be kept on-line, with no performance impact for the system users.

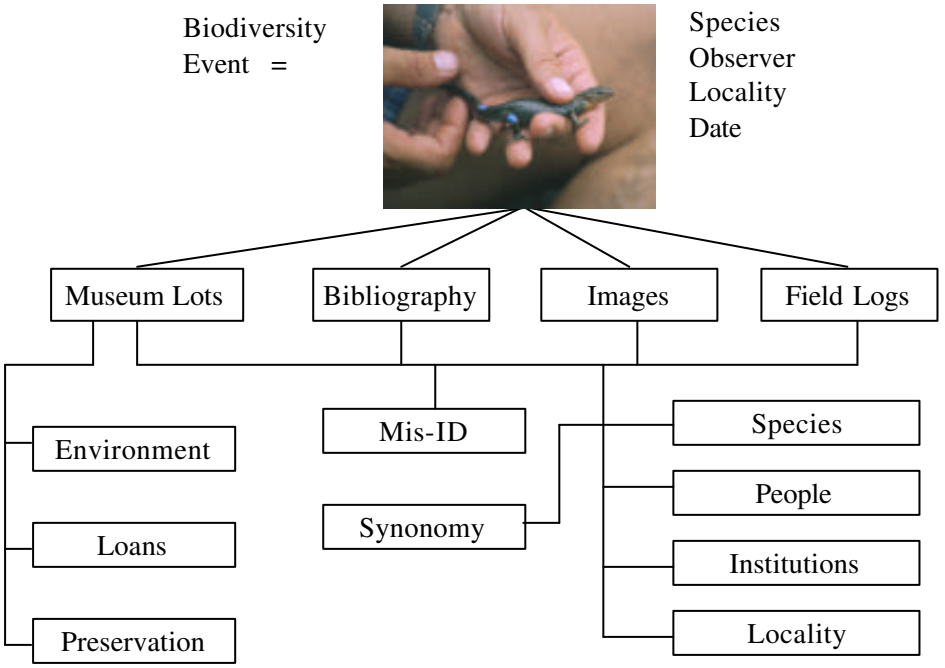


Figure1. The basic structure of the Bermuda Biodiversity Database

Locality data are being linked to the Government Geographic Information System (GIS). Digitised ordnance survey maps currently serve as the base layer for the GIS. However, the recent production of an accurately georeferenced aerial photomosaic is proving to be a much more useful base layer on to which biodiversity data can be superimposed. This is an excellent example of the collaborative nature of the BBP. In April 1997, the BZS and BAMZ partnered with the Ministry of Works and Engineering and the Bermuda Land Development Company to support the aerial photographic survey of Bermuda and the surrounding marine platform.

Data Collection

a) What is already known?

As one of the best-studied islands on Earth, one of the principle aims of the project has been to collate, and make readily available, existing biodiversity information. The Bermuda Natural History Bibliography (a component of the Biodiversity database, and currently available as a searchable database on the BAMZ/BZS web page www.bamz.org) houses over 3,400 scientific documents. This includes unpublished student theses and technical reports. The BAMZ Natural History Museum houses over 5,000 lots and over 12,000 slides of Bermuda's flora and fauna, whilst surveys of overseas institutions have uncovered additional publications and specimens from Bermuda.

b) Filling in the information gaps

A review of the historical data has nevertheless revealed many information gaps. Priorities were therefore established. Efforts to encourage collaborators to help fill these gaps have, to date, resulted in over forty ongoing scientific studies. These have been focused primarily at the taxonomic level, but have also included population studies of threatened endemic and native species, or invasive species. A BBP Scientific Contribution Series has been established that currently has 35 manuscripts (either published, or accepted for publication) with assigned numbers.

At the outset of the BBP, there was a recognised need for a baseline habitat survey to be conducted, both to provide a broader framework on to which species-specific information could be added, as well as to provide a benchmark against which future changes could be monitored. The timely development of the Government GIS provided an added incentive to launch an intensive mapping survey of Bermuda's terrestrial and marine habitats. It was realised that integration of the habitat data into the GIS would allow for both qualitative and quantitative analysis and would serve as a powerful vehicle for information management and decision support. Additionally, we have discovered that GIS is also a powerful presentation tool, as the information presented is intuitive, and otherwise obscure relationships are easily clarified. It is a very effective way to display scientific findings to non-scientists.

To date, over 1,200 randomly selected points have been surveyed across Bermuda's open spaces by the BBP team. Data have been collected on both canopy and understorey plant species, as well as saplings, enabling some predictions to be made about the future canopy species.

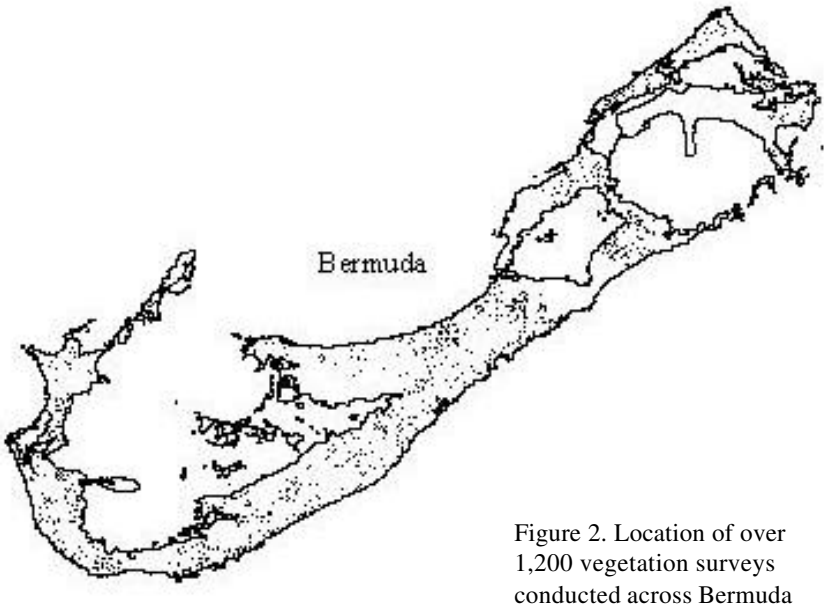
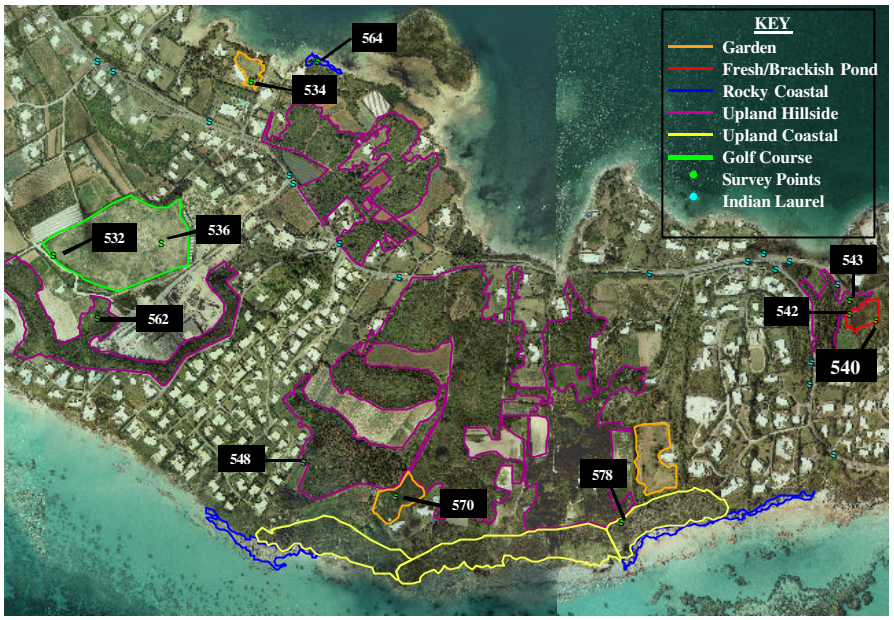


Figure 2. Location of over 1,200 vegetation surveys conducted across Bermuda



Courtesy of the Ministry of Works & Engineering

Plate 1. Example of terrestrial habitat digitization using 1:10,000 high resolution aerial photos, and also showing the location of some of the vegetation survey points

This information has been used, in conjunction with the high resolution 1:10,000 aerial photos, to develop a terrestrial habitat map for the island (see Plate 1). It is particularly encouraging that the Department of Planning, charged with the production of forward planning statements to direct land-based development and with a mandate of protecting the natural amenities of the islands, will incorporate the information from these surveys in the next Development Plan.

Prompted largely by the 1997 International Year of the Reef, and in recognition of the need for environmental sensitivity maps to guide pollution abatement and coastal development decisions, similar efforts to map Bermuda's shallow water marine habitats are being undertaken through the BBP. 300 transect surveys have been completed across the Platform. Priority is being given to the mapping and assessment of coral and seagrass habitats and inshore areas which are most threatened by coastal development and pollution. Interpretation of a set of 1:15,000 marine orthophotos currently being developed will be supported by extensive ground truthing of bathymetric and benthic features.

Community Involvement

The importance of including the community in the BBP has been a firm goal from the start. By including the wider community, it was hoped that we could promote a sense of ownership and thereby encourage environmental stewardship. Additionally, we recognised that the public could provide extremely valuable, cost-effective information.

Community participation in the collection of biodiversity data, has included: school groups assisting with the terrestrial vegetation surveys; local recreational and professional divers conducting coral and fish surveys; local amateur photographers providing photographs (often the only record of a particular species); and the general public providing information of species sightings. The latter has proven particularly successful with regard to gathering information on Bermuda's only terrestrial endemic vertebrate, the Bermuda Skink. Flagged as a priority species since the inception of the BBP, in 1998 a questionnaire was inserted in the local utility company's monthly billings, requesting information about Skink sightings across Bermuda. This partnership saved us nearly $10,000 in postage alone and resulted in nearly 200 responses. The information provided was invaluable, and indicated that the Skink was more widespread on the mainland than originally thought. Follow-up surveys by a Bermudian doctoral candidate are planned over the next year.

Efforts to expand data collection in the marine environment have also been met with enthusiasm by the local dive community. We have adopted the protocol designed by the Reef Environmental Educational Fund for engaging local divers in collecting reef fish data, whilst a small group of volunteers have been trained in the AGRRA (Atlantic Gulf Rapid Reef Assessment) protocol for assessing coral reef health.

Figure 3. Skink flyers (questionnaire and results) distributed to 33,000 households through the local utility company's monthly billings.

Information Dissemination

The data that have been collected and collated are useful only if they ares actually disseminated. But the information is only then useful if it is analysed, produced and presented in a format that is relevant to the audience. A politician will not read a technical report, and the general public are not likely to get excited over a scientific publication. Through the BBP, considerable effort has gone towards producing materials for different audiences. These range from scientific publications and technical reports, to newspaper articles, popular magazines, flyers, a web site and various exhibits at BAMZ.

The next step

The next logical step for the BBP is the development of a Biodiversity Strategy and Action Plan for the Island. With funding from the UK Darwin Initiative, and in collaboration with Fauna and Flora International, this initiative is now underway. We hope to be able to develop a common vision and effect a step-by-step plan of action for conserving Bermuda's unique biodiversity. With the aim of developing a plan through community consensus, we hope that the work we have already undertaken to involve the community in the BBP, will help us to secure the 'buy-in' necessary to accomplish this.

Acknowledgements

The author is grateful to the Government of Gibraltar, the Gibraltar Ornithological and Natural History Society, and the UK Overseas Territories Conservation Forum for sponsoring and organising such an inspiring and productive conference.

This is Contribution No. 36, Bermuda Biodiversity Project (BBP), Bermuda Aquarium, Natural History Museum and Zoo

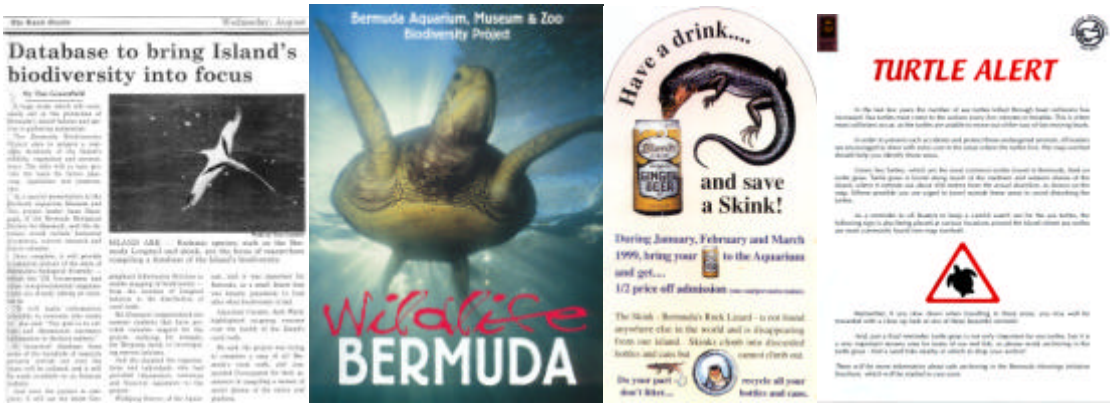


Figure 4. Some examples of the different approaches adopted for disseminating information

Section 4: Making protected areas effective

Making protected areas effective: Overview and National Trust experience

Martin Drury

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This morning's topic arises directly out of yesterday's discussion about *Raising Awareness*, because without awareness there will be no public support; without public support politicians will not listen; and if politicians do not listen, areas of special value will not be designated for protection.

The title of my contribution is *Overview and the NT Experience*, a title I happily accepted when Mike suggested it to me six months ago; but, when I came to think about what I was going to say, I realise that while I could say something about the National Trust's experience – or that part of it which might be helpful to other members of the Forum – I did not feel I had a sufficiently lofty viewpoint to give an overview.

So, here are a few remarks about our own experience. I will then briefly describe three examples taken from countries which happen not to be represented here today.

I suppose there are four things needed to give protection to an area of land of special interest:

- official designation (or ownership)
- a sound management plan
- funding
- local support

Turning first to the National Trust's experience. When we came into existence in 1895 there were no laws on the statute book to protect either land or buildings for their historic, scientific or cultural value, though there was, it is true, some recently enacted legislation to prevent landowners from enclosing the common land on which certain people had an ancient right to graze animals, cut turf, gather firewood etc. Indeed, it was because there was no law which gave everyone the right of access to land for recreational purposes that the NT was founded. It was not, of course, animals and plants that the founders had in mind, but people and the inspirational qualities of wild landscape that the English had been taught to admire by Wordsworth and Ruskin. One of the three founders wanted to provide what she memorably called "open-air sitting rooms for the poor" and another, a disciple of Ruskin, wanted to keep the railways out of the Cumbrian dales.

The power to declare land inalienable proved so effective, however, that it was soon used for the defence of other interests. In 1899 a group of Cambridge scientists banded together to buy Wicken Fen, the last unreclaimed fragment of the Cambridgeshire fens and a habitat of plants and creatures which was even then under threat; thus, incidentally, creating Europe's first nature reserve.

So, the instrument we have used has been ownership and our experience has taught us that there is no more effective way of protecting areas of scientific or cultural value. Other legislation for protecting areas was not introduced until after the 2nd World War, but it is operated by local governments and they vary enormously in the rigour with which they apply it.

There is another instrument we use which has the advantage of being cheaper because it does not involve acquisition and ownership – and that is the *restrictive covenant*, known in the United States as an *easement*. From time to time we are given restrictive covenants over land or buildings, and sometimes we buy a piece of land and sell it on, retaining covenants over it. In this way the owner of the land is prevented in perpetuity from doing certain things on it unless he/she first obtains the Trust's permission. Covenants have proved effective, but they are always at the mercy of British law, which is inherently unsympathetic to anything which constrains the right of a landowner to do what he likes with land or on it, so long as he does not damage the interests of others. So far, on the rare occasions when we have taken a landowner to court for infringing our covenants, we have always won. But, it is never certain that we will do so, and if we were to lose a case, it would be cited against us in future actions. So, covenants are at the mercy of case law; they are a precarious form of protection and defending them involves steady nerves, careful judgement and an element of bluff.

And now to my three examples of effective protection of special areas of interest, each of which illustrates in varying degrees the presence of the four elements of legislative frame work (or ownership), a management plan, funding and local support.

First, the old city of Havana in Cuba, an area of about a square mile, bounded on one side by the sea and on

the other by the line of the old city wall, densely packed with the great houses of the old Spanish ruling class and semi-ruinous churches and convents, and criss-crossed with narrow streets which open out every now and then into city squares. The houses are all in multiple occupation and festooned with washing lines and redundant pipes and electric wiring. It is all intensely picturesque, teeming with life, very poor and in a terrifying state of decay. Every time there is a heavy storm a house or two is lost. But,

- the city is owned by the State and managed by the office of the city historian;
- the man in charge, the city historian, is a person with a rare combination of qualities. He is an aesthete, a good administrator and a man with a strong social conscience and a mission;
- his mission is to restore the city, building by building, street by street, without displacing the people who live and work there;
- with his mostly young staff, made up of architects, historians, planners and welfare workers, he has prepared a grand plan for the old city which involves an elaborate process of consultation with the inhabitants of each street.
- the operation is being funded by tourism; the number of tourists coming to Cuba is increasing at the rate of about 1 million a year;
- he has negotiated with the government to receive a percentage of every dollar spent in the old city.

So, the old city of Havana (both pictures above) is protected by ownership (in a Communist country there is no need for legislation), a plan, funding and local support.

The second example is taken from the city of Tallin in Estonia. Just outside the city is a prehistoric burial ground. During the Russian occupation it was well cared for, but after the Russians left, it became neglected and overgrown. Its deteriorating condition caught the eye and the imagination of a young woman doctor in Tallin. She gathered together a group of colleagues from the hospital where she worked, who restored order to the site and now tend it every week. This is a minor affair, but it is significant because it illustrates what can be done by the enthusiasm and unpaid effort of a small group. It is how the National Trust began in England a century ago: small groups of people banding together to rescue, and care for, places which they valued. With local support of this kind, none of the other three elements are needed.

My last example comes from the Bahamas. The National Trust of the Bahamas was founded in 1959. Several large areas among the islands are designated as National Marine Parks and they are owned and managed by the National Trust. One of these Marine Parks covers the northern half of a chain of atolls called the Exuma Cays. The park is a vast area of sea and atoll and it has been declared a 'no-take zone', which means that fishing is forbidden within it. Marine life therefore flourishes and the local economy benefits from services provided to the people who come in large numbers to dive and snorkel and from the fee they pay to moor or anchor. But, the local people also benefit in another way. The prevailing current carries the spawn of the conch and lobster northwards into areas where fishing is allowed and where they earn their living in the traditional way from fishing.

So successful has this park been that the National Trust has been approached by the people of the neighbouring island of Andros with a request that a Marine Park and 'no-take zone' be designated along their shores. This sends a powerful message to politicians: conservation is not only good for business, it is also popular with the electorate.

Here, as in Havana, are the four requirements for protection: legislation and ownership, a plan, funding and local support.

Little Water Cay Nature Trails and Middle Caicos Darwin Initiative Project

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Little Water Cay Nature Trails

A project, which has won renowned recognition for the Trust and international publicity for the Turks and Caicos Islands is the Little Water Cay Nature Trails Programme.

This programme is one of the great success stories in conservation management in the TCI.

Due to its close proximity to Providenciales (the main island for tourism and business), the tranquillity of the beach, and its resident population of endemic rock iguanas, Little Water Cay had long since been a popular attraction for islanders – and increasingly for tourists.

It had come to the attention of the Trust, following a nation-wide study of the population and habitat of rock iguanas in the Turks and Caicos Islands, that this particular habitat which is a nature reserve, was indeed under threat. A plan was then devised and initiated by the Trust to reduce the detrimental impact which the many visitors were having on the natural habitat and consequently on the animals.

Funding to construct raised boardwalks, viewing platforms, information signs and educational pamphlets was secured through RARE Center for Tropical Conservation and the MacArthur Foundation. The effect of these completed activities greatly reduced the damage to the natural habitat and the iguana population.

The management of Little Water Cay Nature Reserve was an undertaking of the Trust in partnership with the Watersports Association and the Turks and Caicos Government. A training course for Tour Operators and boat captains was also a part of the project.

Little Water Cay Programme is the only operating income-generating project developed by the Trust. A user-fee of $3.00 per person is included in each package sold to visitors by tour operators who run excursions to Little Water Cay. This revenue is passed on to the Trust through the purchase of iguana pins, which serve as a ticket or pass. Revenue from the programme is applied to ongoing maintenance of the trails, other projects and core support.

Upon opening of the programme three years ago, the Trust had entered into a five-year lease agreement with TCI Government. Since then the Trust applied for a long-term agreement with the Government, and this year a ninety-nine year lease agreement was awarded to the Trust for both Little Water Cay and Little Ambergris Cay.

A management decision was made earlier this year, prompted by concerns from members of the Watersports Association, to increase surveillance on the cay. We now have a warden in place for the programme. Presently, the country is experiencing what we call 'slow season'; tourist arrivals are in a lull. At the Trust, we have taken this time to prepare for the forthcoming tourist season. Plans are in progress to conduct in October a short refresher course for Tour Operators and boat captains.

Darwin Initiative Middle Caicos

This is yet another challenging and exciting enterprise for the National Trust taken on in partnership with the UK Overseas Territories Conservation Forum and CABI.

The key component of the Darwin Project is to develop a Conservation Management Plan for the wetlands complex of North, Middle and East Caicos, including the internationally important Ramsar site.

The Project Manager has been in place since April 2000 and is quickly becoming familiar with the sites and unique culture of the islands. Plans are currently (September 2000) underway to commence the main period of research. International scientists and specialists are expected to arrive in November to work with the local people to record data on native plants, birds, and other wildlife.

Other progress by way of the project is the recent acquisition of the former school building in Bambarra, Middle Caicos, which will serve as headquarters for the project and eco-tourism centre. This was granted to the Trust by TCI Government pursuant to Section 5 (c)(d) of the National Trust Ordinance. Funding is now needed for renovation of the building.

Another objective of the project is to provide opportunities for small business development, training and employment for the local people. To this end, the Trust has conducted two Small Business Workshops for persons interested in conservation management and eco-tourism. Community meetings are organised and held quarterly. As a follow-up activity to the workshops, the Trust will be hosting a Culture Fair in collaboration with the Tourist Board, 13th & 14th October 2000. Entrepreneurs from Middle Caicos are expected to participate.

There are also other small projects beginning to emerge from the Darwin Initiative, such as the fresh fruits, eggs and vegetables scheme, which will be spearheaded by the Project Manager.

Community meeting as part of the planning of the Darwin Initiative project

Rare West Indian Whistling Ducklings feed near their mother while the drake stands guard, Middle Caicos 1999

BVI National Parks Trust Marine Conservation Programme Case Study

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The BVI National Parks Trust is charged with preserving and managing designated natural and cultural areas in order to improve the quality of life in the British Virgin Islands. The National Parks Trust Ordinance of 1961 and the Marine Parks Ordinance of 1979 govern the Trust's work, which has expanded over the years to address the protection of 18 terrestrial properties and one Marine Park. In addition, the Trust manages 72 uniquely named locations in 9 geographic areas which constitutes a system of legally-defined Marine Protected Areas under a separate Ordinance. In the context of the British Virgin Islands, as in many other coastally defined areas, the tourist industry relies heavily on the presence of healthy reefs, sea-grass beds, Caribbean dry forests and mangroves. Such areas contribute tremendously to the recreation industry. For example, based on figures provided by the Development Planning Unit of the BVI Government in 1998, 392,290 visitors reported travel to the BVI for tourist purposes. Of those, 279,097 or 71.1% were overnight visitors with the remnant 113,193 or 28.9% being either "day-trippers or cruise ship passengers. 89,951 or 32.2% of visitors over-nighting in the BVI were charter boat passengers with other proportions of the 189,461 visitors utilising marine resources in varying degrees.

High numbers of visitors to a subset of areas managed by the Trust may be resulting in greater detrimental impacts to protected sites. Visitation to the Territory has fluctuated over a four-year period (Appendix I); however, forecasts indicate a continued increase in total visitation as a result of the continued aggressive promotion as a marine destination for yachters and other types of visitors. The National Parks Trust has managed the marine environment for several years through the Marine Conservation Programme. Approximately 200 moorings have been established at dive sites to prevent the damage and/or loss of coral reefs by means of anchor damage. Moorings were installed and are maintained by a dedicated staff of four who are responsible for the placement of the moorings, all maintenance aspects of the system and monitoring of permit compliance. Users pay for the ability to use National Parks Trust moorings. Dive Tour Operators and other stakeholders, originally involved in the establishment of the system, assist in the monitoring the system by reporting moorings requiring repairs. Reports are fedback to the Marine Park Wardens who will do both required maintenance on the mooring and monitor for permit compliance.

While the Trust works under the assumption that the resource (i.e. coral reefs) is partially protected by its management intervention, no long-term studies have been conducted which would track the degree of attainment of the stated goals of the programme which are: the prevention of anchoring and increased rates of permit compliance.

Lack of information hampers the determination of the rate of programme efficacy, and ultimately additional interventions required to ensure resource protection. Identification of this problem led to the design of a project whereby Marine Park Wardens acquire the following variables as part of their normal maintenance and monitoring routine:

- Expected and actual number of moorings at a dive site (attrition resulting from misuse by boaters who damage components of the mooring buoy);
- Number of boats moored and anchored at the monitored dive site;
- Number of individuals complying with permit acquisition prior to the use of the mooring and number of permits sold on site;
- Number of dive sites without any boats using moorings.

Analysis of data associated with anchoring rates at different sites acquired over the initial five-month period has begun to elucidate important patterns of how users are interacting with the system. A total of 24 sites were monitored during the study. Twelve sites were monitored at least once while the other twelve were monitored more than that. In light of the fact that Wardens have ever-changing maintenance priorities, monitoring is limited to areas requiring some degree of attention at the time. Four popular dive sites (n = 4) were monitored on 22 to 41 separate occasions during the study representing the number of sites included in the analysis of the data presented. Furthermore, sites having no moored boats at the time of monitoring (n = 12) were independently listed[1].

[1] An arbitrary figure of ten individual monitoring events was chosen as the criterion to determine whether a site was frequently not moored.

Therefore, sample data (Appendix II) describe these sites.

Observed rates of anchoring at popular sites can be partially attributed to the fact that as mooring buoys rapidly become occupied during the day, users may be deterred from leaving a site that may be saturated with boats. Rates of anchoring also fluctuate according to the time of year (data not shown) as would be expected.

A subset of sites requires unique attention. Average anchoring at popular sites ranged from 2.54% to 8.37% of boats found at a site[2]. The Wreck of the Rhone, the only declared Marine Park, was the least anchored site amongst the popular sites. This can be accounted for largely by the fact that the Wreck is the only site in the Territory where anchoring is strictly prohibited. The Wreck had on the average the least amount of anchoring taking place when compared to other popular sites. Rates of anchoring fluctuated significantly at some sites where boating volume was heaviest. For instance, the marine elements of the Baths National Park and the Caves exhibited a greater degree of variation over the study period as many visitors frequented the area and infractions to the suggested no-anchor zones are greater.

Equally important to the study are sites with no boating activity associated (Appendix III). Twelve monitored sites had at least ten events where no boats were encountered. Of particular significance, three of those sites are adjacent to the Wreck of the Rhone Marine Park. These dive sites are not adjacent to the main attraction and thus do not receive as many visitors.

Information gathered during this pilot phase of the study will augment the BVI National Parks Trust's capacity to manage effectively marine sites in the Territory. Anecdotal and observational information exists relating to both numbers of boats and their distribution along marine protected sites; however, such information cannot be the sole basis for making management decisions. Results acquired thus far validate common knowledge that a subset of over-promoted and over-utilised sites has relatively higher rates of anchoring. Concrete recommendations can be made regarding optional sites which can be used to shift visitors. Conversely, as under-utilised sites may become saturated, appropriate restrictions may be imposed which may arrest over-utilisation.

Since programme inception, stakeholder groups such as dive tour operators and charter companies have been involved in the design of the system and further monitoring of use. An aggressive campaign centring on informing users of visitation patterns can continue to protect the resource as stakeholders and user groups become aware of available alternate sites in a dynamic manner. Informal consultation with stakeholder and user groups will be instrumental in conveying under- and over-utilisation and the need to shift visitors from parts of the system to others in order to prevent saturation.

Long-term acquisition of visitor use patterns will assist in the refinement of the placement of moorings throughout the Territory and, therefore, the management of marine sites in the British Virgin Islands.

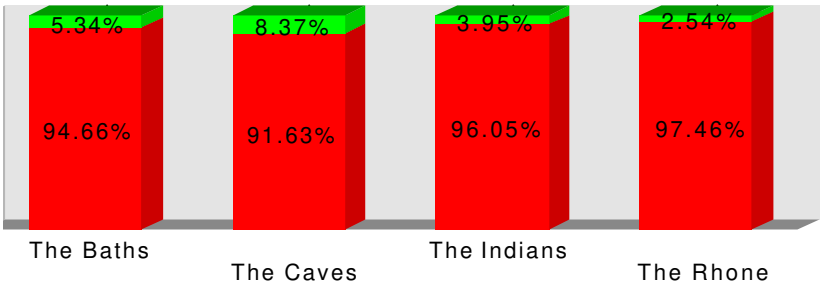
APPENDIX I: Visitor Patterns to the British Virgin Islands (1995-1998)

Tourist Arrivals by place of stay	1995	1996	1997	1998
Overnight				
Hotels	68,536	72,624	77,045	81,670
Charter Boats	101,360	101,288	76,147	89,951
Rented Acco	2,091	2,282	2,442	1,705
Own Acco	1,310	1,423	1,376	920
Friend	46,213	66,066	87,308	104,851
Total	219,510	243,683	244,318	279,097
Daytrippers	23,775	8,749	16,486	8,051
Cruiseship	122,054	159,600	104,864	105,142
Total	365,339	412,032	365,668	392,290
% Overnight vs. total visitation	60.1%	59.1%	66.8%	71.1%
% Single day stay vs. total visitation	43.7%	25.5%	28.8%	28.9%
% Charter boat visitors	46.2%	41.6%	31.2%	32.2%

[2] This represents eight locations along 3 distinct geographic locations.

APPENDIX II: Total Anchoring vs. Boats Encountered

Percentage of Boats Anchored vs. Total Number of Boats per Site

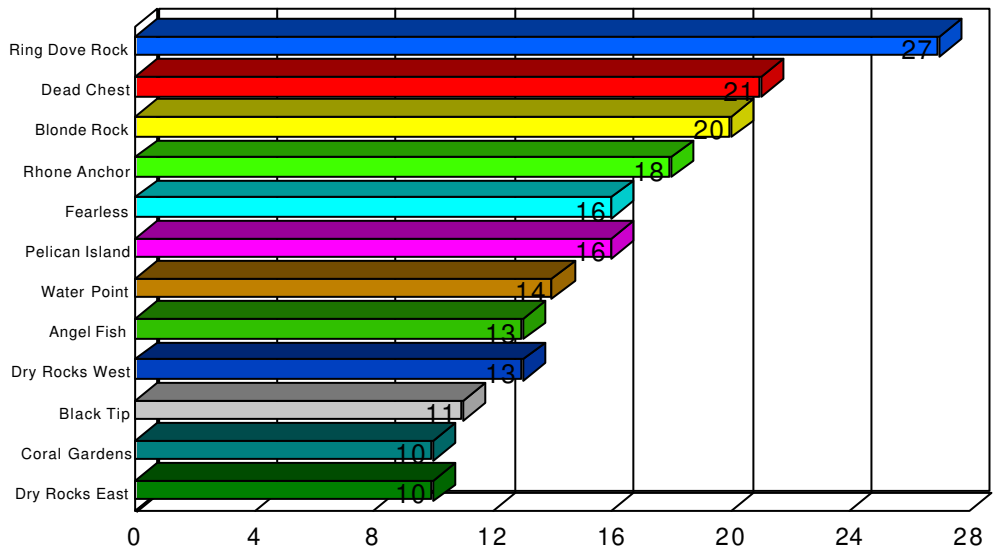


		Sum (Boats at Site)	Avg.	Variance	Std. Dev.
The Baths	Boats at Site	479	23.95	280.58	16.7504
n (Monitoring Events) = 20	Boats Anchored	27	1.42	3.59	1.8949
The Caves	Boats at Site	219	6.26	8.73	2.9540
n (Monitoring Events) = 35	Boats Anchored	20	0.59	1.28	1.1313
The Indians	Boats at Site	243	5.93	9.72	3.1176
n (Monitoring Events) = 41	Boats Anchored	10	0.24	0.64	0.7994
The Rhone	Boats at Site	230	6.39	13.79	3.7131
n (Monitoring Events) = 36	Boats Anchored	6	0.17	0.73	0.8570

n (Monitoring Events) = 132		Boats at Site	Anchored Boats
	Sum	1171	63
	Average	8.87	0.49
	Variance	90.56	1.41
	Standard Dev.	9.5161	1.1866

APPENDIX III:

Count of Dive Sites encountered without Boats



The St Helena Millennium Gumwood Forest Project

Rebecca Cairns-Wicks & Isabel Peters

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This talk will describe the St Helena Millennium Gumwood Forest Project, a community and conservation initiative to recreate a native habitat and celebrate the Millennium. This project is an example of how we on St Helena are trying to encourage involvement of civic society in the development and management of protected areas on St Helena.

The planting of young trees has brought new life to a barren and degraded wasteland and will provide a legacy of the conservation of the island's native heritage for future generations.

Why plant Gumwoods?

On St Helena, tree planting often marks special events and occasions. As an island just recovering from the effects of deforestation and with a highly threatened native flora, it seemed fitting to mark the Millennium with tree planting, and even more so with the planting of an endangered endemic species, the gumwood *Commidendrum robustum,* an arborescent member of the *compositae* family. Gumwood forests once covered approximately 1/3 of the island but quickly disappeared after the arrival of man and his associated animals. Today only one small remnant of Gumwood forest remains with less than 1000 individuals (below).

In 1977 the Gumwood was named as St Helena's National Tree, although prior to the Millennium Forest Project few islanders were familiar with it; and many would have been unable to identify a Gumwood tree or if they could, would not appreciate its value in terms of the world's biodiversity. The adult Gumwood has a crooked branched frame and rough bark with an overall umbrella shaped canopy. The seedlings are of a different shape to the adult trees being tall and slender and much straighter with larger leaves.

The Millennium Forest is situated in an area called Horse Point, which is on the North East side of the island. The surrounding scenery is breathtaking with some of the island's mo st spectacular geological features. However if you had seen the site before the project began, it seemed the most unlikely place to want to plant a forest. Adjacent to the island's refuse dump it was also used as such. The area is dry and dusty with an annual average rainfall of 400mm and littered with gullies caused by severe soil erosion that followed deforestation.

It is rather surprising that the area was once covered in Gumwood trees and formed part of the Great Wood which in 1716, although much reduced in size, occupied 1500 acres. The Great Wood was finally destroyed in the nineteenth century, as browsing livestock prevented regeneration and man felled the trees for timber and fuel. In the mid 1980s, a small patch of Gumwoods was planted at Horse Point. Since then this site has been designated as an area for their reintroduction.

In establishing the Millennium Gumwood Forest Project, its aims and objectives are:

To transform a degraded site into a forest, that will beautify the area and provide an amenity for everyone to enjoy.
The creation of the forest has aes thetically enhanced the area and presents an attraction for both locals and visitors.

To raise the profile of native flora, specifically the Gumwood
Through this project islanders became more aware of the ecology of the Gumwood tree. The promotion of the project overseas has also raised the profile of this tree internationally.

To increase and support local biodiversity
The Gumwood forest habitat is one that previously supported many endemic invertebrates particularly weevils. Horse Point was also home for the endemic giant earwig, *Labidura herculeana,* the world's largest earwig now thought to be extinct. Whilst it might be too late for the giant earwig, the establishment of vegetation cover is likely to support many insects and birds.

To enhance the community spirit of the island
The strong sense of community spirit on the island has declined in recent years due to a combination of factors. This project has embraced all sectors of the community and got most of them involved in something new: getting together to plant a forest.

To reduce soil erosion
Due to the physical conditions at Horse Point, the area is highly prone to erosion. Re-establishing the Gumwoods in this area will help to stabilise the soil and prevent further erosion.

To develop techniques that can provide important lessons for dry land rehabilitation on St Helena and elsewhere in the world
Currently over 60% of the island's land area is classified as wasteland. Through revegetation, a significant amount of land can be brought into productivity. This project can therefore act as an example of how this can be achieved.

And last but not least,

To provide a practical example of how a protected area can be properly developed through public consultation and participation.
The primary mechanism for landscape protection and management definition is the Forestry Ordinance (1954), which designates areas as either National (productive forests, unproductive, bare land or conservation) or Dedicated forest. There is little correlation between the actual physical area and that which it is designated as, as many areas have no tree cover. As the demand for land for housing and development increases there is increasing pressure to release protected forestland and the rationale for protecting the unproductive or barren land is not always understood by the public. To rectify this, a National Plan of Protected Areas (NPPA) is being developed that will encourage local participation in the planning procedure and ensure transparency of the criteria for designating protected areas.

For the first time this project is one that has got all sectors of the community directly involved in establishing a conservation area. In fact the project has gone further than this, it has stimulated local ownership and pride. People have ownership of their trees, and they have been returning to the forest to place mulches around the tree, fertilise it or simply water it.

By introducing people to the benefits of conservation it is hoped that we have stimulated public interest in the development of protected areas. Thus we hope to build upon this to gain support for the development and implementation of the NPPA. Without this project, it is likely that the general public would have remained detached, or would have provided opposition to the NPPA.

How it has happened

The project has taken two years to come about, during which time the project was designed, the site planned and primed, the project promoted (on island and abroad) and funding sought.

Although the project was a government initiative, the Project Steering Committee has striven to involve the public in all aspects of the project work through actively promoting the project amongst all sectors of the community.

It took a tremendous amount of hard work to get the forest to the planting stage as the area had to be primed and the microclimate for each tree modified to ensure optimal survival. Planting of the forest has taken place between June and September (during our winter months) this year (2000).

A tree for each island resident was provided free of charge. All that was needed was for individuals to give up a bit of their time to go out and plant it - their tree, in their forest.

Prior to the start of planting 38% of the local population had signed up to plant a tree and, as the time for planting grew closer, interest in the project increased. Despite a few hiccups, planting began officially on 4th August. This date was chosen, as it was HM The Queen Mother's 100th Birthday. Our Governor planted a tree for the Queen Mother and the zone was dedicated to her, and yes it does have 100 trees. Members of the public who came along for a special planting party three weeks later planted approximately 600 trees. To date over 2500 trees have been planted in the forest, and they are all doing very well.

To optimise user benefits from the forest and to promote the conservation of the Gumwood, an information building is being constructed at the entrance of the forest. As this is such a historic project the names of every person who has contributed to the project will be recorded and displayed in this building.

The total cost of the project was estimated at £32, 600, which included site preparation, design and promotion. The FCO Environment Fund for Overseas Territories provided the bulk of funding and other contributions came from the Governor's Discretionary Fund and a proportion of the costs has been met through Government Departmental budgets. In addition on island we raised £1400 through sponsorship and donations from private companies, and donations large and small amounting to some £1200 has been received from groups and individuals abroad. Monies are continuing to filter in.

What happens next with the forest?

No financial provision was made for the management and development of the forest after planting. However our post-planting objective is to make this project self sustainable. We anticipate achieving this through managing the forest as a charitable trust, marketing endorsed merchandise, encouraging visitors to buy trees and establishing a friends of the forest support group. We already have sufficient funds to cover the salary of a part-time forest warden to look after the trees during their first year.

This project has so far been a success. It has galvanised the whole island into action to create a forest and as such provides an example to the rest of the world of the island's community and conservation spirit. We need continued support to ensure that the Millennium Forest remains a success. From our end we will continue actively to promote the project and seek funding. You can help us by telling friends, family and colleagues about St Helena's Millennium Gumwood Forest.

The support financial and otherwise from many of you here today has contributed significantly to the success of this project, and I would like to take this opportunity to thank you for that support. The Millennium Forest was all about taking this (picture of site before planting)

and turning it into this (picture of forest now).

But without this (picture of people planting) it would have been just another forest.

On St Helena we took the simple act of planting trees and turned it into a Millennium project that brought our community together in a combined effort to conserve our native biodiversity, from which many valuable lessons were learnt. The Project Management will endeavour to ensure that the Millennium Gumwood Forest provides further such lessons for both those on island and others around the world.

Managing areas with no human populations

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You could be forgiven for thinking that this is a non-problem. So much of the threat to the environment in Overseas Territories comes from human activities of one kind or another that you might conclude "No Humans, No problem!" Not so.

First, as pressures increase in the places that are inhabited, people look to uninhabited areas to satisfy their aims. They may want to harvest natural resources, either for their own needs or for commercial gain. They may simply want to enjoy open spaces, but inflict inadvertent damage by their presence. As more people do these things, using ever more powerful technology, the threats to previously pristine systems intensify.

Second, there are few places which, even if they are uninhabited now , do not feel the effects of previous habitation or the impact of pollution, degradation, change - call it what you will - transmitted from elsewhere. Examples are the impact of global warming on sea levels in places which contributed nothing to the warming, or the ecological damage done to habitats through the chance import of invasive species. A simple example is flax, which risks taking hold in Inaccessible Island, off Tristan da Cunha.

Third, perhaps most important, we are inclined to forget that the life cycles of species essential to our own welfare often include stages spent in areas devoid of human habitation, not because they have sought refuge and not always because they have already been destroyed in populated zones. No, their patterns of existence were simply established long before the explosion of human demand. But their continued survival is now more critical to future human needs, never mind the abstract value of bio-diversity.

So, my first point is that we cannot regard the safeguarding of unpopulated areas as somehow disconnected from or less important than the protection of inhabited areas.

There are however two crucial differences when it comes to achieving in practice whatever degree of protection we may decide in principle is required. The first is the absence of economic activity to generate the resources needed to fund the protective measures all want. The second is the absence of local people to observe and report on the various sorts of interference I mentioned a moment ago. Two blinding glimpses of the obvious, you might say! Yet there is much more to it than this. The absence of local people does not just make it more difficult to detect events and discern trends. There is no one on the spot to do anything about problems, even when they have been identified. And it is increasingly evident that benign neglect is not a solution: however remote, wildernesses need to be managed if their rich eco-systems are to be preserved.

This leads to my second main point: there is no choice, if we attach value to these uninhabited areas, but to bring to bear protection from outside. To put matters in a nutshell, it is not a case of No Humans, No Problem. Rather, we should say No Humans, No Protection or, perhaps, No Policing, No Protection – and, of course, as always: No Protection, Nothing left for anyone.

If we look at the variety of situations in the Overseas Territories linked to the United Kingdom, it is quickly apparent that in most cases there are at least some uninhabited areas. Quite often, these are small islands, difficult of access or impossible to stay on. They still add value to the territory concerned, by adding to exclusive economic zones, providing nature sanctuaries of tourist interest or breeding space to species of commercial or scientific importance. Rightly, the territories' governments acknowledge their responsibility to ensure the requisite protection. They do not argue that they need concern themselves only with the populated parts of their domains. Admittedly, the British Government seems to find greater difficulty in seeing the link between the populated and unpopulated parts of a single Territory. DfID runs a mile when it is suggested that environmental conservation is critical to sustained human welfare. The FCO takes the point, but has nothing like the same resources at its disposal.

Let us turn now to the two Territories that have no settled populations on them - British Antarctic Territory and British Indian Ocean Territory. There are so many differences. One is a land mass, snow and ice-bound for much of the year; the other a constellation of tiny islands, basking in continual heat. One is governed under a Treaty regime giving priority to environmental protection, while the other's Treaty gives priority to defence. One benefits from

substantial research expenditure every year; the other gets the odd bit of scientific examination when fishing licences generate a slight surplus.

But more striking than the differences are the similarities. Both are large, both remote. Both retain near pristine environments (though BIOT's may be the cleaner). Both are subject to strict access controls to protect their environments and the delicate ecological balance. Both are embedded in seas having alluring living resources. One is a nominated World Heritage Site, the other is said to be treated with no less strict regard than nominated World Heritage Sites. The two even share governorship by the same individual in the FCO. Neither can generate on its own all the monies needed to finance its own protection or the environmental obligations accepted by Britain. In both therefore the deficiencies in men, money and transport need to be made good by Britain, if pollution and pillaging are to be kept in check.

The sad fact is that in neither Territory is enough being done. In the Southern Ocean, IUU fishing is a major threat to stocks, and not only to fish and perhaps whale stocks, with potential to affect a much wider area. The habit of long-lining is also causing serious damage to the albatross populations. What do the letters IUU stand for? Illegal, Unregulated and Unreported - and this phenomenon is now so widespread that the acronym has become standard usage at meetings of the FAO. In the Indian Ocean, the process of sweeping into oblivion every creature that swims is less advanced, but the pressures are growing, while the means to prevent over-fishing and control illicit predation are even more limited than in the Antarctic.

So what does all this add up to? I think we can reduce the question of managing areas with no populations to the following four propositions:

1. If the sustaining of bio-diversity is an accepted aim, then there is no ground for making less effort in unpopulated than in populated areas. In fact, it is nonsense to distinguish between inhabited and uninhabited Territories in matters of environmental protection. Human development depends upon the maintenance of bio-diversity generally. This is particularly true where marine habitats and resources are concerned.

2. By the very nature of things, unpopulated Territories cannot generate what is required to ensure their own environmental protection. Remoteness compounds this problem. It also tends to introduce delay in responding to the threats, once they have been noticed.

3. The sovereign authority must accept the implication of its power by taking responsibility for securing in such territories the aims of the various international Conventions and agreements to which it has subscribed. Sheltering behind the constitutional nicety that the Foreign Office officials are real governments 'out there' is not good enough.

4. The eco-systems of uninhabited territories cannot look after themselves. As the experiences of Antarctica and South Georgia show, an ongoing research presence is needed to measure what is happening and a permanent means for detecting and dealing with activities detrimental to the environment is equally essential.

French Départements Outre-Mer and Territoires Outre-Mer (DOM-TOMs)

Alison Duncan

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Location of the French DOM-TOMs

There are two types of territories – départements and territories; the political difference is explained below. The French DOM-TOMs are, for the most part, islands in the tropics with the exception of the French sub-Antarctic islands, Terre Adélie on Antartica and Saint-Pierre et Miquelon a tiny group of islands at the mouth of the St Lawrence river. One DOM is found on the South American continent, French Guiana.

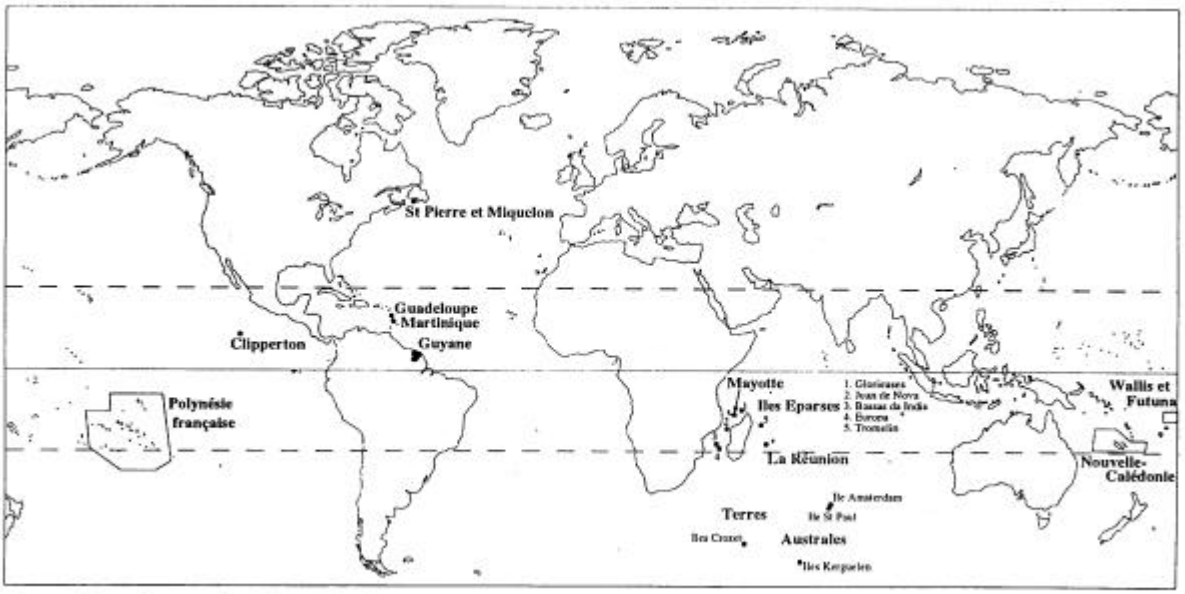
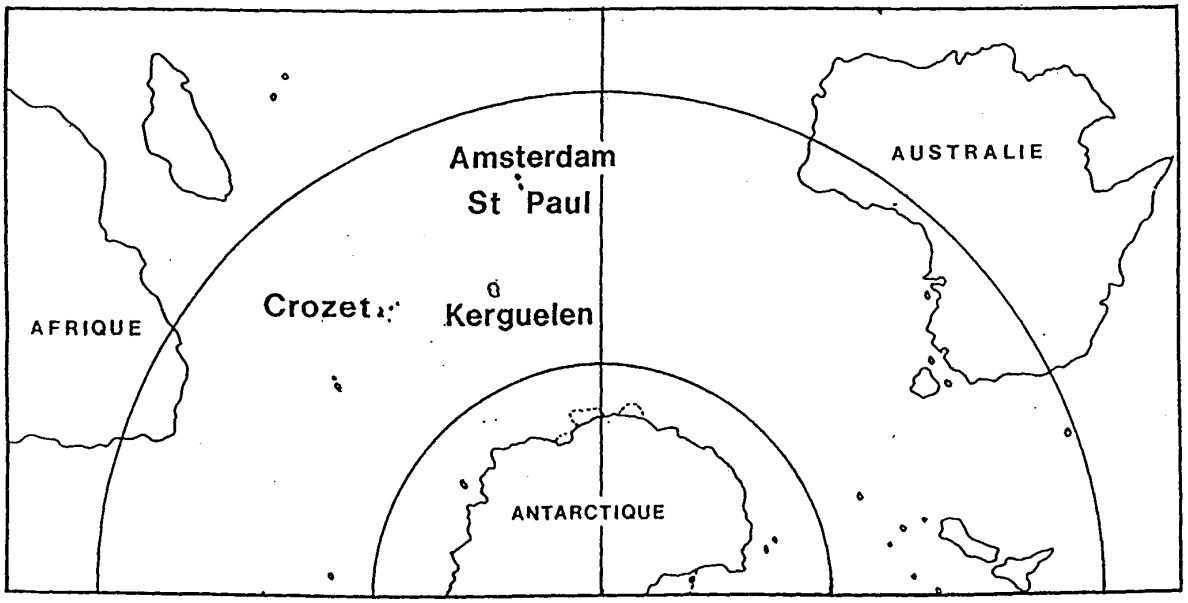
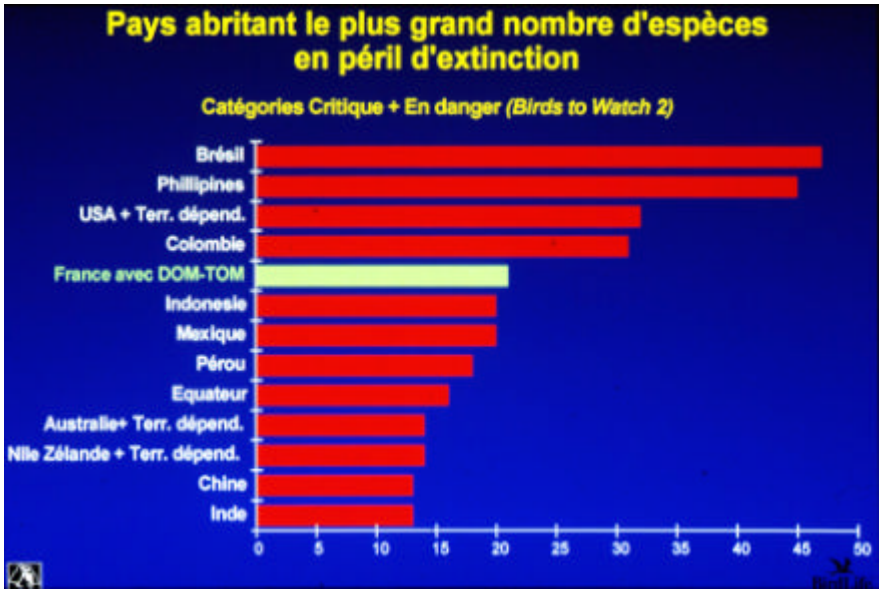


Figure 1: Localisation des DOM-TOM français



The importance of these DOM-TOMs for French biodiversity



Graph: France, particularly its DOM-TOMs, is ranked 5th country in the world with the largest number of bird species in danger of extinction

Biodiversity in the French DOM-TOMs is of international importance. French Guiana contains one of the largest remaining blocks of tropical rainforest in South America; this is the only "European" tropical rainforest. In terms of bird species there are one endemic family, 3 endemic genera, and 59 endemic species; these are all found in the French DOM-TOMs, rather than metropolitan France. France, or rather its DOM-TOMs, together with Brazil, Philippines, USA (including its overseas territories) and Colombia, is one of the five most important countries in the world for the number of bird species which are endanger of extinction (critical and endangered criteria IUCN).

Political link to France

The *départements outre-mer* are integral parts of France, and therefore the European Union. Money for development is thus forthcoming from France and the EU ("Objective 1" for structural funds), but responsibility for the protection of the environment is rather confused, and legislation for environmental protection is more limited and not so well applied in the DOMs as in metropolitan France. There is, however, in each DOM a representative of the Ministry of the Environment (DIREN).

TOMs have a looser political link to France as they govern themselves except for foreign policy and defence. Each TOM has a different administration for the protection of the environment. For example, in French Polynesia there is a ministry of Environment, and in New Caledonia the environment is the responsibility of each Province. The application of legislation, particularly at an international level, lacks clarity. The sub Antarctic islands have a different status because there are only scientific bases on these islands with military support; their administration is Paris based, as it is for the island of Clipperton .

There is yet another status for other territories – *Collectivité territoriale*.

Examples of different levels of protection

For DOMs

Under the Nature Protection Act of July 1960
National Park: *Designated by Conseil d'Etat (highest court in France) after public enquiry. Management body financed by Ministry of Environment.*

Under the Nature Protection Act of July 1976

Table 1. Biological criteria showing the importance of the French DOM-TOMs for biodiversity

	DOM	DOM	DOM	DOM	CT	TOM	TOM	TOM
Biological criteria	**GUADELOUPE**	**MARTINIQUE**	**FRENCH GUIANA**	**REUNION**	**MAYOTTE**	**NEW CALEDONIA**	**FRENCH POLYNESIA**	**TAAF**
Endemic families	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
Endemic genera	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**
Endemic species	**1**	**1**	**1**	**4 + 2**	**3**	**21**	**23 + 3**	**2+1**

Table 2. Protected Areas in French Overseas Departements

STATUS	DOM	DOM	DOM	DOM	
	GUADELOUPE	MARTINIQUE	GUYANE	REUNION	
Administration	DIREN	DIREN	DIREN	DIREN	
Protected Areas					TOTAL
Parc National	1	0	0 under discussion	0	1
Réserves naturelles	2	2	5	1	10
Arrêté de Biotope	5	1	4	1	
Site classés	5	1	0	0	
Réserve biologique domaniale	0	0	1	6	
Site Ramsar	1		2	0	
Réserve biosphère	1		0	0	
Réserve biogénétique	0	1	0	0	
Total	15	5	13	8	

Table 3. Protected Areas in French Overseas Territories

STATUS	CT	TOM	TOM	TOM
	MAYOTTE	NEW CALEDONIA	FRENCH POLYNESIA	TAAF
Administration	DDAF	3 Provinces	Ministry of Environment	TAAF administration
Protected Areas				
Réserves naturelles	0	1	6	
Site Ramsar	0			
Réserve biosphère	0		1	
Réserve biogénétique	0			
Parc Provincial		4		
Parc terrestre et marin	1			
Réserve spéciale botanique		13		
Réserve spéciale faune		7		
Réserve spéciale faune et flore		2		
Parc provinciaux marin		5		
Réserve spéciale de faune marine		1		
Réserve spéciale marine		3		
Parc Naturel Territorial			1	
Total	1	36	8	

Réserve Naturelle : These sites are officially designated by French government after public enquiry. Protection by management, financial support is given to the managing body by the Ministry of Environment.

Arrête de biotope: Designated by the Prefet, in the name of the government, no public enquiry. Protection by forbidding certain activities.

Under the Act to protect natural monuments May 1930, **Site Classés***:* Designated by a départemental

committee for sites. Owner not allowed to alter the site

Under a general convention between the Ministry of Environment and Ministry of Agriculture and Office National des Forêts, February 1981, **Reserve biologique domaniale**: A means of protecting forest habitats

There is currently only one National Park in the French DOMs, in Guadeloupe. Discussions for a second one in French Guiana to protect the only European tropical rainforest have been going on for nearly twenty years now. There are 10 nature reserves in the DOMs, the majority were designated only recently, from 1992 onwards.

For TOMs

There is no uniformity in the protective status of sites in the TOMs. Frequently the sites are protected only on paper, e.g. New Caledonia (see Tables).

Examples of effective management in protected areas

- Amsterdam Island and St Paul Island
- New Caledonia

Amsterdam Island

The principal biodiversity interest of Amsterdam is the highly endangered endemic Amsterdam Island Albatross *Diomedea amsterdamensis* of which there were only 5-6 regular breeding pairs. There are also >37 000 pairs, the world's largest colony of yellow-nosed albatross *Diomedea chlororhynchos bassi,* and a number of other seabird colonies. Bird habitat has been degraded by a combination of several fires and the expansion of a feral population of cattle which was introduced in 1871. Brown rats, cats and pigs have also been introduced.

The vegetation needed restoring, so in 1987 management was begun with the aim of controlling the impact of the cattle population. A fence (8 km) was built to divide the island into two parts, and then the cattle population was reduced by roughly 50%, 1059 were killed in 1988 in one section of the island. A second fence was erected in 1992 on the high plateau to stop cattle incursions here, in order to protect the breeding area of the endemic albatross. Other actions included fencing off the remaining patch of forest and the planting of several thousand native trees *Phylica nitida* in the cattle-free section. The size and status of all population of seabirds will be monitored, and the characteristics of the soil, plant and animal communities in the cattle-free and cattle-occupied area.

Today there are 15 breeding pairs of the Amsterdam Island Albatross, and the vegetation is regenerating.

St Paul Island

In 1994, an interministerial committee, Ministry of DOM-TOMs and Ministry of Environment, on the environment announced that environmental protection in the DOM-TOMs was a priority.

These two islands, St Paul and Amsterdam, were the most degraded of the French sub-Antarctic islands, so it was decided to make an effort to restore St Paul as a habitat for the smaller sea-birds, like petrels, which were prevented from using Amsterdam due to the continued presence of cats and rats.

Of particular interest is the endemic subspecies of petrel Macgillivray prion *Pachyptila salvini macgillivrayi*. This was once abundant on St Paul, but by the early 1990s was found only on its last refuge Roche Quille, a small, adjacent island. Other seabird colonies on the island had declined due to habitat degradation.

This project of eradication of the rats and rabbits was supported by funds from the Development Directorate-General of the European Union, and carried out by the TAAF administration, with support from the CNRS at Chizé, France. Eradication took place in 1997. 14 tons of poison (.02g/kg brodifacoum) was spread by helicopter over the island's 800 ha. Afterwards, 5 people (3 French and 2 New Zealanders) stayed on the island to check the effectiveness of the poison. After 2 weeks there were no longer any rats alive. Some rabbits were left, but these were dealt with by trained dogs. A year later, a return visit established that the rat population was extinct. Monitoring of the situation will continue for 10 years. Petrels have already started to return to use the island.

New Caledonia

This is the gem in the crown of French biodiversity: 21 endemic bird species, about 2 500 endemic plant species, 40 endemic reptiles… Here the Kagu *Rhynochetos jubatus*, an endemic flightless bird species and unique member of its family, has suffered from introduced European mammals such as rats, cats, dogs and pigs. There are an estimated 1000 individuals left on the main island.

Although there is a large number of protected areas noted on paper in New Caledonia, in fact only one of

them is actually managed: The Provinicial Park of the Rivière Bleu.

Set up in 1960, management began only in 1980 and this consisted essentially of putting down poison on the day the park was closed, around dustbin areas and wherever animals were seen. The following day the poison was removed. For pigs, they were shot on sight.

The park's technician, Yves Letocart, has been monitoring kagu numbers for the past 15 years. It would appear that within the park the population has increased. They can now be seen relatively easily crossing the tracks. A radio-tracked individual has been followed for 12 years and has seen its territory reduced by its own offspring, as they leave to set up their own territory.

Today, however, what is urgently needed is to increase the number of areas which are managed like the Parc de la Rivière Bleu. The kagu population over the island is fragmented.

N° Kagus counted	1984	1991	1999
	42	164	208

Kagu *Rhynochetos jubatu)* population in Parc de la Rivière Bleu, New Caledonia, 1984-1999. (Letocart, Y and C Lambert 2000, unpub. report)

Conclusion

French DOM-TOMS contain globally important biodiversity. The responsibility for this is rather confused particularly with respect to international conventions. Tools for the protection of this biodiversity exist in the DOMS, but awareness of the importance of conserving it is not well-developed. This can be seen from the very small budgets made available for species and habitat protection and the slowness with which protected sites have been designated.

The national French government has little or no control over biodiversity protection in the TOMs, with the notable exception of the TAAF.

As an NGO we should be devoting more effort to the protection of this biodiversity, and we would like to benefit from the experience of other national NGOs working with their overseas territories.

Acknowledgements

Thanks to Carol Attié for her help in the preparation of the material on the French DOM-TOMs upon which this talk was based.

Kagu

Sustainable management of La Punta de La Móra in Tarragona

Puri Canals

Projecte LIFE de Gestió Sostenible de la Punta de la Móra, DEPANA, C/ Sant Oleguer 1, 43003 Tarragona,
Tel +34 977.22.71.76 fax +34 977.24.40.15 depanatg@tinet.fut.es www.entorno.es/depana/life

Engaged agents in the project

Proposal and management:
DEPANA

in agreement with:
The owner of "Mas Grimau" Estate, Mr. Agustí Peyra

Funding:
- European Community
- Generalitat de Catalunya
- Spanish Ministry of Environment
- Tarragona County Council
- DEPANA

Co-operators
- Gepec
- "Territori i Paisatge", Trust of Caixa de Catalunya

Budget and financing

Financial source	Amount in pesetas	%
European Union D.G. XI	49,853,500	50
Coast General Direct. Spanish Ministry Environ.	16,228,000	16.28
Environment Department Generalitat de Catalunya	16,000,000	16.05
Natural Environ.Direct. Agriculture Dept./Gen.Cat	8,000,000	8.02
Tarragona County Council	6,000,000	6.01
DEPANA	3,625,000	3.64
TOTAL BUDGET	**99,706,500**	**100**

Main guidelines of the project

- Proposed and managed by a NGO
- Private property in agreement with the owner
- Commitment of all public administrations involved by law over the site

Project timing

- 3 years
- starting 1st October 1998
- ending 31st September 2001

General aims

To achieve a sustainable management of a coastal site (terrestrial and marine) with unique habitats in Catalonia, and to improve and assure recovery of those habitats that have been altered.

Expected results

1. To solve the problems arising from excessive visitors pressure, and to repair and improve those habitats of community interest that have been severely damaged because of this.
2. To assure the conservation of interesting community habitats and avoid non-sustainable management and depletion of some natural marine resources (fishing, clam and shellfish collecting……).
3. To increase the general scientific knowledge of the site, especially about the less studied taxonomic groups.
4. To establish a reliable method of control and study about the qualitative and quantitative evolution of the different biotopes
5. To get the local population concerned about the importance of natural values of the site and to focus the interest of visitors on more educational subjects.
6. To promote the utmost possible upgrading of legal status so as to assure an effective and increased protection in the near future. A desirable degree would be "Partial Nature Reserve".

Main points of action to be developed

1. Adaptation of the walking zone for visitors coming to the site from the Platja Llarga access area, to Torre de la Móra in order to try to cut

down the unwanted effects of overvisiting, and try to divert it to less sensitive natural zones of the site, and also furnish them with information about the project.

2. Demarcation and marking of terrestrial and marine zones included in the protected area.

3. Recovery of zones that have become damaged by overwalking, mainly sand dunes and open woodland of mediterranean juniper.

4. Forest improvement works of all the zone, and building of a nursery for local plant species.

5. Permanent watching of the site.

6. Control of the biological pointers of quality level of the biotopes.

7. Opening of an office in Tarragona for administrative, managing, and public information purposes.

8. Educational activities and issuing of communication materials.

9. Permanent coordination both with owner and involved public administrations.

10. Providing regular and periodical information to the town media.

11. Regular flow of experiences between other similar natural sites and research centres.

Habitats at Punta de la Móra

(Appendix I of the Habitats Directive)

- Endemic *Limonium* communities (*Limonium gibertii*).
- Maritime sand dunes with *Crucianellion maritimae*.
- Open woodland of mediterranean juniper *Juniperetum lyciae*.
- Stone pine woods (*Pinus pinea*).
- Mediterranean woodland of *Oleo ceratonia* communities
- Permanently submerged communities of *Posidonia oceanica*.

The site has been proposed as a Special Area of Conservation of the Mediterranean region, named "Litoral Tarragoní", and included in the Natura 2000 Network of the European Community

Abstract of the project

LIFE project “Sustainable managing of the Punta de la Móra in Tarragona” is aimed at assuring protection of one of the last Mediteranean coastal areas of the Iberian peninsula, that has preserved till now important natural habitats of communitary interest. This protection should not interfere with traditional agricultural practices and social use of the area concerned. The site has been recently proposed as SAC (Special Areas for Conservation) and included in the European Union’s Natura 2000 Network.

Development of the project will be focused on three basic lines of action following the European Habitats Directive, and the Proposal of the 5th Programme of the European Community for Environment and Sustainable Development. These mainstreams are:

1. *In situ* actions aimed at improving the different natural systems (marine, coastal and woodland).
2. Communication, involvement and environmental education, mainly for the local population and visitors.
3. Public administration actions at all levels, to make easier any type of information exchange about managing and planning, between all the different concerned public administration offices.

In the first group of actions we can include:

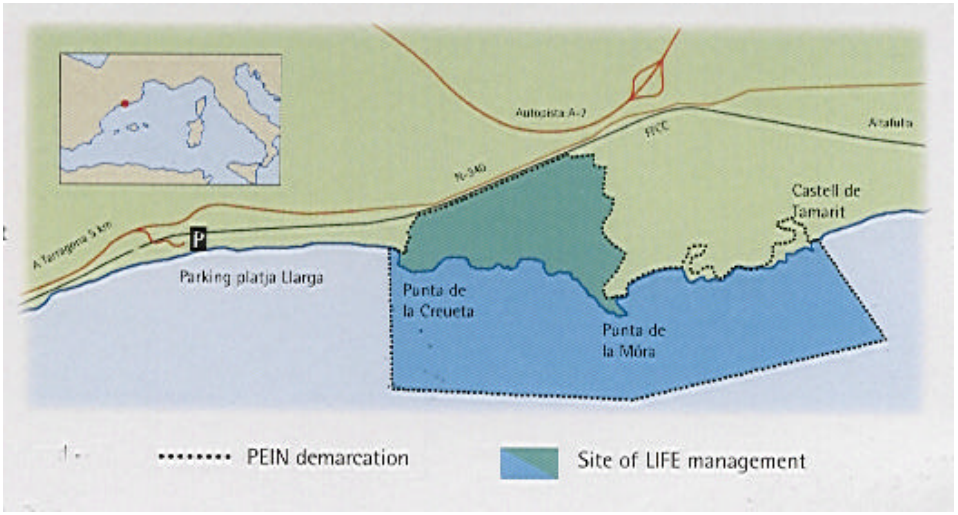
A. Buoy marking of the 20 metre sea-depth contour, with the main aim of protecting from anchor damage, and favouring natural restoration of submerged communities of *Posidonia*, and also the sand and rock benthic communities.
B. Designing and marking of a coastal path, to prevent damage to plant communities of the sea front (sand dunes with *Juniperus* and *Pinus pinea*, and *Chritmo-Limonietum*) included in the Habitats Directive.
C. Forestry management of woodland (*Olea ceratonia*) on the sea front, in order to repair eroded zones, reduce forest fire risks, and protect and increase the biodiversity.

In the second group we can include:

A. Designing and setting information boards at access points.
B. Planning and putting in practice environmental educational activities, with both the local population and visitors.
C. Organization of workshops and courses to exchange scientific knowledge and management experiences between similar sites in the European Union

The third group
will include any sort of actions intended at

encouraging similar activities in the field of public administration management, and also to increase the degree of legal protection of the site.



Basic guidelines of action

1. *In situ* actions to increase the quality of the different biotopes (marine, coastal, and woodland).

2. Diffusion, commitment, and environmental education activities, with the local population and visitors.

Actions with public administrations, in order to make easier the exchange of management and planning guidelines of the public organizations concerned in the zone.

Location map and part of information leaflet on the Project

The woodland

When land substratum near the coastline has appropiate conditions, it may be occupied by wood bearing plants, either trees or schrubs. Typically mediterranean woodlands are the coastal juniper open woods, and the pine-woods both of Aleppo and stone pines. These species are capable of growing on the rocky shore line, which is subjected to a constant and severe action of the seacoming winds and salt water. In response to those, tree growing on the sea facing cliffs takes a lie down bearing, as if it were a living green courtain.
Behind this line, and a bit more inland, growing also on thin rocky soils, some very characteristic plant associations can be found. Dense and thick, only a few meter high, are mainly kermes oak and dwarf fan palm communities, that here grow in a very good condition.
In the more secluded, shaded and cooler places, on deeper soil, also several plants, characteristic of the mediterranean evergreen oak woods can be found.

Squirrel
Sciurus vulgaris

ACTIONS ON WOODLAND

- Restoration of paths and accesses
- Prevention and watchful ness of forest fires
- Works in order to accelera te the natural evolutionary process towards a more mature woodland
- Restoration of damaged and overwalked areas
- Strengthening of declining species
- Fauna improvement

Sea lavender
Limonium gibertii

Audouin's gull
Larus audouinii

The coast

Plants growing on beaches may cause the accumulation of finests sands that later become sand dunes which are a peculiar habitat. Growing on these we can found some very well adapted species, as the marram grass and others. Those have very tough and long, horizontal growing rhizomes that firmly anchor them on such unsteady substratum.
Only a limited number of adapted plants are capable of growing on rocky shore cliffs. They are subjected to the harsh conditions arousing from sea water and saline environment. An endemic especies of sea lavender and rock samphire, locally named sea fennel, are both common on this habitat. Were the rock is altoghether under the sea waves, we can found a great amount of algae adapted to this environment, like the cistoseira upon which some fishes feed.
Permanently submerged sandy seabeds are locally colonized by the mediterranean especies of seaweeds posidonia and cymodocea, named locally "alguers". These submerged marine grasslands are of great biological interest because they stabilize the seabed, provide suitable refuges to great many different marine organisms and are spawning areas for coastal fishes.

ACTIONS ON THE COASTLINE

- Regulation of the fishing activities
- Regulation of boating and other nautical activities in the area
- Studies about shoreline dynamics
- Creation of signposted nature trails

Two banded seabream
Diplodus vulgaris

Effective site management planning

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Summary

Detailed management plans can be a wondrous sight to behold. If so, ignore them.

The point of a management plan is to structure thinking, balancing a number of conflicting pressures, and move towards achieving a series of long-term goals. Usually framed for biological or earth science interests, but equally suitable for visitor, educational and historic functions, plans must take full recognition of the political/practical/public use pressures as well – but do not have to agree with them. Erudite plans are usually intractable, and do not work. In practice, logically thought out plans, leavened with practicality, have the best chances of being used, and delivering meaningful data and outcomes in the long term.

For a plan to work requires a combination of good writing and reasoning, and use of clear practical/political acumen. Plans that do not get owned by decision makers and fund holders are known as dead plans. For a plan to work it must be implemented, involve monitoring and be continued. Non-working plans are also known as dead plans – and often involve dead species.

In the following few pages I outline the thinking process behind a plan, and how you can get on and do something useful.

1. Background

Planning is not new. Recognisable planning was going on more than a century ago, as foresters sought to maximise yields, and deliver the right blocks of trees at the right time.

The necessity for planning has never stopped. Rather, as conflicts for resources increase, it has become ever more necessary.

The key thing is that we should recognise what a plan is, what it isn't, and how it should be approached. It ultimately in the end must be

- DELIVERED and
- IMPLEMENTED

I would like to quote a few statements lifted from the 1983 Management Planning Handbook (NCC 1983):

- "for many years the mere existence of an agreed management plan was considered adequate for the purposes of managing a site. When fully completed, plans, often in the form of weighty scientific documents, dealt at length with the various attributes of sites…."

- "Little, if any, attempt was made to relate the requirement to the resource available…"

- "no formal procedures were laid down for monitoring progress in relation to objectives… Reviews were undertaken,… which served to enhance the value of the plan as a work of reference."

- "In terms of practical management the plans were at best used as broad guidelines to indicate areas where work should be concentrated"

The above points indicate why most plans have failed to work. What they omit are firm links between:

- The purpose or objectives, and
- The process or prescription

Essentially the planning process is <u>continuous and dynamic</u>

Much emphasis has been placed on the size of a plan – it is essentially *as long as it needs to be*. There is no merit in volume; rather it tends to cloud issues and waste resources. What the plan must do is to follow a clear logical flow – without it the next user cannot see how decisions were made, nor can the originator understand the issues that were in place much earlier if they were neither stated nor documented.

2. Plans – who needs them?

The answer is quite simple: all site managers, or anyone with responsibility for, or involved in, site and species management need plans. But surely, there are lots of cases where management happens without plans. Apparently so, but then these typically lack the detail/records or decisions and outcome from which

one can gain insight into whether the objectives were delivered or not. As they are typically undocumented and at best done with minimum of discussion, it is hard to know whether they really worked, or whether there were clear, objective lessons learnt.

The learning aspect of planning is a key issue. Conservation cannot afford to repeat mistakes in isolation – that is called local extinction, or worse.

3. The basic functions of a management plan

These include:

1. Providing a description of the site

A basic goal is providing a clear description of the site- its major attributes and what it is there that requires planning and action. One of the best ways to get to grips with the issues is not just mere enumeration or listing, but also the preparation of maps with the key features placed on them – dated.

2. Identifying the objectives of site management

This is, arguably, the most important function of the planning process. After all, unless you know your objectives, you cannot plan, and you certainly cannot monitor or work out whether you are succeeding or not. Hence the need to clearly state what you are trying to achieve, with an idea of timescales built in. Note: pie-in the-sky objectives will quickly get exposed.

3. Resolving conflicts and prioritising objectives

Occasionally, two objectives may appear of equal merit. Discussion needs to be undertaken, and ranking used (usually referring to differing levels of legal obligations for habitat A or species B). Usually, it is the thinking process of the plan that resolves these early issues.

4. Identify and describe the management/actions needed to achieve the objectives

The plan must identify not just the objective – but also the actions needed. In many cases, where intervention is identified as not being needed, the appropriate monitoring programme still needs identifying. *Monitoring* is an integral part of planning.

If activities are taken for which there was no identified objective, or no reference/rational can be made – then it is pointless undertaking it . Whims are expensive.

5. Identify the monitoring needed to assess the effectiveness of management

Especially if there is intervention management (doing something as a direct action), there will be a need in due time to see if that action has met that objective. Hence, did we achieve our hope/expectation – or does another process need to be set in train? *If a plan does not identify the need to monitor, then it is not a plan.*

6. Maintain the continuity of effective management

Contrary to rumour, site managers, or conservation directors are not immortal. When it is said that "they hold a complete management plan in their heads", that's the time to really worry. An overt management plan shows what is needed; it does not selectively add or remove things that do not fit, and it most certainly does not change jobs or retire. Instead, it is accessible to see what went before, and why.

7. Obtain resources

A plan is done for a group or authority. It identifies the basic minimum needed to remedy or continue a situation. Either way it involves resources. By setting out the programme of work – even as little as monitoring something – it bids for resources. It also sets out what might happen if resources are unavailable, or how much can be achieved, and with what consequence for denial or delay. As such, it is a powerful weapon for public accountability – especially when commitments/contributions to biodiversity obligations are concerned.

8. Communication

Issues/problems can be common – such as atoll or beach erosion, for which being able to share experience in a common format/against a common background is critical. "Sharing saves lives" is how one UK conservation organisation described information exchange.

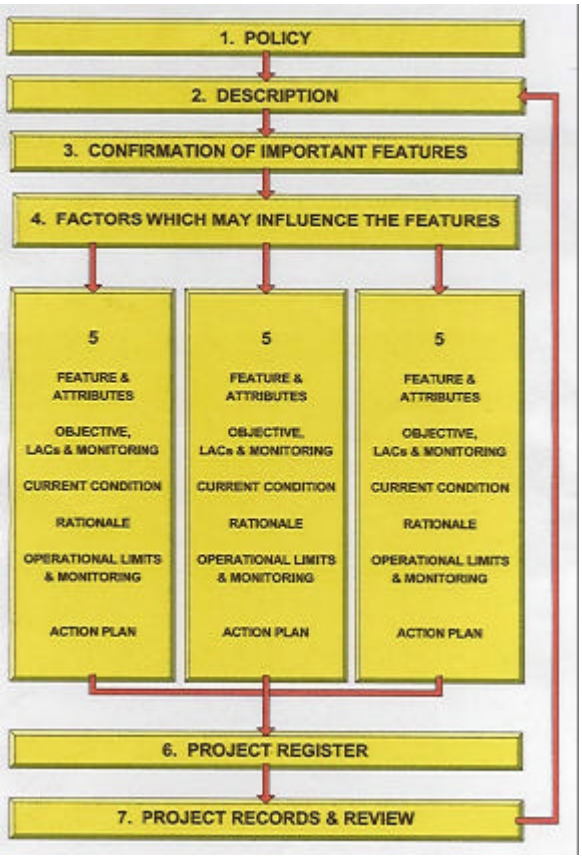
9. Show that management is effective and efficient

Plans always need to be assessed, and are no more immune from this in seeking efficiency that any other business process – only here we are in the conservation business

4. The Basic Structure

There is **no** exact structure that will fit all sites/species. There is a basic set of units that encapsulate an **approach** to planning. It is this mental process that I am concerned with, and that will form the basis for the practical session later this afternoon.

The contents of a plan could be long and exhausting – and appear almost scientific if compiled like a mantra, without thought. Looking at the points in section 3 above, it is clear that there is a **mental process/ approach** to be gone through as part of the producing of a plan. This can be shown simply in the Figure below.



In the following paragraphs I want to skip through the key stages, and let you begin to see that what you are doing is honing down from a wide list of possibilities to a largely coherent set of potentials and possible outcomes – and doing so in an externally recognisable way.

4.0 Plan Summary

The last bit of a plan to be completed, this encapsulates the key elements in the plan. If well written, it is tactically invaluable, spelling out the decisions and processes involved for those habitats/species or that territory. It can be the key to "selling" the plan to decision makers who have limited time.

4.1 Policy

The plan must reflect the policies of that Society/Group or Government. Stating these early on in the process allows recognition of context to objectives and statements possible in later sections.

4.2 Description

At its simplest it is a collation exercise, bringing together all relevant data, and placing these under a range of standard headings – part of the way in which communication between players can be achieved. Data need to be concise and easily assimilated – and gain from use of maps/diagrams.

One key conclusion is, if data are missing, this is grasped as an action in a later section, when a project will be undertaken to fill the gap in knowledge

4.3 Confirmation of important features

This starts to place the features that make that location important, in some sort of evaluated context. It distils down from the many components possibly described in 4.2, and also begins to consider the non-biological: earth science, landscape, research, public use and access.

The biological is placed against a series of standard biodiversity hangers – such as size, rarity, naturalness, and fragility, to check on the suitability of the components being open to multiple use – and to start the thinking in 4.4

By the end of this section one should have a clear idea of relative priorities, and responsibilities from the local through to the international. This starts the mental ball rolling on to constraints – which appear in 4.4

4.4 Factors which may influence the features

Having got as far as describing, and then ranking, the features of interest, and recognising that there may be a clear public-use role, it is time to consider the trends/factors/constraints that can impact on that/those features.

The key first stage is to recognise the owners/landholder's objectives, if these are not the same as the planning body. These need to be agreed or reconciled, mindful of possibly transcending legal limits to achieving their objectives: ideally they will follow your own long-term objectives.

Factors will include natural and anthropogenic factors, legal obligations and linked environmental issues. The last item may seem notionally confusing, but it is for example important for a particular species where it depends on the health/integrity of a much larger block of habitat being maintained.

For convenience in working through the pros and cons, the summary issues often work well as a column of plus points, and a column of negative points.

4.5 Feature objectives, limits and monitoring

In this section (refer back to the Figure) you start to work through the final stages that lead to the potentially getting-dirty "doing bit". This can come only after you are sure you know what you should be doing, and why. Note that you do this on the one-by-one basis for each of those features – such as a species/habitat/community – that were arrived at after reaching the end of 4.4

In setting an objective for the feature, there must be some *attribute* that is intrinsically inseparable from that feature and can be used to evaluate the success/failure in reaching that objective. For a species this will be something like number of breeding pairs/ individuals along a transect. For a habitat or community it might be extent, allied to an aspect of structure or composition

The *objective* describes where you want to be – and includes the upper and lower bounds when things start to get a little unhappy; these are the *limits of acceptable change (LACs)*. Recognising where these are, and why, is decided in principle in the evaluation stage of 4.3. Basically they are set so that within these bounds the feature will be expected to continue in the long-term. LACs are an early warning system – allowing action to be taken before it is too late.

As part of the process of assessing where you are with a particular feature, you need to use an appropriate *monitoring method* – one suited in type and style/frequency to your resources, but able to deliver a realistic assessment of change. Unless it does, you will waste your precious time and resources, and possibly that feature too!

The *rationale* acts basically as a double-check that you have recognised the keys affecting that feature, and are going to get on and then do something about it. This gets us to the real doing bit – the *Action Plan* .

For each feature you will have recognised factors causing change, and considered whether these are a problem or not. If the factors are not a problem, then merely monitor it – using a method that is open and valid, and keep good records. If they are a problem, then you work out a set of activities or *projects*. These describe what needs doing, by whom and when. They will also include the recording of the outcomes.

Essentially for the recurring 3-5 year time-scale that you might be working to in the management and planning for the species/site/territory, you will be setting up a programme of activities. If undertaken, and reasoned decisions made on the trends shown, you should not only have a working plan – but more importantly, be achieving your conservation and other objectives. After the first few years you will then start to see how some of the patterns have changed, and can begin to flesh out some of the bits of the plan that you were unhappy about.

Planning for the Gibraltar workshop on Effective Management Plans

1. Background

In the first part of the planning session (above) all participants will have quickly been introduced to the basic thinking process that underpins any planning exercise.

Amongst the key messages to get a plan that actually works was the need to produce reasoned trade-offs between different pressures, and the recognition of constraints to almost all objectives. In addition, there is a need to sift between what is desirable and what is practicable – whilst setting out a timetabled set of actions that would hopefully produce some of the objectives in the middle- to long-term.

For the purposes of the workshop, we will split into three different groups, each led by several local experts. The job of the participants (having selected one rapporteur per group) in each group is to tease out:

The key features in the area visited (4.2 in the talk) - a summary including these will be provided

Confirm the important features (4.3)- and determine their context, including:

- extent: how big?; large enough to be viable in the future?; is it in rapid decline?; is it within acceptable limits? – and how are these determined: biologically or politically?
- diversity: is the diversity of the habitat/ community indicative of stability or negative change?; are we worried?; is intervention needed – and will it be at the expense of another key feature?

- rarity: is it rare?; why is it surviving?; is it part of a seral change and can be left to disappear (a hint here is the status on the protected list for Gibraltar)?
- naturalness: is the feature natural, or the product of extensive modification?; will it change if pressures on it alter?; what might these be?

Add other parameters as you think fit, noting why you used them.

Identify the factors which may influence the important features noted in stage 2, on a one-by-one basis (4.4).

For **Windmill Hill Flats** these might include:
- Military needs and their impacts on the range of habitats/species allowed
- The limitations that ownership can place on management, and how individual species/habitats react to this
- The sensitivity of the plant communities to heavy use and fire
- Dealing with invasive and feral species – what place management?

For the **Upper Rock** these might include:
- The limits imposed by Protected Nature Reserve status
- The extent to which habitats should be managed – are the objectives clear?
- Balancing conservation interests with public use
- The role of public use, and acceptance of habitat change in highly used areas
- Interpretation – are the communities able to withstand current use levels?
- Changes in community structure – acceptable or driven by escapes ?

For the **Marine area** these might include:
- Potential limits from being in 2 conservation designations
- The plethora of extractive pressures on the resources to be listed – including fishing and sea bed raking, dolphin tours, over-exploitation of edible littoral species; recreational angling
- Practical law enforcement
- Development of the coast
- Pollution

For all three groups, use of the +/- tabulation might help

Having identified the main features, visited in concept at least the main constraints, the groups will now need to :

4.1 Set objectives for a sample of the features, with LACs (4.5)
4.2 Consider actions that may be needed for those features that need intervention management, and write a basic project or projects that would be needed to carry out the work. Note that any activity must contain a monitoring component
4.3 Set time scales – with good reasons – for the activities, and define quantifiable parameters for use in the monitoring work. Note that monitoring can be used in all aspects of the plan.
4.4 Consider whether the objectives and projects that you are setting are actually realisable within the potential finances/resources available. If not, set the work out according to practicability, and consistent with Gibraltar's legal obligations.

Summarise any issues that your group thinks needs to be done, but are constrained by existing procedures/ systems etc. Identify how these might be circumvented, and where the major decisions need to be taken to achieve the requisite change.

For each group, a short set of steps working through the practical exercise will be needed for inclusion in the post meeting documents. This IS a practical exercise.

It is hoped that all participants will have gained a better appreciation of issues, and the mental process accompanying plan consideration during the course of the exercise and the accompanying discussions.

Appended are the background notes on each study site (pregared by GONHS), followed by the reports of the brief workshops.

CALPE 2000 FIELD WORKSHOPS

The Marine Environment

Habitats and main impacts

The majority of what remains of Gibraltar's natural coastline is rocky shore with a small intertidal range typical of the Mediterranean. Most of the accessible rocky shoreline is exploited to some extent, mainly on a small scale (*e.g.* for fishing bait). Recreational angling is increasingly a problem and certainly creates disturbance which minimises the importance of the shoreline for waders. The sea cliffs remain relatively unspoilt, except near industrial activity.

The seabed drops rapidly from 0 to 700m and is generally sandy, but with a number of natural and artificial reefs, the latter having been created (by GONHS) to increase the diversity of species. Seabed species are varied and show the influence of the Mediterranean and Atlantic. They include endemic Nudibranchs.
Offshore, nutrient rich waters result in a diversity of marine life. Migratory fish move though the area, as do cetaceans, and common and striped dolphins calve in these waters.

Fishing with drift and seine nets and conch raking by Spaniards, despite being illegal, is allowed for political expediency and is a problem.
Some littoral invertebrates are protected by law as are all cetaceans, turtles and selected fish.

Species List

In addition to the species listed below are the birds. Some waders use the rocky shores, especially in winter (common sandpiper, turnstone, whimbrel, little egret) but are constantly disturbed by recreational anglers.

Thousands of seabirds occur on passage offshore. Yellow-legged gulls nest everywhere. Sea-caves on the east side are used by nesting western Mediterranean shags, as well as alpine swifts and pallid swifts, and as winter roosts by crag martins. There is a sizeable winter population of gannets and black headed gulls, with smaller numbers of razorbills and great cormorants.

PHYLLUM: MOLLUSCA
CLASS: GASTROPODA

Haliotis lamellosa
Diadora apertura
Calliostoma conulum
Gibbula varia
Gibbula richardii
Gibbula cineraria
Gibbula magus
Monodonta turbinata
Patella caerulea
Patella vulgata
Patella rustica
Patella ferruginea
Melaraphe neritoides
Nodilittorea punctata
Bittium reticulatum
Vermetus gigas
Thais haemastoma
Ocinebrinia edwardsi
Mitra ebenus
Pyrene maldonadoi
Siphonaria pectinata
Onchidella celtica
Haliotis tuberculata
Turbo rugosus
Spurilla neapolitana
Herria costai
Erodonia viridis
Thuridilla splendida
Peltodoris atromaculata
Flabellina affinis
Cerithium vulgatum
Aporrhais pespelecani
Zizyphinus granulatus
Turritella communis
Scala clahtrus
Vermetus gigas
Pisania maculosa
Crepidula formicata
Conus mediterraneus
Murex erinaceus
Murex trianchus
Murex brandaris
Capulus hungaricus
Dolium galea
Clathrus clathrus
Ranella gigantea
Cassidaria echinophora
Cassidaria tyrrhena
Natica hebraea
Cypraea pyrum
Cypraea lacrimalis
Nassa reticulata
Nassa variabilis
Tritonium nodiferum
Aplysia punctata
Aplysia fasciata
Jorunna tormentosa
Falio dubia
Elysia viridis

CLASS: POLYPLACOPHORA

Chiton olivaceus
Callochiton achatinus
Acanthochiton communis

CLASS: CEPHALOPODA

Allotheutis sublata
Loligo vulgaris
Sepia officinalis
Eledone aldrovandii
Eledone moschata
Sepiola randoletti
Ptodarodes sagittatus
Octupus vulgaris

CLASS: BIVALVIA

Mytilus galloprovincialis
Mytilus edulis
Perna picta
Musculus discors
Chlamys varia
Anomia ephipphium
Cardita calcyculata
Chlamys opercularis
Nucula nucleus
Pinna rudis
Pinna squamosa
Pinna nobilis
Lithophaga lithophaga

Lima lima
Lima hians
Spondylus gaederopus
Venus verrucosa
Verus casina
Cytherea chione
Notrius irus
Donax vittatus
Donax trunculus
Mactra glauca
Tellina tenuis
Tellina planata
Tellina distorta
Tellina crassa
Scobicularia plana
Solecurtus strigilatus
Ensis siliqua
Pharrus legumen
Teredo navalis
Lutraria lutraria
Tapes descussatus
Meretrix clione
Pholas dactylus
Mactra corallina

CLASS: HOLOTHURIOIDEA

Cucumaria planci
Holothuria forskali
Stichopus realis

PHYLLUM: ARTHROPODA

CLASS: CRUSTACEA

Scalpellum scalpellum
Chthalamus stellatus
Chthalamus depressum
Chthalamus montagui
Balanus perforatus
Acasta spongitis
Blanus improvisus
Lepas anatifera

SUB-CLASS: MALAVOSTRACA

Palaemon elegans
Palaemon serratus
Galathea squamifera
Ligia oceanica
Diogenes pugilator
Nerociba bivalyata
Pagurus anachoretus
Sphaeroma serratum
Pilumnus hirtellus
Gammarus locusta
Pachygrapsus marmoratus
Xantho incisus

SUB-CLASS: MALOCOSTRACA

Squilla mantis
Talitrus saltator
Punnotheres pinnotheres
Inachus dorsettensis
Portunus corrugatus
Neptunus hastatus
Hippolyte prideauxiana
Maja verrucosa
Maja squinado
Eriphia spinifrons
Carcinus meanas
Calappa granulata
Galathea squamifera
Palinurus elephas
Eupagurus excavatus
Nephrops norvegicus
Penaeus kerathurus
Parapenaeus longirostris
Anilocra mediterranea
Scyllrides hatus
Scyllarus arctus
Eupagurus anachoretus
Plesiopenaeus edwardsianus
Hamurus gammrus

PHYLUM: TUNICATA

CLASS: ASCIDIACEA

Clarelina lepadiformis
Distomus variolosus
Didemnum candidum
Botryllus schlosseri
Botrylloides leachi

PHYLUM: PORIFERA

CLASS: DEMOSPONGIAE

Halichondria panicea
Hymeniacideon sanguinea
Dysidia fragilis
Spongia officinalis

PHYLUM: CNIDARIA

CLASS: ANTHOZOA

Vertillum cynomorium
Epizoanthus areaceus
Actinia equina
Actinia cari
Anemonia sulcata
Paranemonia cinerea
Anthopleura balli

Anthopleura rubripunctata
Cerianthus membranaceus
Parazoanthus axinellae
Condylactis aurantiaca
Binodactylis verrucosa
Sagartia troglodytes
Calliactis parasitica
Leptosamnia pruroti
Balanophyllia regia
Asteroides calycularis
Alcynium palmatum
Parerythropodium coralloides
Pteroides griseum
Eunicella carolinii
Eunicella verrucosa
Eunicella singularis
Paramuricea clavata
Corallium rubrum

PHYLUM: ANNELIDA

CLASS: POLYCHAETA

Exogone gemmifera
Nereis pelagica
Cabella paranina
Spirographis spallanzanii
Myxicola infundibulum
Hydroides norvegica
Pomatoceros triqueta
Filograna implexa
Spirorbis pagenstecheri
Spirorbis borealis
Protula intestinum
Serpula vermicularis

PHYLUM: ECHIURA

Bonellia viridis

PHYLUM: PLATYHELMINTHES

CLASS: TURBELLARIA

Thysanozoon brocchii

PHYLUM: BRYOZOA

CLASS: GYMNLAEMATA

Tubucellaria careoides
Margaretta cereoides
Myropora truncata
Frondipora reticulata
Pentapora fascialis
Retepora cellulosa
Schimospora armata
Flustra carbasea

PHYLUM: VERTEBRATA

CLASS: CHONDRICHTHYES

Isurus oxyrinchus
Carcharodon carchanas
Cetorhinus maximus
Alopias vulpinus
Scyliorhinus canicula
Scyliorhinus stellaris
Prionace glauca
Sphyrna zygaena
Torpedo torpedo
Torpedo marmorata
Torpedo nobilana
Latimeria chalumnae
Raja clavata
Raja alba
Raja batis
Dasyatus pastinaca
Myliobatis aquila
Squalus acanthias
Squalina squalina

CLASS: OSTEICHTHYES

Parapristipoma octolineatum
Sprattus sprattus
Sardinus pilchardus
Engraulis encrasicholus
Anguilla anguilla
Muraena helena
Conger conger
Belone belone
Cypsilurus heteruras
Hippocampus hippocampus
Nerphis lumbriciformis
Syngnathus abaster
Syngnathus typhle
Syngnathus acus
Zeus faber
Phyraena sphayraena
Atherina presbyter
Chelon labrosus
Liza ramada
Dicentrarchus labrax
Epinephelus alexandrinus
Serranus cabrilla
Serranus scriba
Serranus hepahis
Epinephelus guaza
Anthias anthias
Puntazzo puntazzo
Diplodus vulgaris
Diplodus cernius
Pagnus pagnus

Oblada melanura
Dentex dentex
Pagellus erythrinus
Pagellus bogaraveo
Spanus auratus
Pagellus acarne
Lithognathus normyrus
Diplodus annularis
Boops salpa
Maena chyselis
Maena maena
Mullus surmulehis
Mullus barbatus
Argyrosomus regium
Sciaenia umbra
Unbrina cirrosa
Pomatomus saltator
Trachurus hachurus
Trachurus mediterraneus
Seriola dumertii
Naucrates ductor
Lichia amia
Campogramma vadigo
Trachonitus glaucus
Coryphaena hippurus
Brama brama
Chromis chromis
Labrus mixtus
Labrus bergylta
Crenilabrus mediterraneus
Crenilabrus ocellatus
Crenilabrus melops
Crenilabrus cinereus
Crenilabrus quinquemaculatus
Crenilabrus scina
Coris julis
Thalassoma pavo
Euscanus cretensis
Trachninus draco
Trachinus vipera
Uranoscopus scaber
Scomber scombrus
Scomber japonicus
Sarda sarda
Thunnus thynnus
Thunnus alalunga
Auxus thazard
Euthynnus alleteratus
Crenilabrus finca
Labrus merula
Xiphias gladius
Polyprion americanum
Callionymus lyra
Blennius gattugine
Blenius pavo
Blennius tentacularis
Blennius sphinx
Blennius canevae
Blennius rouxi
Blennius trigloides
Tripterygion tripteronotus
Gobius bucchichii
Gobius paganellus
Pomatoschishes microps
Trigla lyra
Trigla lucerna
Eutrigla gurnardus
Dactylopterus volitans
Scorpaena porca
Scorpaena scrofa
Scorpaena notrata
Solea solea
Remora remora
Mola mola
Lepadogaster lepadogaster
Lophias psiattorius
Spondyliosoma canthanus
Apogon imberbis
Macrohamphosus scolopax
Capros aber
Balistes carolinensis
Onos tricliratus
Mugil auratus

CLASS: REPTILIA

Dermochelys coriacea
Caretta caretta
Chelonia mydas

CLASS: MAMMALIA

Physeter catodon
Delphinus delphis
Stenella coeruleoalba
Grampus griseus
Tursiops truncatus
Orcinus orca
Globicephala melaena
Globicephala macrorhynchus
Balaena glacialis
Diplodus bellottii

ALGAE

Derbesia lamourouxi
Udotea pectiolata
Halmimeda tuna
Codium tomentosum
Codium bursa
Ralfsia verrucosa
Punctaria latifolia
Petalonia fascia
Cutleria multifida
Sporochnus pedunculatus
Halopteris filicina
Dictyota dichotoma
Padina pavonia
Fucus spiralis

Fucus serratus
Asparagopsis armata
Falkenbergia rufolanosa
Hypnea musciformis
Peysonnelia squamaria
Hildenbrandia rubra
Corallina elongata
Phymatolithon calcareum
Liththamnion fruticulosum
Lichinia pygmaea
Nitophyllum punctatum

Windmill Hill Flats

Habitats and main impacts

The main characteristic of this site is the fact that it is flat. It contains a combination of pseudosteppe (open habitat), with areas of low scrub (garrigue) and higher maquis. There is an artificial pond within the site. Military training creates disturbance to vegetated areas and probably prevents the establishment of some bird species that attempt to nest. These have included corn bunting and black-eared wheatear. The site holds many plants not found elsewhere in Gibraltar. Introduced invasive plants are smothering some areas of natural vegetation.

It is one of the sites where attempts are being made to re-establish the Gibraltar Campion in the wild. During migration periods it holds a large number and variety of grounded migrants. It holds small populations of wintering birds. Feral cats are a problem for rabbits and the Barbary partridge which nests there.

Selected species

PLANTS
Main shrub species:
Olea europea
Calicotome villosa
Genista linifolia
Pistacia lentiscus

Ground cover:
Gramineae
Asteriscus maritimus
Carpobrotus edulis (introduced invasive succulent)
Dittrichia viscose
Oxalis pes-caprae (introduced)
Pennisetum clandestinum (introduced invasive grass)

Other species:
Colchicum lusitanicum
Crocus salzmanii
Ferula tingitana
Foeniculum vulgaris
Iberis gibraltarica
Mantisalca salmantica
Narcissus papyraceus
Salvia verbenaca
Scilla peruviana

REPTILES & AMPHIBIANS:
Rana perezi (introduced in pond) Spanish marsh frog
Coluber hippocrepis Horseshoe whipsnake
Lacerta lepida Ocellated lizard (part of re-introduction programme)
Mauremys caspica European pond terrapin (introduced in pond)
Podarcis hispanica Iberian wall lizard
Tarentola mauritanica Moorish gecko.

MAMMALS
Oryctolagus cunniculus Rabbit

BIRDS
Nesting:
Alectrois barbara Barbary partridge
Cisticola juncidis Fan-tailed warbler
Falco tinnunculus Kestrel
Sturnus unicolor Spotless starling
Sylvia melanocephala Sardinian warbler

Wintering:
Carduelis carduelis Goldfinch
Emberiza cia Rock bunting
Galerida cristata Crested lark
Galerida theklae Thekla lark
Motacilla alba White wagtail
Motacilla cinerea Grey wagtail
Phoenicurus ochruros Black redstart
Saxicola torquata Stonechat

Many more species of bird occur on passage.

The Upper Rock

Habitats and main impacts

The Upper Rock is mainly vegetated by high maquis, about 2-3m tall, with some areas of lower scrub to 1m and clearings more or less well managed as firebreaks. These firebreaks and some natural open screes maintain the diversity of plants (although many have been lost through seral succession) and provide the main feeding sites for the Barbary partridge and rabbits (considered desirable in view of Gibraltar's poor native mammal fauna). Invasive plants threaten this habitat.

There are cliffs and other rocky slopes which hold endemic plants. There are also cave and tunnels which contain dwindling bat roosts.

The semi-wild Barbary macaques inhabit the Upper Rock, preferring the more open habitats where they can cause great damage to plants through trampling, eating and by causing erosion. The yellow-legged gull nests in most habitats and is a predator on small birds and other animals. Feral cats and black rats abound.

There is great pressure on the Upper Rock from tourist traffic.

The Upper Rock is a nature Conservation Area under the Nature Protection Ordinance (1991).

Selected species

PLANTS

Trees:
Celtis australis
Laurus nobilis
Pinus halepensis
Pinus pinea
Calicotome villosa
Genista linifolia

Main shrub species:
Olea europea
Osyris quadripartita
Pistacia lentiscus
Rhamnus alaternus

Ground cover:
Acanthus mollis
Gramineae
Oxalis pes-caprae

Other species:
Cerastium gibraltaricum
Colchicum lusitanicum
Ferula tingitana
Foeniculum vulgaris
Gladiolus communis
Iberis gibraltarica
Narcissus papyraceus
Psoralea bituminosa
Saxifraga globulifera
Scilla peruviana

REPTILES:
Coluber hippocrepis Horseshoe whipsnake
Elaphe scalaris Ladder snake
Hemidactilus turcicus Turkish gecko
Malpolon monspessulanus Montpellier snake
Natrix natrix Grass snake
Podarcis hispanica Iberian wall lizard
Psammodromus algirus Algerian sand racer
Tarentola mauritanica Moorish gecko

MAMMALS:
Macaca sylvanus Barbary macaque
Miniopterus schreibersi Schreiber's bat
Oryctolagus cunniculus Rabbit
Rattus rattus frugivorus Black rat
Vulpes vulpes Red fox (probably extinct – reintroduction programme in preparation).

BIRDS
Nesting:
Alectrois barbara Barbary partridge
Falco tinnunculus Kestrel
Falco peregrinus Peregrine falcon
Larus cachinnans Yellow-legged gull
Turdus merula Blackbird
Monticola solitarius Blue rock thrush
Troglodytes troglodytes Wren
Parus caeruleus Blue tit
Sturnus unicolor Spotless starling
Sylvia melanocephala Sardinian warbler

Wintering:
Carduelis carduelis Goldfinch
Motacilla alba White wagtail
Motacilla cinerea Grey wagtail
Saxicola torquata Stonechat
Phoenicurus ochruros Black redstart
Turdus philomelos Song thrush
Erithacus rubecula Robin

Many more species of bird occur on passage.

Management Planning Field Workshops: Outline reports

edited by Tim Reed

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BACKGROUND

The workshops were undertaken in order to show how the potentially abstract notions discussed in considering management planning worked in practice. Prior to the practical sessions, the basics of planning were covered in outline. The basic aim/objective of the practical sessions was not to produce a set of "pure" plan components, but to expose participants to the approach, and to see how it might benefit their respective organisations. It was not expected that the groups would mirror each other in their results: some contained experienced planners; others were totally new to the concepts. The results reflect these levels of experience, but all showed clear signs of undergoing the basic thinking process that is management planning.

INTRODUCTION

Each group took an independent slant on the planning practical. Nonetheless, all went through the planning process, especially the thinking stages on the way to their outcomes. That all terms were not used consistently in no way took away from the achievement of the groups.

Each group had a guide who acted as repository of knowledge for the site, and provided a resume of issues at each location. The role of the catalysts was to help stimulate the process of questioning/ drawing out issues and setting objectives/identifying options for the group. The group's job, in turn, was to take the basic information and help to reach outcomes for each of the habitats/areas.

WORKSHOP 1. MARINE EDGE

Guide: Eric Shaw
Catalysts: Joseph Smith-Abbott
Tim Reed

The group took in 2 sites/features
a) Posidonia beds
b) Camp Bay

a) Posidonia Beds – the Feature

Issue
The beds near the newly extended revetment wall by the airstrip are, and have been, under threat.

After having suffered 60% loss in the last 3 years, 15% further loss is threatened.

Considerations:
Extent – 40% remains
Fragility – to extraction/burial/seabed mining. Fragile
Rarity – An EU Directive special Habitat. Patching found in Bay of Gibraltar.

Factors affecting Posidonia beds:
Legally protected:
- Laws (1991 Ordinance) not enforced

GONHS lobbying:
- Not being listened to
- Pollution from reclaimed area in Gibraltar
- Pollution from Spain across the bay

Could use Ramsar protection:
- Government scared of Ramsar implication. No long-term strategy for safeguard in place.
- No public support of Posidonia problems
- Offshore turbidity
- Porifera algae taking over in Spanish area.

Objectives:
Develop new Posidonia beds by changing seabed topography near new infill, along with current regime, to allow Posidonia regeneration.
Time scale 10-20 years

Activities
- Lobby Gibraltar Government to recognise need to sign Ramsar Convention to strengthen Posidonia protection: Time Scale + 5 years
- Funding for excavation work: Time scale 3 years
- Begin reseeding of new Posidonia plants: Time scale 3-5 years

Monitoring
- (Use existing French survey method)
- Map initial status in year one
- Monitor success in trail plots every year
- Monitor scale of colonisation every 2 years

Funding
Gibraltar Government – project to gain and sustain ££ - review annually

b) Camps Bay

Issue
To stop development of the Camp Bay beach area, and loss of offshore artificial reefs.

Feature
Offshore artificial reefs (sunken ships) placed at the edge of steeply sloped shelf with rich sea communities.

Considerations

Extent:	10 boats or 800 m length
Biodiversity:	richest area in Bay and as far as Malaga
Rarity:	supports species and communities unique to bay
Fragility:	robust
Public Use:	high diversity value and use

Factors affecting area

Rich biodiversity site	No alternative locations
Rich diving area	No sustained public profile
Potential vote winner	Closes off political avenues
Possible to safeguard legally	No obvious political gains
GONHS owns wrecks	Low concern for public

Objectives
Put in place legislative support for Camp Bay's protection by designating as marine Reserve in + 5 years

Activities
- Lobby Government on low risks for designation + 5 years
- Incorporate into policy planning as a safeguarded area
- Evaluate use and monetary value of existing use levels by divers over 3 year period
- Monitor public perception of the Camp Bay issue annually
- Represent better informed case after 3 years

Key constraint
Government awareness of cheapness of action, but not yet prepared to undertake change.

WORKSHOP 2. WINDMILL HILL FLATS

Guide:	Leslie Linares
Catalysts:	Colin Clubbe
	Madeleine Groves

The group approached the task by beginning with the compilation of the basic site description. This led to the derivation of the key features.

Key Features
- Flat Areas
  - West – dominated by invasives
  - East – more natural, less disturbed
- Rocky Scrub
- Steep rocks with endemics
- Artificial pond

Factors
MOD (owner)
- MOD short term views/non-consultation

Limited access
- Limited access – hard to monitor

Breeding & migrating birds
- Important for international obligations

Invasive plants
Feral plants
Natural processes
- succession

Reintroduction of priority species
- Lack of knowledge of priority species biology

Three species were considered. The group concentrated on *Silene tomentosa*

Silene tomentosa
- endemic to Gibraltar
- only 2 individuals
- not reproducing in the wild
- reproducing in the Botanic Gardens

Objective
To establish a viable population in the wild
a) Short term – establish life cycle + 5 years
b) Medium term – reintroduce within 10 years

Action Plan
1. Improve GONHS: MOD Conservation Committee Communication – provide written resumes of key agreements for new staff.
2. Inform MOD of presence/absence and location of Campion and other important species – using maps in particular.
3. Produce maps of species locations.
4. Produce information signs for recognising key species
5. Continue annual survey and, in particular, monitoring - recording individuals.
6. Investigate horticultural propagation techniques
7. Identify distinct projects needed that could be carried out as beneficial 6th Form projects in the local school

WORKSHOP 3. THE UPPER ROCK

The Upper Rock group took several different strands in their approach to planning, dispensing in part with the basic description, adopting the resume provided on the hand out.

Feature 1. The Apes

Background parameters that influenced the discussion

- The Macaques are potentially an artificial population
- They are viewed primarily as a heritage feature, secondly as a biological feature
- The population could expand rapidly, and is not limited to the Upper Rock
- The population is illegally fed. This has a series of risks:
  - disease (hepatitis A carrier)
  - aggression – within community and to humans

Constraints

- Provide annum income
- Income not retained by GONHS
- MOD support
- Expense of management
- Tourist Board manages apes - No?
- Animal welfare problems
  - obesity
  - diabetes
- Culling contentious
- No interpretation
- MOD confused

Objective

1. Maintain a healthy population of apes on the Upper Rock

- range
- timescale (*not stated*)

Prescription

- Eliminate animal/tourist interaction (*method ?)*
- Veterinary screening
- Control fecundity
- Inform visitors of health and population issues

2. "Allow controlled viewing by a million visitors per year"

- Create an enclosed and controlled area
- Enforce regulation
- Fund (hypothecation?)
- Educate public
- Provide interpretative facilities

Feature 2. Botany

Current issue

A relatively even aged scrub stand community

Objective

Establish a mosaic of different aged indigenous plant communities on the Upper Rock (*Timescale?)*

Constraints

Funding potential (entry); diverting funds to project MOD permission

Action Plan

- Establish current distribution and status *(scale ?)*
- Discuss mosaic options and agree viable structure *(timescale?)*
- Carry out process and mosaic creation
- Monitor success rate of process by using indicator species (*method?)*

Feature 3. Landscape feature of the Upper Rock

Description

Mosaic of heritage features and scrub

- heavily influenced by man
- natural communities fragile and unstable

Constraints

- Views
- Firebreaks
- Some access
- Lack of interpretation/signing
- Radio masts
- Fencing
- MOD - few paths and steps
- Limited access; no disabled access; poor roads and parking

Objective

To strike a balance between visitor enjoyment, preserving landscape and providing effective, but unobtrusive firebreaks

Action Plan

- Examine alternative ways of access e.g. cars at bottom and then shuttle bus *(method?)*
- Provide architectural interpretation (*methods?)*
- Minimise visually obtrusive fencing (*timescales*?)
- Regularise MOD dialogue

Success parameter/monitoring attributes

- Number of visitors and length of stay
- Visitor satisfaction survey

Feature 4 Fortifications – cultural/history

Policy
Roles for conservation, interpretation, education and fortification retention

Description
A matrix of built batteries, walls, tunnels and caves from C14 – C20
The heritage value ranges from unique to general, along with condition.

Objective
To provide supportive renovation opportunities/action at a series of key sites.

Constraints
- MOD
- Proposed developments
- Ill-defined timescales
- Private vehicles
- Pressure groups
- Poor quality of repairs; wrong mortars
- Funding

Action Plans *(timescales?)*

1. O'Hara's Battery
- WWII battery
- Need clear management and public access
- Good existing condition

Need
- Funding
- Expertise

To do
- Confirm ownership *(timescale?)*
- Evaluate condition *(methods?)*
- Gain funding
- Conservation strategy for medium/longer term

2. Charles 5th Wall
C15 wall
Good existing condition
Need
- Conservation and public awareness concerns
- funding
- Expertise

To do – as O'Hara's Battery

3. Tunnels
World War 2 MOD tunnels
- Condition and extent need clarifying
- Baseline information required

To do: as O'Hara's Battery

In conclusion
The built heritage needs better over-view and the development of a time-tabled strategy within which to produce and deliver the heritage for the future.

MANAGEMENT PLANNING WORKSHOP: OVERVIEW

Each of the groups approached their tasks with vigour. The approaches varied, but worked within the general constructs of the planning guidance.

Common problems met were:
1. Defining tight objectives
2. Expressing timescales
3. Recognising methods/methodologies which need to be used
4. Prioritising actions
5. Strategic steps for influencing key players, such as MOD/Government.

These problems (and the very limited time available to work through the examp les) not withstanding, the Planning Workshop met its basic aims: each of the groups achieved a good first step on the way to undertaking their own, individual, management plans.

Section 5: Tourism and funding for the environment

The problems of two aspects of intensive tourism (cruise and all-inclusives) in the Caribbean

Polly Pattullo

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I would briefly like to look at two aspects of intensive tourism in the Caribbean – I suppose intensive means (to put it crudely) lots and lots of people pouring off boats and planes waiting to be served in the sort of luxury they never get at home, in an environment they have been told is like "paradise".

Firstly, cruise ships, and secondly all-inclusives. Both raise rather different but fundamental questions about the possibility for sustainable development in the region.

The Caribbean – with its small, vulnerable societies, including the five UK Overseas Territories - is struggling. It has experienced rapid change as the islands emerge from colonialism to independence. The legacy of a colonial history remains only too apparent as the islands attempt to realise their own sovereignty. Most are still undergoing a shift from agricultural-based economies to modern economies – with tourism, for many, seen as "the engine of economic growth". Tourism accounts for 43 per cent of GDP of the region (1999).

I want to describe the sort of predicaments that Caribbean governments must address as they become more and more dependent on tourism.

To start with cruise-ship tourism – and a look at the scenario in Dominica, a very late arrival at tourism's so-called pot of gold.

Nowadays, perhaps four days a week in the key holiday season, a large, white, self-contained floating hotel arrives at the jetty of the small capital of Roseau. If you walk along one of the narrow town streets that run parallel to the sea and cast your eye towards the ocean, all you will see is a large gleaming block of whiteness. From some angles, the cruise ship looks bigger than the town. So there it sits with its perhaps 2000 residents (the cruise ship not Roseau). Some of them may not like the look of this charming but slightly run-down little town, with indifferent duty-free shopping; it may be raining; the mountains loom; there is not a white-sand beach in sight.

Anyhow, some of them disembark. The mini-bus drivers queue up for work – some get it, for they are contracted to the agents who are, in turn, contracted to the cruise ship itself. The freelancers do their own hustling – often incurring the wrath of the cruise ship officials who say the tourists are being "hassled".

The main sites are the most accessible: the Trafalgar Falls – magnificent, twin waterfalls about 20 minutes drive from Roseau – and the Emerald Pool, a modest little waterfall in the middle of the rainforest, but close to the road. Cruise ship tourists are not famous for their hiking abilities.

The T-shirt vendors try to make a buck from the cruise shippers; so do the old ladies selling mangoes. The woman who sells ice to the soft-drink vendors says she tries to get a cut too; the young guys who have trained as tour guides get abuse from the taxi-drivers who are protective of "their" tourists. Even the "bad boys" with their spliffs don't seem to do much business. Hardly anyone stops at the road-side craft stalls. Many villagers just note the cruise tourists passing by in a whirr of cameras.

A daily carrying capacity in terms of environmental impact of 150 people has been recommended for key sites in Dominica: perhaps 1000 people from the cruise ships are now visiting these sites daily. In itself that poses all sorts of problems which overstressed Dominica finds it hard to address.

When the tourists return to the ship, probably in time for an enormous late lunch – to eat American beef, south American bananas, and drink Florida orange juice etc – they will have spent about 30 dollars each, including their tour. Their contribution to tourism earnings is perhaps 10 per cent of the total although they represent nearly 80 per cent of visitors (244,603 as opposed to 65,501 stayover). Oh, and Dominica sells much-needed water to the cruise ships - at a token rate. The rate was even lowered by the previous government as an inducement to the cruise ships to visit. But one of the biggest has just pulled out – kicking Dominica and St Martin off its itinerary and substituting St Kitts and Trinidad. Once again, a policy of short-term gain turned into long-term loss.

Another problem connected to the cruise ships is that stay-over visitors go to Dominica because of its pristine wilderness. They do not want to go to the Emerald Pool and find 300 cruise ship tourists plodding down the fern-lined trail. Similarly the proposed – very ambitious plan – for a long-distance

hiking trail does not sit happily with cruise-ship tourism. The approval of the stay-over tourists is crucial if Dominica's eco-tourism policy is to be meaningful. Dominica's up-market tourism may also perhaps have been affected by the pro-Japan stance of the Dominica government at the International Whaling Commission.

But, whatever the problems, now that the cruise-ship tourists are there, they have created their own dependency: taxi drivers, a powerful lobby, would be up in arms if their trade were limited; the agents would lose income if there were a limit on arrivals and even the t-shirt sellers, some of whom are Rastafarians with generally impeccable environmental records, would be under more "pressure".

Meanwhile, the Florida Caribbean Cruise Association – that immensely powerful organisation which runs the industry – sets the agenda: make sure your people don't hassle the tourists, keep them away from the cruise ship disembarkation area, no we won't pay a higher tax and if you insist, we will just cut you out of next year's scheduling – and go somewhere else.

And so the cruise ships sail off into the sunset leaving behind them – in the case of Dominica – an environmental levy of US$1.50 per head . Even this was a hard-won concession fought bitterly by the cruise industry, which had threatened a boycott. The levy has been set to pay for a much-needed waste management scheme, funded by the World Bank, for all the countries of the Organisation of Eastern Caribbean States. (Recent developments indicate that the World Bank has frozen funding because of management irregularities.)

Meanwhile, the cruise ships continue to ply their way up and down the Caribbean – leaving their garbage behind. Last year Royal Caribbean, the world's second largest cruise company, for example, was fined US$18m for dumping oily bilge water and chemicals. It was not the first time.

If the floating "all-inclusive" hotels are problems for the Caribbean, land-based "all-inclusives" raise different opportunities and threats.

South of Dominica lies St Lucia, an island which has fast developed a tourist industry. There, the majority of the hotels are all-inclusives – the hotels where you pay for everything in advance and can eat, drink and play as fast and as much as you can.

Yet St Lucia – now essentially a mass tourism destination with 259,000 stop-over visitors and 423,000 cruise visitors a year – a very different profile to Dominica – sells itself on its environment. "Simply beautiful" is St Lucia's marketing slogan. So how has the environment fared faced with such a proliferation of large hotels?

The greatest impact has been at the construction stage of hotel development. Land is cleared to build hotels at the waters' edge – because that's what tourists want. Inevitably, the effect is erosion of coastal land, sedimentation and pollution of the reef. Beaches have become degraded – and imported sand (from Anguilla? The Virgin Islands?) has created further degradation of the reefs.

The bigger the hotel, the greater the impact. And since all-inclusives tend to be bigger – and also built in ecologically vulnerable and remote areas – they impact more forceably at construction stage.

However, all-inclusives are usually wealthier than smaller hotels – and have the resources to achieve economies of scale and operate proper management systems. Indeed, according to a British Airways Holidays inquiry into the impact of all-inclusives on St Lucia's environment, it was reported that they could be leading the way in terms of environmental management.

All inclusives also have the advantage of higher occupany rates and provide more stable employment (in many smaller hotels, jobs come and go according to the season). So far, so good. But the negative aspects are fundamental: these enclaves which the tourists rarely leave are no-go areas for locals (unless they pay a large visitor's fee). So there is a sense of exclusion – as expressed in the St Lucian calypso "Alien in me own land". The all-inclusive tourist spends little money outside the resort – so local vendors, taxi drivers and restauranteurs go without.

It is on these grounds that I have always been reluctant to award brownie points to all-inclusives. I dislike the way that they provide "ghetto" holidays. However, it would appear, at least on the evidence of this one study in St Lucia, that they have the potential to make some environmentally responsible decisions. I suppose the key word here is "potential". What the Caribbean desperately needs now are some examples of good management, not just in theory but also in practice, and some government policies which have long-term rather than short-term gain at their heart – and mean what they say.

Then the needs of the islanders and the possibilities for sustainable tourism might be realised.

Cruise ship tourism and conservation in the Falkland Islands

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The basis of this presentation was a 7-month research project carried out by Falklands Conservation during the 1999-2000 cruise ship season (November to March) in the Islands.

WHY THE FALKLANDS?

A common question when linking the Falklands with tourism: why?

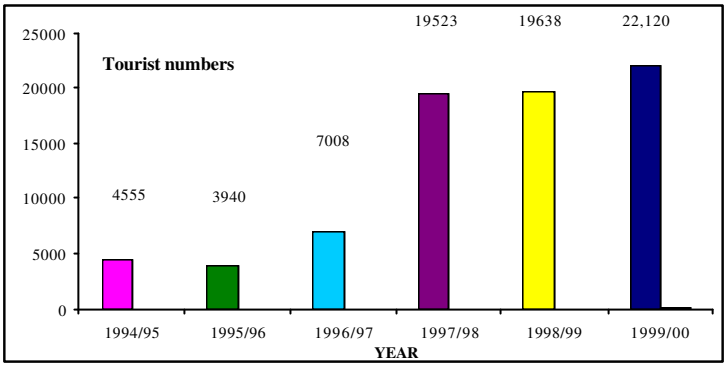
Geographical Location
Because of the geographical position of the Falklands and the current attraction to South America within the cruise industry, many cruise vessels visit the islands as part of a round trip to or from Antarctica and South Georgia.

Outstanding Wildlife
There is a population of Black browed Albatross, making up 80% of the world's total. Five different species of penguin breed, including one of the world's largest rockhopper populations which are near threatened.

Unspoilt Natural Environment
With a friendly English-speaking population, the Falkland Islands make a favourable add-on destination. The people aspect is something we have over South Georgia or Antarctica.

CRUISE SHIP TRENDS

Graph A (below) illustrates the increase in the number of passengers arriving in the Falklands.



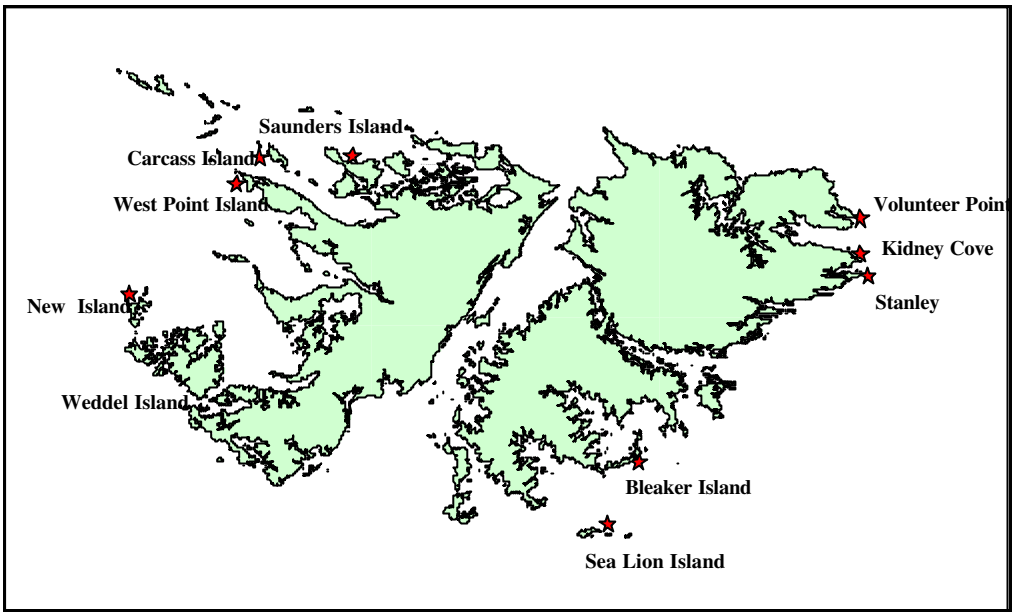
Lars-Eric Lindblad bought the first cruise ship to the Falklands in 1968. Sir Peter Scott, while travelling on one of these ships in the late 1970s, became involved with the founding of Falklands Conservation.
The style of expedition cruising pioneered at this time is still in existence today.

Today, cruise ships account for 98% of the tourists visiting the Falklands with over 37,000 people coming to the islands; these figures include staff, crew and passengers.

Visitors arrive on 3 different type of vessels, which we have classified as expedition vessels (50-400), intermediate vessels (400-700) and luxury vessels (700-2000). Focus of these three types of cruising varies from the nature-based, environmentally focused expedition vessels to the entertainment- and shopping-based cruises. The International Association of Antarctic Tour Operators, IAATO, is a self-regulating body which has adopted a strict set of standards with regard to the environment, and helps promote environmentally responsible tourism. Only vessels with under 400 passengers belong to this association and only IAATO vessels can land in Antarctica and South Georgia.

FALKLANDS SITES

As can be seen from the map on the next page, there are various small island sites outside of the capital Stanley visited. These are under private ownership and mainly visited by expedition and intermediate vessels, as opposed to the larger luxury vessels which visit just Stanley and the surrounding area.



MANAGEMENT TECHNIQUES

These management observations are based on the expedition cruise vessels. This is due to the fact that these vessels travel around the islands, visiting remote destinations. For these, generally:

- Information sent out before embarking on cruise
- Lectures on board – generally one hour long
- Intercom lectures on deck while cruising
- Daily programmes provided – and a newsletter
- Open bridge policy
- Libraries – containing relevant educational books on the environment
- High staff/passenger ratio – 1:20 although it was found common for 1:10
- Staff are well trained and generally experts in various appropriate fields

Management techniques ashore

Because there is a high staff to passenger ratio, supervision ashore is intensive and generally carried out to a very high standard.

Landing briefing and groups arranged
Before landings, briefings are given regarding: the site visited, a map is shown, what they will be doing, warnings given regarding sensitive areas, etc. People are then arranged into groups either before landing or at the landing site.

En-route briefings ensure groups maintained
This gives the opportunity for questions to be answered.

Guidelines are maintained.
Staff enforce codes of conduct and the groups largely become self-regulating.

Landowner interaction
Quite often tea with the landowner is offered. This makes people even more aware that they must respect the environment, as effectively it is someone's backyard.

Here we see a group of visitors on West Point Island viewing the Black -browed albatross and rockhopper colonies on the cliff sides having undertaken the 30-minute trek to get there. You can see that they are in a fairly tight group and are an appropriate distance from the birds.

CASE STUDY OF GOVERNMENT RESERVE GYPSY COVE

It may appear that all of the cruise ship operations in the Islands are very well run and environmentally aware. In most cases this is so. However, Falklands Conservation first got involved with tourism due to problems created by large numbers of uncontrolled passengers at Gypsy Cove, a site near Stanley. This is a Government-owned Nature Reserve, 4 miles outside the town. It is subjected to very high numbers of people, concentrated in bus-loads, from luxury cruise ships, as well as local and military visitors. This last season, over 6000 tourists were observed at Gypsy Cove in a 16-day period. The Falkland Islands Tourist Board does provide a warden for the site on days when a large cruise vessel is expected into Stanley.

The main issue with Gypsy Cove is a concentration of people at any one time. This year, to put that into context, the highest numbers of people counted in an area approximately 100m x 100m was 421. With this number of people, many inexperienced with wildlife and all excited about their only chance to see penguins in the Falklands, there is a high level of noise. This can be seen to affect birds, many staying in their burrows, or remaining on the beach. This has a particular effect during the moult, when juvenile birds are crêched in the tussac grass areas and are visibly cowering away from people amongst the grass. The tussac areas are fenced. However, this does not enclose the entire area, so people follow the beaten track, and then are simply channelled into an area of burrows where there is no guidance and only one warden between hundreds of people.

Litter and cigarette butts, a total lack of rubbish bins and no toilets are common complaints that wardens receive throughout the summer, as well as many expressions of amazement that there is so little control of people or protection for the birds. Most of the people visiting this site are unaware of environmental issues, to the point that they do not know what type of penguins they are going to see, let alone that they might put a foot through a burrow if they do not look

where they walk.

The picture above shows the fence lines at Gypsy Cove where the tussac has been closed off. You can see the effect of thousands of feet on the thin sandy soils and also how people have totally followed the fence line up to a point where they are suddenly left totally to their own devices, to wander across fragile vegetation and a slope with about 50 Magellanic penguin burrows in it (photograph below). One

warden is completely insufficient to cope with this volume of people or to have a positive effect.

The Falkland Islands vegetation is particularly fragile, given the extremely dry summers and high winds. Once a protective layer of vegetation is removed through trampling, it can take years for the cover to re-establish, leading to erosion and ultimately the increased risk of breeding bird burrows collapsing when disturbed.

Much work has been carried out looking at the effects of disturbance on seabird populations. Penguin heart rates have been shown to increase

simply by one human walking too close, and more drastic effects of this have been shown to cause a lowering of the breeding success rates in other parts of the world.

More directly, groups of people standing on a beach or a cliff side can physically prevent birds from returning to their nest sites, in extreme cases leading to chicks not being provisioned with food, or the desertion of a partner through the breeding season.

An increase in chick predation and abandonment can result from adult birds being scared away whilst guarding their young and, in some extreme cases reported in the islands last season, even being handled. Whilst it is an offence to handle birds without a licence in the Falklands, there is a long way to go before all who visit are fully aware of this.

Finally the increased risk of fire from rubbish and cigarettes is an ever-present risk in the islands, especially during the dry summer months. A fire in peat soil can burn for many years and have devastating effects on the wildlife of the area.

"CONSERVATION" LEVY

One of the major issues being addressed currently in the islands is the Conservation Levy. This was first introduced during October 1999, as part of the new Cruise Ship Ordinance. It was payable only by any passenger on a vessel with more than 100 people on board. During the last few months the Government has raised this to cover everybody entering the islands, irrespective of vessel size. This decision, which was met with a lot of hostility from cruise operators, has since been reversed to discourage ships from using Ushaia in Argentina as an alternative to the Falklands.

The new legislation states that any ship visiting another site within the Falklands (apart from Stanley), and paying a landing fee there (as is the case with most of the island sites), is exempt from the levy, as are all the ships with less than 100 passengers on board.

The major issue of contention about this levy is that, as with many other so-called "environmental" taxes in territories, these funds are not ring-fenced for use on environmental projects. Rather they are simply added to the general coffers. Despite Falkland Islands Government spending similar amounts on environmental projects, passengers are misled into thinking they are directly contributing towards environmental protection and conservation, when in fact this is not the case.

The steps taken recently by Government are in the right direction. However, we maintain a stance that this funding should be ring-fenced for use specifically on the environment – or else the fee simply called a landing or harbour tax. [Later note: the term "Conservation has since been dropped from the name of the Levy.]

CONCLUSIONS

In conclusion, the Falklands need tourism and it is likely that they will continue to do so. Sustainable livelihoods are desperately needed to keep people living and working in remote areas. To do this, the Falklands need to recognise the importance of good practice. There is no need to try to invent anything new – lessons have already been learnt that we can use for our situation.

Finally, the Falklands must recognise the environmental concerns of the tourism industry and act on them. The raw material of tourism is intrinsic to the Falklands and is what makes them special. This can – and must – be treated in a sustainable way.

The St Helena situation

Rebecca Cairns-Wicks & Isabel Peters

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In this paper we describe the tourism situation on St Helena; the constraints on its development at present; how we see it developing, and more importantly how we hope to ensure that this development is sustainable and inflicts the minimum impact on the environment (natural, cultural and built) in the future.

St Helena has much to offer today's tourist. Primarily our tourism is based around the island's heritage and nature, our most marketable features. The island is still relatively unheard of, and its physical isolation stimulates interest and adds an air of intrigue. The island has an equable climate with good year-round weather; there is political stability and a relatively low crime rate; the people are friendly and life is relaxed. Also an important feature is that visitors are able to become a part of life on the island for the duration of their visit. These factors all contribute to making the island a very attractive long-haul destination.

Tourism operates on a small scale; we receive approximately 5000 - 6000 visitors per year, all arriving by sea, as there is no air access to the island and this contributes some £60,000 to general revenue.

St Helena's economy is heavily tied to the level of budgetary aid from the UK Government, which has declined by about a third in real terms since 1990. This decline reflects an increase in revenue raised locally and reduced government expenditures. However the public sector remains the dominant employer accounting for 64% of those in employment. Tourism is seen as one way of supporting private sector development as it has the potential to become a future key economic generator for the island. Tourism is therefore a development priority for the Island and emphasis has been placed upon developing the tourism product. This includes provision of infrastructures for visitor attractions based loosely in most cases on improving and enhancing the environment.

Access

In developing tourism and gaining sustainable wealth from it we are constrained by limited access. Being served by only one regular ship that links us to the rest of the world, opportunities for tourists to get to St Helena are severely limited. The *RMS St Helena* has 128 berths but most of these are usually occupied by St Helenians and government personnel. It takes five days to get to St Helena from Cape Town and longer from the UK or other destinations. An eight-day stay on the Island can mean four weeks away from home and thus it is difficult for working people to fit in visits as part of their allocated holiday time. The number of yachts calling at St Helena is increasing, but this group has the lowest spend.

The number of cruise ships calling has also increased in recent years, but here we are at the mercy of the seas. We have had occasions where cruise liners would not land their passengers because of adverse sea conditions. Luckily over the past two years all cruise ships have been able to land passengers and the number of visits per year are increasing.

How far are we in developing tourism?

Government intervention into the direction that tourism should take began in 1993, when a tourism feasibility study was commissioned. This was followed in 1997 by the development of the Tourism Master Plan: A Strategy for Heritage and Nature based Tourism. These two documents provided a way forward in developing tourism on the island and some progress has been made in recent years.

The Tourism Master Plan identified priority tourism projects and, following its publication, the UNDP agreed funding for the following projects:

- The development of a leisure park in Jamestown, which has enhanced the urban area and provided a facility for outdoor recreation.
- The upgrading of nature trails and circuits, with associated interpretation panels, which offers an opportunity to enjoy and appreciate the natural environment.
- Island-wide directional signage.
- Vocational training programmes for tourism and related skills areas, which included tour guide training.

And plans are awaiting approval for the development of Sandy Bay Beach, the most easily accessible "beach area" on the island. Some provision has also been made for the development of the Environmental Centre.

A government-run Tourist Office provides the co-ordinating and implementing body for island tourism

activities. Other jobs within tourism are primarily in the private sector, although there is still a reluctance to start up new tourism businesses and in some cases a reluctance to embark on projects that will have benefits solely for visitors. Our arrivals continue to be *ad hoc* and the numbers are such that the economic rate of return will not justify the initial financial input.

Funding for tourism projects comes primarily from overseas project funds.

The fragility of our prime tourist product

St Helena's isolated position in the South Atlantic Ocean has given rise to a rich and diverse natural heritage and high levels of endemicity. The many groups of settlers throughout history have left us with a unique and captivating cultural and built heritage and an appealing tourism product.

However much of our natural, cultural and built heritage, the very foundations of our tourism product, has been eroded and in some cases is in danger of disappearing for ever. There is a pressing need to develop projects that will help to preserve and conserve the relics of our past.

Much of our natural heritage was destroyed by man's activities in the seventeenth and eighteenth centuries. Today many of our endemic species are endangered and several others remain on the brink of extinction. Some rehabilitation programmes are in progress but there is an urgent need for resources both financial and human to continue and expand these. Likewise, many of our historical heritage sites are in states of disrepair and ruin. Whilst it is generally recognised that these features need to be preserved and conserved there are no financial resources available. There is the danger that this can have serious implications on the tourism product. However, the development of tourism itself could create the financial opportunities for restoration and conservation work. But here we are in a *Catch-22* situation, we need to preserve and conserve our tourism product before tourism takes off and before we have the financial resources to do it.

While there is very little real economic benefit derived from tourism, there is little scope for arguing that money generated from tourism should be put into environmental conservation.

When funding is available from tourism sources for conservation projects, consideration of the main visitor group must be taken. Most of our visitors are of post-retirement age and therefore all development projects pertaining to tourism must take this into account. Environmentally based projects will not find favour from tourism funding if they promote or aim to protect an area that is not easily accessible to this visitor group.

That said, in promoting the island's heritage and nature, some of the best sites are off the beaten track, and ideal for a more active user group. Such sites can be made accessible and more user friendly but require finance, again with no short-term return. The limits on access do not enable us fully to capture this market at this time. The worst-case scenario is that, when we can get such a visitor group to the island, there will be nothing for them to see.

What Happens Next

It is generally recognised that, in order to improve the economic prosperity of the island, access will have to be upgraded. Our government has commissioned a comparative study of air and sea access. In addition to this two private companies have recently expressed an interest in providing an airport and air service to St Helena. Whichever form is chosen, it is perhaps safe to say that now we are looking at when – and not what if – access is improved.

For the present, the development of tourism continues to be *ad hoc* and is reactive rather than proactive. With improved access we expect an increase in visitor numbers, and a more cohesive approach to planning is needed. Currently visitor numbers are not seen as large enough to cause any significant impact to the environment. As such, no carrying capacity studies have been done, but this has been planned for in the Island's three-year Country Policy Plan. In light of pending developments, it is realised that such a study has become more of a priority. Change is coming and we on St Helena must be ready to ensure that minimal negative damage is done to the environment.
We are coming into tourism later than other countries around the world and, as such, can learn from the mistakes made and hopefully be able to plan appropriately to put safeguards in place before we receive an influx of visitors.

Educating Islanders on this

However despite all good intentions it is recognised that economic pressures still have potential to outweigh environmental concerns. The overall education of islanders on environmental issues is improving, but we still have a long way to go. Through building upon this and promoting to islanders the idea that St Helena will not be negatively changed or spoilt by tourism development if it is managed correctly and sustainably, we can establish the appropriate policy and practices now before access is improved.

As an isolated island all of our resources are finite, our environment fragile. We need to establish limits on how many people we can accept per time period, and how far we can go in providing developments without depleting our natural resources. Such findings must be made clear to all potential developers from the onset.

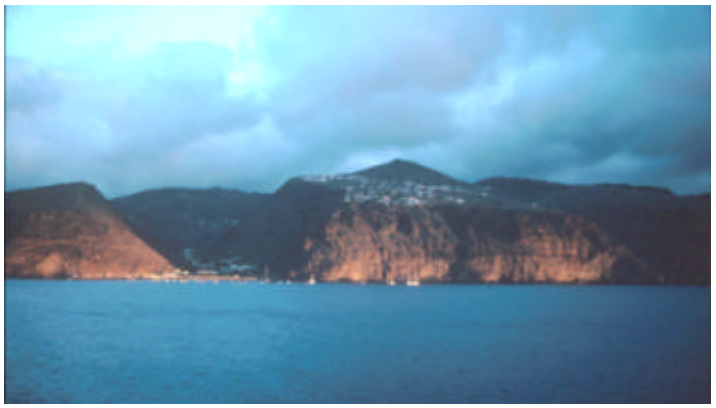
As environmentalists we recognise that tourism can give optimal benefits to our conservation work. Our priority therefore is to ensure that the development of tourism is sustainable and that money generated can go some way to helping conservation work.

For the short-term there are ways that we can get money directly from tourists for use in conservation – by ensuring that we receive optimal benefits from tourism visits, through encouraging visitors to visit key conservation sites and promoting the work done there. One way of doing this is by encouraging them to participate in projects, through which we receive their direct support. For example many of our recent visitors gave donations and or bought trees for the Millennium Gumwood Forest Project. Increasingly today, we have found that visitors are very environmentally conscious and have appreciated our local efforts in conservation issues and given their support.

At the local level, environmental projects are expensive, but the use of local expertise can be harnessed to help conserve some aspects of our environmental and cultural heritage. Through local volunteer action by NGOs and others, direct practical conservation work can be done. Again education and promotion are necessary to gear up people to do such work. A lack of pride in our environmental heritage has led to a general apathy, but through visitors taking an interest, islanders are beginning to feel the importance of preserving and conserving the environment.

To conclude

On St Helena, tourism is just beginning to develop. We have the opportunity now to ensure that the future development of this sector is sustainable. In using the rest of the world as an example, we can actively promote among islanders the necessity of this.



Sustainable Tourism - A potential role for UNEP-WCMC

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A brief introduction to UNEP-WCMC and my role

UNEP-WCMC has mainly been a scientific organisation, focusing on collecting, managing and disseminating biodiversity information. In July of this year (2000), we officially became a part of the United Nations Environment Programme (UNEP). In doing so, we have broadened our horizons by adopting the Global Environment Outlook (GEO) 2000 recommendations for future action. These include the following:

1. Filling the knowledge gap
2. Tackling root causes
3. Taking an integrated approach
4. Mobilizing action

With a background in the pure and social sciences, my role has been to look at the links between our biodiversity data-sets and economic and social issues. My reasoning? I believe that biodiversity statistics do not show anything on their own. In order to paint a more realistic picture of the human impact on biodiversity loss and to even begin addressing the above future actions, we must link our data-sets with human development.

So, why take on tourism?

In the first instance, tourism has an impact on the social, economic and environment arenas. More importantly, tourism could provide a model for understanding these links and also for starting to comprehend what is meant by sustainable development. More specifically for UNEP-WCMC, it would allow us to begin to look at biodiversity in a new way – not as a luxury item, but as something we all need to survive no matter where it is. In fact, it could show us how humans are a part of biodiversity.

How UNEP-WCMC got started

Just over a year ago, the Head of Consumer Affairs, Keith Richards, at the Association of British Travel Agents (ABTA) came to see us, because he had looked at the following statistics:
Visits by UK residents abroad:

- 52.8 million UK resident visits abroad to all destinations
- of which around 33 million are leisure/holidays (predictions for 2000 suggest an increase in leisure/holiday travel to 34 million)
- of these leisure/holiday visits, 50% are on pre-arranged packaged tours and 50% are independent journeys
- Over the five-year period 1994-1999 spending on leisure/holidays abroad increased by 30% to £13 billion. And it is expected to grow by another 24% in the next five years

Combined with these facts:

- Over 80% of holidaymakers would be prepared to pay extra for their holidays if they could be guaranteed that the resort and hotel were environmentally sound. (ABTA Mori survey – 1992)
- An increasing number of tourists put issues such as scenery, culture and environment among the prime criteria for choosing their destination. (European Commission study – 1998)
- While the UK tourist is still keen to relax and switch off on holiday, this is not at the expense of local people or their environment. Many holidaymakers would opt for a travel company which offered positive guarantees, with over half willing to pay more for their holiday. The same report showed that over 60% of tourists want more information about how they can support the local economy and environment through responsible and positive behaviour. (Tearfund: Touris m- an ethical issue - January 2000)

After reflecting on this information, Keith decided it was time to develop awareness of sustainable tourism within their tourism industry membership. In order to do so, he felt a three year programme of research, communication and action would be best to convince this industry of the benefits of promoting sustainable tourism. However, within his section, it was agreed that the research must come from a respectable neutral and objective source. As UNEP-WCMC had already produced reports and interactive mapping systems, which highlight the importance of protecting biodiversity for different industry sectors, ABTA chose to work with us.

What does this mean for you?

Now that we are a part of the UNEP family, I have been liasing with the UNEP office in Paris that is handling the sustainable tourism programme leading up to the next Earth Summit and the International Year of Ecotourism, both in 2002. The main co-ordinator is currently developing their strategy and therefore, we would like to invite you to input into this agenda. The UK Overseas Territories have seen the good, the bad and the ugly impacts of tourism. We believe that your insight and experience would be of utmost value towards contributing to a realistic and productive strategy.

The use of Environment Protection Funds in the Overseas Territories: the Cayman Environment Fund: Original objectives

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Everywhere land is an emotive subject. People go to court with disputes over perhaps a metre or two of land. And in the Overseas Territories, most of whom until very recently knew little but poverty, land was the people's wealth. It is not surprising therefore that landowners become very agitated and critical of Government if they gain the impression that their land may be taken away from them or compulsorily purchased at less than the going rate, or that Government is going to restrict the use to which they may put their land.

It is therefore of the utmost importance that when privately owned land is needed for conservation purposes - so that an area can be created as a nature reserve or to preserve a particularly endangered species - Governments have funds available to purchase the property at the going commercial rate.

In the Overseas Territories where tourism is the main, or a major, source of revenue, a good way of raising funds for purchasing land for conservation is to impose a special tax on tourists specifically for this purpose. Tourists are not going to complain if they are charged two or three dollars knowing that the money is to be used to purchase land for conservation. After all, most tourists visit the Overseas Territories to enjoy the environment – using the word in its widest sense: the beauties of the underwater world, to walk in wilderness areas, go fishing or bird watching or simply to laze on a pristine beach.

What is important is that the money raised by such a tax is used, and seen to be used, for the purpose stated. The funds must be ring-fenced and managed by independent trustees who are responsible for ensuring that it is indeed spent correctly – to purchase land from private landowners which needs to be preserved and undeveloped for the long term benefit of the environment and for inhabitants, both present and future.

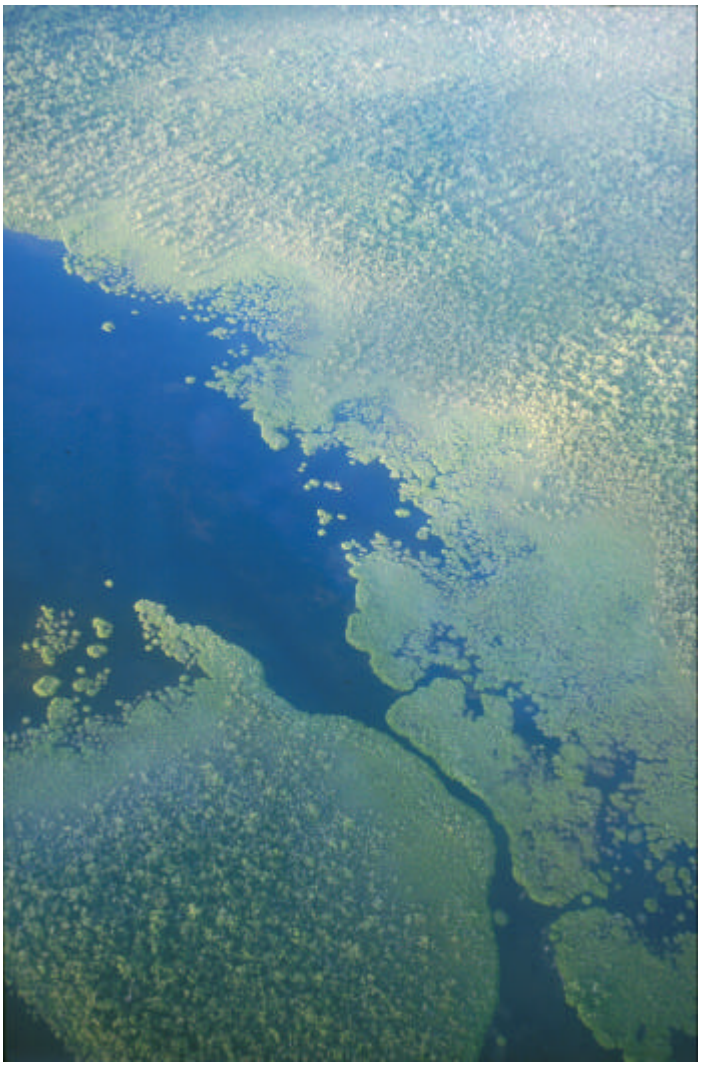
Unfortunately not all Overseas Territories manage this Environment Tax or Environmental Protection Tax – whatever it is called – correctly.

When I was Governor of the Cayman Islands there was much talk of creating national parks and nature reserves. We managed to acquire sufficient land around the largest Red-footed Booby colony in the western hemisphere, on Little Cayman, to create the Islands' first Ramsar site. And other small but important sites were donated or purchased using funds from a variety of sources. But the area we felt it was critically important to preserve was the Central Mangrove Wetland on Grand Cayman. This wetland is the Island's ecological heart. It is of vital importance as a spawning ground for lobsters, conch and many species of fish which are of economic importance; and as a source of moisture to attract rainfall which has decreased noticeably elsewhere on the Island where mangrove has been filled and marshland drained. With building land at a premium, developers have for some time had their eye on this area, and there is concern among Caymanian environmentalists that it will be drained and separated into lots.

With all the talk about the need to acquire this land for conservation purposes, landowners became nervous that Government intended to acquire the land at a price below the going rate. So we conceived the idea of levying an environmental tax on tourists which would be used specifically to purchase land for conservation, in particular the Central Mangrove Wetland on Grand Cayman which would be designated a Ramsar site. I hasten to say that these were informal discussions and not in Executive Council as, had they been in Executive Council it would be wrong of me to refer to them here. In conversations with landowners, I made it clear that any land purchased would be at the going commercial rate. They were content with this.

Rather surprisingly it took more than two years for the Environmental Protection Fund to become law which it did in 1997, two years after I left. Since then, of the approximately US$8 million which has been collected, not a cent has been spent to purchase land. The money raised by this tax on tourists, who believe it is used to protect the environment, has gone into general revenue to help balance the budget.

Unfortunately there is no representative from the Cayman Island Government here to explain to us how they intend to manage this Fund in future and tell us when it will be used for the purpose it was levied; and when it is intended to designate the Central Mangrove Wetland a Ramsar site to ensure its proper protection for the benefit of the people of the Cayman Islands both today and for generations to come. I hope, however, that as a result of this conference the Cayman Islands Government will take the necessary action to ensure that in future the Environmental Protection Fund is removed from direct Government control and used for the purpose intended as announced when the Fund was established.



Statement from Cayman Islands Department of Environment on the current status of the Cayman Environment Fund

In 1997 it was proposed that an environmental protection fee be collected from all departing air and cruise ship passengers. During the 1997 Budget Session of the Legislative Assembly an Environmental Protection Fund was established by Government Motion 14/97 which states:

"AND WHEREAS it is necessary to establish an environment protection fund to ensure that the fees collected are kept separate from general revenue of the Islands and are expended to protect and preserve the environment of the Islands

BE IT NOW RESOLVED:
1. that an environmental protection fund be established in accordance with the powers contained in Section 30 of the Public Finance and Audit Law (1997 Revision);
2. that all environmental protection fees collected under section 7 of the Miscellaneous Provisions (Fees and Duties) (Temporary) Law, 1997 shall be credited to the fund;
3. that the Legislative Assembly or the Finance Committee may make additional appropriations to the fund from the general revenues, borrowings or other funds of Government;
4. that the disbursements from the fund may only be made in accordance with resolutions made by Finance Committee, and under the Authority of the Financial Secretary, for the purpose of defraying expenditure incurred in the protection and preserving the environment of the Islands;
5. that if at the close of account for any financial year it is found that expenditure charged to the fund is less than the sum appropriated to the fund, the surplus shall be held in the fund for disbursement in future years; and
6. that the Accountant General shall prepare a statement of accounts for this fund as part of the Government's annual financial statements."

The collection of $2.00 per air passenger began on April 22nd 1997 but the collection of cruise ship fees was deferred until January 1st 1998. After discussion with the cruise lines the fee was reduced to $1.60 for seasonal ships and $0.80 for year-round ships effective 1st October 1997 under the condition that the fee would be increased to $3.20 and $1.60 respectively on 1st October 1998. The amending law was passed in March 1998.

Currently all fees collected are placed in a separate Treasury bank account and Finance Committee – a committee of all elected representatives with the Financial Secretary as Chairman, approves disbursement of the funds.

The Department of Environment continues to support the concept of a Conservation Trust Fund established by law that would be managed by a Board of Trustees composed of public and private sector representatives. Such a Fund would function as a complement to, and not a replacement for, government's funding of its own conservation agencies.

The Turks and Caicos Conservation Fund: original objectives

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It was initially envisaged that the Turks and Caicos National Trust, the environmental non-governmental organisation, would be the agency responsible for the management of the protected areas system. Thus what we now refer to as the Conservation Fund was first proposed to be the Conservation Trust Fund.

This mechanism to establish a special environmental fund started, as our records show, in 1995. The first draft for the Conservation Trust Fund Bill, Section (7) made reference to the Conservation levy of $5.00 to be paid in by passengers arriving by aircraft.

In the process of establishing this special fund, there have been many drafts and changes. Some of these we (the Trust that is) have resolved to live with, while others we feel are ludicrous and could not be endorsed by the organisation. However I will hasten to add that the Trust remains committed to improving and maintaining an open and professional relation with the local government. We are of the opinion that there should be more dialogue between Government Ministries, Departments and the Trust as the organisation plays a vital role in enhancing the tourism product and managing the natural resources.

The National Trust Ordinance of 1992, Section 17 confers upon it the responsibility to advise the Governor in Council regarding the declaration of a national park, nature reserve, sanctuary or area of historical interest, the making of regulations under Section (8) of the National Parks Ordinance, the granting of applications for development permission referred to the Governor under Section 42 (2)(b) of the Physical Planning Ordinance.

Although there were changes made as aforementioned to the Conservation Fund legislation which affect the management thereof, and subsequently the in-depth involvement of the Trust, the role of the organisation remains as is in safeguarding the natural, historical and cultural heritage of the Turks and Caicos Islands.

The Coastal Resources Management Project, of which the Conservation Fund is a component, was launched in 1998.

By way of the Appropriation Ordinance of 1998, the Government made provision to establish a special fund known as the Conservation Fund to be managed by the Department of Environment and Coastal Resources.

To create the revenue for this environmental fund, the Government proposed the increase of the accommodation tax payable under the Hotel Accommodation Ordinance 1985 from eight percent to nine percent.

The Legislative Council resolved that an amount equal to one-ninth of the revenue raise by the imposition of the Hotel Accommodation Tax be hypothecated for the Conservation Fund. This came into effect in November 1998.

Management of the Conservation Fund lies with the Coastal Resources Management Project within the Ministry of Natural Resources. As of now, monies from the Fund are to sustain the operations of the CRMP and later the National Parks Service which is budgeted as approximately 70%, Micro Projects 20% and 10% set aside as reserve.

The National Trust is not involved in the management of the Fund. The organisation currently receives $30,000 per annum as core support from the Conservation Fund; this constitutes 16% of operating costs. The Trust is also eligible to apply for project funds through the Micro Projects Scheme when this becomes operational.

In concluding I will admit that the entire process, implementation of the CRMP, the Conservation Fund has not been easy. However, although there are matters yet unresolved, at present the situation is much better and the outlook seems positive.

Performance of the Turks and Caicos Islands Conservation Fund

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Introduction

I am very pleased to be with you today to address this conference on the performance of the Turks and Caicos Islands Conservation Fund. In my presentation, I would speak from the perspective of the Ministry of Finance; provide some insight into the decision making process that lead to the establishment of the Conservation Fund; and talk about the polices and procedures that have been put in place to ensure that application and administration of the Fund would lead to realizing the purpose of the Fund. This approach is necessary since the TCI Conservation Fund is only a little over 1 year old, and expenditure has been permissible from it since October 1999.

Background

The TCI Conservation Fund is set up as part of the policy conditionalities of the Coastal Resources Management Project, which is being funded by the UK Government for the Islands as part of the tri-annual bilateral Aid Program between the TCIG and HMG. This conditionality was necessary as the UK was concerned that the Coastal Resource Management Project would not be sustainable without a guaranteed source of income for the future. HMG is committing in excess of $1.8 million to this project. The main interventions of the project that need to be sustainable include, *inter alia*:

- Implementation of management plans of key national parks in the TCI by a newly created National Parks Service;
- operation and management of national parks programme;
- support for the Turks and Caicos National Trust
- a microprojects scheme, that would provide funding for conservation and other environmental projects to be planned and implemented by NGOs, CBOs and individuals; and
- An environmental awareness program, to be implemented under a MOU between TCIG and the National Trust.

The UK officials were probably justifiably sceptical about assurances from local officials that Government would allocate funds to ensure the future of the project. After all, the history of project financing between TCIG and HMG was filled with projects whose continuity beyond the grant period was questionable. The same is true for the environmental sector projects in the TCI, where research suggests that effort to promote revenue generation schemes for the management of protected areas in the TCI dates back to the mid 1980s, with other notable attempts being made in 1991(when the local dive industry was successful in convincing the Minister responsible for the environment not to implement a revenue generation tariff proposal); and in 1995 when a Business Plan for the National Protected Areas System in the TCI was formulated and remained unimplemented.

Governments tend to feel that it is their prerogative to raise revenue and plan expenditure for the national good. Therefore, the ideal of guaranteeing future income for environmental conservation did not come easy in the TCI, where resources are scarce. This was in spite of the fact that Government officials are generally aware of the fragility of the TCI environment, and the importance of its protection and preservation for tourism development in the country. We had a dilemma on hand – we wanted UK funding for the Coastal Resources Management Project, but we were concerned that the idea of essentially 'ring-fencing' income in the Islands' consolidated fund, as was being proposed, would set bad precedent – which we feared would be requested by other sectors.

Our approach was therefore to seek to examine examples of guaranteed funding for programs in the Caribbean. We looked at models from Belize, financing of the BVI National Parks Trust, and models from the Dutch Caribbean, for answers. The Government was also justifiably concerned about the implications of increasing taxation for environmental conservation purposes. There was the legitimate fear that it would undermine the competitiveness of the Islands' tourism industry by increasing costs relative to neighbouring countries. There was also the concern to shift the tax incidence away from the local population. There was the scepticism in the community – especially the Hoteliers – that government could not be trusted.

Because of the above factors, the decision making process leading to the funding decision for the TCI conservation was protracted, lasting several years (after the Coastal Resources Management Project was proposed in 1995). I was personally involved in the

process for about three years before the decision to guarantee income for the TCI Conservation Fund – by hypothecating within the Budget income from a 1% increase in Accommodation Tax – was agreed by the Legislature in 1998, as a special Fund under the Appropriation Ordinance. That is: Accommodations Tax (which is service tax paid at hotels and larger restaurants) was increased from 8% to 9%, with income from the 1% increase being hypothecated in the budget for transfer from the Consolidated Fund to the Conservation Fund. The Conservation Fund was created specifically (by law) to receive this income and to pay out monies for specific purposes set out in the Project Memorandum for the Coastal Resources Management Project. Accommodation Tax accounts for approximately 10% of central Government recurrent revenue. As such annual contributions to the Conservation Fund would be just under 1% of national recurrent revenue, which is major commitment to conservation by a Government.

The decision to hypothecate income from a 1% increase in Accommodations Tax was facilitated by the following favourable factors: policy makers became convinced that tourists would feel good coming to a destination where they knew they were contributing towards the protection of the environment (in fact this was something that is to be promoted); and Accommodations Tax unlike the next major revenue earner from the tourism sector (Airport Departure Tax) is only paid at hotels and larger restaurants (which are not generally frequented by the local population), which satisfied the criteria of shifting the tax incidence away from the local population.

There were consultations with Hoteliers and others that would be affected by the increase in Accommodations Tax.

If one looks at the TCI annual appropriation, one would see several items called funds. However, under local legislation (which is now being revised under a financial reform project) the Conservation Fund is the only fund that is not voluntary in nature. For example: for years the TCI have had Disaster and Contingency Funds, but contributions are made to funds only when there is surplus income

Application of the Conservation Fund

The Project Memorandum (PM) from the CRMP specified policies that were required for the Fund: including:

- Stated Objectives as follows "*to encourage and promote for the benefit and enjoyment of present and future generation of the peoples of the TCI the provision, protection, conservation, enhancement and sustainable use of the natural and historic resources of the TCI.*"

- Specific applications to sustain the project interventions that were initially funded by DFID, as stated above

- Specific Management arrangements for budget preparation (including a requirement for project stakeholders to be consulted through a NPEAC that was specially created) and disbursements were stated.

- Importantly, the Government was required to commit to continue to fund its Department that was responsible for general environment and fisheries management from general revenue; and to ensure that any surplus annual income to Conservation Fund remained available in the Fund for future applications.

These requirements were necessary to ensure accountability and transparency in the management of the Fund. Copies of these requirements are available.

Based on these the recommendations in the PM, the Ministry of Finance developed specific Management Procedures for the Fund, which were also consistent with local Financial Ordnance and Regulations and administrative arrangements in the TCI Public sector. These procedures have been approved by the Executive Council of the TCI, and meet all the requirements of the PM and local Financial Instructions. We believe that would ensure accountability and transparency for the Fund. Copies of the Procedures are available.

Effectiveness of the Conservation Fund

As stated previously, the Turks and Caicos Islands Conservation Fund is little under two years old. Income to the Fund is estimated at about $1.1 million dollars, while expenditure from the Fund (which was allowed only after 1 year of the Fund being established) is about $300,000. The TCI has a three-year rolling budget system. Income projections for the Fund over the 2000 to 2003 period are currently estimated at about $2.5 million. It is far too early to judge the effectiveness of the Fund. However, management polices and procedures could be used to make inferences for the future.

Some relevant observation to note include:

➢ The government has ensured that income from the 1% increase in the Accommodation Tax is reflected in the Budget, as is the hypothecated expenditure (the national budget is a public document). This

commitment removes public scepticism, and holds the government accountable.

- Government has not sought to influence activities of the Fund, which has been left to the committee recommended in the project memorandum;
- The Project Steering Committee is aware that tourism is potentially a fickle industry. This could threaten income to Fund, which is directly dependent on visitor arrivals to the country. Therefore it has recommended that a portion of annual income to the Fund should be set aside as '*rainy day*' reserves;
- Expenditure from the Fund might be biased towards the National Parks Service early-on as it is established and then it might become stable. The Project Steering Committee is keen that all projected expenditure for the National Parks Service is justified in terms of technical and administrative feasibility and cost-effectiveness, to ensure that funding is available for microprojects and other community based activities related to conservation and sustainable use of the natural environment.
- The procedures put in place by the Ministry of Finance for the administration of the Fund ensures timely payments from the Fund for approved activities and projects. (Clear procedures to approve activities and projects have been put in place, which assures transparency and builds public confidence in the administration of the Fund and amongst key stakeholders).

If the above features hold true, I would be confident in the future effectiveness of the Conservation Fund.

Advice

In closing, I would note that establishment of the TCI Conservation Fund was not an easy task. In fact, it was a very difficult undertaking, and there are some issues that still need to be resolved.

Finally, I would suggest the following to other countries that may wish to set up Conservation Funds:

- Consult widely (both domestically and internationally) for models to follow.
- Adapt best international practices to local circumstances.
- Consult with all stakeholders, document their concerns and try to address reasonable ones.
- Try to understand the role of Ministries of Finance, especially where resources are scare.
- Establish clear policies and administrative procedures early on in the process (write them down).

Tourism and Biodiversity: the Balearic experience

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The wave of tourism

Tourism is a quite recent and rapidly growing impact on many island ecosystems. One of the major concerns about this novelty is the variety and strength of its effects on the biodiversity of such small territories. The sustainability of tourism depends largely on its ability to become host-friendly and conservation-minded. And in turn, the fate of biodiversity in areas under tourist pressure is contingent upon its recognition and appraisement.

There have been excellent breakthroughs in this area (e.g. Edington & Edington 1986; Eckert & Cremer 1997), and eco-tourism is a flourishing, albeit still quite a minority novelty, in many places (*e.g.* Castroviejo & Herrero 1992). Yet, the fact is that tourist developers and managers mostly look at landscapes and beaches as products on sale, while tourists themselves appear largely as a nuisance to be ignored by most naturalists. As a result, the vast majority of research papers or essays on either tourism or biodiversity (even in tourist destinations) make little or no serious mention of each other.

Therefore, it might be useful to focus on a case where tourism has a long history and, having reached its zenith as a sustainable industry, is now seeking to survive in a competitive, environmentally conscious area. The Balearic Islands have been a well-known tourist destination for at least fifty years. The enormous changes that the tourist industry has triggered in Balearic society have come a long way from the problems of poverty and emigration to those of opulence and immigration. In terms of biodiversity conservation, some problems have been solved by changes in habits and land use, but many others have appeared along with demographic, economic, and urban growth (Picornell 1991; Mayol & Machado 1992).

Tourists exert a huge pressure on the islands' nature. This is already feeding back on tourism itself. Thus, there is a need for a new model of development aimed at sustainability. In order to develop such a model in every instance we need first to understand the particular biological history of each island. Together with factual documentation on tourism, it may then be possible to foresee ways of putting this new factor into a reasonable, tailored formula.

Splendid biodiversity

The Balearic Islands are home for an extraordinary and unique biodiversity. Such richness is largely due to the fact that they are the most isolated archipelago in the Mediterranean. Moreover, the Mediterranean region, formed by the complex collision of several tectonic plates, hosts one of the highest concentration of species, and one of the largest proportions of restricted-range endemisms (Cody 1986; Oosterbroek 1994; de Jong 1998; Altaba 1999, in press b). The Balearics, known world wide as an emporium of the tourism industry, are something more than a nice scenario for publicity images – and for the naturalist, much more so.

The flora and fauna of the Balearics contains many endemics, often limited to a quite small part of the archipelago's territory. A rugged geography, with more than a hundred islets large enough to host terrestrial ecosystems, and an abrupt orography, with mountaintop zones very different from shoreline environments, add a variety of habitats favouring diversification. However, the study of autochtonous biodiversity is still insufficient, because there are groups having received little or no attention – and may be more worrisome, because species identification has traditionally suffered from a bias towards Iberian fauna and flora.

In almost every islet there are particular varieties of lizards, land snails and non-flying beetles (*e.g.* Alcover *et al*. 1993). These populations have no chance of gene exchange, and have been isolated since the sea level rose at the end of the last glaciation. Some beetles are considered distinct species, but differences in size among populations inhabiting different islets have not deserved recognition as subspecies. In the case of lizards, a lot of subspecies are accepted, endemic to one or two close islets. In contrast, snails have in general not received nomenclatural recognition, even in cases of quite obvious diagnostic differences.

Figure 1 (A to D, from top). The natural vegetation of the Balearics consists mostly of various types of garrigue. At the northernmost tip of Mallorca, large expanses of "càrritx" *Amphelosdesmos mauretanica* alternate with Aleppo pine *Pinus halepensis* woods (A), together with stands of small palms known as "garballons" *Chamaerops humilis*. In the highest parts of the mountain ranges (B) there are communities formed mostly by species endemic to such heights, adapted to an extreme climate. Human activity, transforming island nature over many centuries, becomes evident in the habitat mosaic of Menorca (C), including pastures and cultivated fields among more or less interconnected trimmings of forests and garrigues. Peripheral islets, such as those known as Vedrà and Vedranell and lying to the south-west of Eivissa (D), host endemics belonging to several groups of organisms unable to breach the channels isolating them. Even though they are strictly protected, all such islets have been subjected to tremendous aggressions, rendering their terrestrial ecosystems different from what they would have been before the arrival of humans.

Extending this overview to plants, further anomalies emerge (Alomar *et al*. 1997). For example, the vine *Rubia angustifolia* is endemic to the Balearics, and is not rare in the tiny island of Cabrera. There lives also another plant, similar but growing as a herb and only in a very small area swept by storms. No hybrids are known between the two forms, and their characteristic morphology does not seem affected by cultivation side by side in botanical gardens. Surprisingly, botanical tradition stands heavily enough as to make the latter to be recognized at most at the level of "subspecies" – *Rubia angustifolia* subsp. *caespitosa*.

In some instances at least, it is clear that such insular taxa merit species status, because they have undergone a long evolutionary history in isolation and have not interbred with continental taxa for an extended period. Among birds, the Balearic shearwater *Puffinus mauretanicus*, the Mallorcan crossbill *Loxia curvirostra* and the Balearic warbler *Sylvia balearica* must be considered as valid species – not by applying innovative or debatable species concepts, nor due only to important morphological differences, but after considering evidence on their distribution, behaviour and fossil record (Altaba 1994, 1999). The discovery of endemism among birds highlights how little we really know about biodiversity in the Balearics, or in the Mediterranean at large.

A wreck's environmental history

The origin of the native Balearic biota dates back from the late Oligocene, some 30 million years ago

(Cardona 1979; Altaba 1998; de Jong 1998). At that time, the emerged land-mass that would eventually become the Balearic Archipelago detached from Sardinia and adjacent lands, starting evolution in isolation of the species living there. The only later connection to the nearby continents took place during the Middle Miocene (in the Serravallian, some 14 million years ago), when the formation of the Arc of Gibraltar involved the Balearic Promontory, giving it a form close to the present one. This connection was relatively brief, although it allowed the arrival of a few terrestrial vertebrates (Altaba 1997).

Figure 2 (A to C from top). The Balearic fauna includes many endemic species. The examples shown here are a blind cave-dwelling crustacean known from a few sites (*Typhlocirolana moraguesi*, A), a land snail restricted to the high mountains (*Iberellus balearicus*, B), and a lizard found only in one islet (*Podarcis pytiusensis vedranellensis*, C).

It is worth pointing out here the debate around the purported desiccation of the Mediterranean at the end of the Miocene (in the Messinian, 5.5 million years ago). This hypothesis was intended to explain the saline deposits in the bottom of the basin, and has extended a powerful influence in biogeographic studies. Yet, from a strictly geological point of view, it is quite unclear whether the Mediterranean dried up. And concerning its biogeographic implications, it does not seem it had any noticeable effect on the terrestrial fauna and flora, not only in the Balearics, but throughout the whole basin (Altaba 1998). These facts notwithstanding, it is an idea that has been advocated to explain all sorts of distributions around the Mare Nostrum.

Later on, an undoubtedly important episode happened, still dated with little precision sometime in the Lower Pleistocene: a mass extinction, perhaps caused by a submarine volcanic eruption, triggering a dramatic reduction in the number of insular species, especially in the southern island group (the Pytiusics). Many species of land snails, in addition to lizards, a giant tortoise, an artiodactyl, and a dormouse appear in Plio-Pleistocene sediments. And then, in younger sites, only a few snails and the Pytiusic lizard are to be found. Thus, the islands of Eivissa (Ibiza) and Formentera were quite similar in their ecology to oceanic islands, e.g. those never having been united to continents. This makes them an anomaly of utmost interest in the Mediterranean context (Paul & Altaba 1992; Alcover *et al.* 1994).

Finally, climatic and sea level fluctuations throughout the Quaternary furnished ample opportunities for the evolution of a remarkable biota. Several instances of highly restricted endemism (in islets, mountaintops, isolated swamps, caves and remote cliffs) can be accounted for in this manner.

Human settlement of the Balearics, dating only some 5,000 years ago, represented a cataclysm. In the first place, enormous changes in vegetation were produced (Yll *et al.* 1997). As in other islands worldwide, centuries of such changes brought the introduction of an impressive array of invasive species. Most of these exotics probably arrived though an "invasion corridor" from the area around Sicily, from where merchant Greek and Carthaginian ships sailed to commerce with the aboriginal Balearics (Altaba 2000a). The final result is that the Balearic biota has been deeply altered. Indeed, all present-day terrestrial mammals are newcomers, while those endemic were exterminated by human causes. Such pattern is equivalent to what happened in all Mediterranean islands (excepting the Pytiusics). Of the original insular mammal fauna, only two shrews remain (in Crete and Malta). Birds probably suffered a comparable disaster, even though it is difficult to evaluate its extent because there are still many unresolved issues in the taxonomy of pre-human species in the whole Mediterranean region.

Figure 3 (A to B from top). The native herbivore of the northern Balearics was a small caprine, called *Myotragus balearicus.* Virtually free of predators (only eagles could prey on it), it must have exerted an intense pressure on vegetation. It became extinct shortly after the arrival of humans to these last unsettled islands in the Mediterranean. Today we find its remains in caves, and also in the peculiarities of the endemic flora. The extremely toxic "didalera" (*Digitalis minor*, A) is one of the few non-endangered natives, thriving even in areas with a high density of feral goats. Other plants have mechanical defences, such as the amazingly thorny "socarrell gros" (*Anthyllis hystrix*, B), which often exhibits the effect of northerly winds in its shape and position of live parts.

Among insular species, many have survived devastation of original ecosystems thanks to the existence of unexpected refugia, where habitat conditions are often only marginally adequate. This is the case of New Zealand's tuatara, Guadalupe's native flora, or Mauritius' monsoon forests, all of which still hang out in tiny peripheral islets. This is also the case of native lizards in the northern Balearics (or Gymnesics), and of some endemic plants scattered across the whole archipelago (Altaba in press b). Another surprising example is provided by the Mallorcan midwife toad *Alytes muletensis*, first known from subfossil remains, and later found living in some remote mountain streams (Hemmer & Alcover 1984).

Island vertebrates underwent an almost complete extinction, but this collapse did not affect other groups of organisms, at least not to a comparable degree (Altaba 1999, in press b). Even though the number of introduced land snail species is very large, it does not appear that any extinction has taken place among the Mediterranean island fauna. Land snails and plants have comparable patterns of endemism, yet only the former leave a good fossil record. However, it is also true that no extinctions have been recorded among endemic plants. (The only known loss is *Lysimachia minoricensis*, which survives in botanical gardens after disappearing from the wild well within the 20th century.)

In order to understand this exceedingly low (or null) extinction rate among plants and land snails, it is necessary to rewind Balearic history to grasp how a previous "extinction filter" (Balmford 1996) had already affected these taxa. The profusion of thorns and toxins among plants endemic to Mediterranean islands suggests indeed that they evolved under a selection imposed by a very intense herbivory pressure by endemic ungulates roaming virtually free of predator control. Therefore, the substitution of domestic or feral livestock (such as goats in Mallorca; Altaba 2000b) for those ungulates meant no havoc, in contrast with what happened in many oceanic islands lacking herbivores where plants had no defence.

There is thus no evidence suggesting a great extinction among Balearic (or Mediterranean) native plants (Greuter 1994) taking place before the existence of botanical records. Instead, there is much favouring the alternative that plants (and land snails as well) remained largely unaffected by traditional, extensive land uses. Therefore, the outcome in this particular context is that much of the original biodiversity still exists, although most of the endemics' ranges have become even more restricted, and thus more dependent on a fine-grained pattern of land use. In the last quarter century, however, changes in those uses have occurred with unprecedented magnitude and speed, putting now many species in critical danger (Altaba 1999, in press a; Bestard *et al.* 2000)

Tourism on a fragile land

Following a few millenia of human occupation, the Balearics have become a complex mosaic of habitats largely affected by the activities of our species. After a

resident population of the Balearic Archipelago is close to 800,000. Nearly 60% of these live in the metropolitan area of Palma, where most political, industrial, commercial and financial activities are concentrated. The parallel increase of tourism has promoted a conspicuous economic progress (Mayol & Machado 1992; Manera *et al*. 1999; Conselleria de Turisme 2000).

As a result, the per capita income stands as the highest in Spain. In 1999, the three airports received 19.2 million passengers, while the main harbours registered 2.2 million. That same year, the islands were visited by 10.7 million tourists, occupying 405,000 beds and 256,000 restaurant seats. This generated a gross income around 916 billion pesetas (ca. 5.5 million euros). Unquestionably, the Balearics are a leader in vacational tourism. The tourist sector is highly sophisticated, and is also a leader in the development of other tourist destinations worldwide.

There are, however, negative aspects to all this development. Indeed, the massive destruction of the coastline has yielded the term "Balearization". Domestic refuse production is twice Spain's average. With nearly 900 cars per 1000 residents, traffic has become a nightmare. The mean level of water tables has fallen 90 m in 15 years, and aquifers lie at a mere 7% of their capacity. Electrical consumption rose 37% between 1993 and 1998. Air pollution in Palma is twice that of Madrid. All together, the "ecological footprint" is equivalent to that of a much larger population on an enormously wider territory. And these problems are appreciated by tourists: 34% of all their queries relate to environmental questions.

Those queries are indeed taken seriously, because current wealth is based mostly on tourism: 84% of the Balearic GNP is related to it. And it is widely acknowledged that the vagaries of tourism may not be predictable. On a yearly basis, it is a fact that the fraction of hotel rooms occupied fluctuates drastically: while it is at least 97% in August, it falls to a mere 12% in December. This variation is responsible for much temporary unemployment. In addition, income is quite unevenly distributed, making the Balearic poverty ratio stand among the highest in the European Union. Even if the gross economic figures may look satisfactory, there is a growing concern about environmental issues (Verd 2000).

All this happens on a territory that provides huge incomes but receives little investment from the Spanish central government. For example, roads are just 67% of Spain's average per inhabitant, and the proportion of university students stands at half. Although if new investments are to be in the form of plans elaborated by the Spanish Environment Ministry, it may be better to avoid them; they appear to aim at paving the whole coastline and transforming protected areas into a perpetual display.

Figure 4. Preserving the remaining natural habitats, such as Cape Cavalleria in Menorca (the northernmost tip of the Balearic archipelago), depends upon finding a win-win solution for both the conservation of endemic communities and the public use of these lands. Tourism can easily be a disturbing impact, yet with careful planning it can promote the successful, albeit complex management of protected areas.

Keeping Paradise afloat

Much, perhaps most, of the natural heritage of the Balearic Islands is currently endangered. Most endemics survive only where there are less human-induced perturbations, and thus fewer exotics (Pretus & Chust 2001). The biological richness surviving in the still little altered landscape cut-offs deserves to be protected with exquisite dedication.

There are sound scientific reasons for conservation in such small and impacted territories. Also, and perhaps in a more important way, deep ethical motivations exist. In addition, an economy based on the two pillars of entertainment and information should constitute sufficient grounds not to spare any efforts.

The current economics might render these islands an advance of what human impact is causing everywhere: with an extremely high, and growing energy consumption, and with an accelerated occupation of the territory with no equilibria, they are years ahead of what ought to happen elsewhere.

A clear sign of the current situation was recently in the local news. The first publicized draft of an ambitious Territorial Plan for Mallorca included a firm proposal to "ameliorate" the island's nature. This was to be performed through the introduction of several species that have never existed there, including beech, roe deer... even Spanish lynx! A storm of criticisms and jokes (*e.g.* Perelló 2001) elicited the following response from the surroundings of the Council of Mallorca's presidency: "that was simply the pre-diagnosis, not even a diagnosis previous to the Plan's development" (Artigues 2001). With such reasoning, it becomes clear that the island's biodiversity is still far from understood or appreciated in certain relevant quarters.

Yet, there are reasons for hope. After many years of modest or dubious environmental action, the Government of the Balearic Islands is now ruled by a left-centre coalition whose goals include explicitly conservation and sustainability. Most interestingly, the Department of the Environment is now in the hands of the Greens, and several relevant steps are being taken (Conselleria de Medi Ambient 2001). Resource use and traffic are being rationalized, recycling and waste reduction is incentivized, and water demand is starting to be managed. A comprehensive Biodiversity Law is now almost ready to go through the Parliament of the Balearic Islands, and an extensive network of nature reserves is being developed. Most noticeably, environmental education is taking off with impetus (Bestard *et al.* 2000).

Putting tourists into the equation

There is an urgent need for finding a model of sustainable development in the whole Mediterranean region (Mooney 1988; Bifani 1999). It must be kept in mind that the current bonanza for the Balearic economy has been the outcome of various crises affecting potential competitors. The bet is now for a more varied, more even and more recognized tourist offer. This is to be achieved through action along two paths: giving an explicit value to natural areas, and tuning tourist zones.

The tourist industry, even if hostile to anything that might imply less than cost-cutting, is drifting towards a general "greening", pushed by market forces putting a value on environmental matters (Picornell Vaquer 1999). On the part of the Government of the Balearic Islands, there is an innovative programme, called "Ecotur", aimed at helping tourism companies along this path (Chacártegui Cirerol 1999). The risk, of course, consists of putting on too much make-up, to the point of achieving the disguise of truly "Balearized" townships (such as Calvià; see Eckert & Cremer 1997) as environmentally friendly places.

The enormous cost of a serious "greening" plan requires additional financial resources, which ought to be produced largely by the tourism industry itself. On 10th April 2001, the ecotax has finally been approved in the Parliament of the Balearic Islands, with the applause of the majority, widespread and eloquent support among residents and tourists, and the acrimonious promise of legal battles on the part of witnessing hotel owners and of the Spanish central government (Payeras 2001).

The Balearics now support a very complex society, which is starting to make sophisticated evaluations in order to make careful choices for the future. Biodiversity is already deeply rooted in most people's view of the islands they inhabit (Ginés Gràcia 1999). Public participation in decision-making is a fundamental issue, requiring large doses of environmental education focused on the reality of the islands' resources and problems. Tourists also can and should be taught, instead of being driven merely as valuable livestock. In the end, tourism must be seen in the first place as a legitimate, obligately peaceful and potentially egalitarian sharing of the Earth.

The human footprint, deep and ancient in the Balearics, allows us to comprehend what kind of impacts our species' activities have. Maybe then might we be able to predict what effects our attitudes can have. Thus, the lessons we can extract from the Balearic Islands may be valuable to understand and save biodiversity throughout the world. Human condition notwithstanding, times ahead look better for the amazing, fragile and precious biodiversity of a small archipelago shipwrecked in the middle of the "first Eden" – showing, by the way, how we may learn to coexist on a planetary scale with the birds, lizards, beetles, snails, plants, and everybody else.

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Figure 5. Environmental education is probably the key issue in finding a model of sustainable harmony between biodiversity conservation and tourism. Enlightening of both residents and visitors may be the best way to promote wealth and happiness in those small territories fortunate enough to be selected as holiday destinations. As an example of this perspective, perhaps the soundest reason to enforce protection of Cabrera National Park is, arguably but simply enough, that it is the last place in the Mediterranean where one can read the Odyssey and feel it is somehow true.

Ulixes 21: Towards Sustainable Tourism in the Mediterranean

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Med Forum (Malta)

Introduction: Tourism in the Mediterranean

The Mediterranean Basin has an exceptionally rich range of natural and cultural values, the explanation for its tourist potential. The area is one of the world's main foci of tourist attraction. In 1996, this area received 175,726,000 international tourists, representing 30% of the tourist flow in the world. This tourist flow has clear repercussions in the Mediterranean's economy: about five million jobs and an income of more than 100,000 million dollars a year, representing – in the coastal strip – about 7% of the Gross Domestic Product.

Even so, tourism also has devastating effects on the coastal environment. Water pollution, soil erosion processes, degradation of the underwater flora and fauna, and especially landscape degradation, are some of the clearest signs of a tourist model based on extensive growth and in indiscriminate use of land, far above the territory's carrying capacity. This tourist model is based on concentration in both space and in time. This concentration in space is because the tourist infrastructure is sited in the coastal strip, in a thin layer that ignores the adjacent inland areas. In fact, 75% of the tourist activity in the Mediterranean is concentrated in the four countries that are members of the European Union, and only 25% is generated in the rest of the Mediterranean Basin. It is concentrated in time, because the arrival of tourists is highly seasonal, peaking in the summer period, a fact that increases the impact on the environment and weakens the economic model of Mediterranean tourism.

What do we mean by sustainable tourism?

The World Commission on Environment and Development (WCED) defines "sustainable development" as that "which meets current needs without compromising the ability of future generations to meet their own needs". In the 2nd World Conservation Strategy (1990) *Caring for the Earth*, the term sustainable development is used with the following meaning: “to improve the quality of life of the human beings by living within the carrying capacity of the ecosystems that support life”. The need for sustainable development forms part of the world priorities expressed in the recommendations of Agenda 21 adopted at the Rio Conference and Community Action Programme 5 for Sustainable Development.

Starting from the basis that tourist activity should form part of a broader framework of sustainable development in the Mediterranean, we consider that tourism is not an end in itself but a means to ensure more harmonious development of the societies of the Mediterranean Basin.

This project starts from the conviction that tourist activity is neither intrinsically positive nor negative; this, in our opinion, is a function of tourism's impact on the space in which it occurs, meaning we can consider it as an instrument that increases the value of natural or cultural resources or as an instrument leading to the ruin of these resources.

The mass tourism model, which has characterized tourist flows since the 1950s, is a clearly unsustainable model, for at least four reasons:

1. It has not considered the importance of the conservation of the natural systems or of the rational use of natural resources as a value.
2. It has emphasized growth over the qualitative aspects of growth.
3. It has distributed the benefits of development very unfairly.
4. It has not included the surrounding area and its special features within the tourist offer, thus favouring homogenization and depersonalization.

Rather than a model based on economic growth and the predatory use of natural resources, what is needed is a model of tourism that is sustainable. We understand sustainable tourism to mean the tourism that combines tourist development with respect for and preservation of natural, cultural and social resources. Sustainable tourism favours the reduction of tensions between the tourism industry, the visitors, the host communities and the environment.

We consider that sustainable tourism is a tourism that is:

- ***Long-lasting*** (economically viable in the long-term, planned and well managed, which implies avoidance of mass tourism, and a low impact).

- ***Environment friendly*** (adapted to the carrying capacity of the natural and cultural spaces, minimizing seasonal effects)
- ***Diversified*** (in relation to the hinterland, adapted to the site's personality, based on local enterprises and avoiding total dedication to tourism)
- ***Participatory*** (with the participation of the local towns and villages)

Aims of the Project Ulixes 21

Project Ulixes 21 seeks to spread information about the values of the Mediterranean coastline and the environmental problems affecting it, as a consequence of the generalization of a tourist model that does not contemplate the need for its development to be compatible with the conservation of the environment. The basis of this project is the deep conviction that tourism models in the Mediterranean must be encouraged to restructure and aim for criteria of sustainability.

The project's aims are to communicate, raise public awareness and educate the different agents involved in tourist activity about the need for greater integration of environmental problems in the planning and use of all the activities derived from tourism, to ensure sustainable development of tourism in the Mediterranean coastline. Therefore the target of the project includes tourists, local administration, citizens of the localities receiving tourists and all the social and economic sectors that live from this activity or are related to it.

The project starts from the idea that it is essential for the different agents genuinely to want to cooperate and to assume, in their daily life, the responsibilities relating to sustainable development. The emphasis is on that it is necessary to raise the population's awareness and their commitment to seek solutions to the environmental problems of the Mediterranean coastline, so that they can take responsibility for themselves and play an active role in the present and future.

Field of activity

The project will take place in two geographic areas:

In the country of origin: especially Germany, Great Britain and France, and will seek to influence potential tourists and tourist-related companies and organizations.

At the destination: in the countries that receive tourists, specifically on the Mediterranean coastline of France, Spain and Morocco, Malta, Tunisia (Portugal and Croatia in the near future). Here the target will be the actual tourists, the managers of tourism (especially the local authorities) and also the populations that receive tourism.

Activities and Targets

	ACTIVITIES	TARGETS
WEBSITE www.medforum.org/ulixes21	Interactive web page Info about project 4 languages	General public Experts Potential tourists
TOURIST AWARENESS-RAISING CAMPAIGN	Awareness among tourists An amusing questionnaire 600,000 leaflets so far	Mediterranean tourists Potential tourists
TRAVELLING EXHIBITION	20 panels about the Med environment and tourism	General public School children
GUIDE-BOOK FOR MANAGERS	Good practices Concepts of sustainable tourism and recommendations	Tourism managers Professionals Students
INTERNATIONAL CONGRESS	Sustainable tourism in the Mediterranean: The participation of civil society	NGOs Administration Professionals Students

Wildlife and Tourism: the Gibraltar Situation

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Introduction

Gibraltar is sited on the north-eastern side of the Strait of Gibraltar dominating the Bay of Gibraltar to its western side. Rising some 1400 feet (398 metres) above sea-level, it is as impressive now as it was in classical times.

The eastern side of Gibraltar is predominantly cliff formation, broken only by talus slopes from its summit down to sea level. The western side is steady vegetated slope of Mediterranean matorral with maquis and garrique dominating the Rock's upper reaches right down to, and until it reaches, the city on the lower slope.

Gibraltar is fortunate to have nature protection laws, insofar as they protect all natural habitats both terrestrial and marine (Nature Protection Ordinance 1991). These laws now provide protection to the 30% of Gibraltar's natural coastline that still remains, and gives blanket protection to its territorial waters. Likewise these same laws protect the Rock's upper reaches that are to the great part still natural, with blanket protection to all flora and fauna wherever found.

Flagship Species

Within each respective area, marine and terrestrial, Gibraltar supports two flagship species. The Common Dolphin *Delphinus delpis* for marine and the Barbary "ape" *Macaca sylvanus* (a maquaque) for the terrestrial.

The marine flagship species *Delphinus delpis* has been visited on a commercial level by single vessel, the Sea Marauder for over twenty years but only during the summer months. Until research work carried out by the Helping Hand, a sister charity of the Gibraltar Ornithological and Natural History Society (GONHS), commercial dolphin watching was not exploited as it is today. This work showed that the Bay area is in fact the home range for dolphins that were present throughout the year, plus the added fact that the Bay area is also a calving ground to no less than three species of dolphin, *Delpinus delphis*, *Stenella coeruleoalba*, and *Tursiops truncates*.

Today vessels ply this trade with a carrying capacity of well over one hundred passengers. The original vessel carried twelve and did no more than three trips each day. Whereas now, the hours of daylight dictate the number of trips undertaken.

The terrestrial flagship species *Macaca sylvanus* has it origins on the Rock lost in time. The Phoenicians made note of these animals on the coast of Barbary, Greek and Etruscan art depicted them on vase paintings. The first notation of their presence in Gibraltar was by Ayala is 1778 in his history and description of the same. General Rainsford likewise reported then in 1791. Present day thought has them ranging fromkey remnants of a native European population to secreting themselves to Gibraltar by subterranean tunnel from Morocco. Fact, fiction, legend or import, the choice is wide open; in truth we do not know how they came to be here. What we do know is like the dolphin they are here and they are our flagship species.

Problems

What are the dangers for flagship species? The first danger is us, the ones who wish to protect and preserve. To the great part, most NGOs spend a great deal of their time trying to promote the need for preservation and protection of species believed in danger. Present day examples are tigers in India, or polar bears in Alaska.

Within the waters of Gibraltar, the efforts of a few reflect much the same story. Construction of an artificial reel, on Gibraltar's western shoreline, took well over a decade to find any kind of support. Now, 25 years down the line, it is being exploited by both government and commercial interests, without any understanding of what kind of support it truly needs for its longevity.

Support for these issues, when it arrives, comes as it does in many areas throughout the globe – from governments, councils, administrations acting for and on behalf of, whoever! Plus the ever-vigilant commercial entity. They know of the tigers of India and the polar bears in Alaska. They likewise know of the flagship species of Gibraltar; who told them? We

told them, the NGOs, societies and all round green do-gooders.

In our search for support and protection we have pointed out at every given opportunity how eco-tourism can help the hidden economy. Now tigers, polar bears, dolphins and apes can be seen by everyone anywhere any time in the name of eco-tourism, and all with the blessing of governments, councils and administrations.

So where does that leave us? In the case of Gibraltar's flagship species, to the great part on very thin ice. Our initial plan of introducing true protection law (Gibraltar Gazette April 1991) was a wise move. The need to protect under the law is vital. Without that all, species protection is futile.

Dolphins in the bay area of Gibraltar, however, are under pressure, and protocols for dolphin watching vessels are long overdue. To date, these are not forthcoming from local governments.

The Junta de Andalucia in Spain on the other hand is looking into the loss of this future eco-tourism before they have it in place, by setting up protocols for dolphin watching vessels before these commercial interest are *in situ*. This, for their part, is a lesson they have taken on board from their problem with whale watching in the Canary Islands.

Apes on the Upper Rock are suffering a similar situation. With tourism ever on the increase, tour operators and taxis are subjecting these animals to human interactions on a scale never before seen – with results of stress-related problems such as biting, loss of family structure, and splits within groups as we have never seen before. This, plus visitor feeding all types of foods with the aid of the tour operator drivers (coaches and taxis), to the point where animals are obese, effectively decreasing fertility and bringing about shorter life-spans. Notwithstanding that, when these new types of food are not available, the animals go in search of them within urban areas.

Solutions

What effectively are needed are draconian measures to protect operators from themselves and their blindness that it will last forever or at least until they are rich. Governments, councils and administrations for their part should not fear these commercial interests. Both are in need of each other, and the wildlife is in need of the funding for its protection and preservation.

Effective laws and protocols must be introduced and administered effectively and firmly, for and on behalf of all participants (operators, governments, flora and fauna).

A sinking fund to provide for the protection, preservation and management on the part of wildlife should be provided from those who gain from it (governments, operators and eco-tourists).

Eco-tourism is such that people will gladly pay if they see monies are being spent effectively on protection, preservation and management – and they are the end-users who, via operators and government, pay the bill.

Without effective measures on these flagship species and other areas of the eco-tourism's hidden economy, such as botanical walks, bird watching and diving holidays, will – along with our big-sellers – be lost to the local economy. For us there will be no turning back.

Nature and its habitats have suffered much and survived all. There have been many losses down through time from which there is no return. Nature's ability for collective survival, however, has been adhered too. Let us not have our right of free-will, above all things, bring about our downfall through lack of vision. If we must sell, let us sell a better future for flagship species and all wildlife. Let us once more become part of our landscape and not just the shaper of it.

Conclusions

The need for laws in nature protection should not end with their implementation. Laws should be effective on the ground, not just on paper but in practice. Blanket selling of an eco-product, should take on board its after-effect on the product once sold. Funding should have a pass-down effect so all who benefit likewise contribute. Overselling of an eco-product can be detrimental in the long term without the following being taken into account.

Policing – effective and firm

Education – effective and understandable

Funding – levy operators and ecotourists. Don't like it; don't buy it; don't sell it

Management - global and myopic

Protocols - implementation accentual

Consolidation is the key-word to the stability of eco-tourism. Oversell has a detrimental effect not only on wildlife but also on the hidden economy that grows up around such commercial ventures.

Superabundance, plethora (call it what you like), when selling eco-tourism is the one thing we do not have. Our fragment of paradise is limited; because of this

we must limit its growth accordingly. However it can only be done with the cooperation of all involved.

The Government of Gibraltar, for its fragment of paradise, needs to show courage and forward planning far beyond its term in office if our flagship species are to survive this new era of plenty. They are the ones who must see wisdom in the misfortunes of others who have tried and failed in their stead.

Flagship species: Dolphins in Gibraltar Bay, and a Barbary macaque (right) in apparent consultation with the author (left).

Trails: Conservation that makes Dollars & Sense

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Over the past few decades tourism has been one of the world's most consistent growth industries. Worldwide, international tourist arrivals grew by 9.7% from 1980 to 1985, and by an astonishing 31.7% between 1985 and 1990.

In 1992 an estimated 425 million people, representing almost 10% of the Earth's total population, made trips outside their own countries. They spent almost US$ 2 trillion, contributing to a sector that ranks third amongst all export industries and makes up 25% of international trade in services. Former American Airlines Chairman, Robert Crandall, writes: "Travel and tourism meets an annual payroll of US$ 540 billion, pays 6% of the world's total taxes, provides one in fifteen of the world's jobs and accounts for more than 7% of all capital investment."

The economic importance of this industry to small islands, such as those in the Caribbean, is indisputable. Indeed tourism is the lifeblood of many West Indian nations. In 1990, this region received 11.84 million tourist arrivals and an additional 7.45 million cruise ship passengers. Together these visitors spent US$ 8.9 billion and provided direct and indirect employment for more than 300,000 people. Between 1970 and 1990, Caribbean tourist arrivals grew by 180%. The Caribbean Travel Organisation reports average annual growth over the past fifteen years at about 7%, considerably higher than worldwide average annual growth in this sector. Spending is also on the increase.

Today, islands face difficult times. Agriculture for many is under threat with changing global trade practises, withdrawal of preferential trade agreements and competition. Aid and donor assistance is becoming more targeted and more frugal. As island nations develop, they are perceived as being "less in need". All this is happening at a time when human populations are burgeoning and material expectations are on the rise. For many islands tourism is seen as the answer. There is little doubt that it can generate enormous windfalls and does create jobs. The problem is that, unless carefully managed, it can wreck havoc on fragile environments, with little or no return.

Believing that tourism is inevitable, and that island governments will continue to solicit more and more arrivals, RARE Center has encouraged Forestry and National Trust personnel at least to try to access some of the monetary benefits that tourism brings, to plough back into conservation and resource management. It has done this through the production of a step by step manual: *Trails: Conservation That Make Dollars and Sense*, and a targeted programme of construction grants.

Tourists are interested in the environment. In 1990 Elizabeth Boo (WWF) noted that a 1982 study showed 29 million Americans were interested in "non-consumptive wildlife use", having participated in 310 million nature trips away from their homes in 1980 alone. She added that these figures included 1,031,000 people who made 4,067,000 trips, with a predominately ecological interest to foreign countries.

A Fitch and Bubbenmoyer study (1989) noted that "there are more than 80 million Americans interested in bird watching… Some 30 million consider themselves "active birders", making bird watching one of the fastest growing pastimes in the USA". The report added that bird enthusiasts spend more than US$1 billion on bird seed alone, and have a demographic profile that would delight any salesperson. Forty percent are between 18-45 years old and 17% have disposable household incomes in excess of US$ 50,000 – and that was in 1989!

As resource managers we MUST maximise the potential financial resources that interested nature lovers can bring to our islands, while minimising the damage they do. Carefully constructed and managed trails can facilitate this. If only 10% of the Caribbean's stay-over tourists visited a trail and paid just US$10 for the privilege, more than US$10 million would be generated annually.

To address this matter, *RARE* Center has produced a manual: *Trails: Conservation that Makes Dollars and Sense*. Printed in English and Spanish, this manual guides its reader through a step-by-step process of designing and constructing a nature-trail system. It aims to help the resource manager to maximize the economic benefits of their country's natural heritage through tourism, while minimizing its environmental impact. It strives to provide the "tools" required to develop quality, low-impact trails, and to upgrade guide services, thereby providing visitors with new opportunities to see more of their destination, while at the same time bringing in much needed foreign exchange and jobs. The manual's ten chapters include ones dedicated to market research, preparation of proposal, site-selection, cost/benefit analysis, trail

construction, marketing, interpretation, financial management and carrying capacity. It also includes Survey Pro computer software which is used in the visitor surveys. The manual is directed at mid-level technical officers who are actively involved in trail design, construction, interpretation or administration; including Forestry or National Trust personnel.

Like RARE Center's other manuals – *Promoting Protection Through Pride* (Education) and *Reaching Out Through Radio* (Family Planning Serial Dramas), the text provides a basic, step-by-step guide taking the reader through the entire process of trail development. The manual's loose-leaf binder format enables the reader to insert his/her own examples where appropriate. Sample sheets, funding proposals and worked examples are printed on yellow paper. As these are reached, they can be replaced with copies of original work. Design formats for trail furniture and interpretive materials are printed on blue paper, so they can be given to those individuals directly involved in construction. RARE Center's original trail development manual was distributed free throughout the English-speaking Caribbean, with over 50 government agencies and non-government organizations receiving complimentary copies. Additional manuals were sent to regional organizations such as the Institute of Tropical Forestry, the Canadian International Development Agency, UNDP, and the British Development Division.

NOTE: A further manual on guide training is currently in press and will be of value in improving guide training skills. A fully revised trail manual, and a Spanish translation are also in the final stage of development, incorporating lessons learned.

RARE Center also invited proposals for trail grants, requesting the applicant use the manual's opening sections to form the basis of their proposals (an analysis of visitor preferences, a survey plan of the proposed site, a line-item list of materials, and a cost/benefit analysis etc). In the months following its distribution, RARE Center received about 30 letters of inquiry and/or trail development proposals from around the region. About one-third of the proposals failed to follow the guidelines outlined in the manual, lacking two or more of what were deemed essential prerequisites, such as data on tourism arrivals, a comprehensive bill of quantities, a survey plan, or a cost-benefit analysis. Of those proposals that did include all, or almost all, of these prerequisites, many appeared to have followed the steps outlined in the manual.

For example, in the Jamaica's Oatley Trail, the JCDT conducted a visitor survey and utilized the software included in the manual. In the Turks and Calicos, the TCI National Trust had pre-existing data from their tourism department and used this in their proposal. In the case of the Cayman Islands and Montserrat, trail traces were surveyed, while in the case of Nevis, existing maps were used.

Of the proposals that were received, and which included all or most of the proposal prerequisites suggested in the trial manual, some like Trinidad's North-East Forest trail, were rejected, because there was little evidence of matching funding being obtained and it was thought unlikely that the trail would be financially viable – based upon the statistics provided. Others were rejected simply because RARE Center had insufficient funds to finance all the proposals that were submitted. When data were missing from the proposals, each applicant was afforded the opportunity to submit an addendum to bring their proposal more into line with what was required. In most cases, RARE Center personnel were familiar with the various sites and, where they were not, a site visit was undertaken.

Over several years, RARE Center assisted in financing the construction of ten trials: nine in the wider Caribbean and one in the Pacific. Approximately US $137,000 of RARE Center's own funding was expended on these, with this leveraging about 260% (US $359,123) from other sources. Each trial was then visited either at its official opening or shortly thereafter. Once again, it was found that the local lead agencies had used RARE Center's trail manual in the manner to which it was intended. It was used as a reference source as and when required. For example, at Belize's Tropical Education Center trial, the manual's format sheet for look-out construction was given to the contractor as the basis for his work. On the Cayman Island's Mastic Trial, Trust staff used the manual and made a number of recommendations that have been subsequently included in it. In the Turks and Caicos they have used the accounting format provided in chapter three of the manual.

In line with donor requests, RARE Center has continued to monitor all of the trail sites it has financed and has produced regular updates on their status and financial viability. Four of its trails have now been open for several years. These sites include: Des Cartier in Saint Lucia; Little Water Cay in the Turks and Caicos; the Mastic Trial in the Cayman Islands; and En Bas Saut also in Saint Lucia. These trails offer an interesting mix of both ecosystems and management operations. For example, the Saint Lucia sites are located in rainforest, while those in the Turks and Caicos and Cayman islands are located in dry areas. Those in Saint Lucia are managed by government departments, while those in the other two sites are managed by non-governmental National Trusts. Three of the four sites are generating significant profits, while the Mastic Trail continues to

run at a modest profit, after several years of operational losses.

To illustrate the potential value of trails in the conservationist's portfolio, here are the latest operations figures from the four aforementioned trails. Both the Saint Lucian trails were new and were carved out of the forest; in the Cayman Isalnds the trail followed an existing trace, while in Turks & Caicos, visitation to Little Water Cay to see the Iguanas has been a long-time phenomenon. However previously there were no board-walk trails, and visitors often damaged Iguana burrows, and no revenue accrued from visitation to contribute toward the area's management.

Trail: Des Cartier Trail

Country: Saint Lucia

Collaborating Agency:
Forest and Lands Department

Reporting Period:
April 1st 1999 – December 31st 1999.

The Forestry Department's Des Cartier Trail continues to function well generating significant revenue for the local economy as well as contributing much needed funds to the Government's Consolidated Fund. Although Saint Lucia was hit by many storms during this reporting period, the trail continues to do well. The Des Cartier Trail also has to compete with new trails opening all over the island. Despite all this, Des Cartier remains the premier rainforest trail in Saint Lucia.

Income for reporting period:
During the nine-month period under review the Forestry Department generated EC$85,925 (US$32,061.75).

Expenditure for reporting period:
During the nine-month period under review the Forestry Department expended EC$28,329 (US$10,570.64), on trail maintenance, tour guides, and other related costs.

Profitability for the reporting period:
Between April 1st 1999 and December 31st 1999 Forestry Department's Des Cartier Trail generated a profit of EC$57,596 (US$21,491.04).

Since the US$10 entry fee levied by the Forestry Department represents less than one-fifth of the total (US$55) charged by the tour company, we can estimate the amount of revenue generated for the general economy during the reporting period by multiplying the 3,206 tourists that visited the trail by US$55 fee charged, which equals US$176,330.

In the forty months since this trail first opened it is estimated that it has generated over US$954,470 or more than EC$2.5 million for the local economy.

Source: Annias Verneuil, Forestry Department

Trail: En Bas Saut Trail

Country: Saint Lucia

Collaborating Agency: Forestry Department

Reporting Period:
April 1st 1999 – December 31st 1999.

The Forestry Department's En Bas Saut Trail continues to function well generating significant revenue for the local economy as well as contributing much needed funds to the Government's Consolidated Fund. Visitation to this trail has significantly increased over the past nine months and, over this reporting period, surpassed revenues even from the Des Cartiers trail. This is despite the fact that new private-sector nature trails seem to be opening monthly competing for the same target audience.

Income for reporting period:
During the nine month period under review the Forestry Department generated EC$88,573 (US$33,049.62).

Expenditure for reporting period:
During the nine month period under review the Forestry Department expended EC$27,955 (US$10,430.97), on trail maintenance, tour guides, and other related costs.

Profitability for the reporting period:
Between April 1st 1999 and December 31st 1999 Forestry Department's En Bas Saut Trail generated a profit of EC$60,618 (US$22,618.65).

Since the US$10 entry fee levied by the Forestry Department represents less than one-eighth of the total (US$85) charged by the tour company, we can estimate the amount of revenue generated for the general economy during the reporting period by multiplying the 3,636 tourists that visited the trail by US$85 fee charged which equals US$309,060.

In the thirty-three months since this trail first opened it is estimated that it has generated over US$581,073 or more than EC$1.5 million for the local economy.

Source: Adams Toussaint, Forestry Department

Trail: Little Water Cay Trail

Country: Turks and Caicos Islands

Collaborating Agency:
Turks and Caicos National Trust

Summary report: April 15th – December 31st 1999.

Executive Director of the Turks and Caicos National Trust Ethlyn Gibbs-Williams notes:

The Little Water Cay Programme still operates under the same principles set out in the Memorandum of Understanding drawn up in 1996. However, there have been changes in the management of the Programme. A committee of seven members drawn from the Watersports Association, the Tourist Board, the National Trust, the Department of Environment and Coastal Resources and the Private Sector advise on projects to be funded from the LWC Conservation Fund and make recommendations on matters pertaining to the management of the Nature Reserve. Little Water Cay continues to receive international recognition. CNN featured the nature reserve in a 30 minute documentary on the Turks & Caicos Islands aired in the latter part of 1999.

She continues: From observations during our periodic checks, there seem to be no evidence of negative impact to the natural habitat. However, it was noted that in addition to the debris brought in by the storm surges often experience during this time of year, natural factors such as termite invasion has been noticed for the first time.

Income for reporting period:
The Little Water Cay Nature Trail programme continues to be well-visited and profitable as well. Between January 1st 1998 and 31st 1999 approximately 23,219 tourists have visited the trail; the cost of this varies from US$ 35-75, depending on which other activities are included in the tour: snorkelling, picnic etc. Assuming the average tour price to be US$ 45, it is estimated that, over this period, the Little Water Cay Trails have contributed in excess of US$ 1,044,855 to the local economy. Each visitor pays an additional fee of $3 into a fund that helps to maintain the trail and support other conservation projects. Thus, to date almost $70,000 has been paid into this fund. Projects supported have included a trail on Middle Caicos, educational materials, mooring buoys, an underwater snorkel trail and funding the visit of an Iguana biologist.

Based upon the $3 entry fee, total income for this reporting period, March 30 through December 31, 1999 was $17,981. This gives an average of $1,998.00 per month and can be translated into 666 visitors to the reserve on a monthly basis.

Expenditure for reporting period:
Ethlyn Gibbs-Williams reports:

Administrative cost for this period March 30th-December 31st 1999 totalled $2,115.37. This includes telephone charges, fuel, and other incidentals itemized on invoices submitted to the Trust by Marsha Pardee.

The amount of $2,622.00 was spent on supplies, which includes $2,598.00 for purchase of iguana buttons and $24.00 on iguana etiquette cards. Maintenance cost for this period amounted to $413.00. The LWC Conservation Fund also contributed $2,000.00 towards other projects during the reporting period (MC Ecotourism Project Trail Guide).

Profitability for the reporting period:
Total expenses for the period totals $7,150.37. Therefore, net income to the Conservation Fund was $10,830.63.

Source: Ethlyn Gibbs-Williams; Executive Director TCI National Trust

Trail: Mastic Trail

Country: Cayman Islands

Collaborating Agency:
National Trust for the Cayman Islands

Reporting Period:
April 15th 1999- December 31st 1999

Silver Thatch Excursions has continued to be the only tour operator conducting guided tours of the Mastic Trail. The arrangement requires a commission payment of 15% to the National Trust for the Cayman Islands.

Fred Burton, Executive Director of the National Trust for the Cayman Islands notes:

Impacts on the natural environment resulting from trail use continue to be very slight. The tour operator reported that he was collecting small amounts of trash, apparently from local unguided walkers, during the cooler months (up to June). No statistics on unguided use are collected, but Trust staff and the tour operator have noted a gradual increase in local recreational use of the trail. This is welcomed, since it serves one of the major purposes of the trail (to increase awareness and build a sense of value for our dry forest ecosystem among the resident population).

The condition of the trail stood up well to the wet season, confirming that an annual volunteer-based clearing session is sufficient to maintain the trail in good shape. The next session will be scheduled in early 2000. The trail was heavily flooded at several times during the summer, in particular as a result of record rainfall in November 1999. By mid December the trail was dry again throughout. The generally flat terrain, and preponderance of rock substrates, means that no significant damage to the trail results from such events.

Income for reporting period:
*Please note that the reported income is for four months.

Statements from Silver Thatch have not been received for the full 1999 year, so trail use statistics are not yet fully available. The level of paid-tour activity remains well below potential, as a result of low interest among other tour operators. However the Trust continues to see a modest net income from this arrangement.

Month	Number of tours	Number of persons	Commission to Trust
April	6	28	US$ 181.50
May	9	27	US$ 202.5
June	7	38	US$ 120.71 *
July	3	6	US$ 60.00

* Incl. 23 students from Red Bay Primary School.

Expenditure for reporting period:
There has been no expenditure on the trail by the National Trust in the period April – December.

Profitability for reporting period:
Based on the fact that all trail works are carried out by a team of volunteers, that no materials were purchased during this reporting period, and that the guide is provided (and paid for) by Silver Thatch Tours, the full US$ 564.71 generated for the Trust by the Mastic Trail was profit.

Source: Fred Burton, National Trust for the Cayman Islands.

A question often posed to RARE Center field staff, is whether to construct guided or self-guided trails, and which are more profitable. A self-guided trail requires an initial investment for interpretive signs and trail pamphlets, but involves little subsequent expenditure for interpretation. Perhaps the biggest drawback is that unsupervised visitation can lead to resource degradation – either directly from flower picking, littering or vandalism, or indirectly from over-use. The latter can lead to erosion of the trail and the disturbance of wildlife populations owing to noise and unrelenting activity.

With a guided trail, access to the area can be better regulated. However, a guided trail requires major commitments of time and labour, as well as the accompanying recurrent financial expenditure. Guided trails typically will lead to higher revenue streams and greater visitor satisfaction, assuming the prescence of a competent, informed guide! An added benefit is the protective role guides play. Their frequent visits enable them to detect illegal activities around the trail, and they can supervise the activities of the visitors they accompany. A final alternative, is a mix of the two: open access to the trail and the provision of guided tours for those desiring a greater insight into the area's fauna and flora. One possibility is to offer guided tours at certain times or on certain days, with interpretation limited to self-guided activities at other times.

Experience drawn from RARE Center's ten trails has proven that the most effective, and financially viable way to manage trails is to franchise them to certified tour operators. Under this system the trail and its environs are declared off-limits to the general public, without a permit. Perhaps they lie within a Forest Reserve or Protected Area. The Management Authority (Forestry Department/National Trust) then allocates (either directly or through tender), specific days to local operators that the handle the tour operations. Such that it becomes the responsibility of the tour company to solicit clients and sell tours. The tour company also arranges and provides transport from the client's hotel to the trail-head, lunches and other services. They might provide their own certified guides, who have received training from the Management Authority, or provide space for an Authority guide to join them. The Management Authority, in conjunction with the Tour Operator, can determine maximum and minimum group sizes, and other logistical details.

A per-person user fee is levied and incorporated into the overall cost of the tour. For example, a visit to the Des Cartier Trail costs US$ 55/per person. Of this US$ 10 is paid as the user-fee to the Forestry Department. Invoicing tour operators can be carried out weekly or monthly using ticket stubs collected by the guide and provided to the Management Authority. In the low season tour companies can be encouraged to work together on any of their allocated days, liaising amongst themselves to reach declared minimum group size, thereby maximising their profits.

This management option generates revenue and employment, as well as boosts private-sector involvement. It also provides a mechanism for visitor control and minimizes the day to day involvement of the Management Authority in visitor solicitation. Most Tour Operators have their own staff based at hotel desks and have far better access to potential clients than does a resource agency, such as a local Forestry Department.

Visitor fees can also be used to under-write local visitation, and certain days of the week – such as weekends can be allocated to in-country clients.

RARE Center's trail program, and our local in-country collaborators have shown that carefully designed, well marketed and managed trails can provide tangible dividends in terms of jobs and income, while increasing the likelihood of local support for conservation.

If you would like to find out more about RARE Center's trail programme and our manuals, please contact:

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Bird catching on an industrial scale in the Sovereign Base Areas (SBA) of Cyprus

by Judy Dawes and David Whaley

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In Gibraltar we reported bird-catching on an industrial scale within the Sovereign Base Areas (SBA) of Cyprus. Since then, many of you will have seen this taken up by the British newspapers and wildlife magazines.

We had brought the situation to the attention of Michael Gore, and he was able to involve the RSPB. During the autumn migration, an RSPB investigative team visited the Eastern Sovereign Base Area and were able to photograph and video the extensive netting and liming. Coincidentally a journalist birdwatcher also visited the Republic and reported extensively on bird-catching within the Republic.

Both governments have responded positively, and we wait to see if serious efforts are made during the spring migration to curb the illegal activities of the bird-catchers. We shall be closely monitoring the situation and now have direct lines to the people who can make decisions.

We had another success in helping to persuade the SBA to allow the Republics Game Fund (anti-poaching) officers to join the SBA police in joint patrols within the SBA. The expertise of the Game Fund will be of great help.

We continue to assist the Cyprus Conservation Foundation, where we can, in their efforts to prevent the despoilation of the Akamas penisula, a wild gem that requires National Park status. We are in close touch with conservationists on the Western Sovereign Base Area who, together with the Republic's Forest Department, are preparing an action plan for the Akrotiri Penisula, an important wetland. We are also trying to assist the Cyprus Ornithological Societies in their efforts to bring the importance of conservation issues into schools.

We hope to be able to persuade both the SBA and the Cyprus Government departments to take part in the next Overseas Territories conservation conference.

The breeding birds atlas field work continues – slowly. This year we hope to fill the obvious gaps (such as "why haven't we recorded Cyprus Warbler in this square?") and publish an atlas for the Paphos District, in the west of the island. This is about one sixth of the total area.

Section 6: Biodiversity Action Planning

Action planning - a guide for the perplexed

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"Mobilising people for collective action is a time-consuming process that requires the presence of committed, competent and people-orientated project personnel and shared understanding of project objectives by both the co-operators and the project personnel." (Anon. 1996)

Why action plans?

A cynical view of biodiversity action plans is that they create "just more bureaucracy". Yet, there are sound legal and practical reasons for developing action plans for conservation.

The legal background is provided by the Convention for the conservation of biological diversity ('Biodiversity Convention'). Article 6 of the Biodiversity Convention states that:

Each Contracting Party shall
a) develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity …..
b) integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies….

Whilst CBD gives obligations for governments, there are also important reasons for conservation practitioners to draft action plans. Plans, or more correctly, action planning, provide a structure and coherent framework for conservation actions at a variety of spatial scales. Plans provide a means of promoting dialogue between parties and establishing the direction and objectives for conservation policies and actions.

It is very important to be aware that action planning is a *process* and not an end in itself. In this context, the discipline required to analyse problems and derive science-based solutions is crucial. Indeed, the preparation of an action plan may result in the discovery of new critical factors negatively influencing the conservation features under consideration.

What is an action plan?

Action planning can be defined as conservation planning at any scale above that of the site. Plans may be developed for

- biotopes/habitats;
- individual species;
- groups of species; or
- processes.

Plans can be drafted a various scales, from local, to national, to international. Thus, considering the interaction of objectives with scale, one can visualise a wide range of scenarios where plans might be developed for conservation purposes — from international species plans to local habitat action plans. Figure 1 gives some examples (mainly for waterfowl and wetlands).

Biodiversity planning should be held in common, and equally owned, by all parties whose activities can affect the status and outcome of the process for the species or biotopes concerned.

Types of plans

There have generally been two approaches to the preparation of conservation action plans.

The first main group of plans can be considered as 'expert reviews of conservation needs'. These can be rapid to draft (in that they are typically prepared by a small group of technical experts), and provide comprehensive analysis of issues. These plans set clear agendas for action, whilst being technically very detailed in their analysis of issues and solutions. The problem with such plans is that these very attributes mean that there is often, if not always, little of no 'ownership' of the plans by other parties – for instance, government and non-conservation organisations. Plan development generally precedes any commitment to take, or fund actions. This usually means that there is little or no wider commitment to take action and little engagement by those organisations whose actions are necessary.

There are many examples of such expert action plans — the Action Plan series of IUCN's Species Survival Commission (*e.g.* Gimenez Dixon 1996; Woodroffe *et al.* 1997; Servheen *et al.* 1999) being notable for their taxonomic scope, detailed technical analysis of problems, and suggested solutions. Other examples of such species action plans for birds include those for

	Local	National	International
Species	UK county-scale biodiversity actions plans for priority species	Threatened UK vertebrates, invertebrates and plant species — Biodiversity Steering Group 1998, 1999a,b RSPB species action plans for UK RDB birds	Various waterbird species — Anstey 1989; Green 1992; Stroud 1992; van Nugteren 1997 Globally threatened bird species in Europe — Heredia 1996 IUCN/SSC Action Plans — *e.g.* Woodroffe *et al.* 1997
Species groups			Waders at flyway scale — Davidson *et al.* 1998 Waterfowl at hemispheric scale — USA/Canada 1986 IUCN/SSC Action Plans — *e.g.* Gimenez Dixon 1996; Servheen *et al.* 1999
Biotopes/ Habitats	UK county-scale biodiversity actions plans for priority habitats	UK freshwater and maritime habitats — Biodiversity Steering Group 1999a,b	Global action plan for the wise use and management of peatlands — Ramsar Recommendation C.VII.1
Processes		Albatross by-catch reduction — Biodiversity Group-Environment Australia 1998[1]	

Figure 1. Some examples of the wide possible range of action plans (mainly for waterfowl and wetlands) at different scales and for different conservation objectives.

White Stork *Ciconia ciconia* (Goriup & Schultz 1991), White-headed Duck *Oxyura leucocephala* (Anstey 1989), and White-winged Wood Duck *Cairina scutulata* (Green 1992).

A second and different approach is taken with what might be called 'consultative plans'. Such plans are not just a statement of conservation needs but (at least in part) imply organisational commitment to tackle the problems addressed. Whilst there is more prospect of actions being undertaken — through the greater 'ownership' of the plan and engagement with it of key parties — they take much longer to draft and finalise. This is because the agreement of multiple organisations is required (especially relating to expenditure of resources and possible changes or organisational policies that will be required).

Structure of plans

Experience has shown that the detailed structure of action plans is largely unimportant. The main challenge is to implement a plan, not to draft it.

All plans should follow a three-part structure that follows the international norm for site management plans. This aids the development of a logical and analytical approach to the implementation of actions. This top-level structure is:

- Part 1. **Description** or "What do we know?"
- Part 2. **Evaluation** or "What do we want to do?"
- Part 3. **Prescription** or "How do we want to do it?"

There are various models for structure of plans. For species, the format adopted by for some international plans for geese (Stroud 1992; Nugteren 1997) closely follows the UK/French standard for site management plans (NCC 1987) since adopted by the Ramsar Convention (Resolution C.V.7 - see Ramsar Convention Bureau 2000e), and others (*e.g.* Eurosite 1999). A more simple structure has been adopted for plans for globally threatened birds in Europe (Heredia 1996).

The structure adopted for UK species and habitat Biodiversity Action Plans is likewise simple (Biodiversity Steering Group 1995; 1998 *etc.*), although it is typically obscure as to what commitment actually exists to implement the various desired actions.

In drafting an action plan, attention to the following can help aid its eventual implementation:

➢ The language used is important, and should be appropriate for the target audience. Plain English (or other language(s) used) should be always employed. If the plan contains much technical detail and it is important to communicate the contents of the plan to

those without a technical background, it would be appropriate to think about a non-technical summary document. In these instances, the plan might also useful contain actions related to developing public awareness of the actions being undertaken (see also Ramsar Convention Bureau 2000d).

➢ In drafting a plan, consultation with interested parties is essential — especially if these some change in the behaviour or activity of these organisations/ individuals is anticipated. To this end, clearly focussed workshops can be helpful to explore the issues and reach conclusions, although these should be clearly steered. There is much available guidance relevant to such initiatives in the field of participative management of protected sites (*e.g.* WWF-Pakistan 1996; Claridge & O'Callaghan 1997; Ramsar Convention Bureau 2000c; IUCN 1999). Much of this guidance can be readily adopted for the purposes of guiding community involvement in the preparation of action plans.

➢ Throughout the drafting of the plan, a party willing to provide the services of a Secretariat is essential to keep the process moving on. Actual drafting of elements of the plan may be devolved with responsibilities assigned, but there needs to be central co-ordination of the process.

➢ It is essential to form a Steering Group or Committee to oversee the process of plan preparation. This should ideally contain representatives from the main stakeholder groups or sectors potentially affected by the implementation of the plan (*e.g.* other Ministries or departments in the case of a plan developed by a government conservation department). Responsibility for drafting aspects of the plan may be assigned within this Group.

Ideal objectives

Plans should contain ideal objectives. These are literally 'ideal' and should be of a very long-term nature. They will serve to guide the overall direction of action for the duration of the planning process. Indeed, the objectives may not realistically be achievable in a defined time-scale but their clear statement will give direction to conservation actions.

Associated with ideal objectives, more short-term objectives and targets should be set. Thus, for an action plan addressing the status of a critically endangered species, an ideal objective might be to restore species X to the whole of its former natural range, whilst the immediate objective of the plan might be to increase the population of species X from 50 to 300 individuals in the course of the next 10 years.

A good example of ideal objectives comes from Uganda's national wetland policy, which has five goals:

- ❖ to end practices which reduce wetland productivity;
- ❖ to maintain the biological diversity of natural or semi-natural wetlands;
- ❖ to maintain wetland functions and values;
- ❖ to establish the principles by which wetland resources can be used optimally now and in the future; and
- ❖ to integrate wetland concerns into the planning and decision making of other sectors.

Plan implementation

The largest challenge for those who seek to develop action plans is to ensure that they do not become inaction plans. Generally, the major challenges of action planning are to understand and work with people. This means taking an analytical approach and considering, at the earliest stages, which the various stakeholder groups are, and how best they can be involved. There needs to be continual consideration of relationships and how they may be developed and influenced. This requires considerable time and patience! There are many plans that exist on paper, yet have done little to alter activities on the ground.

Important considerations are that the plan should:

- ✓ clearly define who is responsible for its implementation. This needs to be written in from the outset;
- ✓ ideally define the resources that are need to implement the plan at the outset[1]; and
- ✓ consider structural needs, especially within government where coherent implementation of national policy can sometimes be problematic in the absence of adequate inter-departmental co-ordination (see Ramsar Convention Bureau 2000a).

Finally, it should be stressed that the production of conservation Action Plans is not an end in itself, but part of a continuing *process*. Plans should help and facilitate rather than hinder action and co-operation. This process involves regular review, and modification of actions in the light of this feedback. It will also include substantial components of diplomacy, negotiation (to achieve mutually acceptable solutions which benefit respective parties), and the development of agreements that will be honoured. There needs to be the commitment to find

[1] Although there are examples of plans where resources were not initially earmarked at the outset and the implementation process has successfully sought subsequent financing (*e.g.* the North American Waterfowl Management Plan – USA/Canada 1986).

ways through problems to joint, shared solutions that will stand the test of time.

Problems with plans

A number of action plans have been developed in recent years which, for various reasons, have yet to be fully implemented. Given the large amount of time and resources that went into the development of these plans, this is a highly regrettable situation. Various common themes emerge from 'still-born' action plans that allow us to avoid these situations developing in the future.

Particular problems seem to emerge where:

❖ The plan or planning process is driven by a single organisation (or country in the context of an international plan), but without wider ownership from other parties. If the commitment to co-ordination from that lead-partner then starts to wane, the whole initiative can rapidly stagnate.

❖ Even where one organisation continues to give leadership, action planning can also hit problems if there is no wider enthusiasm for the process. There needs to be wider 'ownership' of the process. Engagement with key stakeholders or relevant sectors (*e.g.* fisheries, agriculture) at the earliest stages is crucial in this respect.

❖ Such ownership needs to be real — *i.e.* it needs to transcend nominal sign-up and be reflected in actual changes to the operational or corporate planning of organisations or agencies. Ownership should thus be judged in terms of actions rather than words!

❖ Where the planning process has started to become too complex and bureaucratic. Most government conservation agencies have few resources and very limited staff time. The time required to implement an action plan is always competing with other high priority demands on staff time. Accordingly, when these demands on that time become excessive, engagement will most probably fail.

❖ Plans will generally fail to achieve their full potential where provision has not been made for a Secretariat or other central co-ordination facility. The need for such co-ordination for the lifetime of the plan is critical.

❖ Where there is no active review mechanism. As for site management plans (NCC 1989; Eurosite 1999; Ramsar Convention Bureau 2000e), regular feedback and review of actions is essential.

Sources of further information

The Ramsar Convention has recently published the Ramsar 'toolkit'. This provides international best practice guidance on various aspects of wetland wise-use and management. As noted above, much of this guidance is also highly relevant to aspects of successful conservation action planning.

Ramsar handbooks for the wise use of wetlands:

Handbook 1. Wise use of wetlands. 24 pp.
Handbook 2. Developing and implementing National Wetland Policies. 64 pp.
Handbook 3. Reviewing laws and institutions to promote the conservation and wise use of wetlands. 46 pp.
Handbook 4. Integrating wetland conservation and wise use into river basin management. 32 pp.
Handbook 5. Establishing and strengthening local communities and indigenous people's participation in the management of wetlands. 92 pp.
Handbook 6. Promoting the conservation and wise-use of wetlands through communication, education and public awareness — The Outreach Programme of the Convention on Wetlands. 46 pp.
Handbook 7. Strategic Framework and guidelines for the development of the List of Wetlands of International Importance. 60 pp.
Handbook 8. Frameworks for managing wetlands of International Importance and other wetlands. 60 pp.
Handbook 9. Guidelines for international co-operation under the Ramsar Convention on Wetlands. 51 pp.

The handbooks are freely available in English, French and Spanish from the Ramsar Bureau, as well as published on the Ramsar web-site — www.ramsar.org.

Comprehensive guidance on the preparation of UK local Biodiversity Action Plans has been published by the Department of the Environment, Transport and the Regions:

Guidance for local Biodiversity Action Plans.
1. *An introduction. 7 pp.*
2. *Developing Partnerships.*
3. *How Local biodiversity Action Plans relate to other plans.*
4. *Evaluating priorities and setting targets for habitats and species.*

These are available from UK Biodiversity Secretariat, DETR, Tollgate House, Houlton Street, Bristol BS2 9JD, UK.

Similar useful guidance exists in the form of a 107 page report published by the Scottish Office in 1997: *Local Biodiversity Action Plans. A Manual.* This is available from The Secretariat of the Scottish Biodiversity Group, Scottish Executive, Rural Affairs and Natural Heritage, Victoria Quay, Leith, Edinburgh EH6 6QQ, UK.

A useful summary of actions required under the Biodiversity Convention including action plans and planning) is given by Hill *et al.* 1996.

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Action planning and implementation for the conservation of biodiversity of the Saba Bank, Netherlands Antilles

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The Netherlands Antilles consists of a group of five islands in the eastern and southern Caribbean. The islands are:

Bonaire: well known for its beautiful reefs; 10,000 inhabitants

Curaçao: with similarly well-developed reefs as Bonaire. The city of Willemstad, seat of the central government, is a World Heritage Site; 150,000 inhabitants

Saba: Small steep volcanic island with top shrouded in mist, with beautiful 'elfin forest'; approximately 1000 inhabitants

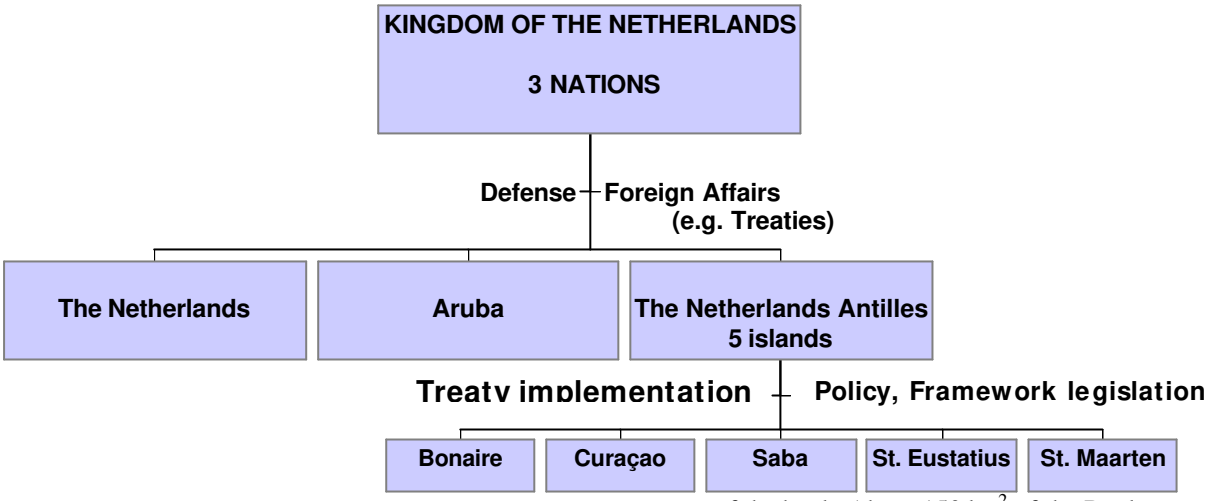
St. Eustatius, or Statia: with a large volcanic crater with a vegetation of highly developed evergreen seasonal forest; approximately 1500 inhabitants

St. Maarten: Half French, half Dutch; a beautiful island, however with rampant development; approximately 30,000 inhabitants.

The Netherlands Antilles forms part of the Kingdom of the Netherlands, which consist of 3 nations of equal status: The Netherlands, Aruba, and the Netherlands Antilles.

The Kingdom as a whole deals with defence matters and Foreign Affairs (in practice this means the Netherlands)

The five islands of the Netherlands Antilles, Bonaire, Curaçao, Saba, St. Eustatius or Statia, and St. Maarten, function more or less as a federation, with policy and legislation set out as frameworks which the islands fill in and implement.



The Environmental Section thus sets national policy concerning the environment and nature conservation. Treaties that the Netherlands Antilles are part of (Cartagena Convention with LBS and SPAW protocol, CBD, Ramsar, Bonn Convention and Inter-American Sea Turtle Convention) are implemented through framework legislation. Each island then implements this through its own nature ordinances, which must be formulated within a certain time. National nature policy entails among others that each island is mandated to protect at least one terrestrial and one marine area.

One area that falls largely under the central government, and not one of the islands, is the Saba Bank, only four miles from the smallest island, Saba The Saba Bank is a large submerged shallow marine area, partly within Saba's territorial waters, and for about two thirds in the Economic Fishery Zone of the Netherlands Antilles. It is bigger than all the islands of the Netherlands Antilles put together, mostly shallower than 50 metres.

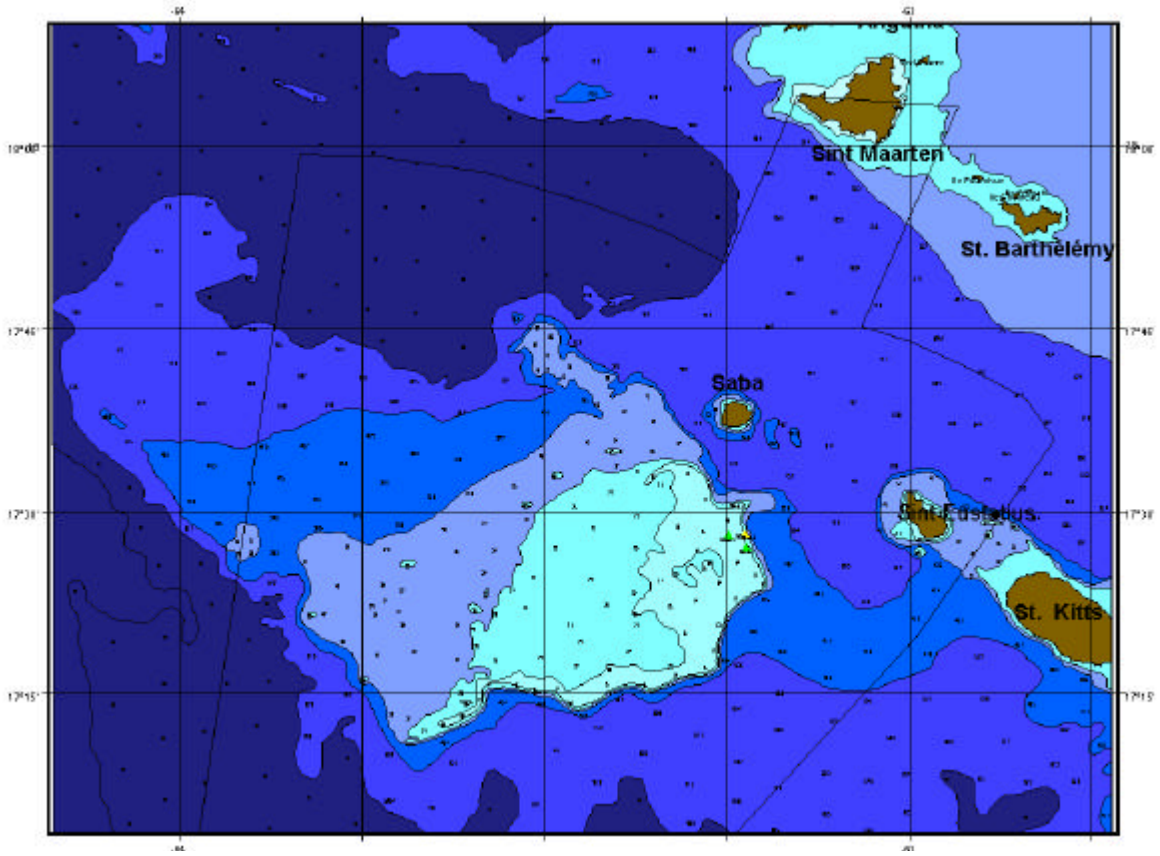
Our first step was to commission a review and quick survey of the bank. About 150 km^2 of the Bank are reefs; corals are found there. The eastern and southeastern edges are covered with actively growing coral reefs, which are very rich in cover and diversity. These reefs are an important source of coral and fish larvae for the surrounding regions. The bank is also an important fishery resource

Very little was known about the bank except for a general idea of where the reefs were situated and the depth profile for the Bank. Being such a rich area, however, we felt that we needed an integrated management plan for the area.

For that we first needed to get a good picture of the entire biodiversity of the Bank and do a complete biodiversity mapping of the Bank.

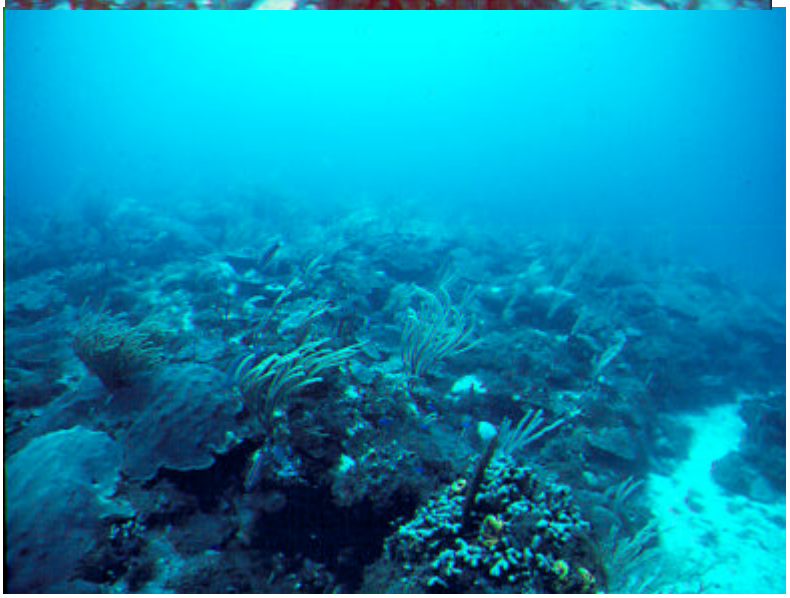
The first step was a fishery survey about a year ago, fishery being potentially a risk if overfishing was going on; we did not know whether this was so. It was also the easiest to find funding for, since it was a clear economic resource, and it was easy to convince people that it needed management for it to be sustainable. The Bank in fact proved to be of great economic importance to the island of Saba, especially through the lobster fishery and to a lesser extent red snapper fishery. The FAO had estimated the maximum sustainable yield for the bank at 30-40 tons of lobster. It is in fact at the moment 100 tons and there are no obvious signs of overfishing; average size is among the highest in the Caribbean.

The fishery survey, however, was just the start; it was helpful in creating the necessary attention for the Bank. We now need to start mapping the different habitats of the bank, describing those habitats and their species composition, identify sensitive species and areas. Conch and sea turtles come to mind right away. Only then can a sustainable



Saba Bank: 40 by 60 km submerged atoll; 8-200 m depth: 2400 km^2; 8-50 m depth: 1600 km^2

Coral reefs of the Saba Bank



management plan for the area be formulated.

So, we now know more or less what we want to do, and how to go about it, but what is still lacking of course is the funding. We are looking everywhere for funding for the biodiversity survey of the Bank, and we have not found the way yet. There have been some dead ends already, in particular regarding funding through the GEF. The Netherlands Antilles are in a similar position to the UK Overseas Territories; we are part of the Kingdom of the Netherlands and as such have signed the Biodiversity Convention. The Kingdom as a whole, however is not a developing country. It is in fact a donor country. The Netherlands Antilles as such are not considered to be a signatory of the Convention, thus are not eligible for GEF funding. We will keep looking for funding of course and hope the now evident economic importance of the bank will help.

Jersey's Biodiversity Strategy

Mike Freeman

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In a small community the concept of diversity in its broadest terms is sometimes greeted with suspicion.

The high standard of living and the good quality of life that most of the inhabitants enjoy promotes complacency and reduces the desire to safeguard the intangible resources of a rich and varied wildlife. Despite being a very prosperous island as a result of the finance industry, the materialistic ethos often leads to dismissal of concerns about local and international biodiversity.

Jersey is extremely well connected to the outside world, because of the needs of the finance industry, but there is a residual isolationist sentiment, which was recently articulated by a local politician who, in the face of criticism from the OECD, suggested that the Island declare independence from the UK. This sentiment leads to resistance when it is suggested that the Island has a responsibility to preserve biodiversity.

DESCRIPTION

Geography

Jersey is the largest of the Channel Islands, situated off the north-west coast of Normandy in the Bay of Mont St Michel. The French coast is 22 km to the East and 50 km to the South

Geology

The island is approximately 117 km^2 but owing to the large tidal range (up to 12 m) this area increases to 163 km^2 at low tide. The underlying geology is largely granite and shale.

Soils

The overlying soils vary from areas of clay, sandy loess and alluvium with acid soils, particularly over the granite.

Climate

The climate is milder than that of the British Isles with mean temperatures of 7 degrees centigrade in January and 18 degrees in August. Summers are generally warm and dry, yet with the occasional drought. Winters are usually mild but with frosts in some years.

Topography

The island slopes from a height of 153 m on the north coast to 60 m above mean sea level in the south. In the west, a large, mainly undeveloped, coastal plain (picture above) faces a fetch of 4,500 km across the North Atlantic to the coast of Newfoundland. This bay is considered a special place, and an integrated management strategy has been developed including extra planning restrictions.

The Bay contains the largest area of natural fresh water in the island, St Ouens Pond (below), which is 4.5 ha in extent surrounded by 9.0 ha of reed beds. The associated wet meadows, with a rich orchid flora, and the dune grassland of 12.1 ha make this an exceptionally rich area.

The south end of the bay comprises the largest sand dunes in the island, Les Blanches Banques, which now still cover 113 ha. The dunes are exceptionally rich in plants and insects, with about 375 plant species,

including 16 UK Red Data Book (RDB) species. The dunes are also home to the green lizard *Lacerta viridis* not found in the UK. No longer an active system, the dunes have, for fifty years, been cut off from the sea by a sea wall, mainly constructed during the German occupation in World War Two.

Housing development is gradually surrounding and pressing in the boundaries of this site. Golf courses have also taken a sizable chunk of the dunes, which once extended towards the bay to the south, but the land is now covered by housing.

The south west consists of coastal cliffs, which are warmer than the north coast cliffs and have a distinct flora. The south is coastal plain, mainly developed and which contains the Island's capital, the town of St Helier. The ash from the Island's refuse incinerator and other rubbish have been dumped on the shore here, and an area of foreshore has been claimed; this will be used for housing and so on.

To the east is more flat land, and offshore a large intertidal area, which is now designated as a Ramsar site for its rich marine flora and bird life (see below for the edge of the site at La Rocque, also illustrating the large tidal range). There is a long strip of housing along the coast; behind are agricultural fields, and some remaining connecting habitat corridors.

The south-east coast is a series of small coves. In the north-west, the land rises to the steep cliffs which form the whole of the north coast, a narrow steep strip with dominant heather and bracken, broken by the occasional natural harbour (see picture in following column).

The centre of the island is a mainly agricultural plateau, cut by steep-sided valleys radiating from north to south. The inland area is mainly agricultural with development along the coast, although there is extensive settlement throughout the inland part of the Island.

JERSEY'S BIODIVERSITY

- 33 UK RDB plant species
- Two lizards not found in the UK
- Red Squirrel
- Agile frog not found UK
- Rich marine flora and fauna
- Important dunes, coastal heathland

Jersey's geographical position partly explains the number of RDB species in a UK context. Species include the four reptiles (two not found in the UK), the red squirrel, two amphibians (one unknown in the UK), several invertebrates rare or not recorded in UK, and a rich lichen flora, not to mention the rich marine life. This means that Jersey's biodiversity is well worth a high level of attention.

Unfortunately, we have found it very difficult to win the political battle for funding at a level which is well justified by our richness in species and habitats . A "green audit" carried out in 1992 concluded "public sector conservation initiatives are hampered by lack of resources and there is no voluntary group concerned solely with nature conservation." Voluntary groups peripherally involved in nature conservation are hampered by lack of funds and expertise. We would like to help more with funding but do not have the resources

SOME FIGURES

- Size = 116.5 km^2
- Farmland = 54%
- Urban =20%
- Semi-natural =26%
- Population = 88,000
- Visitors = approx 600,000 /year (1999)

Points to note here are the high density of population; the area of farmland, over half the Island; and the still considerable area of semi-natural habitats. The density of housing is effectively sub-urban across the Island, and we are keen to link habitats. Clearly a high level of public awareness is essential; this is difficult to measure, but we believe we are making progress. A

well educated population is helpful, but the very materialistic ethos, fostered by the dominance of the financial sector, works against us. The natural beauty of the Island is slow to be affected, while underlying consequences of poor decision-making are slower to become apparent. When problems do become apparent, such as algal blooms on some beaches as a result of nutrient rich run-off, the public demand an instant solution. The tourism industry is beginning to use the natural environment as a major selling point, but expectation still outstrips reality

FARMING & COUNTRYSIDE

- Dairy moving towards zero-grazing
- High input, no rotation
- Water pollution
- Incremental urbanisation
- Loss of biodiversity
- Need for marine protection

Once again farming faces the crossroads. The policies of relying on intensive production of a few crops, mainly new potatoes and cauliflowers, have resulted in concentration of land holdings and the loss of small mixed farms. Changes in the dairy industry mean that pasture and hay have given way to fodder maize and silage, affecting the habitats of arable weeds and farmland birds.

The importance of the influence of agricultural activity on the natural environment is increasingly recognised, yet the main effect seems to be that interdepartmental arguments about responsibility for budgets and policy formulation are intensifying. We hope that the major review that the agricultural department is undergoing at present result in a positive outcome for the natural environment, and are offering consultation. One of our fears is that, in a move to increase production, money will be spent on "improvement" of marginal areas, an approach which in the past has had the effect of halting succession to natural habitat and diminishing their value to wildlife.

MONEY

- 1992 Total Expenditure on nature conservation 0.0006% of total Government Expenditure
- Conservation Budget 1992 £215,000.
- Conservation Budget 1999 £668,000
- GDP 1992 £1305M
- GDP 1998 £2754M.

Jersey is a rich island, a very rich island, and yet efforts to preserve its rich flora and fauna do not seem to receive the level of support one might expect

OBJECTIVE FOR CONSERVING BIODIVERSITY

To conserve and enhance biological diversity in Jersey and to contribute towards the conservation of global biodiversity when appropriate

This is a pretty tall order, and interpretable in many ways. Individual states have individual priorities, and each strategy should reflect the unique biodiversity of individual states.

It is important not to confuse the map with the terrain. If we decide to complete the map, or strategy, before we start work we could end up never finishing. What, I think, is required is a balance between planning and action. Any strategy is only a map; it is not the terrain

UNDERLYING PRINCIPLES

- Sustainable
- Wise Use
- Individual and community involvement
- Based on sound knowledge
- Integral part of Local Government policy
- Decisions guided by precautionary principle

While there should be an individual approach to the creation of a strategy, there are certain underlying principles which should guide its creation. Sustainability and wise use are self evident, but it is most important that all sectors of a government are aware of the strategy when making policy. Inevitably, decisions made in areas apparently removed from issues of biodiversity often in practice have an impact upon the natural world. This means wide consultation, not only during the drafting of the strategy, but afterwards.

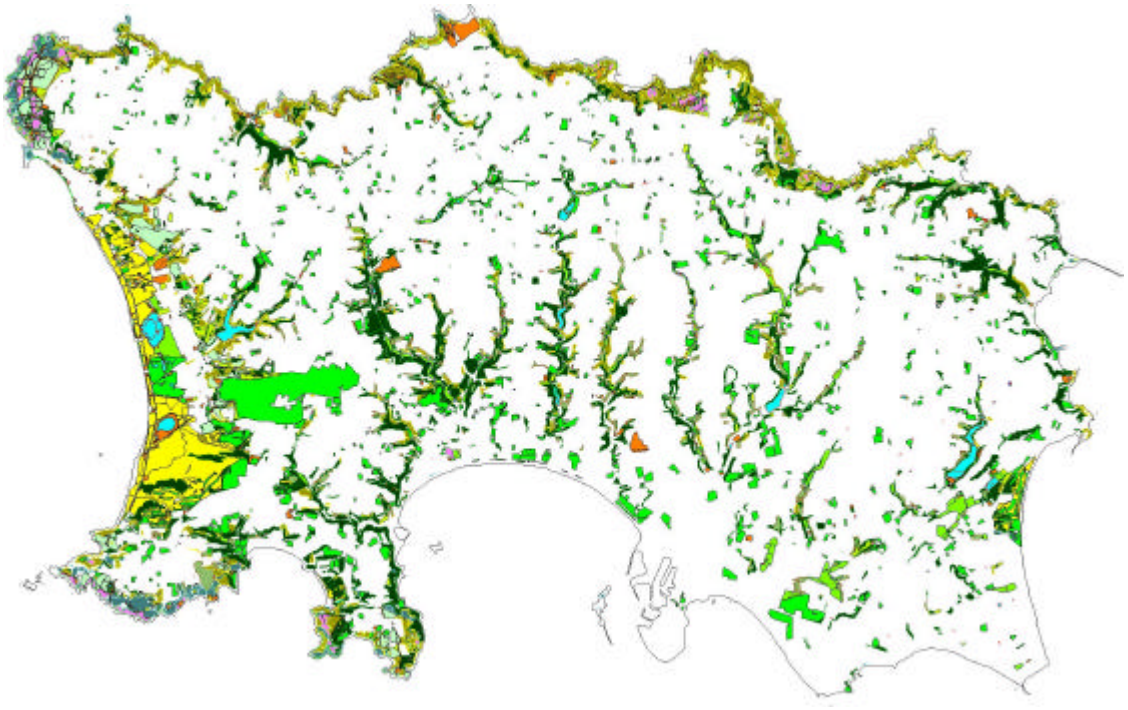
PROCESS

The basic process by which we will achieve our objectives.

- Complete inventory
- Clear statement of policy
- Species and Habitat management plans
- Monitoring

The first stage, the inventory, is complete for all the most prominent groups. Bats, lichen and fungi need more work, and this is in hand, using consultants or local staff as resources allow.

Species management plans have been completed for 21 vascular plant species, 9 invertebrate species, and 1 amphibian.



The next stage , the completion of the strategy is taking some time, and the completion of the strategy and the public consultation leading to adoption is, on past experience likely to be a rocky ride. Monitoring is ongoing, although of course staff shortage is a major problem here as elsewhere

THE STRATEGY

The creation of an inventory is the first stage of the strategy. The "Phase 1" habitat survey (see map above) is now complete. The main features confirm what we have already seen; the valuable habitats are in the west, along the north coast and along the steep valley sides where the slope precludes cultivation. We intend to monitor gross change in habitat area using these survey results as a baseline.

The "phase 2" habitat survey will concentrate on gathering information on the less studied, smaller areas of valuable habitat in Jersey, leading also to the identification and eventual designation of more SSIs. We have also dabbled in remote sensing, and we have a map which is a product of a satellite data gathered to help in planning in the Island. The difficulty is the interpretation of the data, but the overall result is a useful contribution to our habitat recording. Improvements in the interpretation of the satellite data, using the results of the ground-proofed habitat survey will help us in the future as the technology improves.

History of Biodiversity Strategies in Jersey

- First plan completed 1993
- Priority species and habitats
- Too prescriptive for other committees
- Not wide reaching enough
- Not enough consultation
- Provided outline

The first strategy was completed by group of students from University College London in 1993. It was not acceptable politically. It took a very target-centred approach, with plans for individual habitats and species and educational aims. The main reason why it was not acceptable was because it prescribed changes in the way other departments should operate. All consultation was with small groups. Most of the work was done over an intensive 12 days.

It took another two years and a change in the structure of the department to begin a new approach. In the meantime information gathering proceeded, continuing invertebrate studies over 20 years, plant and habitat surveys over same time, designation of 3 SSIs and 3 more this year, lichen surveys over last two years, major studies on red squirrel (a flagship species) and others about to begin on the agile frog (the subject of a captive breeding programme since 1994) and on bats.

Also, since 1996, major steps forward in preserving the marine environment were the appointment of a marine biologist and Ramsar designation studies towards coastal zone management plans. A big programme of awareness raising, major week-long events and publications, and an education strategy are being implemented.

What the strategy will deliver

- Compliance with international obligations
- Framework for implementation of local policy

- Action plans for habitats and species
- Base-line data to measure and monitor change
- Continue species information gathering

The extent to which our government feels bound by international obligations to the natural environment is debatable. There seem to be no sanctions for non-compliance, and therefore no compulsion to comply. A desire to control inflation by concentrating on reducing government's staff levels has seriously affected our need to expand our activities to a satisfactory level. The high commitment of our small staff has kept things going, but has prevented us from carrying out the tasks given to us by the strategic policy review of 1995, entitled "2000 and beyond".

SUMMARY

- Lack of political will, but
- Strategy will be:
  - o sustainable
  - o achievable
  - o realistic
  - o timed (and costed)

Despite the apparent lack of political will, we are determined to implement a strategy to preserve and enhance the valuable natural environment of our Island.

Through our involvement in this conference, we hope that clarification of roles and responsibilities of dependent territories and of the UK government will help us all to implement fully the spirit of the Convention on Biological Diversity.

Henderson Island Management Plan: what stops a plan becoming action

Michael Brooke & Leon Salt

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Henderson Island in the Pitcairn Islands in the South Pacific is a 37km^2 raised coral island that is extremely isolated. It is also exceptionally undisturbed ecologically, despite a period of Polynesian occupation from the ninth to sixteenth centuries. It holds large number of endemic animal and plant species. For these reasons the island was designated a World Heritage Site by UNESCO in 1988, in response to a proposal from UK Government. Attached to the designation was the condition that the British Government draw up a Management Plan for the site. A plan was drafted by the Sir Peter Scott Commemorative Expedition to the Pitcairn Islands, and submitted to the Joint Nature Conservation Committee (UK Government's statutory adviser on nature conservation) in 1992. Following this submission, there was a period of consultation with interested parties before, in 1995, the draft was 'shelved' by JNCC. Since then, the British Government has not pursued the matter and therefore the condition of designation remains unfulfilled.

In our talk we ask whether the lack of a formally approved Management Plan has had adverse consequences for conservation. However, we begin by trying to identify the factors impeding progress with the Plan.

Firstly, the geographical separation of interested parties makes it well nigh impossible to assemble all parties at one place to resolve differences of opinion over the draft plan. These parties include the Pitcairn Island Council based on Pitcairn, the British High Commission in Wellington, New Zealand, the Foreign and Commonwealth Office and other Government Departments in London, England, the Joint Nature Conservation Committee in Peterborough, England, and various conservation NGOs, most based in the UK.

Secondly, there is persistent concern among the Pitcairn Islanders over the Management Plan, partly arising from the historical circumstances surrounding the designation of the World Heritage Site. It is difficult to allay this concern because of the geographical isolation mentioned above. It is also the case that any active management prescribed by the Plan will require physical input from the Islanders who live 110 miles from Henderson. Given the present population of Pitcairn, some 50 people, the Islanders are rightly concerned they will have neither the manpower nor the financial resources to undertake that management.

Thirdly, the JNCC has not pressed for the Plan to be completed, despite having commissioned the draft in the first place. This has partly arisen because the size of JNCC's International Unit was reduced in 1994 and the JNCC as a whole in 1995.

Fourthly, the lead Department within the UK Government, the Foreign and Commonwealth Office, has not pressed for the Plan to be completed, mainly because of the burden of other work. Even less interest has been shown by the Department of Culture, Media and Sport, responsible for liaison with UNESCO over World Heritage matters.

Fifthly, NGOs have not perceived completing the Plan as the highest priority issue on the Pitcairn Islands, especially as important plant conservation management can be undertaken on Pitcairn itself without the Henderson Plan.

Has this lack of progress had adverse consequences? To address this, we first list the principal objectives of the draft plan. These are:-
(i) To provide a management structure
(ii) To prevent introduction of alien fauna and flora
(iii) To control the removal of biological material and Polynesian artefacts
(iv) To prevent damage to the reef and turtle nesting beaches
(v) To develop miro and tao, used for carving by the Pitcairn Islanders, as a sustainable resource
(vi) To control tourism and other visitor impact
(vii) To improve scientific knowledge
(viii) To provide rat-free nesting areas in the wider Pitcairn Islands for petrels.

Some of these objectives (ii, iii, iv and vi) have been achieved *de facto* by Henderson's isolation which continues to be a key feature assuring its protection. One objective (viii) has been partly achieved outside

the framework of the Management Plan. Rats have been eradicated from the atolls of Oeno and Ducie, both important petrel nesting sites. Rat eradication on Pitcairn remains a task for the future. Objective (i) has manifestly not been achieved, but is a means to an end. Objective (v) has also not been achieved, and is perhaps the objective most likely to be advanced if the Plan were completed. There has been no significant advance in scientific knowledge since the 1991-92 Expedition (Objective vii), but it is doubtful whether this situation would have been materially different were a Management Plan in place.

In summary therefore we find that some conservation progress has been achieved (e.g. Objective (viii)) without the benefit of the Plan. Other objectives (e.g. Objective (v)) have not been achieved and would very likely be advanced within the framework provided by the Plan. Moreover, an agreed Management Plan for this World Heritage Site would provide a structure within which any future threats to the ecological marvels of Henderson could be assessed.

Santalum insulare var. *hendersonense*, a variety of sandalwood endemic to Henderson

Female green turtle hauling ashore on Henderson's East Beach

The south-western coast of Henderson is dominated by fabulously eroded *makatea* limestone.

The Millennium Seed Bank Project

Steve Alton

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The first tranche of UK mainland Biodiversity Action Plans (*Biodiversity: The UK Steering Group Report, 1995*) included, amongst the species plans for higher plants, several actions along the following lines:

'5.3.3 Collect seed from a representative number of native sites in different parts of the range of this species and deposit in the Millennium Seed Bank at Wakehurst Place (Kew). Plants should also be propagated for reintroductions if necessary'

So why collect seeds for a seed bank? What is seed conservation about?

The Royal Botanic Gardens, Kew, have maintained a seed bank at Wakehurst Place in Sussex, England, since the middle of the 1970s. The bank takes advantage of the fact that the majority of seeds have a natural dormancy, designed to take them safely through periods of adverse environmental conditions. Seed banking involves invoking this dormancy and then storing the dormant seeds under 'adverse' conditions until they are needed. Different species have different storage requirements, and some can be stored for longer than others, but the time-spans involved are generally considerable. For instance, in the case of sorghum the time taken for viability to decrease from 97.7% to 84.1% is estimated to be 6106 years (Ellis & Roberts 1980).

Some species, however, do not store. The reasons for this are the subject of a great deal of research, but the fact is that an estimated 15% of the world's plant species produce seeds that cannot be banked. Generalisations can be made; large, fleshy seeds are difficult to store, and species from habitats that are continually wet, such as tropical rainforest, tend to produce seeds that are not desiccation-tolerant. Having said this, nearly all of the UK's aquatic plant species produce seeds that can be dried and stored.

The banking process begins with a short period of drying. Seed collections are stored in moisture-permeable containers – cotton or paper bags – and on arrival are placed in a room at 20% relative humidity. This is solely to aid with the seed cleaning process, since material collected under wet conditions is often difficult to work with. Once the collection is dry, it is cleaned to remove as much non-seed material – pods, leaves, dust, etc – as possible.

A sub-sample is then removed for testing. An x-ray reveals what proportion of the seed is filled, and germination on plates of agar gives an initial percentage germination figure to act as a benchmark for future tests. Germination is vital – there is little point in storing seeds that cannot subsequently be turned back into plants. Scarification, chemical treatments and a range of temperature- and light-regimes are all used to ensure that germination is achieved, and the protocol developed for each species is recorded.

The bulk of the collection, now cleaned and tested, is then sent for its final drying. This time, the collection spends at least 4 weeks at 20% relative humidity, gently losing moisture to its surroundings. Finally, it is sealed in airtight containers and placed in the bank, which is maintained at -20C. Every 10 years, a sub-sample is removed and germinated. The germination rate can be compared with the original germination results to give a picture of how well the sample is storing. All the tests are, however, destructive and the size of the stored sample decreases each time. For genetic reasons, collections are rarely bulked up by taking a sample from the bank and growing it to maturity. This would put artificial selection pressure on the 'population', favouring plants that grow best in glasshouse conditions. The ideal is to re-collect from the wild, sampling widely and evenly across as large a population as is available.

Although most seeds are small and can be packed into a small volume, it was always anticipated that the Kew Seed Bank would eventually run out of space. A proposal was put together for a programme of seed collecting work throughout the world, centred around a new, purpose-built seed bank building. Kew was fortunate to be successful in its application for funds from the National Lottery, and the Millennium Seed Bank was born.

The first stage of the project involved the collection of seed from effectively the whole UK mainland native flora, some 1400 species. Using over 250 volunteers from around 35 organisations, collecting took place from 1997 to 1999. Currently, 93% of the native flora is represented in the Bank, the remaining species being those which a) cannot be banked, b) do not produce seed or c) are difficult to locate, identify or both.

The overseas collecting programme is concentrating on the arid and semi-arid tropics, with large-scale collaborative projects in Africa, Central and South America, the USA, Madagascar, Australia and India. The aim is to collect 10% of the world's flora by the year 2010.

The Wellcome Trust Millennium Building, centrepiece of the project, comprises a state-of-the-art seed storage facility, laboratories, accommodation for overseas visitors and an interpretative exhibition for the public. Now that the facility is open, with 8 times the storage capacity of the previous Bank, we are keen to encourage collaboration. Like any other bank, we rely on deposits and withdrawals, and we are happy to store, free of charge, seed material from our partners' priority species. In return we can offer long-term secure storage in state-of-the-art facilities, information on the viability of the sample, and guidance on successful germination.

Although *ex situ* conservation is not, and will never be, a substitute for on-site habitat management and protection, it can form a useful tool within an integrated conservation strategy. If you are interested in working with us, please get in touch.

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Seeds are stored at sub-zero temperatures

The Wellcome Trust Millennium Building, designed to house the new Millennium Seed Bank, as well as offices, laboratories and a public exhibition area

Summary and further actions

Taking things forward: Led by Sara Cross (Director for Development, UKOTCF) and Sheila Brown Brathwaite (Permanent Secretary, British Virgin Islands Ministry of Natural Resources & Labour), with support from John Cortes (General Secretary, GONHS), and Mike Pienkowski (Chairman, UKOTCF)

Appendix 1. Final published programme for the conference

Appendix 2. Participants and their contact details

John Cortes (General Secretary, GONHS), Sara Cross (Director for Development, UKOTCF), Sheila Brown Brathwaite (Permanent Secretary, British Virgin Islands Ministry of Natural Resources & Labour) and Mike Pienkowski (Chairman, UKOTCF)

Taking things Forward

The final session of ***Calpe 2000: Linking the Fragments of Paradise*****,** an international conference on environmental conservation in small territories, 28th September to 1st October 2000, John Mackintosh Hall, Gibraltar – Sponsored by the Government of Gibraltar, organised by the Gibraltar Ornithological & Natural History Society, with the support of the UK Overseas Territories Conservation Forum.

This conference was designed to be of help in some of the priority issues identified by workers in small territories. The conference was deliberately participatory for all, rather than segregated into speakers and audience, because exchange of experience was a key. For this reason, the organisers wanted to capture rapidly some of the main conclusions arising from discussions. Throughout the meeting, a small team kept track of these. This was led by Sara Cross (Director for Development, UKOTCF) and Sheila Brown Brathwaite (Permanent Secretary, British Virgin Islands Ministry of Natural Resources & Labour), with support from John Cortes (General Secretary, GONHS), and Mike Pienkowski (Chairman, UKOTCF). Additional contributions were sought from others. Sara and Sheila gave the presentation, which is given below. As indicated then, minor changes have been made to their summary below in order to include adequately the later sections.

Taking things Forward

For many of the OT delegates who were at the meeting in London *A Breath of Fresh Air* just over a year ago (June/July 1999), one of the major issues was how conservation action could be taken forward. At that meeting much was spoken on what was referred to as the Environmental Charter for the Overseas Territories (and, for the benefit of those people, we will briefly outline the progress made at a Governmental level on the Charter process, shortly). However, the essence of what we are talking about can be encapsulated in the term Strategic Environmental Action Planning, and this is applicable to all small territories, and indeed has been a major theme of this conference in Gibraltar.

As the London conference drew to a conclusion last year, we recognised how valuable it had been in drawing together so many enthusiastic, committed and normally widely dispersed people. We already knew that this conference, *Calpe 2000*, was in the early planning stages, and were extremely glad of that. This was because we believed that it would provide an excellent opportunity for all participants to report on progress they had made in developing those ideas for action which generated so much enthusiasm 15 months ago. We hoped also that it would encourage further exchange of ideas and networking with the additional participants from small territories who have made such a valuable contribution to the knowledge we have all gained during our time in Gibraltar.

As mentioned, we will now turn briefly to the Environment Charter process, in response to questions from many OT delegates, in order to communicate what we understand to be the situation on its progress, before returning to summarise outcomes from the progress that has undoubtedly taken place at this *Calpe* conference. In October last year, the Environment Policy Department of the Foreign Office, after an extensive period of wide consultation, generated a statement of draft key principles, which were aspirational statements, related to various existing international agreements and written in deliberately accessible language. The draft key principles were sent to all OT Governments for comment, in time for the first Consultative Council meeting of Ministers. Feedback from the Territories to date has been slow, with only a few comments having been received by the FCO.

However, government officers and NGOs in several of the OTs have flagged up the need to take forward in parallel some work to illustrate how these key principles would translate into real actions. This process would also help clarify the principles themselves. Consultations with several OTs have made clear that more facilitation is needed to assist people in the Territories to kick-start the process of developing their own action plans, up to now on hold due to the lack of time and human resources. Several OTs are discussing with the Forum the ways in which this facilitation might most usefully be provided, and FCO has indicated that it is supportive of this approach.

During this conference, it has again been apparent that environmental education and public awareness are vital tools for the realisation of the value of environmental resources, both in protected areas and in small islands as a whole. The conference has illustrated the many arenas and methods which participants are employing to get the message across, from island-wide campaigns and focused public meetings, to developing materials with which teachers can be trained to integrate environmental messages into the school curriculum. One of the pertinent messages was that all Territories must instil in their own people a sense of pride in their unique flora and fauna. Schemes such as the National Trust [for England, Wales & Northern Ireland] school guardianship programme, which involves children learning hands-on ecological skills directly from professionals in the field, should be encouraged and developed wherever possible. BVI has a similar

programme involving the Department of Agriculture, where children are taught how to grow vegetables using small plots of land, while developing a sense of responsibility and awareness for the environment. These experiences can make a significant impression on young minds, and thus are important to the long-term sustainability of the Territory's land mass. The performance by the Gibraltar school children was excellent. They obviously were not put off by the short period of time given to prepare, and like most Gibraltarians, they are obviously quite fast learners! The calypso was very catchy and taught us about the iguana in a simple but very interesting way. Their inclusion added a very welcome flavour to the proceedings as a whole, and again we would like to thank all those involved, including the children, for their efforts.

The immense value of information networking cannot be stressed enough for the individuals gathered here today. In the past, we have been so widely dispersed, and some of us have been so isolated from the wider world that communication has been difficult and intermittent. The advent of electronic communications in the form of email and the internet have brought us all much closer together, simply by allowing us to share our experiences with ease and at low expense. The development since the last gathering of a database for environmental information in the Overseas Territories now has the potential to draw us together even further, and will empower us to work together and pool our efforts to make things happen constructively. We will be able to keep abreast of each other's concerns and successes, and learn a tremendous amount about our own situations by being able to read about others in a similar position. The database has the potential to be a marvellous mechanism for enhancing over-stretched capacity, and we strongly encourage everyone to use it, give us feedback on it, and to encourage its future development, in line with your most pressing information needs. The more pertinent information we can include, the more powerful a tool the database will be. We see it being equally useful to those outside this hall, whether they be tourists, Governors, politicians or potential developers, as a means of finding out just how important the Territories are for their biodiversity interest.

The biodiversity work that delegates from Cayman and Bermuda demonstrated this weekend have shown us how powerful a tool digital mapping systems can be to record important information on key species and habitats. These traditionally difficult and expensive techniques are rapidly becoming more accessible to the environmental NGO community, enabling conservation organisations to build geographic information databases of enormous value in protected area planning and endangered species conservation.

The wide range of presentations of the Saturday morning session showed how different islands try to ensure that their protected areas remain just that – protected.

The St. Helena Millennium forest project showed us how an inspirational idea, again fostering national pride for an endemic species could generate a huge commitment from local people to participate in setting up a long-term environmental project. This level of commitment will surely guarantee its long-term success, as the forest grows to maturity.

A number of presentations demonstrated how economic benefits to the country as a whole could be generated through environmental conservation activities. These are not just through employing locals as environmental workers, but also through the involvement of local people in associated industries, such as ecotourism, and its resultant infrastructure of accommodation, roads, transport etc. Again, a sense of local ownership is paramount to successful protection. We heard how wildlife clubs in Seychelles local schools ensure that this sense of ownership begins at an early age. Economic benefits arising from environmental conservation, and associated ecotourism, cannot only assist in sustaining the protection of important areas, they can also stimulate and encourage cultural activities, unique to each territory. Local people can benefit in this way through cottage industries, revitalising traditional skills and again enhancing a sense of national identity and pride.

The power of largely volunteer effort with limited financial resources has been evident throughout this conference, in the form of GONHS. Their achievements were particularly clear during the field trips as well as the presentations and discussions. They have a mature relationship with Gibraltar Government which seeks their advice, contracts work to them, respects their views and often follows their advice. Even when it cannot, it values the input of ideas and arguments. Many conference participants have indicated how they admire – and even envy – the immense commitment of time which constitutes the strong volunteer team and effectiveness of GONHS. We are sure that many will try to take up many of the ideas. And, as for GOHNS, just imagine what they could achieve with a paid core of employees to support their volunteer effort!

A frequently repeated message in several sessions has been the importance of owning land in order to ensure long-term conservation. In some situations, this is not an option. For example, GONHS cannot do this but are able perform miracles as managers; however, we think that they would be the first to admit that ownership would make many things easier. Those territories with National Trust type legislation have a particularly helpful mechanism available for

governments to enlist the resources of NGOs. Lands given by governments to National Trusts can be declared inalienable, so that the NT cannot treat this land as an ordinary disposable asset, but must safeguard it in trust for the people. Such transfers of land by government tend to attract further contributions by private individuals and organisations, making this a very cost-effective investment by government. It is also important to ensure an income stream for site-management. Sunday morning's discussion presented one strong route. Conservation Funds can be one of the few popular taxes. At least part of these can be ear-marked for the organisations managing protected areas. Again, there are extra benefits in that NGOs managing such protected areas can often draw in matching funding from both domestic and international sources, as well as major volunteer effort.

Something of a consensus evolved in discussion of the management of dedicated environmental funds in several OTs. The most successful examples involve an environmental tax being placed in a statutory fund separate from general government funds, managed by a Board with representation from government, NGO and private sector interests. Openness and accountability, strong and unambiguous legislation, and a constructive relationship between environmental NGOs and local governments are seen as key elements. Relative access between government and NGO agencies to grants from such funds is an ongoing concern needing resolution in several OTs.

Producing a summary of such a packed conference during the conference is a taxing business. Obviously, the final sessions suffer most. However, we will incorporate them more fully – and tidy these comments – in the proceedings.

What Next? Further Opportunities to Meet?

One of the oddities of Overseas Territories is that, until recently, there was little encouragement to exchange experiences. The Forum has brought together environmental NGOs in UK Overseas Territories. Increasingly, this opportunity has been used too by OT governments. At this conference, we have also benefited from the experiences of the UK Crown Dependencies, the OTs linked with France and the Netherlands, several small independent states, and relevant experience from larger countries. We will therefore continue to explore ways of maintaining these mutually beneficial links. For example, the Forum will be talking further with its French colleagues; and will be exploring with colleagues in the Netherlands Antilles the possibility of including some of their material from there within the Forum's database. We should also make use of the complementary regional networks. An example is the work of the Organisation of Eastern Caribbean States in developing an environmental charter which should be exploited in our attempts to develop forward strategies.

We need to keep in touch, in order to benefit from our shared learning, This is increasingly easy with modern communications. For example, do please use the Forum's database. We should also think about meeting again – not too soon, because it is exhausting to organise these meetings! More importantly, however, we must allow ourselves enough time to apply our new ideas and achieve conservation, before devoting time to exchanging this knowledge. Probably, about two years' time might be about right. Several places may be interested in being the venue. We are aware that Bermuda has already expressed some interest, but so too have other places. One plea from the Forum: if hosts want the Forum to be involved, please get in touch early – as Gibraltar kindly did – because we all suffer from restricted human capacity!

In terms of other actions, we all need to push forward the initiatives and ideas we note above, and others. Indeed, one important area which embraces many others concerns strategic environmental planning. This really means sorting out our priorities, working out the responsibilities of the various stakeholders in achieving these; and using this process to make sure that these actions happen, including:

1. Development of user-friendly, dynamic management plans, using examples provided here;
2. Seek to update our legislation to make it more effective and enforceable;
3. Persevere to ensure that trust funds are used as intended;
4. Expand education initiatives wherever possible, especially involving the users;
5. Encourage the consistent use of EIAs for development initiatives;
6. Continue and expand the ongoing dialogue with the UK Government to impress upon them the obvious need for adequate funding and technical assistance to ensure that UK's OTs can work towards achieving sustainable livelihoods through the environmental sector of their economies;
7. NGOs must continue to provide policy makers with full detailed information to avoid perceived distrust.

So, let's not forget the enthusiasm of this meeting. Let's build upon that enthusiasm when we return home, and direct our efforts into working on the ideas outlined above to use the experience of this meeting to progress conservation.

Appendix 1.
Final published programme for the conference

CALPE 2000: LINKING THE FRAGMENTS OF PARADISE
An international conference on environmental conservation in small territories

28th September to 1st October 2000, John Mackintosh Hall, Gibraltar

Sponsored by the Government of Gibraltar, organised by the Gibraltar Ornithological & Natural History Society, with the support of the UK Overseas Territories Conservation Forum

BACKGROUND

This conference forms one of a new series sponsored by the Government of Gibraltar, under the series title "Calpe", which is the old Roman name for Gibraltar. This particular conference addresses the very topical issue of environmental conservation. Its title reflects one of the first publications highlighting the immense biodiversity value of the UK Overseas Territories, and the need to provide for increased exchange of knowledge between them and other areas.

The fundamental role that this plays in the economic and social well-being of people, as well as its inherent importance, is being recognised increasingly. Throughout the world, countries are preparing action plans for the environment. Indeed, those which are party to the Convention on Biological Diversity have committed themselves to integrate planning for the environment into all planning processes. This need is at least as true of small territories as elsewhere; in fact, it may be more so, because such territories are often very closely dependent on their natural environments.

The conference is intended as a working meeting, to help Territories take forward work, particularly in a range of areas that have been identified as priorities by workers in the small territories:

1. Environmental awareness and education
2. Information networking
3. Tourism and funding for the environment
4. Making protected areas effective
5. Biodiversity action planning

Emphasis will be placed on sharing knowledge and experience between workers from the various UK Overseas Territories, but also with other Overseas Territories, such as those of France, Spain and the Netherlands, as well as relevant small independent states.

PROGRAMME (as at 22 September 2000)

Wednesday 27 September and Thursday 28 September: Arrival

Thursday 28 September

[0900 Speakers, seminar leaders etc: briefing with audio-visual technician]

1000-1600 Optional tour of Gibraltar and principal wildlife sites. Coaches leave from John Mackintosh Hall. (As an alternative for late arrivals or the travel weary, there will be a guided tour of the Gibraltar Botanic Gardens starting at 14.30 until about 1600, led by Brian Lamb (Curator) and Andrew Anbrines (Horticulturist).)

[1700-1800 Business AGM of Forum – for member organisations only]

1815 Examples of successful ecological restoration projects in Bermuda – talk by Dr David Wingate, Bermuda National Trust & Bermuda Audubon Society
1900 Reception at John Mackintosh Hall, hosted by The Hon Ernest Britto ED, Minister for Public Services, the Environment, Sport & Youth, Gibraltar; followed by viewing of displays

[Dinner individually organised by participants]

Friday 29 September

OPENING SESSION (Chair: Dr Mike Pienkowski, UKOTCF)
0900 GONHS welcome and introduction to the Deputy Chief Minister
0915 Opening of the Conference by The Hon Keith Azopardi, Deputy Chief Minister and Minister for Trade, Industry, Telecommunications and Heritage, Gibraltar
0930 Conservation as viewed from a Gibraltar perspective. John Cortes, GONHS
Outlining purpose of conference and ways of working

1000 ENVIRONMENTAL AWARENESS AND EDUCATION – plenary session of 10-minute talks on a range of projects and experience in various Territories

1000 Conservation education & awareness programmes - Paul Butler, RARE
1020 Our Land, Our Sea, Our People (schools programme in Turks & Caicos Islands): Ethlyn Gibbs Williams, TCI National Trust
1035 Montserrat: Sarita Francis, Montserrat National Trust

1050 Coffee

1120 Environmental awareness and education on St Helena: Isabel Peters, St Helena Govt & Stedson Stroud, St Helena Conservation Group
1135 Raising awareness on wetlands of international importance in Cayman: Fred Burton, Cayman Islands National Trust
1150 Raising awareness - experience from a large organisation: Martin Drury, The National Trust [of England, Wales & Northern Ireland]
1205 Discussion

1245 Lunch

1345 INFORMATION & NETWORKING – short presentations in plenary on the Forum's database/web project, introductions to aspects of information handling, and guidance on advice available during the conference and afterwards

1345 Forum's database/web project – introduction and purpose Mike Pienkowski (UKOTCF)
1355 Forum's database/web project – demonstration. John Wheeler
1405 Forum's database/web project – invitation to comment on future priorities
1425 GIS and mapping: Fred Burton (Cayman Islands NT)
1445 Biodiversity recording and planning: Bermuda . Anne Glasspool (Bermuda Govt Museum & Zoological Society)

1505 Parallel workshops and helpdesks on several aspects of ENVIRONMENTAL AWARENESS AND EDUCATION and INFORMATION AND NETWORKING
(with coffee available, rather than as specific break)

1. Public awareness needs: surgery/discussion led by Paul Butler (RARE)

2. Producing educational, curricular & awareness material: workshop led by Ethlyn Gibbs-Williams (TCI National Trust), Rachel Sharp (RSPB re Ascension)
3. Wildlife clubs/ school kids performance preparation: work with ca 20 local 10/11-year-olds to produce various display material and performance, probably on seashore life as an example, for the plenary later in the day - led by Jim Stevenson (RSPB), Ijahnya Christian (Anguilla National Trust), Paul Linares (GONHS).
4. Training and helpdesk on using the Forum's database (both to obtain and supply information) and on web-site design generally; John Wheeler (Forum consultant)
5. Helpdesk/discussion on membership & contacts database handling: Dace McCoy Ground (TCI NT; ex- Cayman and Bermuda NTs)

1715-1745 Plenary for the kids presentation

1800-1900 Annual open meeting of the UK Overseas Territories Conservation Forum, with short presentations on its work, including its regional Working Groups.

[Dinner individually organised by participants]

Saturday 30 September

0900 MAKING PROTECTED AREAS EFFECTIVE – short plenary presentations, not on selecting protected areas, but on making those areas meet their objectives ("using, not choosing")

0900 An overview and the National Trust experience: Martin Drury
0920 Little Water Cay Iguana Trail and Middle Caicos Darwin Initiative: Ethlyn Gibbs-Williams (Turks & Caicos National Trust)
0935 BVI National Parks Trust: Joseph Smith Abbot
0950 St Helena Millennium Forest: Isabel Peters, St Helena Government
1005 Managing areas with no human population: Nigel Wenban-Smith (Friends of the Chagos)

1020 Coffee

1050 French Départements Outre Mer and Territoires Outre Mer: Alison Duncan (Ligue pour la Protection des Oiseaux, France)
1105 Reserve management in Catalunya: Dr Puri Canals (President of the Iberian Council for the Defence of Nature and Chairman of DEPANA)
1120 Seychelles: Dr Nirman Jivan Shah (BirdLife Seychelles & formerly Director of Conservation for Seychelles National Parks)
1140 Discussion

1215 Lunch

1315 Introduction to effective site-management planning, and the field workshops: Dr Tim Reed

1345 Parallel workshops on managing a range of protected areas. It is intended to offer a choice including options ranging between various terrestrial and marine habitats. The workshops will incorporate work in the field.

1730 Further opportunity to view displays and publication stands, and consult help-desks

[1730-1830 Exploratory meeting on forming a Forum European Working Group of the Forum. Participation by invitation.]

2000 Coaches leave for conference dinner

2030 Conference Dinner in the huge caves inside the Rock of Gibraltar, within the Upper Rock Nature Reserve

Coaches return from dinner

Sunday 1 October

0850 TOURISM AND FUNDING FOR THE ENVIRONMENT - plenary presentations on positive and negative experiences in securing funding from the tourism industry for environmental conservation

0850 The problems of intensive tourism (cruise & other) in the Caribbean: Polly Patullo
0910 Attracting cruise ships and setting the agenda: Falklands: Rebecca Ingham & Debbie Summers (Falklands Conservation)
0925 The St Helena situation: Isabel Peters, St Helena Govt & Stedson Stroud, St Helena Conservation Group
0940 Criteria for environmentally responsible tourism: the study for the Association of British Travel Agents: Monica Brett (WCMC)
0955 Transparency, criteria and NGO participation in tax-base conservation funds: the Seychelles experience: Dr Nirman Jivan Shah (BirdLife Seychelles & formerly Director of Conservation for Seychelles National Parks)
1010 The Cayman Environment Fund: Original objectives: Michael Gore (former Governor of Cayman; Chairman Forum Wider Caribbean Working Group)
1015 How well have these been achieved?: Report on behalf of the Government of the Cayman Islands
1025 The Turks & Caicos Conservation Fund: Original objectives: Ethlyn Gibbs-Williams (Turks & Caicos National Trust)
1030 How well have these been achieved?: Delton Jones (Government Economist, Turks & Caicos Islands)

1040 Coffee

1105 Tourism and Biodiversity: the Balearic experience: Dr Cristian Ruiz Atalba (Mediterranean Institute of Advanced Studies, Mallorca) & Catalina Ponsell Vicens (Josep Maria Llompart IES, Mallorca)
1120 Ulixes 21 – Towards Sustainable Tourism in the Mediterranean: Vanessa Hamilton (MedForum (Malta))
1135 Wildlife and tourism – the Gibraltar situation: Eric Shaw, GONHS
1150 Business planning for tourist income from trails etc: Paul Butler (RARE)

1215 Plenary discussion on future prospects in this area (jointly chaired by Penny Patullo & David Taylor [Chairman Forum South Atlantic Working Group; former Governor Monserrat; former Chief Executive Falklands])

1315 Lunch

1415 BIODIVERSITY ACTION PLANNING – plenary talks on: why we need plans; whose plans are they?; what do they look like?; how do we prevent them becoming an industry?; and how to make them effective

1415 Plans and their implementation: David Stroud (Joint Nature Conservation Committee)

1435 Action planning and implementation for the conservation of biodiversity of the Saba Bank: Paul Hoetjes (Section Nature & Environment, Dept Public Health & Environmental Hygiene, Netherlands Antilles)
1450 Jersey's Biodiversity Strategy: Mike Freeman (Ecologist, States of Jersey)
1505 Henderson Island Management Plan and what stops a plan becoming action: Leon Salt (Pitcairn Commissioner) / Dr Michael Brooke (Chairman Forum Pitcairn Working Group)
1520 Millennium Seed-bank Project: Steve Alton, Wakehurst Place, Royal Botanic Gardens Kew

1535 Coffee break

1605 Seychelles GEF & Environmental Management Plan: Dr Nirman Jivan Shah
1625 Plenary discussions on biodiversity action planning

1730 Taking things forward: Sara Cross (Director for Development, UKOTCF) & Sheila Brathwaite (Permanent Secretary, British Virgin Islands Ministry of Natural Resources & Labour)
1800 Closing of conference: The Hon Dr Bernard Linares, Minister for Education & Culture, Gibraltar
1815 Informal discussions

[Dinner individually organised by participants]

Monday 2 October

Disperse

Appendix 2.
Participants and their contact details

Conference participants are listed below, with details (where available) given in the following order:
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