

## Section 3: Information & Networking

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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](http://www.ukotcf.org) and click UKOTCF database on the side-menu – then explore.

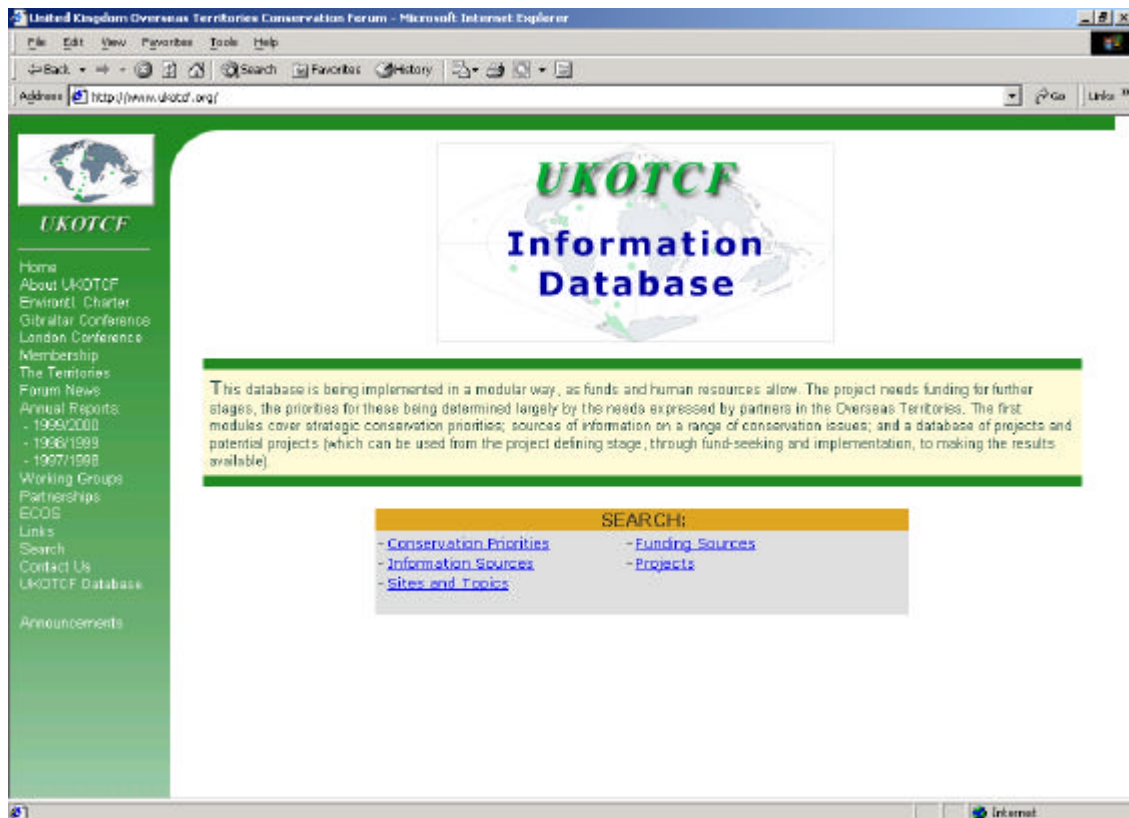
Neither are we able to include here the workshop on adding information. However, a main feature of the

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](mailto: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](http://www.ukotcf.org)), because some information is handled better as static pages and some as a database which can be interrogated.

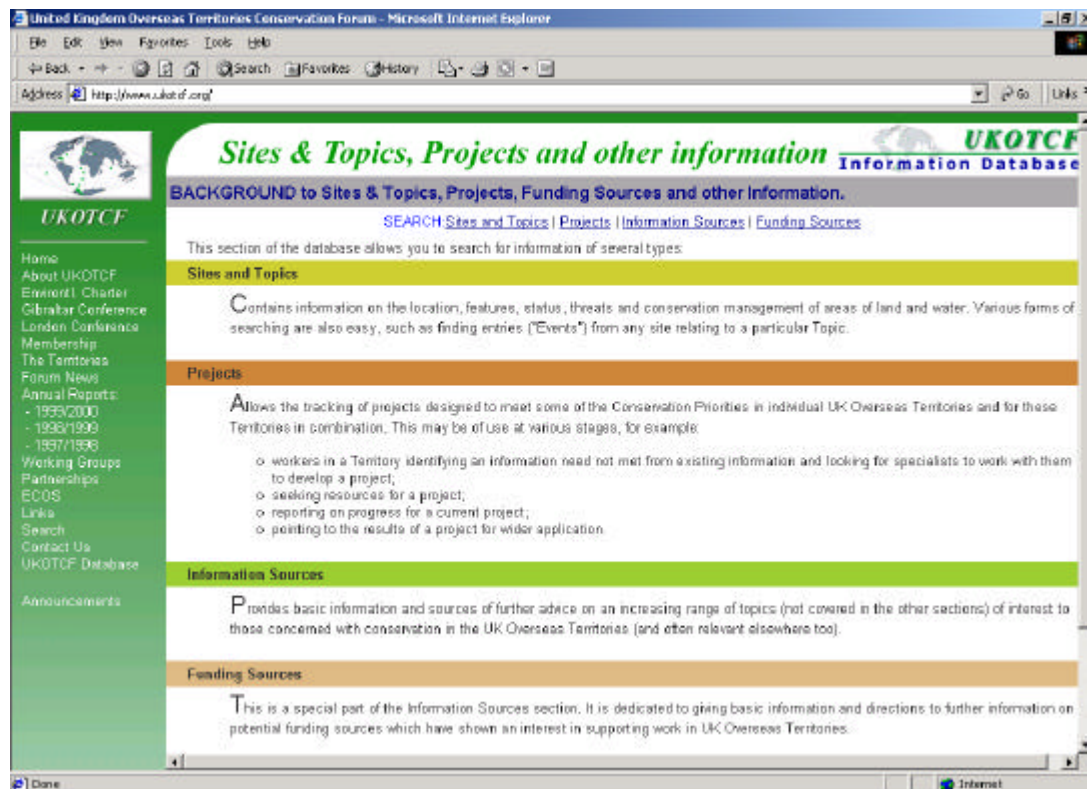
We are implementing the database in a modular way, as funds and human resources allow. This means that some modules are working without having to wait for the entire system – thereby avoiding a problem which has plagued computerisation in many governmental systems.

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](http://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.

The screenshot shows a web browser window displaying the UKOTCF Information Sources database search page. The page has a green header with the title "Information Sources" and the UKOTCF logo. Below the header is a navigation bar with links: "Home", "About UKOTCF", "Environ. Charter", "Gibraltar Conference", "London Conference", "Membership", "The Territories", "Forum News", "Annual Reports", "Working Groups", "Partnerships", "ECOS", "Links", "Search", "Contact Us", "UKOTCF Database", and "Announcements". The main search area is titled "SEARCH INFORMATION SOURCES" and contains a search form. The form has three sections: "Subject Category" with a dropdown menu set to "International Convention", "Organisation Type" with a dropdown menu set to "Select Organisation Type", and "Search" with a text input field for "Search all records by word or phrase:". Below the input field are "Submit" and "Reset" buttons. At the bottom of the search area, there is a section titled "(Examples and hints for word/phrase search)" with a list of search tips. The tips include: multiple words are grouped and treated as phrases; partial words may be used as word-beginnings; search words may be combined with the reserved words AND, OR or NOT; queries (and reserved words) are case-insensitive; and punctuation, including characters such as \* and ., etc., should be omitted.

UKOTCF Information Sources

SEARCH INFORMATION SOURCES

[Sites and Topics](#) | [Projects](#) | [Information Sources](#) | [Funding Sources](#) | [Background](#)

Search the Information Sources database by:

Subject Category / Organisation Type / Word/Phrase ([Examples & Hints](#))

- These searches may be combined -

Subject Category

Display all Information Sources for:

Organisation Type

Display all records for:

Search

Search all records by word or phrase:

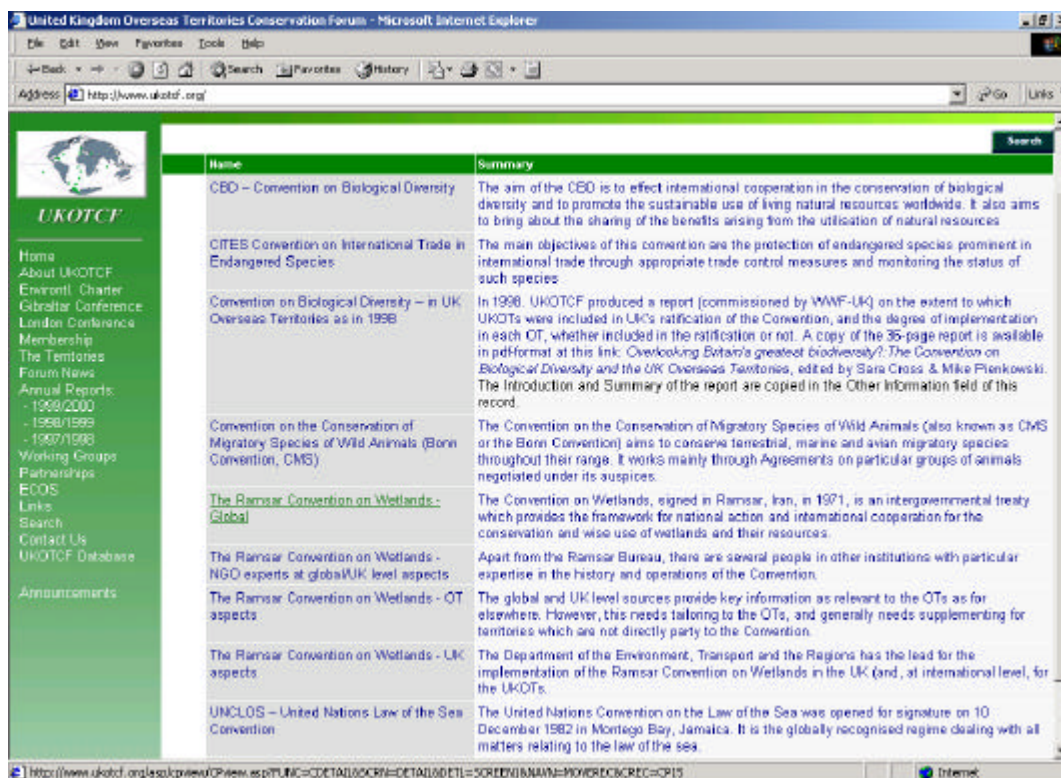
(Examples and hints for word/phrase search)

- multiple words are grouped and treated as phrases, eg "coastal and marine", "wetland sites", "endemic shrimps" (without the punctuation) will return sections containing those phrases
- partial words may be used as word-beginnings, eg "vol" will return occurrences of the words "volcanic", "volcano", "volatile", etc. "chagos arch" will find "chagos archipelago", (but "chag archipelago" will not)
- Search words may be combined with the reserved words AND, OR or NOT - examples:
  - "coastal AND marine" will return sections containing "coastal" and "marine", but not necessarily grouped together
  - "coastal OR marine" will return text sections containing either word
  - "coastal NOT marine" will return sections containing the word "coastal" but not "marine"
- queries (and reserved words) are case-insensitive, so 'chagos' is the same as 'Chagos'
- punctuation, including characters such as \* and ., etc., should be omitted. Non-English accented characters should also be replaced by unaccented characters.



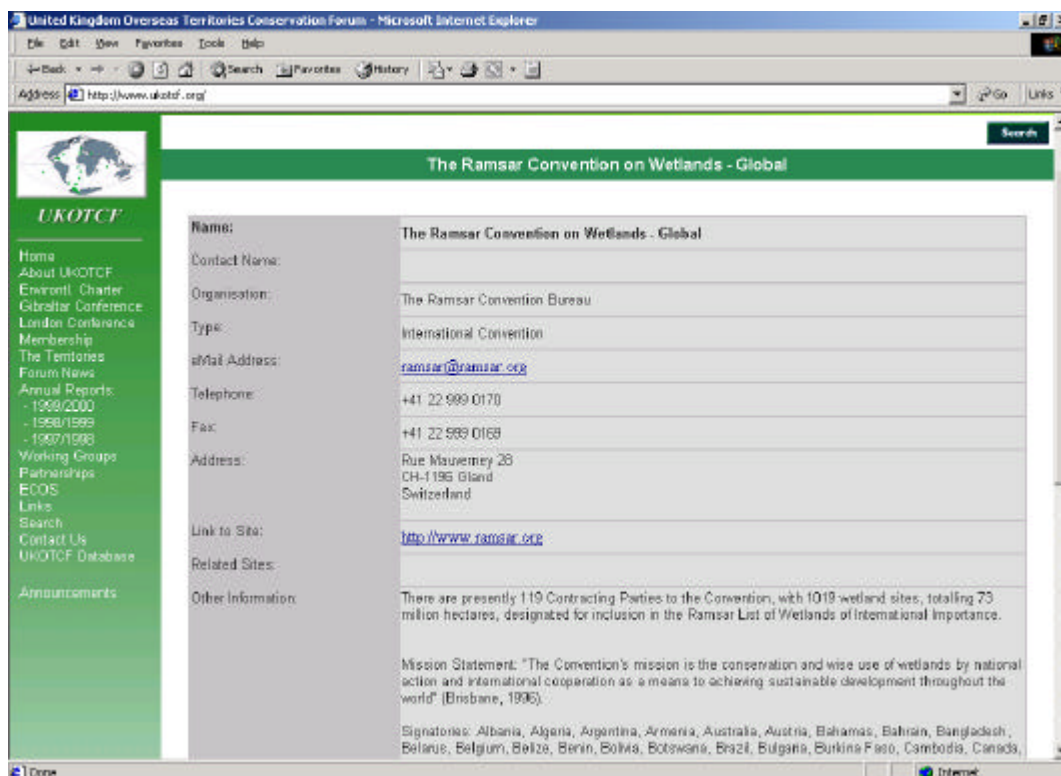
## Funding Sources

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.



The screenshot shows the UKOTCF website in a Microsoft Internet Explorer browser window. The address bar displays <http://www.ukotcf.org/>. The website has a green header with the UKOTCF logo and a navigation menu on the left. The main content area features a table with the following information:

Name	Summary
CEO – Convention on Biological Diversity	The aim of the CEO is to effect international cooperation in the conservation of biological diversity and to promote the sustainable use of living natural resources worldwide. It also aims to bring about the sharing of the benefits arising from the utilisation of natural resources.
CITES Convention on International Trade in Endangered Species	The main objectives of this convention are the protection of endangered species prominent in international trade through appropriate trade control measures and monitoring the status of such species.
Convention on Biological Diversity – in UK Overseas Territories as in 1998	In 1998, UKOTCF produced a report (commissioned by WWF-UK) on the extent to which UKOTs were included in UK's ratification of the Convention, and the degree of implementation in each OT, whether included in the ratification or not. A copy of the 36-page report is available in pdf format at this link: <a href="#">Overlooking Britain's greatest biodiversity? The Convention on Biological Diversity and the UK Overseas Territories</a> , edited by Sara Cross & Mike Plenkowski. The Introduction and Summary of the report are copied in the Other Information field of this record.
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, CMS)	The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) aims to conserve terrestrial, marine and avian migratory species throughout their range. It works mainly through Agreements on particular groups of animals negotiated under its auspices.
<a href="#">The Ramsar Convention on Wetlands - Global</a>	The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
The Ramsar Convention on Wetlands - NGO experts at global/UK level aspects	Apart from the Ramsar Bureau, there are several people in other institutions with particular expertise in the history and operations of the Convention.
The Ramsar Convention on Wetlands - OT aspects	The global and UK level sources provide key information as relevant to the OTs as for elsewhere. However, this needs tailoring to the OTs, and generally needs supplementing for territories which are not directly party to the Convention.
The Ramsar Convention on Wetlands - UK aspects	The Department of the Environment, Transport and the Regions has the lead for the implementation of the Ramsar Convention on Wetlands in the UK (and, at international level, for the UKOTs).
UNCLOS – United Nations Law of the Sea Convention	The United Nations Convention on the Law of the Sea was opened for signature on 10 December 1982 in Montego Bay, Jamaica. It is the globally recognised regime dealing with all matters relating to the law of the sea.



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The Ramsar Convention on Wetlands - Global	
Name:	The Ramsar Convention on Wetlands - Global
Contact Name:	
Organisation:	The Ramsar Convention Bureau
Type:	International Convention
email Address:	<a href="mailto:ramsar@ramsar.org">ramsar@ramsar.org</a>
Telephone:	+41 22 989 0170
Fax:	+41 22 989 0169
Address:	Rue Mauverney 28 CH-1196 Gland Switzerland
Link to Site:	<a href="http://www.ramsar.org">http://www.ramsar.org</a>
Related Sites:	
Other Information:	<p>There are presently 119 Contracting Parties to the Convention, with 1019 wetland sites, totalling 73 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance.</p> <p>Mission Statement: "The Convention's mission is the conservation and wise use of wetlands by national action and international cooperation as a means to achieving sustainable development throughout the world" (Brisbane, 1996).</p> <p>Signatories: Albania, Algeria, Argentina, Armenia, Australia, Austria, Bahamas, Bahrain, Bangladesh, Belarus, Belgium, Belize, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Canada,</p>

## 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 lose 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 5<sup>th</sup> 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 your maps to be compatible with your 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 your 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 your 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.