BRITISH INDIAN OCEAN TERRITORY

Interim Conservation Management Framework

About this framework

The community of those with an interest, and stake, in the environmental protection of the British Indian Ocean Territory (BIOT) is large and diverse: a testament to its unique status and condition. This document, produced by the BIOT Administration (BIOTA) in conjunction with partners, is intended to provide a clear and coherent structure within which to reconcile these broad-ranging interests. Building on existing policies and initiatives, it describes the Territory's main biodiversity resources, identifies its key stressors and, in pursuit of a shared vision, sets out priorities for practical action. A 'living' document, which will be subject to regular review, this is an interim framework and will, pending the outcome of policy reviews by the UK and BIOT Governments, be replaced by a longer term plan in due course.

As has long been the case, partnership – with statutory, non-governmental and academic sectors, amongst others – is, and will remain, central to conservation efforts within the Territory. These efforts include, at their heart, a vast marine protected area, supported by the Bertarelli Foundation through a public-private partnership brokered by the Blue Marine Foundation. We welcome equally the collaboration of those whose interest in BIOT overlaps, or extends beyond, the boundaries of this Framework; organisations like the Bertarelli Foundation and Chagos Conservation Trust, who have themselves developed priorities and plans for science and conservation in BIOT. It is therefore fitting that this framework is the product of consultation, with ambitions that reflect a broad array of expertise, ownership and resource. The Administration is committed to developing these partnerships, and to ensuring that, through its governance of the Territory, operational, security and infrastructure requirements are reconciled with those of environmental protection.

Vision

Our overarching vision is:

To maintain and, where possible, enhance the biodiversity and ecological integrity of the British Indian Ocean Territory, recognising and celebrating its unique global value. We want to see its ecosystems thrive, its human uses carefully managed, such that BIOT continues to act as a reference site for global conservation efforts and an observatory for undisturbed ecosystems; and to see our own efforts, formerly piecemeal, corralled and prioritised alongside a continued understanding of the Territory's needs.

We will examine and enhance our enforcement efforts, and develop monitoring methodologies which are effective, demonstrate value for money, and can be used as templates for other large MPAs. We will routinely monitor and test our approach, ensuring that management activities translate into biological outcomes; and will communicate our work, such that others may derive benefit from it, and the broadest array of resources and expertise may be brought to bear.

Introduction

One of 14 UK Overseas Territories, BIOT incorporates the islands of the Chagos Archipelago, and covers c.640, 000 km^2 of ocean at the geographical centre of the tropical Indian Ocean. Lying at the southern end of the Lakshadweep-Maldives-Chagos ridge, the archipelago contains five islanded atolls, and a greater number of drowned atolls and other submerged banks, central to which is the Great Chagos Bank, the world's largest living coral atoll. A 'no take' marine protected area (MPA) was declared in 2010, which extends to the 200nm boundary of the Territory's Environmental Preservation and Protection Zone (EPPZ). This is, at present, the world's largest no take marine area, and lies at the heart of BIOTA's ambitious plans for world-leading conservation and management of the Territory.

BIOT currently has no permanent population, only UK and US military personnel, together with associated civilian contractors, based in Diego Garcia. There are no inhabitants on the other islands. The UK Government is, however, committed to a review of its policy on resettlement of BIOT; to inform this, an independent Feasibility Study is underway. This framework will accommodate and account for the outcome of this policy review, in due course.

Description of natural values

Marine

BIOT hosts a wide variety of marine habitats, coupled with exceptionally unimpacted marine ecosystems. These habitats extend across more than 60,000 km^2 of shallow marine substrate, 86 seamounts and 243 deep knolls, and host over 220 species of coral, 855 species of fish and 355 species of molluscs. Research also indicates that BIOT may be considered among the least contaminated of all reefal sites in the Indian Ocean, and indeed the world[1]. It is considered to be an important biogeographic 'stepping stone', enabling greater connectivity of shallow marine biota across the Indian Ocean in geological and, to some degree, ecological timeframes[2,3].

BIOT's shallow reefs, together with the islands they adjoin, are relatively well documented: they are, in some cases, amongst the best understood globally[4]. Although the area of actively growing reef is uncertain, it is clear that reefs remain in exceptionally good condition, notwithstanding episodic impacts from ocean warming. Indeed, this is thought to have caused over 90% mortality in 1998, since when the rapid recovery of BIOT's reefs contrast starkly with that of some other sites across the Western Indian Ocean. Given global declines in reef health, those of BIOT – which already represent 25-50% of those in 'excellent condition' across the Indian Ocean – are becoming, proportionately, increasingly valuable. Survey results indicate that coral diversity in BIOT is amongst the highest in the Indian Ocean, and includes the endemic Chagos brain coral, or *Ctenella chagius*; equally, that the reef fish biomass it supports is six times greater than the next highest figures for Indian Ocean coral reefs (regardless of whether fished or protected) [5]. Although BIOT's fish fauna is similar in composition to that of the Maldives, endemic species are present, including *Amphiprion chagosnensis*, the Chagos anemonefish. The archipelago also hosts areas of seagrass, many hectares of which were discovered as recently as 2014, following results from satellite tracking of green

[1] Sheppard, C.R.C, M.R.D. Seaward, R. Klaus & J.M.W. Topp (1999), 'The Chagos Archipelago: an introduction', in *Ecology of the Chagos Archipelago* (ed. C.R.C. Sheppard & M.R.D. Seaward), Linnean Society, p.17

[2] Sheppard, C.R.C et al. (2012), 'Reefs and islands of the Chagos Archipelago, Indian Ocean: why it is the world's largest no-take marine protected area', in *Aquatic Conservation: marine and freshwater ecosystems*, vol.22 , p.245

[3] Sheppard, C.R.C. et al. (2013) 'British Indian Ocean Territory (the Chagos Archipelago): setting, connections and the Marine Protected Area', in *Coral Reefs of the United Kingdom Overseas Territories* (ed. C.R.C.Sheppard). Passim.

[4] Sheppard, C.R.C. et al. (2012), *Conservation and Management in British Indian Ocean Territory (Chagos Archipelago)*, p.3

[5] Graham, N. A. J., and T.R. McClanahan (2013), 'The Last Call for Marine Wilderness?', *BioScience*, v. 63, no. 5, pp. 397-402.

turtles that migrated from Diego Garcia to forage on the Chagos Bank[6]. Broadly recognized for the ecosystem services they provide, these areas provide foraging habitats for endangered green turtles (*Chelonia mydas*), whilst the barachoises of Diego Garcia provide a unique foraging habitat for juvenile hawksbill turtles (*Eretmochelys imbricata*).

Beneath the deep oceanic waters of BIOT lies an exceptional diversity of geological features, including submarine mountains, an abyssal trench (the Chagos Trench, extending to over 5400m), a broad abyssal plain[7] and, as noted above, an estimated 10% of all Indian Ocean seamounts. Features such as these provide, for their large bathymetric range, numerous depth-defined habitats fully representative of mid oceanic biota that are known to support a huge diversity of marine systems. Yet to be mapped or explored, BIOT's deep water habitats are expected to harbour undiscovered and unique species. Moreover, given the increasing damage to benthic habitats and communities worldwide by deep-water trawling (which has never been known to happen in the Territory), BIOT has a unique role in deep-water ecosystem conservation and research. The Territory's pelagic waters are, in addition, host to a number of important species, including birds, cetaceans, tunas and elasmobranchs. There is increasing evidence that large no take MPAs, like that of BIOT, are necessary to protect migratory species[8], such as pelagic fish and marine mammals, and to offset the effects of fishing beyond them[9].

Terrestrial

Although the islands forming BIOT are only several thousand years old – too short a period to achieve great speciation or endemism – their geographic setting and remoteness render BIOT's terrestrial environment of significant bio-geographic importance[10]. However, while its marine system remains broadly pristine, large parts of BIOT's terrestrial environment has suffered from human interference.

The islands of BIOT have a total terrestrial area of approximately 60km^2. All are low-lying coral islands, most with a maximum elevation of 1-2m, and formed exclusively from limestone sand and rock, with further organic components. Even so, there is considerable variety in their vegetation distribution and plant associations[11]. Of 280 higher plants recorded in the Territory, only about 45 are considered native, the rest having been introduced through human activity. The coconut palm (*Cocos nucifera*) may not have been introduced originally, but its propagation to create plantations on many islands across the Territory led to significant loss of natural vegetation cover, and continues to suppress the regeneration of native flora, and associated fauna. Human habitation was also accompanied by the introduction of non-native fauna, many of which (e.g. the black rat, or *Rattus rattus*) are invasive and have compounded declines in island biodiversity.

Predominant amongst the native broad-leaved tree species are *Barringtonia asiatica* (Fish Poison Tree), *Guetterda speciosa* (Beach Gardenia), *Hernandia sonora* (the Lantern Tree) and *Pisonia grandis*. Sandy or rocky shorelines are generally dominated by the shrub *Scaveola taccarda*, known as Scavvy, and *Argusia argentea,* the Beach Heliotrope, both of which play vital, if different, ecological functions. Many islands have

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[6] Hays, G.C., J.A. Mortimer, D. Ierodiaconou and N. Esteban (2014), 'Use of long-distance migration patterns of an endangered species to inform conservation planning for the world's largest marine protected area', *Conservation Biology,* published online, DOI: 10.1111/cobi.12325

[7] Williamson, P. (ed.) (2009), *Marine conservation in the British Indian Ocean Territory: science issues and opportunities*. Report of Workshop held 5–6 August 2009 at the National Oceanography Centre, Southampton.

[8] Game, E.T. et al. (2009), 'Pelagic protected areas: the missing dimension in ocean conservation', *Trends in Ecology and Evolution, 24(7)*, 360–369

[9] Walters, C. (2000), 'Impacts of dispersal, ecological interactions, and fishing effort dynamics on efficacy of marine protected areas: how large should protected areas be?', *Bulletin of Marine Science*, 66, 745–757

[10] Sheppard, C.R.C et al. (1999), *Ecology of the Chagos Archipelago*, p.15

[11] Topp, J.M.W. and C.R.C Sheppard (1999), 'Higher plants of the Chagos Archipelago', in *Ecology of the Chagos Archipelago* (ed. C.R.C. Sheppard & M.R.D. Seaward), Linnean Society, p.233

extensive terrestrial areas that are either bare limestone or have a covering of low vegetation. There are also small areas of mangrove (*Lumnitzera racemosa*) on at least two islands, and an area of peat on Eagle Island.

The islands host large numbers of breeding bird species, many of them in globally important numbers. Hardwood stands support populations of Red-footed booby (*Sula sula*), Brown (*Anous stolidus*) and Lesser *(Anous tenuirostris*) Noddy, alongside Greater (*Fregata minor*) and Lesser (*Fregata ariel*) Frigatebird. On the island of North Brother, low limestone cliffs provide a habitat for Audubon's (*Puffinus lherminieri*) and Wedge-tailed Shearwaters (*Puffinus pacificus*), whilst the bare rocky islands of Resurgent and Coin de Mire host Masked Booby (*Sula dactylatra*). The shifting sandbars of the Egmont Islands support a variety of nesting terns, with Sooty Terns (*Sterna fuscata*) breeding in large numbers across the Territory. The archipelago regularly hosts vagrants from all four compass points.

The critically endangered hawksbill and endangered green turtle, previously exploited in the archipelago, now nest undisturbed throughout the two thirds of BIOT's coastline that is thought to provide suitable habitat[12]. The coconut crab (*Birgus latro*), also of global conservation concern, is present in significant numbers: indeed, surveys indicate that, on Diego Garcia, population densities appear to be amongst the highest recorded globally for this species[13]. Whilst considerable knowledge exists of BIOT's higher plants, birds, mammals and insects, other terrestrial taxa – including invertebrates and fungi – remain poorly studied, and their global significance unknown[14].

Key Stressors

Despite its remote location and largely uninhabited state, BIOT is subject to a wide range of environmental and anthropogenic stressors. An understanding of these, and of potential future threats, provides a backdrop for identifying priority management needs and informing an ecosystem-based management approach[15]. Given its status as a relatively pristine control site for the Indian Ocean and beyond, information gained here on the effects of stressors and on factors contributing to ecosystem resilience will have applicability for managers and researchers worldwide. We recognise that this list of stressors is based on our current knowledge and may change over time.

1. Illegal fishing and harvesting

Although commercial fishing is banned throughout BIOT, the MPA remains subject to pressure from illegal fishing and harvesting. As the global human population increases and degradation, resource exploitation and loss occurs elsewhere, this pressure is liable to increase. Historically speaking, two main forms of illegal exploitation have occurred:

i) Boat-based fishing: generally either by small multi-purpose fishing vessels targeting shark or, for tuna, by large-scale longline vessels;
ii) Island-based encampments, primarily for the purposes of collecting sea cucumbers[16];

Besides the direct loss of wildlife through take and by-catch, illegal fishing and harvesting pose significant secondary risks, including the (re-)introduction of invasive species, and pollution.

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[12] Mortimer, J.A. and M. Day (1999), 'Sea turtle populations and habitats in the Chagos Archipelago', in *Ecology of the Chagos Archipelago* (ed. C.R.C. Sheppard & M.R.D. Seaward), Linnean Society, p.159

[13] Vogt, S. (2004), 'Coconut Crab (*Birgus* latro) Survey on Diego Garcia', in *Diego Garcia Integrated Natural Resources Management Plan* (September 2005), http://www.zianet.com/tedmorris/dg/2005NRMP-Appendixg-coconutcrabsurveys.pdf (accessed 10/6/2014)

[14] RSPB (2014), *The UK's wildlife overseas: a stocktake of nature in our Overseas Territories*, p.30

[15] Papahānaumokuākea Marine National Monument (2008), *Papahānaumokuākea Marine National Monument Management Plan*, vol.1, http://www.papahanaumokuakea.gov/management/mp/vol1_mmp08.pdf (accessed 10/6/2014), p.57

[16] Price A.R.G., A. Harris , A. Mcgowan, A.J. Venkatachalam, & C.R.C. Sheppard (2010), 'Chagos feels the pinch: assessment of holothurian (sea cucumber) abundance, illegal harvesting and conservation prospects in British Indian Ocean Territory', *Aquatic Conservation: marine and freshwater ecosystems*, vol.20:117-126

2. Invasive and pest species

As noted, the introduction of non-native species has accompanied prolonged human activity in BIOT. While some remain rare and relatively harmless, others are more aggressively invasive, the black rat and domestic cat (*Felis catus*) amongst them, with damaging impact on native flora and fauna. Although probably native along BIOT's shores, the massive enhancement of coconut palms in plantations across the archipelago has led to this species also damaging the natural environment, preventing the regeneration of native systems. Besides these legacy cases, introduction of further non-native species is, of course, an ongoing risk.

3. Climate change

Recent decades have brought increased awareness of the changing global environment and the implications this may have on ecological processes. These include increases in average global temperatures, sea level rise, and changes in chemical compositions of the world's oceans. Whilst the scale of their impact and implications are subject to debate, several trends have been well documented, of which those most relevant to BIOT include: weather changes; coral bleaching and mortality, sea level rise, likely increasing rates of erosion or inundation events; and oceanic chemical composition change.

4. Coastal change

Coastal change, including by means of accretion and erosion, is well documented[17] across the Territory. Given the broad-ranging complexity of island dynamics, however, its scope, causes and consequences are not yet clear[18].

5. Disease

Although the incidence of diseases affecting marine organisms is increasing globally, the factors contributing to disease outbreaks are poorly known[19]. While observations in 2014 indicate a generally low prevalence of coral disease throughout the Territory, five disease types were recorded, of which *Acropora* white syndrome was found to be locally severe at several sites[20].

6. Pollution

Despite the near pristine chemical status of its waters[21], BIOT is subject to high levels of debris. Comprising largely of plastics, polystyrene and rope, pollutants are thought to originate principally from land-based sources around the Indian Ocean and maritime activities throughout it. Although research has indicated that the environmental impact of beached debris in BIOT is slight[22], nesting turtles, crabs and avifauna are at particular risk through ingestion, obstruction or entanglement. Floating debris is common and a major hazard to marine species and seabirds. It includes discarded fishing gear and abandoned or lost fish aggregation devices (FAD), potentially the results of illegal fishing activity. Wastewater discharge by vessels,

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[17] See references in Hamylton, S. & H. East (2012), 'A Geospatial Appraisal of Ecological and Geomorphic Change on Diego Garcia Atoll, Chagos Islands (British Indian Ocean Territory)', *Remote Sensing*, vol.4, *passim*

[18] Hamylton, S. & H. East (2014), 'Response to Sheppard, C., Atoll Rim Expansion or Erosion in Diego Garcia Atoll, Indian Ocean? Comment on Hamylton, S. and H. East, 'A Geospatial Appraisal of Ecological and Geomorphic Change on Diego Garcia Atoll, Chagos Islands (British Indian Ocean Territory)' *Remote Sensing*, vol.6, *passim*

[19] Harvell, C., K. Kim, J. Burkholder, R. Colwell, P. Epstein, D. Grimes, E. Hofmann, E. Lipp, A. Osterhaus, R. Over-Street, J. Porter, G. Smith, & G. Vasta (1999), 'Emerging Marine Diseases ─ climate links and anthropogenic factors', *Science* 285: 1505-1510

[20] Couch, C. (2014), 'Assessing Coral Disease Prevalence, Severity and Susceptibility', *Chagos Science Expedition Report 2014*, published online at http://chagos-trust.org/sites/default/files/images/Chagos%202014%20Darwin%20Science%20and%20conservation%20expedition%20report_0.pdf (accessed 05/08/2014)

[21] Readman, J.W., I. Tolosa, J. Bartocci, C. Cattini, A.R.G. Price & A. Jolliffe (1999), 'Contaminant levels and the use of molecular organic markers to characterise the coastal environment of the Chagos Archipelago', in *Ecology of the Chagos Archipelago* (ed. C.R.C. Sheppard & M.R.D. Seaward), Linnean Society, p.297

[22] Price, A.R.G. (1999), 'Broadscale coastal environmental assessment of the Chagos Archipelago', in *Ecology of the Chagos Archipelago* (ed. C.R.C. Sheppard & M.R.D. Seaward), Linnean Society, p.293

and dumping of additional pollutants, is prohibited throughout BIOT's internal and territorial waters, although this remains a threat.

7. Visiting vessels

Although carefully managed to minimise their impact, visiting vessels nevertheless pose a variety of threats to both terrestrial and marine environments. Foremost amongst these are: the introduction of non-native species; damage to the benthos, as a result of anchoring; illegal fishing; and pollution.

8. Human activities on Diego Garcia

The facilities on Diego Garcia have provided an important support to environmental restoration, monitoring, surveillance and science across the Territory. Although the development, running and maintenance of these facilities inevitably have impacts on the natural environment, these have, in large part, been managed and contained. Care must be taken, however, to ensure that protocols and regulations remain abreast of changing human demands, and of BIOT's ecological character.

Priority areas for conservation and management

Our proposed actions, over the interim period covered by this plan, fall across the five priority areas below. An ambition is set out beneath each, which links to our overarching vision for the Territory.

1. **Understanding and interpreting the ecosystem**
   - Promote ecological characterisation, monitoring and research that increase understanding, inform management, and are consistent with our ambitions for conservation and protection.
2. **Conserving wildlife and habitats**
   - Protect, preserve, maintain and, where appropriate, restore the physical environment and natural biological communities of BIOT.
3. **Reducing threats**
   - Assess, characterise and, where possible, mitigate threats to BIOT's natural resources, including through the use of effective enforcement to deter and counter illegal exploitation.
4. **Managing human uses**
   - Reconcile human activities in BIOT with environmental obligations and ambitions, to maintain ecological integrity and minimise adverse impacts on the environment.
5. **Coordinating and communicating conservation management activities**
   - Facilitate cooperative conservation efforts that promote ecosystem-based management, complement operational requirements, and maximise collaborative value.

Monitoring and Evaluation

Although the time period for this interim plan is short, we recognise that much important work is already ongoing, and in some cases has been underway for many years. The value this framework adds is to corral this work, together with new initiatives, under a strategic set of ambitions, in support of an adaptive management process. To this end, the BIOT Administration will review, in conjunction with partners, the status and effectiveness of each action every six months, detailing progress made and setbacks encountered. This review will be circulated, in draft, to all interested parties, to ensure an opportunity for wider comment and review. This will also to ensure that lessons are learned, collaborative opportunities identified, and issues addressed at an early stage.

List of proposed actions

Action	Target / Indicator	Partners (see key below)
1. Understanding and interpreting the ecosystem		
Commence programme to evaluate impact of no-take MPA on tuna stocks, in collaboration with IOTC.	Evaluation plan and protocols developed and implemented. Buy-in secured from IOTC and neighbouring partners.	BIOT Fishery Enforcement Advisers
Monitor status of reef sharks and fish assemblages to evaluate the impact of no-take and IUU controls, in a range of representative habitats.	Select from existing study areas key monitoring locations. Protocols developed and implemented. Biological changes linked to environmental variables and management measures.	JCU, UWA, ZSL, CORDIO
Monitor the status of pelagic sharks and fish (e.g. tunas) to evaluate the impact of no take and IUU controls.	Establish key monitoring locations. Protocols developed and implemented. Biological changes linked to environmental variables and management measures.	UWA, ZSL, AAD, St Andrews, Bertarelli
Monitor movements of elasmobranchs (sharks, manta rays) within BIOT to understand connectivity and behaviour with recovery of these populations.	Connectivity between atolls quantified as movements increase as abundance and size of animals increase. Manta rays and focal shark species: greys (as reef example), silvertips (as quasi reef/oceanic) and tigers.	Stanford, ZSL, Manta Trust, Bertarelli
Initiate survey programme for marine mammals.	Establish monitoring plan and protocols. Initiate monitoring. Focal studies integrated with science expeds.	BIOT Fishery Enforcement Advisers, Swansea, Bertarelli
Develop remote, satellite-linked, monitoring/enforcement units.	Data collected on species abundance, diversity and environmental variables. Deterrent to, and ancillary to monitoring of, IUU. Baselines and surveillance coverage improved.	ZSL / UCL
Review protocols for data collection of confiscated illegal catches.	Improved understanding of species and morphometrics of poached species. Lab analysis of parameters such as stable isotopes, xenobiotic accumulation etc.	UWA, BIOT Fishery Enforcement Advisers
Establish detailed baselines for assessing coral disease prevalence.	Key monitoring locations established and initial analyses undertaken.	Warwick, Hawai'i
Monitor coral cover.	Building on previously established baselines, indicators of reef health provided.	Warwick
Monitor continuous sea temperature and ocean acidity to better understand risks from climate change.	Enable ongoing assessment of temperature change and associated anomalies.	Warwick
Commence discovery and documentation of deep-sea ecosystems.	Mapping of representative sea-mounts and island/plateau slopes. Description of associated benthic ecosystems, including sessile marine species and demersal communities. Multifrequency acoustic studies of Deep Scattering Layer interaction with seamount and archipelagic slope systems to examine bentho-pelagic coupling. Initial expedition identifies longer term monitoring plan.	Oxford et al., Bertarelli
Establish detailed baselines for assessing island geomorphological change, with an aim to informing management actions.	Baseline maps for DG and northern atolls completed.	BIOTA, NSU
Monitor diversity, abundance, movements and	Diversity and abundance of seabirds increases with habitat rehabilitation; distance for foraging decreases	CCT, ZSL

distribution of seabirds.	with increasing abundance of bait schools and tunas. Management actions informed.	
Establish detailed baselines for terrestrial environments, including poorly studied taxa and vulnerable habitats (including mangrove).	Biodiversity interests and priorities identified. Terrestrial Management Plan informed.	Kew, Bradford, CCT, RSPB, ZSL
Monitor sea turtle populations, incubation conditions, foraging behaviours, genetic characteristics and migration.	Conservation and management actions informed.	Swansea Florida
Review ecological character of Ramsar site in Diego Garcia.	Management actions, if/where necessary, informed. Obligations under Ramsar met.	BIOTA, DEFRA, CSA
Video-document key terrestrial and marine habitats.	Complete visual baselines for key monitoring locations, to complement ongoing scientific programmes. Open source data made available for ongoing research and communications.	Bangor, Jon Slayer, Google, Catlin Seaview, Oxford, Queensland
2. Conserving wildlife and habitats		
Develop terrestrial management plans for outer islands, including identification and recommendations for ongoing or future restoration or ecological improvement.	Terrestrial conservation work informed and prioritised according to ecological need.	BIOTA, Kew, RSPB, Bradford, CCT, ZSL
Undertake field-based review of habitat restoration projects underway on DG.	Production of management plans / guidelines for habitat restoration.	BIOTA, US, Kew
Intervene, where necessary to protect or preserve terrestrial biodiversity.	Vulnerable species and/or habitats protected in the immediate term, prior to implementation of terrestrial management plan. Proposed interventions subject to peer review.	
Complete planned rat eradication project on Ile Vache Marine in August '14.	Absence of rats, as determined by follow-up surveys after 6 and 12 months. Inform plans for broader rat eradication.	Peter Carr / BIOTA
Produce official list of 'pest' species.	Removal policies for invasive species informed and peer-reviewed.	Kew, ZSL, Hawai'i, Warwick
Continue monitoring and habitat management of wetlands in Diego Garcia.	Biodiversity and ecosystem goods and services of DG's wetlands secured.	BIOTA, CSA, DEFRA
3. Reducing threats		
Review and develop a new enforcement strategy for the MPA, including review of legislative options available with reference to UNCLOS and other relevant international agreements.	Reduction in resource loss through illegal exploitation, with reduction in secondary risks. Strategy to be informed by comprehensive description of the current incidence and patterns of illegal exploitation. Use of all available data and capabilities, civilian and military, to support this, and inform continuous surface picture compilation.	BIOTA/HQ, BIOT Fishery Enforcement Advisers, Bertarelli
Undertake socio-economic study of drivers for illegal exploitation.	Enforcement strategy informed, and full range of options for reducing drivers of illegal exploitation considered.	BIOT Fishery Enforcement Advisers, Manta Trust
Work with regional partners, bilaterally and through IOTC, to promote understanding and effective prevention of illegal exploitation.	Regional ownership of a regional threat. Effective coordination of associated efforts leading to reduction in resource loss and secondary risks throughout BIOT and the broader Indian Ocean.	BIOTA, BIOT Fishery Enforcement Advisers
Undertake a strandline survey of beach debris.	Environmental impacts identified, to inform action plan.	BIOTA
Continue beach clean-ups in Diego Garcia.	Minimal adverse environmental impact, targeted towards turtle nesting areas, supported by volunteer participation.	BIOT HQ Swansea / Florida

Introduce protocols for treatment of FADs, discarded or abandoned fishing gear and other significant floating debris.	Protocols and templates for recording information on, and handling, incidences of fishing gear found in the water and during beach clean-ups revised and included in database. Data summarised annually.	BIOT Fishery Enforcement Advisers / SFPO
4. Managing human uses		
Enforce controls and regulations designed to protect the environment of the Territory.	Ecological integrity maintained, and adverse anthropogenic impacts minimised. Protection of vulnerable sites and species, including those listed under Ramsar and IBA designations.	BIOTA/ HQ, US
Monitor water quality in DG lagoon.	Phosphates and nitrates decline over time.	BIOTA (US, Cefas)
Undertake a detailed assessment of all legal non-commercial fisheries.	Undertake a creel survey to describe in detail the fisheries around DG and the northern atolls, including numbers of fishers, gear, catch and locations, in order to inform future regulation or management.	BIOTA, BIOT Fishery Enforcement Advisers
Refresh reporting requirements for recreational fishery, and fishery from visiting yachts.	Accurate and compulsory recreational fisheries monitoring (re-)established across all fishing categories (boat and shore based). Maximum amount of biologically useful information extracted from recreational fishing; impact assessments enabled. Appropriate mechanisms for ensuring or incentivising reporting are investigated.	BIOTA/HQ, BIOT Fishery Enforcement Advisers, MWR, ZSL/UCL
Assess / monitor ecological impact of treated wastewater effluent on reef conditions in DG.	Impact minimised through effective mitigation measures.	BIOTA/HQ, US
Assess landfill sites for signs of leaching.	Identify nature of hazard (if any) to inform mitigation.	BIOT/HQ, US
Review and, if necessary, revise protocol for disposal of confiscated illegal catch.	Minimal impacts on environment and human health.	BIOTA/HQ
Maintain the highest standards of environmental controls with regard to construction and engineering projects in Diego Garcia.	Environmental impacts minimized.	BIOTA/HQ, US
Assess current approach to reducing risks of shark-human contact on Diego Garcia.	Maximise safe access to nature for personnel, with improved information to reduce risks. Guidelines produced to advise on, and improve, public safety.	BIOT HQ / MWR, UWA
Re-assess protocols for waste disposal by visiting yachts.	Reduced environmental impact from excess waste on northern atolls.	BIOTA
Refresh /enforce regulations around outer-island anchorages.	Minimal benthic damage; reduced risk from sediment plumes.	BIOTA, BPV
Review and refresh BIOT environmental regulations.	Environmental regulations aligned with international obligations and best practice. Dedicated MPA legislation enacted, which consolidates and updated existing legislation.	BIOTA, DEFRA
Commence programme to evaluate impact of no-take on fishing fleet dynamics in collaboration with IOTC.	Evaluation plan and protocols developed and implemented. IOTC buy-in secured.	BIOT Fishery Enforcement Advisers
5. Coordinating and communicating conservation management activities		
Develop and implement active communications plans for conservation and environment, including information signage and outreach on DG and the outer islands.	Maximised engagement and education of personnel in Diego Garcia, and visitors to the outer islands.	BIOTA, BIOT HQ
Facilitate involvement of DG-based personnel in conservation and management efforts.	Maximised engagement and education of personnel, with increased benefits for morale and welfare. Maximised capacity for DG-based activities (habitat restoration, beach cleaning, turtle and bird monitoring).	BIOTA / HQ, MWR, Swansea, Florida, ZSL / UCL
Development and implementation of centralised data store for environmental information on BIOT.	Improved sharing of, and collaborative access to, scientific data on BIOT.	BIOTA, CCT

Determine and enforce data-sharing protocols for those working in BIOT.	Improved sharing of, and access to, cross-cutting value on environment in BIOT.	BIOTA
Recruitment of temporary resident environmental officer on Diego Garcia.	Effective attainment of DG conservation goals, through liaison with interested parties. Governing standards and environmental regulations implemented. Science and conservation projects communicated to local and visiting personnel.	BIOTA
Launch BIOTA website.	BIOT's unique environmental value broadcasted; management lessons communicated; key resources provided.	BIOTA
Produce and implement standardised protocols / documentation for science visits.	Clarity for all parties on roles and responsibilities, with bureaucratic burden minimised. Ease of doing business maximised.	ZSL, Bangor, Warwick, BIOTA
Routine scrutineering of science equipment stored in Diego Garcia.	Kit degradation minimised, and outlays for replacement / repair reduced.	BIOT HQ

Key of acronyms/abbreviations of partners in table above:

AAD	Australian Antarctic Division
Bangor	Bangor University
Bertarelli	Bertarelli Foundation
BIOT HQ	Office of British Representative, BIOT
BIOTA	British Indian Ocean Territory Administration
BIOT Fishery Enforcement Advisers	(Marine Resources Assessment Group)
BPV	BIOT Patrol Vessel
Bradford	University of Bradford
CORDIO	Coastal Oceans Research and Development in the Indian Ocean
CCT	Chagos Conservation Trust
Cefas	Centre for Environment, Fisheries and Aquaculture Science (UK)
CSA	Chief Scientific Adviser, BIOT
Defra	Department for Environment, Food and Rural Affairs (UK)
Florida	University of Florida
Hawai'i	University of Hawai'i
JCU	James Cook University
Kew	Royal Botanical Gardens, Kew
MWR	Morale, Welfare and Recreation programme (US)
NSU	Nova Southeastern University
Oxford	University of Oxford
Queensland	University of Queensland
RSPB	Royal Society for the Protection of Birds
SFPO	Senior Fisheries Protection Officer, BIOT
St Andrews	University of St Andrews
Stanford	Stanford University
Swansea	Swansea University
UCL	University College London
UWA	University of Western Australia
Warwick	University of Warwick
ZSL	Zoological Society of London