Chagos News

The Periodical Newsletter of the
Chagos Conservation Trust and
Chagos Conservation Trust US
No 48 July 2016

ISSN 2046 7222

Contents

Cover image © Ronan Holt

Editorial

Anne Sheppard, CCT Trustee

Research in the Chagos Archipelago has undergone several changes of pace over the years.

Many decades ago it was only a very occasional researcher (dedicated too, considering how difficult the islands were to get to) who visited the islands. Then in the 1970s there were a series of expeditions, the results of which have provided the baseline data for some of the present day research. In 1998 there was the shock of the first massive bleaching event and some timely research on a CCT expedition just before that in 1996 augmented these results and set the stage for work which turned out be important to understanding effects of climate change on reefs.

Following that, starting in 2006, there has been a huge surge in research carried out in the archipelago, the results of which show just how important the archipelago is as an Indian Ocean biodiversity refuge. Well over a hundred scientists visited in these programmes, carrying out research in a wide range of subjects and all agree - very clearly - that it is very important that it be protected.

CCT is proud to have been at the forefront of all this, as a focus for the expeditions, a co-ordinator for many, and as a leading participant in the creation of the Chagos Marine Reserve. This has involved a lot of work by the many who give their time in a voluntary capacity, either in the running of the trust or the large amount of time spent by the scientists who carry out the research and write reports and articles informing the scientific community, politicians and the public about this extraordinary place.

Today, there is a huge increase in research into new areas, which we all greatly welcome, and CCT will retain its focus into the core areas of the islands and shallow reefs that build them.

Informing the public is very important. With the recent increased involvement of many research groups there has been an increase in the media output, excellent films from Stewart MacPherson, Jon Schleyer and the Khalid bin Sultan Foundation being some of the newest.

Our Facebook presence is growing, and shortly CCT will have a new website. This is in preparation now and will hopefully be ready in the next few months and will also be linked to the Chagos Information Portal, ChIP, (see last issue of Chagos News).

To cap it all CCT is producing a superb new book on the history of the archipelago (see the announcement on page 14).

With a Facebook page, a website, ChIP, this newsletter, scientific publications, books and all the videos, and the annual conferences, there is a lot more information available for members.

Director's Report

Helen Pitman, CCT Director

The 8th June saw us celebrate World Oceans Day.

The vast expanse of water covering 71 per cent of the globe is home to a huge diversity of species and is relied upon by many millions of people for food and income. It is a time to reflect and acknowledge that although the oceans face a myriad of threats from pollution and overfishing to climate change, collectively we can work to help them recover and thrive well into the future.

We've heard and read about the coral bleaching occurring in the Chagos Marine Reserve due to record-breaking temperatures. A group of leading coral scientists, including CCT trustee Dr Heather Koldewey, saw first-hand the effects during the Bertarelli Foundation science expedition. But it may not be all doom and gloom. As we know the marine reserve did recover after the 1998 global bleaching event and we all sincerely hope this will happen again.

The last six months have been an exciting time for the CCT. As we came to the end of our 2013-2015 strategic plan it was time to reassess the direction we wanted to take and plan for the next three years. We've decided to focus on continuing to build a strong organisation; inspiring action by increasing the knowledge and understanding of the importance of the Chagos Archipelago; and as always working towards the continued protection of this a global asset (see p4).

In April we were happy to announce we were awarded a Darwin Initiative grant that will enable us to conduct a comprehensive survey of two thirds of the marine reserve's islands, with a team made up from CCT, Zoological Society of London, Royal Botanic Gardens Kew, Royal Society for Protection of Birds and the International Union for the Conservation of Nature. The project was masterminded by, and will be led by, CCT trustee Pete Carr and will produce a Chagos Archipelago Terrestrial Action Plan for the British Indian Ocean Territory Administration.

This is an essential step towards the goal of increasing the natural biodiversity on the islands of the archipelago by managing, reducing or eliminating threats such as invasive plants and animals that have a negative effect on the island habitats and species.

We were also invited to take part in a number of initiatives including the recent *Rethinking the future for coral reefs* symposium, convened by HRH The Earl of Wessex, which aimed to stimulate a fresh discussion amongst scientists, educators, media and NGOs on how to tackle some of the threats to coral reefs.

As ever the CCT is grateful for your support and we hope that together we can continue to have a positive impact on the Chagos Archipelago.

Protecting a global asset

The Chagos Conservation Trust has a long and credible history in island and coral reef research and conservation in the Chagos Archipelago. Since 1996 we have coordinated and lead expeditions with over 100 scientists involved from institutions across the world.

Over 250 scientific papers have been written on the discoveries made in one of the most remote places on earth, over a decade of sea temperature data has been collected and without the Chagos Conservation Trust vital information about many species wouldn't have been known.

We continue to research and monitor the coral reefs of the marine reserve and the many islands that exists there. By concentrating on these two important parts of the ecosystem we aim to work towards fully understanding the natural environment of the Chagos Archipelago and ensuring it is well protected and conserved for the benefit of people and our planet.

Islands of the Chagos Archipelago

The Chagos Archipelago islands are home to a variety of plants and animals, including 18 species of seabirds. Many of the 58 islands have been invaded by invasive black rats, which are known to have a catastrophic impact on oceanic island ecosystems.

We have developed a five-year island ecological rehabilitation programme that aims to identify the most degraded islands to be restored in the hope they will provide natural habitat for native species to thrive in once again.

Island rehabilitation strategy

- A comprehensive review of the biodiversity of the islands, focussing on invasive alien species and their management
- Creation of a terrestrial action plan to prioritise and cost rehabilitation
- A rat eradication programme for the priority islands
- A long term seabird and native vegetation monitoring programme

Coral reefs of the Chagos Archipelago

The Chagos Marine Reserve protects valuable habitat and one of the world's most resilient coral reefs at a time when scientists fear that coral reefs around the world face rapid decline due to pollution, warming and ocean acidification.

Coral reef research is a priority for us and will continue to be so over the next three years through our coral reef strategy.

Coral reef strategy

- Collect baseline data and assess the stress response and health of the coral reefs
- Develop a coral cover monitoring plan
- Monitor sea temperatures and assess changes and associated anomalies
- Develop species action plans to address any threats to the reef biodiversity

A Royal Visit

Professor John Turner, CCT Trustee

His Royal Highness the Prince of Wales was briefed on science and conservation in the Chagos Archipelago during his visit to Bangor University.

Prince Charles opened the new Marine Centre Wales at the School of Ocean Sciences and was given a tour of the new buildings and RV Prince Madog.

The new facilities have been built to high environmental standards to minimise energy consumption, and provide natural light and scenic views of the Menai Strait.

The building was financed as a part of the £25 million SEACAMS project, part funded through the European Regional Development Fund. Research focuses on marine renewable energy, sustainable fisheries, and impacts on the wider environment, and involves partnerships with companies and businesses, governments and agencies in the marine sector of Wales and internationally.

Prince Charles was introduced to CCT Trustee Professor John Turner and Dr Ronan Roach to hear about the world's largest contiguous Marine Reserve, and how the protected reefs of Chagos have proven more resilient than most reefs around the world to coral bleaching and disease.

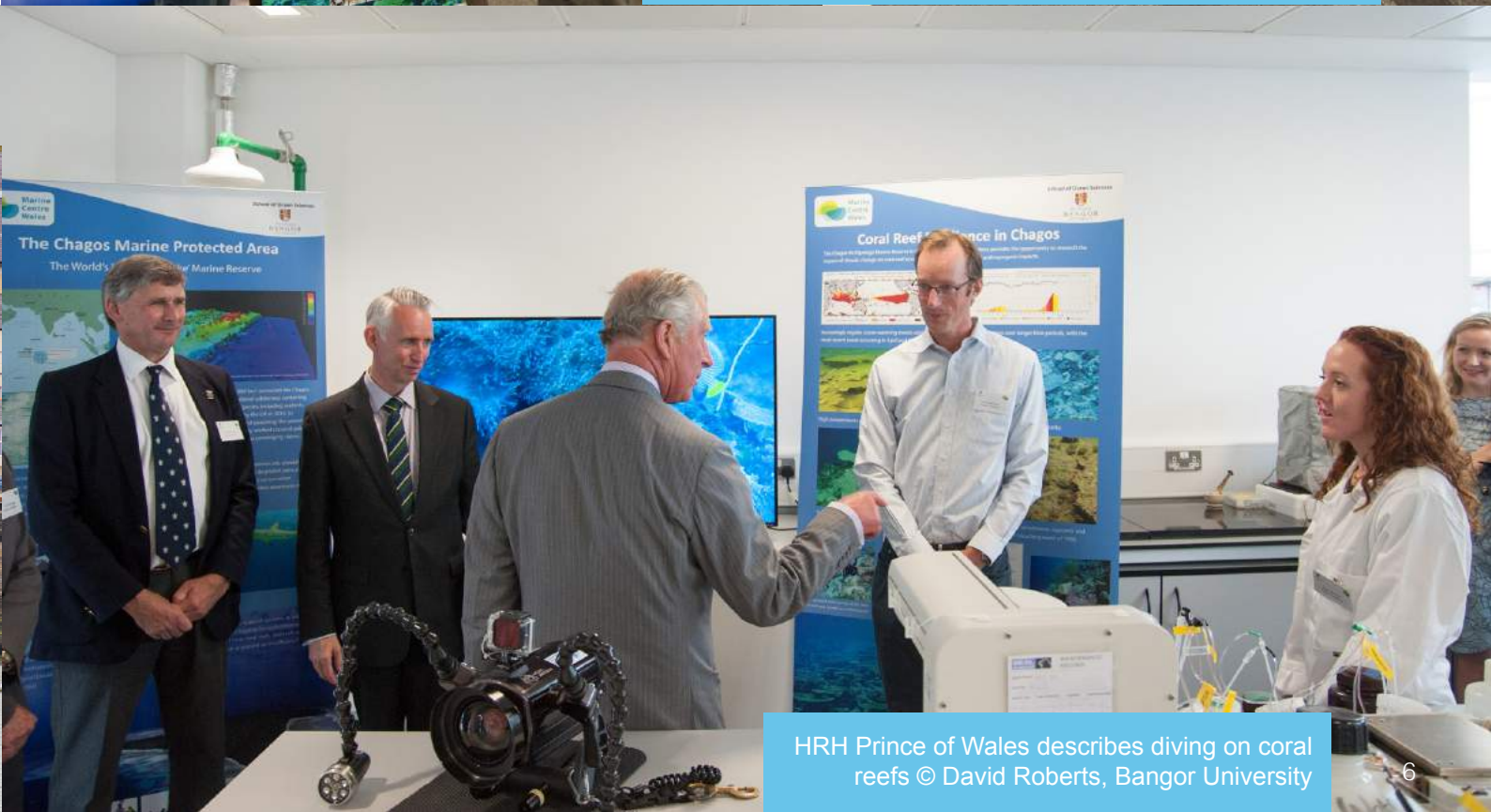
He viewed underwater video from the Chagos Archipelago on a large display screen and saw CCT/Darwin Initiative branded posters depicting the Chagos Marine Reserve and recovering reefs.

His Royal Highness was evidently very interested to learn more about Chagos Archipelago, asked questions about climate change and coral bleaching, and what it was like to dive in such a remote location, and told us about some of his own diving experiences on coral reefs.

The School of Ocean Sciences on Menai Strait with Research vessel *Prince Madog* on pier © David Roberts, Bangor University

HRH Prince of Wales is briefed on Chagos Marine Reserve by John © David Roberts, Bangor University

John and Ronan rehearse their briefing in front of the Chagos MPA display © David Roberts, Bangor University



HRH Prince of Wales describes diving on coral reefs © David Roberts, Bangor University

The Chagos Difference

Professor Charles Sheppard, CCT Trustee and Chairman

The 2015-2016 warming event and what can we learn from the earlier 1998 event.

This year, 2016, is the second time we have seen a widespread, massive mortality of corals on reefs of the Chagos Archipelago. The first time was in 1998, and a large part of the substantial research programme that developed over the following 15 years was triggered by that heavy mortality. Those research results led to the Chagos Marine Reserve itself. They showed that recovery happened, and explained why it recovered, and what must happen to ensure the area recovers again.

This article explains that. But first, what do we remember about the aftermath of 1998?

The 'Friends of the Chagos' had been recently born (precursor to today's CCT) and we managed to persuade the BIOT Administration that one or two of us should go and examine the reefs there after 1998, because from results elsewhere in the world we thought that the Chagos Archipelago must have been heavily damaged too. Satellite heat maps showed it after all. This persuasion was not easy: certain influences had told BIOTA that there had been no reef damage, but as the rest of the Indian Ocean had suffered badly, we simply did not believe it. We pointed out that the whole land area of BIOT was, in fact, totally dependent on healthy, growing reefs, and it would be essential to know if they no longer were.

Eventually we prevailed, so in 1999 I visited again on a swift snorkelling trip to several atolls, accompanied by John Topp who at that time was the first conservation adviser to BIOTA.

The scene we saw almost everywhere in 1999 was heart-breaking. The bleaching and subsequent mortality of corals was amongst the worst and most extensive in the entire ocean.

Wherever we looked, the corals were dead and crumbling. There were none alive at all over extensive, shallow areas. As we were

The aftermath of the 1998 warming event, that killed almost all the corals in water to 20m depth © Anne Sheppard

In southern atolls, the fairly deep dense leafy corals were also totally killed © Anne Sheppard

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Even where corals have been killed, fish remained abundant
© Anne Sheppard

limited to snorkelling we could see only the shallowest 20 m or so, but everywhere almost all the coral skeletons were grey, dusty and broken, with very few left alive. The new digital cameras were available by then and I remember taking hundreds of pictures, all monotonously depressing. The limestone coral skeletons were often recognisable as corals, but many were already turned into rubble.

Relatives of corals, the soft corals, have been much less researched than corals, yet they occupy a lot of space on the reef too. In Chagos they had been conspicuous, if never particularly abundant, except on reefs facing the southeast trade winds where they had provided most of the living coverage of the reef. These, like the stony corals, have similar symbioses with algae and had also bleached and died. However, their skeletons are not stony but are made of a soft gelatinous matrix, so they had disappeared completely, leaving no visible traces whatsoever.

In 1999, therefore, these areas of reefs had a substantial and abnormally high expanse of uncolonised, bare rock. This was very unusual.

In most reefs of the world today, bare substrate quickly becomes colonised by seaweeds which then preclude further coral growth, but this had not happened on the Chagos Archipelago reefs because (and this became another very important line of research) there had been no fishing or pollution on these reefs, so there remained a huge abundance of grazing herbivores. Algae undoubtedly grew quickly on the bare reef, but were as quickly grazed.

These bare, exposed patches of limestone substrate were occasionally bright white but more often had a dusty, grey appearance. Almost certainly, the lack of nutrients to fertilise algae (because there was no pollution from people), and the huge abundance of herbivores (because there was no fishing) meant that no algae ‘explosion’ had taken place, so these enormously important factors permitted the good coral recovery that we were to see in these atolls in future years.

The reefs are in black and white

But the scene that we faced in 1999 was appalling (see box).

A proper diving survey was clearly needed, and permission for a visit was granted for early 2001. This time, the survey extended to 30m depth or so, and quantitative data was collected on several aspects such as adult coral mortality, the degree to which the coral skeletons were being eroded into rubble, the abundance of new or juvenile corals, and some preliminary studies of the fish communities by Dr Mark Spalding, the present BIOT Conservation Adviser. Before visiting, a new sea surface temperature data set had been analysed and matched with earlier air temperature data obtained from the Diego Garcia meteorological office.

An extract from issue of *Chagos News* after the visit in 1999.

"I snorkelled along the northern edge of Nelsons Island on the northern side of the Great Chagos Bank. The water was clear and calm, and on that part of the island the drop-off lies close to shore. I swam, with the conservation adviser and others from the fisheries patrol vessel, from the edge of the reef flat out to the drop-off. With a lot of surface diving, we could see clearly to 20m deep, maybe more. But no corals or soft corals were left alive. The corals were all there, just dead, standing upright in their positions of growth. Instead of providing a colourful and varied scene, they were standing like tombstones, covered in a film of greyish fuzz. Whether we looked in the shallows where corals are mostly sturdy, digitate forms, or swam down to between eight and 10m deep where the large table corals densely cover a strip along the top edge of the drop-off, all were dead. As the ship's chief engineer put it, it was like seeing the reef in black and white instead of in colour. …I saw less coral and soft coral than once would have fitted into a single one of my quadrats. I had been looking at similar scenes for a week by this stage …"

We found that coral and soft coral mortality in shallow water (to 15m depth) was high everywhere, but the depth to which mortality occurred correlated with latitude. The Great Chagos Bank was particularly badly affected.

Extensive or even near-total mortality occurred from the surface to about 15m deep in northern atolls, but the heavily killed depth range extended to as much as 35m deep in the southern atolls of Diego Garcia and Egmont. Below these apparently critical depths, northern reefs retained a much more normal and vibrant appearance and coral cover. If the central and southern atolls did have any transition to a better condition, it occurred deeper than the 35 or 40 metres we could observe in this survey.

Our measurements of total coral cover in 2001 indicated no improvement over what we had seen by snorkelling in 1999. This was disappointing.

At first I wondered whether these reefs were gone for good and wrote as much, as has since proved to be the case in so many parts of the Indian Ocean. But to brighten this view were results from another member of our team, Dr Simon Wilson. He found that numbers of juvenile corals were extremely high, in many cases the highest so far reported anywhere in the world to that date. With so much spawning going on the future could even, incredibly, be bright – the Next Generation was there! Such an abundance of juveniles did indicate hope for the future.

Simon's work showed that young corals were mostly of spawners - species that release gametes into the water where fertilisation and dispersal takes place. In contrast, species which brood their larvae before releasing them were under-represented because generally these are shallow water species whose adult populations had been the most severely affected.

It was thought that the ‘brooders’ would therefore probably make a slower recovery, which might even change the composition of the shallow water coral community. This also turned out to be true.

Amongst the brooders is *Acropora palifera*, a very important species in high water energy conditions, and this large, sturdy coral is a major contributor to the ‘breakwater’ functioning of the Chagos Archipelago reefs as they take the brunt of waves.

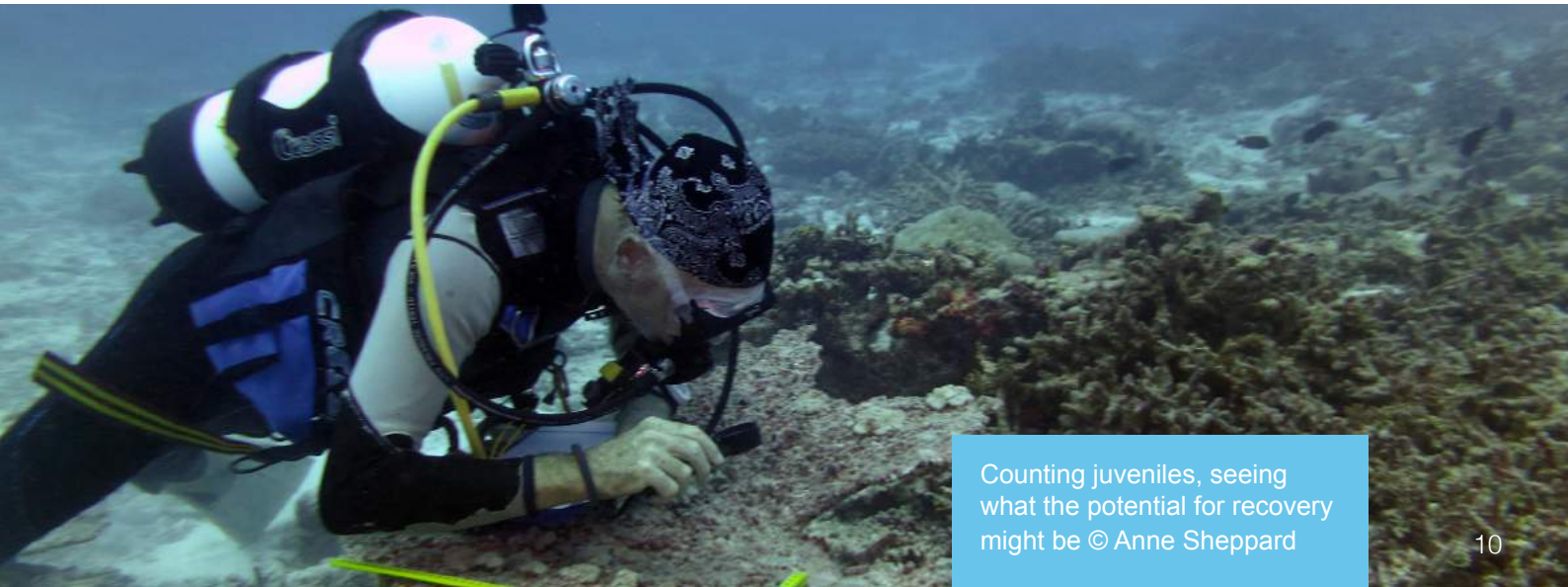
On subsequent visits over the next decade Anne Sheppard measured similarly high levels of juvenile corals almost everywhere. The deep water refuges of survival were presumably key, and we deployed numerous temperature recorders that recorded water temperature at two hourly intervals that also have provided many clues why recovery became a dominant story of the Chagos Archipelago reefs.

Consequence of eroding reefs

After a coral dies its limestone skeleton lies exposed. It forms a substrate for many species of bioeroding animals and plants, that is, species which can etch or burrow their way into a coral for shelter and protection. If alive, a coral’s tentacles will quickly kill any juvenile bioeroding organism but, following the mortality, the coral polyps were gone, leaving an ideal surface for bioerosion. Bioeroders had most certainly not been wiped out by the warming water. Dr Clare Bradshaw on the 2001 trip had the task of working on rates of destruction of dead coral skeletons.

Clare found that bioerosion was considerable, and had led to the creation of substantial quantities of dead coral rubble. Little of that had been carried up to the shores and we guessed that most of it had been lost to very deep water, out of sight. All of them though were riddled like Swiss cheese, the tunnels being the burrows of the organisms that had made the limestone their home. With this bioerosion comes substantial weakening of the whole structure. Three years from the mortality, a common sight was branching corals with their skeletons still apparently intact and in place, seemingly reaching upwards to the light just as they do in life. But with most of these the gentlest pressure would topple them, and they were clearly not going to survive the next storm.

Longer-term effects of this erosion were worrying, particularly those associated with



Counting juveniles, seeing what the potential for recovery might be © Anne Sheppard

the loss of reef complexity and growth. Coral recovery, we predicted, would need to happen rapidly to avert long term disaster. This, too, is what actually happened.

Coral recovery was slow at first. There seemed to be none at all for several years. Then, slowly at first, we started to see recovery.

By this stage it was clear that we were going to be permitted increasing numbers of scientific expeditions to the archipelago so we began what we hoped would become a more consistent series of measurements of various things such as coral cover from the same places and depths. We did this as best we could on several different years, and this has formed one core of the research which has been useful to communities all over the tropical world.

Parallels and lessons for today

How does this help with plans today in the face of the latest, largest and most prolonged warming event ever? The answer is, hugely.

We don't know the full extent of the mortality today, in mid-2016. Several views have been pessimistic – after all, several spot observations during the past year have shown significant bleaching lasting throughout this period, along with reports of widespread mortality. We hope to learn by the end of the year, a few months after water temperatures cool, what the final story is for this warming event.

One lesson we have learned from the earlier wipe-out is critical: that is, the almost complete lack of other local impacts on the reefs enabled reefs here to bounce back faster and more completely than was the case in most of the tropics. This will most likely be the case again following the 2015/16 warming. We certainly hope this is the case!

There will be 'interests' who suggest that as the reefs are dead or damaged, the marine reserve has failed, so it is worthless, that it might as well be fished, that there is no point in conserving it, and so on. We see similar calls to exploit protected areas all the time, and BIOT has certainly been afflicted with these ludicrous claims too in the past.

But it has been clear from several of the more than 200 scientific publications arising since the 1998 wipe-out that it is precisely the protection from other forms of damage that enables reefs to recover from such impacts from climate change and episodes of warm water.

Monitoring here must continue because it will have importance not only for scientific management of BIOT's reefs but for much of the tropical world. We know the 'Chagos Difference' following 1998 was because of the almost complete lack of local impacts, and we suspect that this will be the case today too.

Conservation and protection of these reefs from impacts from those local factors that affect most of the tropical world is crucial if reef life-expectancy in BIOT is to be prolonged under the present scenario of oceanic warming.

The more that these warming events happen – and they will again – the more critical it is to ensure conservation remains strong in this large, hugely valuable area of the Indian Ocean, to the benefit of all.

A thriving reef scene several years later, with healthy corals and high densities of fishes © Anne Sheppard

Corals fully established, but still only a few years old © Anne Sheppard

Big Results, Small Charity

Alistair Gammell, CCT Trustee and Secretary

CCT is only a small charity, but one that faces a huge task, to conserve the islands, reefs and deep waters of the Chagos Archipelago.

The Chagos Archipelago is one of the best preserved parts of the world's oceans and currently the largest fully-protected marine reserve in the world (it will be surpassed in size at least when the UK government finally declares the marine reserve in Pitcairn as it has said it intends to do) and we have been making big progress recently thanks to the generosity of funders.

Because of the exceptional nature of the Chagos Archipelago's environment, it has long been a sought-after but difficult-to-get-to destination for marine scientists. Thanks to CCT's leadership of the campaign, with the support of many other conservation organisations, that led to the archipelago being designated as a marine reserve in 2010, even more scientific expeditions have been enabled to go there.

But it is vitally important that all this past and current science is not lost in fragmented filing cabinets, but remains easily accessible to everyone who is interested. For that reason CCT came up with the idea of creating a Chagos Information Portal (ChIP) to bring together all this information into one place.

This is an enormous task, but one in which we have received generous support from the John Ellerman Foundation.

Phase one of ChIP is online now at www.cct-chip.org but please keep looking because thanks to the John Ellerman Foundation's support, it will continue to grow and become better still.

The islands of the Chagos Archipelago are wonderful places, but introduced rats and coconut plantations have done much to damage the islands' natural biodiversity. Three years ago, the UK government's Darwin Initiative gave us money to eradicate rats from Ile Vache Marine and by good management of the project, we were able to

Salomons Atoll © Anne Sheppard

add in two small neighbouring islands, Iles du Sel and Jacobin.

If we have been successful, and we will not finally know this until later this year, then we will have allowed nature to thrive again on these islands, bringing back to them nesting seabirds and allowing native invertebrates and nesting turtles to thrive and nest unmolested by rat predation. We are currently in the process of writing an application to the European Union's BEST programme to fund us to eradicate rats from a further two islands so we can allow nature to thrive on them too.

The UK government's Darwin Initiative has also just funded us to undertake a project to create a Terrestrial Action Plan for the Chagos Archipelago. This is just starting, but over the coming two years, we will visit every island and document what actions are needed to make that island the best possible place for nature. All the actions will be prioritised and costed, so that we have a complete agenda going forwards as to what needs to be done to rehabilitate. Together with the British Indian Ocean Territory Administration we then intend to carry out these actions and conserve nature on the islands.

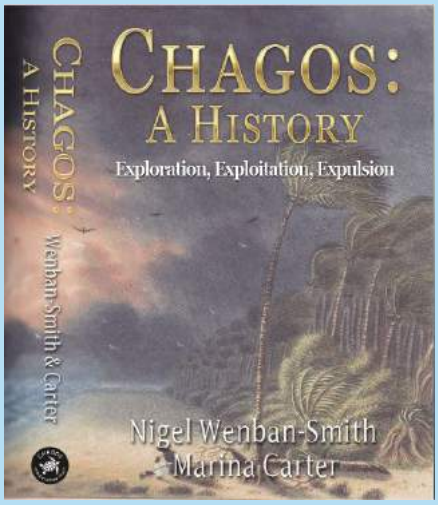
Through your support, our funders' support and the work of our scientists and conservationists, we've been able to punch well above our weight to make big things happen to make the Chagos Archipelago a better place for nature.

Thank you.

The long wait is nearly over!

Chagos: A History: Exploration, Exploitation, Expulsion by Nigel Wenban Smith and Marina Carter, is expected to be ready for purchase by mail order in September. The book, is in hard back, fully illustrated in colour and, over 500 pages, and will cost £40.00, plus postage and packing.

Plans are being made to launch the book in London and perhaps elsewhere, but the main distribution will be made by the printer, York Publishing Services. All members will be sent more details of the book and an order form in due course.



This is a scholarly, comprehensively researched account of the Chagos Archipelago up to the final closure of the coconut plantations in 1973. Long forgotten archives from around the world were combed for accounts from, for example, visiting magistrates. It contains, in short, the accurate story of this archipelago.

Contact Simon Hughes, simonhughes@hughes-mccormack.co.uk, for more information or order forms.

Biodiversity Action Plans

Professor John Turner, CCT Trustee

Protecting biodiversity in the Chagos Archipelago relies on partnerships.

Responsibility for biodiversity conservation and environmental management in the overseas territories is devolved to territory governments, but it is recognised that this is best achieved in partnership with non-government organisations and scientific institutions.

The BIOT Administration is not a signatory to the *Convention on Biological Diversity*, but does endeavour to manage biodiversity in the territory as if it were. The *Strategic Plan for Biodiversity* established by the *Convention on Biodiversity* for 2011-2020 sets targets, collectively known as *Aichi Targets*. One of which is for each party to develop, adopt as a policy instrument, and commence implementing an effective, participatory and updated national biodiversity strategy and action plan.

Further, one of the five priorities identified by DEFRA's 2009 *Strategy for the Conservation and Sustainable Use of Biodiversity in the UK Overseas Territories* was to obtain data on the location and status of biodiversity interests and human activities affecting biodiversity to inform the preparation of policies and management plans including baseline survey and subsequent monitoring.

The recently completed Darwin Initiative project 2012-2015, and the Darwin Plus CAREX (**C**hagos **A**rchipelago **R**esearch **Ex**pedition) project both aim to contribute such important information to strengthen management.

In 2012, CCT prepared a draft management plan, which was a working document to be further developed on the basis of findings from research expeditions. The plan made recommendations on marine, fisheries and island science and monitoring; and general needs and management activities, but did not yet include detailed biodiversity action plans for species (BAPs).

The BIOT Administration made it clear that

Red footed booby
© John Turner

Chagos anemone fish
© Anne Sheppard

they need to own the conservation plan, but acknowledged that they are not subject experts, and recognised the importance of drawing on our, and government department advice, to help develop a plan which is both ambitious and recognises the territory as a world class environmental asset.

They accepted that our draft management plan provided a good basis, and that the scientific workshop held in Geneva in October 2013 provided a further plan of conservation activity. The administration wanted to build upon the plans, but did not want a single non-government organisation to lead it, but rather they would have Natural England provide the technical expertise to bring together stakeholder views into a plan.

The Blue Marine Foundation coordinated a meeting on behalf of the administration at the Foregin and Commonwealth Office (FCO) to discuss the development of the plan, and subsequently there were further consultations and iterations with over 40 stakeholders.

The plan was to take into account the FCO overseas territories overarching objectives as follows:

'The natural environment, whether through individual species, habitats or whole ecosystems, is to be appropriately valued; Unique, highly vulnerable or sensitive natural environments are identified, protected and conserved by appropriate means including through the use of management plans, underpinned by scientific research; Manage terrestrial and marine natural resources sustainably and address challenges of climate change, including by putting environmental considerations at the heart of all decision-making; Oversee exemplary environmental management of the uninhabited Territories; Ensure compliance with the requirements of relevant multilateral environmental agreements; and to strengthen co-operation with the Non-Governmental and scientific community.'

The structural components of the plan were*: Description of natural values; Vision / desired outcomes; Conservation objectives for each key habitat/ecosystem component e.g. coral reefs, seamounts, birds, terrestrial flora/ fauna; Key threats; Main management actions (either proactive management if relevant for terrestrial habitat/ecosystems, or likely restricted/permitted activities for management of marine habitats); Monitoring and reporting plan/cycle; Indicators of success/performance criteria.'*

However, the BIOT Interim Conservation Management Framework produced in September 2014 currently lacks detailed BAPs and CCT and the Darwin Projects are aiming to provide these before the end of the year. BAPs are important, especially for species that are threatened, but also for flagship species because their protection will confer wider benefits for other species which share the same habitat.

Development of Biodiversity Action Plans

During the Darwin Initiative project, we identified important species for which BAPs might be appropriate (see below), and various scientists are now working up data which will contribute to the formulation of these.

Some of the scientific work on species is being further developed in new projects too, such as turtle research (Darwin Initiative funded), elasmobranch studies (Bertarelli Foundation funded), and the Darwin Plus CAREX project, which aims to create a terrestrial action plan for the Chagos Archipelago.

At present, we do not know whether there will be human occupation and access to specific islands, and therefore we are unsure over the level of threat and requirement for future management. As a result, we are reviewing candidate species (and some habitats) for inclusion, not only because of their IUCN Red List status, but also on the basis of their local status in Chagos, potential threat, restoration value, and functional or indicator role.

We want to select species that are threatened or are flagship species whose protection will confer wider benefits for other species in the same habitat. We have good data on some species groups (plants, birds, Holothuria, coconut crab, some fish) and some habitats (coral reef habitats, native woodland).

Each BAP requires: (a) inventories of biological information of selected species/habitats; (b) assessment of the conservation status of each species within a specified ecosystem; (c) targets for conservation or restoration; (d) budgets, timelines and institutional partnerships for implementing the BAP. Scientists working on specific groups will complete a template for their species (not unlike the excellent Darwin Ascension Island examples which can be seen at: http://www.ascension-island.gov.ac/government/conservation/projects/bap/).

Each BAP will be checked and edited by a review team, and the finished documents will be made available through the Chagos Information Portal, (ChIP) and will be submitted to BIOT Administration for inclusion as annexes to the BIOT Interim Conservation Management Framework.

Potential BAP species and habitats are indicated below, from which we will select a dozen or so. If you are interested in being involved in helping to prepare BAPs, then you would be most welcome to join the team. Please contact John Turner, j.turner@bangor.ac.uk.

Coconut crab
© John Turner

Plants: Remnants of native flora and important bird habitat
Cololejeunea planissima var. *chagosensis* (liverwort). Endemic.
Lumnitzera racemosa (Black mangrove). IUCN Red List status Least Concern. Small grove on Moresby, Peros Banhos atoll. Surveyed.
Pemphis acidual (Mangrove). Least Concern. Ile Anglaise & Ile du Passe Salomon atoll
Barringtonia asiatica (Fish poison tree, Rose tree). Least Concern. Few surviving in Chagos. Surveyed.
Cordia subcordata. Least Concern.
Guettarda scabra (Beach gardenia) Least Concern. Groves.
Hernandia sonora (the Lantern Tree). Woodland.
Pisonia grandis trees. Surveyed.
Calophyllum inophyllum
(Note: Terrestrial species BAPs to be considered for preparation by Darwin CAREX)

Invertebrates
Ctenella chagius (endemic Chagos brain coral) Endangered. Surveyed.
Birgus latro (Coconut robber crab). Data Deficient. Surveyed.
Holothuria (Sea cucumbers): Poached & overexploited
Stichopus chloronotus (Greenfish). Least Concern. Surveyed.
Holothuria atra (Lollyfish). Least Concern. Surveyed.
Holothuria nobilis (Black teatfish). Endangered. Surveyed.

Fish
Amphiprion chagosnensis (Chagos anemone fish) Possibly endemic. Not yet assessed for IUCN Red List.
Plectropomus laevis (Coral trout). Vulnerable. Easily overfished. Surveyed.
Epinephelus polyphekadion (Camouflage grouper) Near Threatened. Easily overfished. Surveyed.
Chlorurus strongylocephalus (Heavy beak parrot fish). Least Concern. Small excavator. Surveyed.
Cheilinus undulates (Humphead wrasse). Endangered. Surveyed.
Bolbometopon muricatum (Green humphead Parrotfish). Vulnerable. Major eroder. Surveyed.
Aprion viriscens (Green job fish snapper). Apex piscivore. Surveyed.
Chaetodons (Butterfly fish). Obligate and facultative corallivores are a secondary indicator of coral community health. Eight species assessed:
C. bennetti, C. lineolatus, C. melannotus, C. meyeri, C. ornatissimus, C. trifascialis, C. trifasciatus, C. zanzibarensis.
Chaetodon trifascialis (Triangulate butterflyfish). Near Threatened. Surveyed.
Chaetodon bennetti (Bluelashed butterflyfish). Data Deficient. Surveyed.
All others are Least Concern.

Sharks and Rays: Overexploited in Indian Ocean, poached in Chagos
Manta alfredi (Reef manta ray). Vulnerable. Surveys underway.
Manta birostris (Oceanic manta ray). Vulnerable. Surveys underway.
Carcharhinus ambylrhnchos (Grey reef shark). Near Threatened. Surveyed & underway.
Carcharhinus albimarginatus (Silvertip shark). Near Threatened. Surveyed & underway.
Carcharhinus limbatus/melanopterus (Blacktip shark). Near Threatened. Surveyed & underway.
Nebrius ferrugineus (tawny nurse shark). Vulnerable. Surveyed & underway
Galeocerdo cuvier (Tiger shark). Near Threatened. Rarely seen.
Triaenodon obesus (Whitetip reef shark). Near Threatened. Surveyed.

Turtles
Chelonia mydas (Green turtle). Endangered. Surveyed.
Eretmochelys imbricata (Hawksbill turtle). Critically Endangered. Surveyed.

Birds: **Important breeding colonies in 10 IBAs + 2 provisional IBAs.**
All birds below surveyed regularly now. These are all of Least Concern but important locally due to island vegetation management.
Sula sula (Red footed booby)
Sula dactylatra (Masked booby)
Anous stolidus (Brown noddy)
Anous tenuirostris (Lesser noddy)
Onychoprion fuscatus (Sooty tern)
Fregata minor (Greater frigate)
Fregata ariel (Lesser frigate)
Puffinus iherminieri (Audabon's shearwater)
Puffinus pacificus (Wedge-tailed shearwater)

Potential BAP habitats
Coral reef. To include specific reef zones (lagoon, leeward and patch reefs, seaward reef, algal ridge, reef terrace, shallow and deep forereef slope. All atolls. Surveyed.
Mangrove. Rare and localised in Chagos (Moresby, Eagle).
Scaevola/Argusia/Tournefortia thicket. Important habitat & engineer species. Surveyed.
Native tree groves. Important habitat. Surveyed.

CCT's Investment Review

Birgitta Bostrum, CCT Trustee and Investments Advisor

CCT has had an investment portfolio for over three years since receiving the bequest from our founder Commander John Topp.

After receiving the funds, the board started working on a suitable investment policy and strategy to be implemented.

When deciding on the investment policy we considered:

- Our investment horizon
- Our liquidity needs
- Our attitude towards investment risk
- Any unique features such as environmental investment requirements
- Legal aspects as stated by our constitution or any other documents

Taking all this into consideration, the board decided that we should invest with a long-term investment horizon and take medium to medium-high risks in the portfolio in order to aim to achieve five per cent return per annum. This return goes towards the budget and the money is used to pay for ongoing expenses of the Trust.

Following the decision of what investment style to choose, the Finance Committee (FC), studied a long list of suitable managers and recommended three to manage our investment portfolio. The Board agreed with the recommendations and the three investment portfolios were set up in late summer of 2012.

Three years on, the FC thought that it would be prudent to have a review of both the investment policy and the strategy. This was done during the first quarter of 2016.

The review found that the investment policy was still valid, and though five per cent return might be a high target, it will remain for now. Further, the three investment managers currently used have performed in line or better than managers measured by the so called WMI Charities index, ARC index and two Investment Association groups. As such there was not need to change investment manager due to performance. The FC also studied fees paid for our investment services and found those to be in line with other portfolios of this size.

It was therefore concluded that our investment policy and strategy continues to be suitable for CCT and no changes need to take place currently.

Socially Responsible Investment

CCT's three investment portfolios are managed in a so called socially responsible investment (SRI), sometimes also referred to as ESG (environmental, social, ethical and governance) investment style. This style is about taking steps to ensure that a charity's investments reflect its values and ethos and do not run counter to its aims. In the case of CCT, the Board clearly wanted to make sure that our investments were in line with our environmental focus and beliefs.

A greater focus on the damage to our planet by the continuous use of fossil fuels has become a main focal point in SRI investments over the past several years.

Investment managers use several approaches to influence companies to operate in a more suitable manner, these include:

Positive Screening: involves positively selecting companies for investment that have a commitment to responsible business practices and/or that produce positive products or services.

Negative screening: involves avoiding investing in companies or sectors that do not meet the ethical criteria that the charity has set. Negative screening is currently the most common approach to SRI investing.

Engagement or shareholder activism: is using the influence and rights of ownership to encourage more responsible business practices.

There are currently no standard SRI guidelines for the industry but most investment funds for UK charities follow the guidance of the Church of England's ethical committee. These guidelines are continuously challenged and improved.

CCT's investment funds are managed by Rathbones, Sarasin and Partners and Newton Investment Management.

Pristine Coral Reefs
© Rohan Holt

My Mission to Hawai'i

Claudia Naraina, CCT Chagossian Scholar

In February this year I was invited by CCT and Big Ocean to attend a think tank on the importance of human dimensions in Large Scale Marine Protected Areas (LSMPA's) design and management.

The aim of the meeting was to raise awareness, share knowledge, learn from and integrate indigenous culture in LSMPA's.

It was a great opportunity for me to learn from others and also talk about our project (Connect Chagos), which is not a community of practice but a project where the Chagossian community has had the opportunity to be involved in protecting their marine reserve and be able to be part of scientific expeditions. We were taught and have acquired different skills to be able to assist scientists in their respective research.

Chagos is uninhabited apart from Diego Garcia and the island area is significantly smaller than all the other Big Ocean sites, but the issues are similar to other places in the world. Coral bleaching, poaching and cultural issues are also relevant everywhere, which I have learned by participating in this particular think tank. We actually have learned from each other, some people thought that there were no more native Chagossians and that their descendants had given up on their island and their culture.

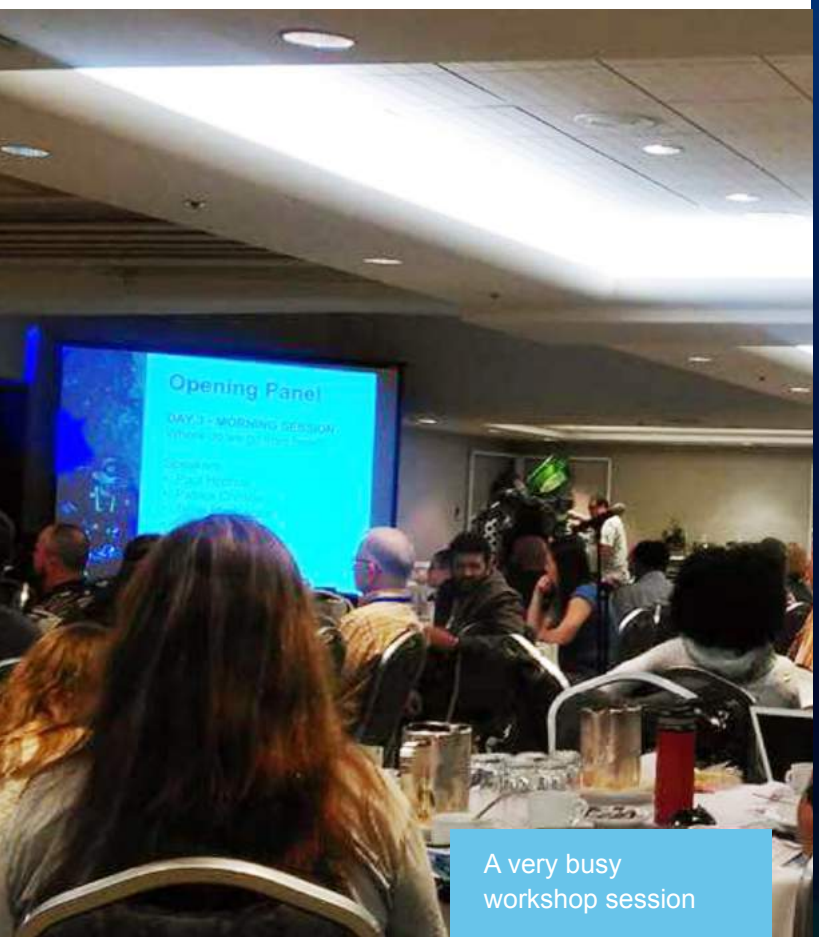
It was my first participation and it was a great experience, as we discussed how to maintain, protect, enhance and how social science can aid in natural resource management. We also

Claudia with fellow particiants

discussed how to use our past history, both cultural and environmental to know where we are going in the future.

It was good to know the economics/ socioeconomics side of things and who could be invited to the next meeting, as other uses and industries could also contribute by sharing the issues that they usually encounter and share their knowledge.

Shared ideas and enthusiasm were used to develop new projects, strategies and methods, to work together to protect unspoiled ocean environment, as it is not only about protecting our respective marine reserves but the global ocean.



A very busy workshop session

Thank you!

We are as always very grateful to those who contribute articles to Chagos News.

For more information on Chagos News please contact the editor at chagosnews@chagos-trust.org.

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