

Using the Global Strategy for Plant Conservation to guide conservation implementation in the UK Overseas Territories

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Summary. The Global Strategy for Plant Conservation (GSPC) was adopted by the Parties to the Convention on Biological Diversity (CBD) in 2002. Staff at the Royal Botanic Gardens Kew were closely involved in the development of the GSPC and contributed to the development of several of the targets and the plan of work which resulted from its adoption. The GSPC has become a key document for Kew to help guide its conservation policy and implementation. The UK Overseas Territories (UKOTs) Programme is one of Kew's cross-departmental science teams whose members work in collaboration with UKOT Governments and NGOs on conservation projects with the overall aim of supporting them in the implementation of the GSPC and in achieving its targets. The GSPC has provided an excellent overall framework to help shape conservation strategy, planning, and action in UKOTs. Like many small islands, UKOTs face a wide range of challenges in conserving their biodiversity and retaining ecosystem services whilst enabling development and maintaining livelihoods. Habitat loss and fragmentation, invasive alien species, development, and the increasing threat of global climate change present the most significant conservation challenges. At the heart of the UKOTs programme is a comprehensive work plan of specimen and data collection, mapping and capacity building in Territories plus facilitating access to historical specimens and data held at Kew. This enables progress towards achieving Targets 1, 2 and 3 (understanding and documenting plant diversity) and Targets 5, 7, 8 and 10 (conservation of plant diversity). All of these activities are accompanied by an extensive programme of capacity building to help support the development of technical skills and infrastructure to enable UKOTs to implement the GSPC (Targets 15 and 16) and the production of materials and interactions with schools and community groups to promote education and awareness-raising of plant conservation to achieve Target 14. UKOTs have been working with RBG Kew to prioritise activities in order to implement the GSPC and to identify those targets of most relevance locally. The main focus has been in documenting and understanding plant diversity and Targets 1 and 2 are close to completion for most UKOTs with good developments towards Target 3 for many. There is mixed progress with Objective 2 of the GSPC: conserving plant diversity. Excellent progress has been made with the *ex situ* Target 8, but more limited progress with the *in situ* targets and plant species still face many threats. Some Territories, most notably the Falkland Islands have made a good start with an Important Plant Areas programme. Although good progress has been made in documenting invasive species, there is major resource investment needed to implement the invasive species control strategies that have been identified. Good progress has been made with Target 14 and awareness is increasing, but there is a definite need for mainstreaming plant conservation issues. Some progress with Objective 5, building capacity for plant conservation, has been made, but a large 'capacity gap' remains and more trained personnel are needed with improved facilities and resources in order to implement the GSPC and meet its demanding targets. The GSPC has provided a unifying framework to enable conservation implementation across the UK's Overseas Territories and will continue to do so in the post-2010 period.

Key Words. conservation assessments, GSPC, important plant areas, red listing, threatened species, UKOTs.

Introduction

The UK Overseas Territories (UKOTs) comprise 16 former British colonies that have elected to retain their direct British links and as such form part of the United Kingdom and their citizens are British. Including many remote oceanic islands, UK Overseas Territories contain unique assemblages of UK biodiversity which are covered under the UK's signatory of

Multi-lateral Environmental Agreements, including the Convention on Biological Diversity (CBD) and CITES, once each Convention has been ratified locally and any enabling legislation enacted. Progress in extending the CBD to the Territories has been poor. To date the CBD has only been extended to include Ascension, British Virgin Islands, Cayman Islands, Gibraltar, St Helena and Tristan da Cunha (Pienkowski

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& Quick 2010). Adopted by the CBD in 2002, the Global Strategy for Plant Conservation (GSPC) has the overall objective of halting the current and continuing loss of plant diversity (GSPC 2002) and provides both a challenge and opportunity to the international community (Wyse-Jackson & Kennedy 2009). Treated as a cross-cutting issue within the CBD, the GSPC is being implemented by UKOTs within the context of implementing the CBD. The GSPC has been embraced by the Royal Botanic Gardens, Kew as a guiding document for working with international partners (Ali *et al.* 2008). Specialist training and capacity building are essential components of all Kew's activities and as such are major commitments to helping Parties achieve Targets 15 and 16 of the GSPC (Clubbe *et al.* 2008).

Kew's UK Overseas Territories Programme is working to help Territories implement the GSPC (UKOTs 2009) and this paper highlights some of the current project work with partners in Caribbean UKOTs (Anguilla, British Virgin Islands (BVI), Cayman Islands, Montserrat and the Turks and Caicos Islands (TCI)), and South Atlantic UKOTs (St Helena, Ascension, Tristan da Cunha, South Georgia and the Falkland Islands). Like many small islands, UKOTs face a wide range of challenges in conserving their biodiversity and retaining ecosystem services whilst enabling development and the maintenance of livelihoods. Within the context of the current and ongoing threats to plant diversity in these Territories, habitat loss and fragmentation, invasive alien species, development, and the increasing threat of global climate change are the most significant (*inter alia*: Clubbe *et al.* 2004; Kingston & Waldren 2003; Millennium Ecosystem Assessment 2005; Stringer 2009; Varnham 2006; Waldren *et al.* 2005; Young 2008).

At the heart of the UKOTs programme is a comprehensive work plan of specimen and data collection, mapping and capacity building in Territories in addition to facilitating access to historical specimens and data held at Kew. This enables progress towards achieving Targets 1, 2 and 3 (understanding and documenting plant diversity) and Targets 5, 7, 8 and 10 (conservation of plant diversity). With this information materials can be developed to promote education and awareness-raising of plant conservation to achieve Target 14. This is all underpinned by an extensive programme of capacity building which contributes to the achievement of Targets 15 and 16. Similarly integrated approaches to conservation have been undertaken in the Pitcairn Islands (Waldren *et al.* 2005).

Individual Territories are quite different, but the GSPC has provided a useful framework for conservation action and helping UKOTs to implement the GSPC has become the Programme's overarching goal within the context of the current and ongoing threats

to plant diversity that all Territories are facing. The threats are real and urgent and if serious inroads are not made into tackling the current levels of habitat loss and the threats from invasive species, in some Territories there will be virtually no biodiversity left to be impacted by climate change, which will remain a social issue but no longer a biodiversity one.

Understanding and documenting the plant diversity of the UKOTs (GSPC Targets 1 – 3)

The Programme's main focus is on delivering Targets 1 (checklist) and 2 (red list) for each Territory, since these underpin the achievement of most of the other targets. All UKOT specimens in Kew's Herbarium, built up from nearly 200 years of collecting, are being scanned and databased. The oldest UKOT specimens scanned so far are collections from St Helena in the early 1800s. These images and their associated data are being made available online as a botanical resource for in-Territory partners to support conservation planning and action (UKOTs on-line herbarium 2009). Images and associated data are also copied to DVD and sent directly to partners both as a back-up and in some cases a vital interim step until some Territories gain sufficient bandwidth to view the images online. An important step during the databasing process is updating plant taxonomy where necessary in the light of new revisions and systematic understanding. All synonyms are retained within the database so that field conservationists can track name changes.

Historical data held at Kew can only provide a picture of the past and although comprising a valuable dataset it is important to supplement these with recent collections, to determine the current status of the flora and to guide conservation decision making. The current status and distribution of plant species is being evaluated by field data collection. For example, as part of a recently completed Darwin Initiative-funded project in Montserrat, a biodiversity assessment was completed (Young 2008). This included an assessment of the status and distribution of Montserrat plants, the first since much of the island was destroyed by a series of volcanic eruptions and associated pyroclastic flows in 1995 – 1997 (Hamilton *et al.* 2008). Over 1000 plant species have been identified, an increase of nearly 30% on earlier work (Howard 1974 – 1989), although virtually all this increase is accounted for by introduced species, some of which are highly invasive and pose a real threat to native communities. Hamilton *et al.* (2008) also produced a new vegetation map for Montserrat which is helping guide conservation activities within the context of the ongoing redevelopment of the island. Fieldwork continues in many Territories and there is a real possibility that Target 1 will soon be met for most UKOTs. Next steps include linking field

images of plants and their habitats to the herbarium specimens to build up a complete online botanical profile for each Territory.

The combination of a field checklist together with distributional information enables assessments to be made using the IUCN red list criteria to determine which species are threatened with extinction (IUCN 2001). Assessing the whole flora enables a Red List to be completed for each Territory, which can act as a guide to developing conservation priorities based on extinction risks and documented threats. Individual assessments for threatened species have been undertaken for many years and individual results published on the IUCN Global Red List website (www.redlist.org). The first assessment of a complete native flora was undertaken by Broughton & McAdam (2002) who assessed all 171 native species from the Falkland Islands. Current fieldwork is providing new data for a re-assessment of this flora. The most recently completed full red list assessment is for the Cayman Islands, where Burton (2008) assessed all 415 taxa thought to comprise the truly native flora of the Cayman Islands and found 46% to be threatened. As part of a recently completed Darwin project, species action plans were developed for the 29 species endemic to the Cayman Islands, of which 24 are threatened (16 Critically Endangered, 5 Endangered and 3 Vulnerable). Candidate red lists have been produced for Montserrat (Hamilton *et al.* 2008), Pitcairn (Kingston & Waldren 2005) and are close to completion for Ascension Island, Bermuda, BVI, Falkland Islands, TCI, Tristan da Cunha, St Helena and South Georgia. A candidate red list contains preliminary red list assessments and highlights where further data are needed to enable a full assessment to be completed. Meeting the 2010 target for several UKOTs is possible, but for many Territories more fieldwork is required for full assessments.

A full review of herbarium specimens and historical data is vital preparation before the commencement of a new programme of fieldwork. The completion of an initial field checklist can help direct resources and can target particular species to try and establish their current status. This herbarium-based research and specimen data information has led to new discoveries e.g. the herbarium specimen of the BVI endemic tree *Senna polyphylla* var. *neglecta* H. S. Irwin & Barneby came to light during research at the start of a Darwin project in Anegada, BVI. Known only from a single fruiting specimen from a 1913 collection, a single tree was rediscovered during fieldwork in 2003. On the basis of this rediscovery a target exploration was undertaken; the total population remains less than 100 individuals and it remains a conservation priority for BVI. In 2008 the discovery of an unknown sedge on St Helena was matched with specimens in the Kew herbarium from an 1806 Burchell collection and a

later undated Melliss collection, likely to be in the 1860s. These specimens matched the new collection which was confirmed as being *Bulbostylis neglecta* (Hemsl.) C. B. Clarke (neglected tuft sedge). Consequently, a species thought long extinct has been rediscovered and secured in *ex situ* conservation through seed collection and banking in Kew's Millennium Seed Bank, although its *in situ* population remains under threat from invasive species. Of particular concern is *Pennisetum setaceum* (Forssk.) Chiov., an invasive grass species originating from South Africa that is aggressively spreading across the cliff ridges where this species was rediscovered and out-competing native vegetation. *Pennisetum* and related grass species are major invasive problems on many island groups including the Pacific Islands (Meyer 2000) and the Caribbean (Kairo *et al.* 2003).

The current focus of activity in implementing GSPC Target 3 is the development of horticulture protocols for threatened species and in training local counterparts in horticulture techniques for managing these species. A full horticulture protocol involves determining experimentally the optimal germination and growing conditions for a threatened species. Ideally, observations are continued through to first flowering and successful seed set. The completed protocol comprises details of the horticulture trials together with a full species dossier detailing current knowledge of the species and its conservation status. These protocols form important data sources for developing species action plans. Protocols are repatriated to relevant partners in Territory and horticulture needs identified, usually in the context of supporting the local botanic garden. The protocol also enables in-Territory staff to more successfully grow seedlings for both conservation and display. Recently completed horticultural protocols include those for the critically endangered tree *Acacia anegadensis* Britton, endemic to BVI (Hamilton *et al.* 2007) and the critically endangered shrub *Rondeletia buxifolia* Vahl, endemic to Montserrat (Corcoran *et al.* 2008). Several more are underway in the Tropical Nursery at Kew on threatened species from the Cayman Islands, the Falkland Islands, TCI and St Helena. Where facilities and resources allow these procedures are also replicated in-Territory.

Conserving the plant diversity of UKOTs (GSPC Targets 5, 7, 8, 10)

Conservation of plant diversity must be based on robust, reliable and recent botanical information, which is why achieving Targets 1 and 2 is so vital. Conservation management plans also need to be informed by an understanding of the threats that native plants and habitats are facing. It is widely recognised that invasive alien species are the second

most severe threat to biodiversity after habitat destruction and that the impacts of invasive species are particularly severe on small island ecosystems (Millennium Ecosystem Assessment 2005). Target 10 of the GSPC is a response to this situation. A review of the non-native species in UK Overseas Territories confirmed the widespread occurrence of invasive species in UKOTs and highlighted their severe threats and impacts (Varnham 2006). Because of this, documenting non-native species and assessing their invasiveness potential is an important component of all field work for the UKOTs Programme.

Invasiveness is based initially on a simple three-point scale: introduced (a non-native plant that is not spreading naturally from its original point of introduction and often requires human intervention to maintain it), naturalised (non-native species with a limited natural spread, but with no noticeable negative impact on native communities or habitats) or invasive (non-native species that are able to spread, often aggressively, and are having a detrimental effect on native communities and/or habitats). Some invasive species are widespread and pose similar threats in many Territories whilst others are more localised in their occurrence and impacts. The sandy beach shrub *Scaevola taccada* (Gaertn.) Roxb., originally from the Indo-Pacific, is spreading throughout the Caribbean and negatively impacting indigenous sandy beach communities. In Grand Cayman the native *Scaevola plumieri* (L.) Vahl is being out-competed by *S. taccada* and has been reduced to two small populations of a few individuals on the south coast of Grand Cayman. Seed has been collected and plants grown at the native species nursery at the Queen Elizabeth II Botanic Park in an attempt to prevent the extirpation of this species from Grand Cayman. A programme of *S. taccada* removal has also been started.

In Montserrat more than 150 non-native plant species have been documented and several of these pose a real threat to the indigenous plant communities. These include *Psidium guajava* L., *Casuarina equisetifolia* L., *Cryptostegia madagascariensis* Bojer ex Decne. and *Spathoglottis plicata* Blume (Hamilton *et al.* 2008). On Anegada, BVI, a similar suite of invasives are posing genuine threats and control measures are urgently needed to prevent localised extirpations and potential species extinctions. For example, the sand dune vegetation is the only habitat for the single island endemic herbaceous vine, *Metastelma anegadense* Britton, which is threatened by expanding populations of *S. taccada* compounded by ongoing habitat loss (Clubbe *et al.* 2004). A recently completed three-year European Union (EU) funded project has resulted in a comprehensive understanding of the invasive species threat to the South Atlantic UKOTs and has developed a Regional Invasive Species Strategy to begin to address these threats. The strategy includes recom-

mendations for control and mitigation measures as well as improved bio-security (Stringer 2009).

A methodology being increasingly used is a Maximum Entropy Model (MaxEnt) to predict potential environmental suitability for invasives (Phillips *et al.* 2006). In Montserrat the known locations for the Critically Endangered Montserrat endemic *Rondeletia buxifolia* have been shown to overlap with the predicted distribution map of guava (*Psidium guajava*), an invasive species that is spreading rapidly from cultivated areas abandoned after the volcanic eruptions of 1995 – 97. The predictions are based on the current extent of guava and measured environmental variables. If no intervention measures are taken and the spread follows this predicated course then *R. buxifolia* could be lost. These tools are making a real difference to conservation activities and directly assisting with conservation planning and decision making (Clubbe *et al.* 2009; Jones 2008). A similar approach has been adopted in recent project work in TCI. Hardman (2009) identified a large overlap between the predicted suitable habitat for key invasive species including *Casuarina equisetifolia* and *Leucaena leucocephala* (Lam.) de Wit and the endemic shrub *Limonium bahamense* Britton, indicating a heightened future threat to the endemic if invasive control measures are not implemented (Hardman 2009; Williams 2009).

Knowing the distribution of endemic and threatened taxa together with an assessment of current threats enables those areas of greatest significance for plants to be flagged up as key areas for *in situ* conservation (Target 7). In some cases these distributions may occur within already established protected areas and in this way the threatened taxa are afforded protection under the Protected Areas legislation. For example, the only known locations of the BVI endemic shrub, *Calypttranthes kiaerskovii* Krug & Urb. occur on the island of Virgin Gorda within the Virgin Gorda National Park where it faces no real threats (IUCN 2009). This species is protected under the legislation regulating BVI's Parks and Protected Areas and so apart from an ongoing monitoring programme this species is well protected *in situ*. In St Helena several endemic species, including the critically endangered large bellflower (*Wahlenbergia linifolia* A. DC.) occur only as remnant populations within small areas of the Peaks (Cronk 2000) and the Protected Area Plan for the Central Peaks (Cairns-Wick 2007) provides a mechanism for their *in situ* protection. However, due to severe threats from long-established invasive species, active and ongoing management of these invasive species is required to ensure the long-term survival of these endemic species *in situ*.

In an increasing number of UKOTs the Important Plant Areas (IPAs — Target 5) methodology is proving a valuable tool for conservation planning and *in situ* conservation of threatened species (Plantlife Interna-

tional 2004). In Montserrat four candidate IPAs have been identified based on the occurrence of two critically endangered endemics, *Rondeletia buxifolia* and *Epidendrum montserratense* Nir (Jones 2008). Species action plans are being developed for these two species and recommendations made for long-term conservation measures, both *in situ* and *ex situ* (Clubbe *et al.* 2009). In BVI, the whole island of Anegada is a candidate IPA based on the presence of five endemic and threatened plant species (Clubbe *et al.* 2004). A current project in the Falkland Islands has identified 16 IPAs across the archipelago which are being ground-truthed prior to designation.

In situ conservation is supported by a range of *ex situ* conservation measures. Kew's Millennium Seed Bank Project has an active programme of seed collecting, storage and training across most UKOTs. Training in seed collection has been undertaken in BVI, Cayman Islands, Montserrat, TCI, St Helena, Ascension and the Falkland Islands, and in some cases funding provided to support ongoing seed collection. A significant proportion of the threatened species from these islands is banked at the Millennium Seed Bank and these Territories are well on the way to achieving Target 8. Gaps in the representation of UKOT threatened species have been identified and will be used to target collecting efforts over the next few years.

Several Territories have established native species nurseries and are growing native species, including threatened species for reintroduction programmes and to increase the use of native species in landscaping. In Grand Cayman the native species nursery at the Queen Elizabeth II Botanic Park is growing thirty native species identified as 'The Cayman Collection', for sale as an alternative to imported non-native species, some of which are potentially invasive. Some species currently imported also threaten the genetic integrity of native taxa e.g. vigorous hybrids of *Cordia sebestena* L. are hybridising with the endemic variety *Cordia sebestena* var. *caymanensis* (Urb.) Proctor, and this could lead to the loss of this endemic variety (Burton 2008). The recently re-discovered endemic Cayman sage (*Salvia caymanensis* Millsp. & Uline) has been bulked up and sold at the Queen Elizabeth II Botanic Park. Although it has been widely planted around Grand Cayman, the original re-discovered populations show an alarming fluctuation in numbers, perhaps reflecting a natural tendency to appear and disappear in response to changing local habitat conditions (Burton 2008). A collection of approx. 40,000 seeds has been banked at the Millennium Seed Bank for long-term conservation. In Montserrat the endemic *Rondeletia buxifolia* has been planted out as a demonstration hedge bordering the newly established Montserrat Botanic Garden. Early indications are that this species grows very well as a hedging plant and

plans are well advanced to use it for landscaping. It could provide an excellent substitute for the commonly used exotic *Ficus* spp. that provide no benefit to native biodiversity. In Middle Caicos, TCI, a nursery has been established and seeds and rescued seedlings of the endemic national tree, *Pinus caribaea* Morelet var. *bahamensis* (Griseb.) W. H. G. Barrett & Golfari, are being grown as an *ex situ* collection. The wild populations of this species are being devastated by an introduced scale insect (Hamilton 2007; Manco 2010). The *ex situ* plants will eventually be used as a basis for a re-introduction programme once there is reasonable potential for success. Native species nurseries have been successfully established in other UKOTs, for example in Pitcairn (Waldren *et al.* 2005).

With these species data a snapshot can be presented of the current status of a flora. Fig. 1 shows the status of the flora for the island of Anegada, the largest and botanically richest of the British Virgin Islands, highlighting species of conservation concern as well as problematic invasives. These data have been used, together with data on other critical taxa, to develop a participatory management plan for Anegada (McGowan *et al.* 2006). The participatory approach to developing management plans is vital to ensure that all relevant stakeholders have the opportunity of inputting into the process and develop a vested interest into implementing the plan. A particularly successful example of this participatory approach was used to develop the management plan for the Centre Hills in Montserrat (Department of Environment 2008). A national steering committee has been established to implement this plan.

Promoting education and awareness about plant diversity in UKOTs (GSPC Target 14)

Target 14 highlights the need to promote the importance of plant diversity, and the need for its conservation in communication, education and public awareness programmes. This has become an important element of Kew's UKOTs programme. The involvement of local communities, school children and society in general with ongoing field programmes is well established. Regular radio interviews, press releases and newspaper articles together with project newsletters all provide the community with access to field activities, results and information. A series of biodiversity posters has been produced for BVI, Montserrat and TCI and are viewable in key public buildings, in schools and on the Kew website (www.kew.org/science/ukots). Plant naming competitions have been a great success in BVI. Some local endemic species have no common name, usually due to a lack of use by the local community or a rare plant that is little known locally. Schoolchildren are taken out on a field trip to see the plant species *in situ* and a talk is

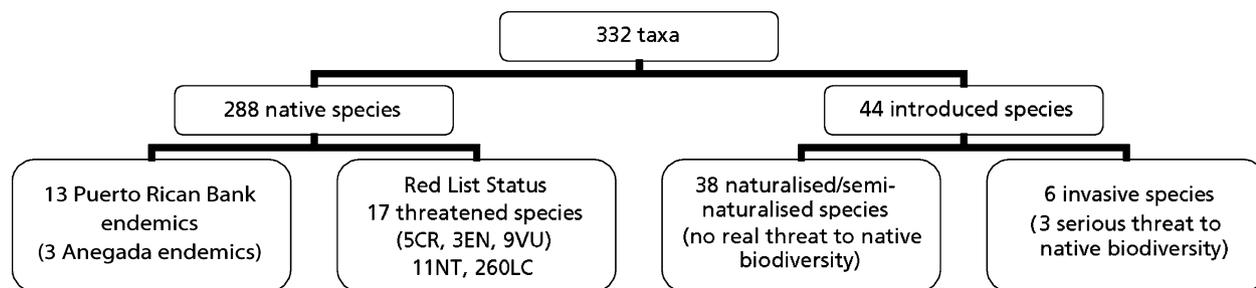


Fig. 1. Current status of the flora of the island of Anegada, BVI.

given in the school about the importance of the species, its habitat and the need for conservation. A competition is then held to choose a local name for it. Consequently, the single island endemic, *Metastelma anegadense* is now known on Anegada as wire wist and the two-island endemic cactus, *Leptocereus quadricostatus* (Bello) Britton & Rose is known as prickly web. Both species are critically endangered and face threats from habitat fragmentation, invasive species and potentially from climate change as most of their habitat in Anegada is less than 3 m above sea level.

Building capacity for the conservation of plant diversity in UKOTs (GSPC Targets 15 – 16)

Capacity building is a cornerstone of RBG Kew's activities and a central goal of the UKOTs programme is to help ensure there is capacity in Territory to implement the GSPC and secure the long-term conservation of both species and habitats. RBG Kew promotes a wide range of opportunities for collaborators to gain the skills needed to implement the GSPC. These include informal placements, internships, fellowships working with specific individuals plus formal courses at Kew as well as workshop based training in Territory (Ali *et al.* 2008; Clubbe *et al.* 2008). UKOT collaborators have attended a wide variety of training programmes at Kew and have participated in many project-based workshops, both regionally organised and in individual Territories. Funded by the UK Government's Department of Environment, Food and Rural Affairs (Defra), a regional workshop was held in Montserrat in 2006 on implementing the GSPC in the Caribbean and a network established to take this forward (Convention on Biological Diversity 2008). The European Union funded South Atlantic UKOTs regional invasive species programme included a regional workshop in Ascension in 2009 which focussed on developing a regional strategy for dealing with the wide range of invasive species that are threatening the whole region (Stringer 2009). The botanical information compiled for this workshop and the recommendations being implemented via the Strategy comprise a major contribution to the achievement of GSPC Target 10.

In Territories support is being provided for key developments in botanical infrastructure required to implement the GSPC. In TCI an herbarium has been established at the National Trust's Middle Caicos Conservation Centre and the first batch of mounted herbarium specimens repatriated from Kew has formed their first national reference collection. The Centre is being landscaped with indigenous species to raise awareness about the conservation of the native flora. With funding from the UK Government's Overseas Territories Environment Programme (OTEP — www.ukotcf.org/OTEP/) a new botanic garden has been developed in Montserrat, managed by the Montserrat National Trust. Central to this has been the construction of a new nursery to provide propagation facilities to grow indigenous, medicinal and threatened species for both conservation and for display (Clubbe *et al.* 2009). Native species nurseries have been established at QEII Botanic Park on Grand Cayman and the J. R. O'Neal Botanic Garden in Tortola, BVI. An extensive programme of collection of endemic and threatened species of these Territories is underway and most of the threatened species are now in cultivation and programmes are underway to develop the conservation and educational potential of these botanic gardens.

In addition to capacity building activities there is active engagement with politicians and the political process both in mainland UK and in Territories to provide advice and to influence policy to improve both the environment and livelihoods in the UK Overseas Territories.

Conclusions

Many UK Overseas Territories have been working with RBG Kew to prioritise activities in order to implement the GSPC and to identify those targets of most relevance locally. Initial project work has focussed on Objective 1 of the GSPC: documenting and understanding plant diversity. As a consequence there have been real advances in this area in recent years and fully achieving Targets 1 and 2 across all UKOTs is now close. With funding from OTEP all these data are being made available online and RBG Kew will be

launching a UK Overseas Territories online herbarium in 2010. There is some positive activity towards achieving Target 3.

There is mixed progress with Objective 2 of the GSPC: conserving plant diversity. Excellent progress has been made with the *ex situ* target 8, but more limited progress with the *in situ* targets and plant species therefore still face many threats. The last documented species extinction on a UKOT occurred in St Helena when the last individual of *Nesiota elliptica* (Roxb.) Hook. f. (St Helena olive) died in November 2003 causing the extinction of this species, which now remains only as a DNA extract in the Kew DNA bank. *Commidendrum rotundifolium* (Roxb.) DC. (bastard gumwood) is extinct in the wild and exists as a single tree growing *ex situ* in a private arboretum on St Helena and is the subject of a concerted rescue mission. Several other critically endangered species in other UKOTs have worryingly low population numbers and are in desperate need of a major input of resources to secure their long-term future. Although good progress has been made in documenting invasive species, there is a major resource investment need to implement invasive species control strategies.

Good progress has been made with Target 14 and awareness is increasing, but there is a definite need for mainstreaming plant conservation issues.

Some progress with Objective 5, building capacity for plant conservation, has been made, but a large ‘capacity gap’ remains and more trained personnel are needed with improved facilities and resources in order to implement the GSPC and meet its demanding targets.

Other targets are perceived as lower priorities by UKOTs. For example, there are no plants in international trade so Target 11 can either be considered redundant or currently achieved. However, enabling CITES legislation and in-Territory training on CITES implementation is being provided, although largely aimed at animal requirements such as turtles. There is little exploitation of plant products and where this occurs it is often of non-native species and not covered by the GSPC and on a small, local scale. Thus Targets 12 and 13 are not considered priorities.

Botanic Gardens have an important role to play in co-ordinating activities leading to the implementation of the GSPC in UKOTs and are well placed to provide an increased education and awareness role. However, they still lack resources to completely fulfil their potential. Many Territories do not yet have a botanic garden, and successful GSPC implementation is being achieved through Government nurseries, NGOs and community participation.

The GSPC has provided a unifying framework to enable conservation implementation across the UK’s precious Overseas Territories and will continue to do so in the post-2010 period as the new targets for 2011 – 2020 are agreed and are implemented.

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References

- Ali, N. *et al.* (2008). *Global Strategy: Kew and the Global Strategy for Plant Conservation*. Royal Botanic Gardens, Kew.
- Broughton, D. A. & McAdam, J. H. (2002). A Red List for the Falkland Islands vascular flora. *Oryx* 36: 279 – 289.
- Burton, F. J. (2008). *Threatened Plants of the Cayman Islands: the red list*. Royal Botanic Gardens, Kew.
- Cairns-Wick, R. (co-ordinator) (2007). *Protected Area Plan for the Central Peaks*. Published on CD, St Helena National Trust, Jamestown, St Helena.
- Convention on Biological Diversity (2008). *Plant Conservation Report*. Available online at: www.cbd.int/gspc/review.shtml [Accessed 12 November 2009].
- Clubbe, C., Gillman, M., Acevedo-Rodriguez, P. & Walker, R. (2004). Abundance, distribution and conservation significance of regionally endemic plant species on Anegada, British Virgin Islands. *Oryx* 38: 342 – 346.
- , Gold, K. & Griggs, P. (2008). *Growing Expertise for Plant Conservation*. Royal Botanic Gardens, Kew. Also available online at: www.kew.org/education/index.html [Accessed 12 November 2009].
- , Hamilton, M. & Corcoran, M. (2009). *Rondeletia buxifolia* Rubiaceae. Plant in Peril, 32. *Curtis’s Bot. Mag.* 26: 131 – 141.
- Corcoran, M. R., Robbins, S. K., Hamilton, M. A. & Clubbe, C. (2008). *Report on the status of *Rondeletia buxifolia* Vahl, including a germination and cultivation protocol*. Unpublished Report, Royal Botanic Gardens, Kew.
- Cronk, Q. C. B. (2000). *The Endemic Flora of St Helena*. Anthony Nelson, Oswestry.
- Department of Environment (2008). *Montserrat Centre Hills Management Plan 2008 – 2010*. Department of Environment, Ministry of Agriculture, Lands, Housing and the Environment, Brades, Montserrat.
- GSPC (2002). *Global Strategy for Plant Conservation*. Published by the Secretariat of the Convention on Biological Diversity. Available online at: www.cbd.int/gspc/ [Accessed 12 November 2009].
- Hamilton, M. (2007). Turks and Caicos Islands Invasive Pine Scale. In: M. Pienkowski (ed.), *Biodiversity That*

- Matters: a conference on conservation in UK Overseas Territories and other small island communities, Jersey 6th to 12th October 2006*, pp. 208 – 213. UK Overseas Territories Conservation Forum, www.ukotcf.org.
- , Robbins, S. K., Johnson, N. P., Sanchez, M. D. & Clubbe, C. (2007). *Report on the status of Acacia anegadensis Britton including a germination and cultivation protocol*. Unpublished Report, Royal Botanic Gardens, Kew. Available online at: www.kew.org/scihort/ukots/Pages/bvi2bi.htm [Accessed 12 November 2009].
- , Clubbe, C., Robbins, S. K. & Bárrrios, S. (2008). Plants and Habitats of the Centre Hills, Montserrat. In: R. P. Young (ed.), *A Biodiversity Assessment of the Centre Hills, Montserrat*. Durrell Conservation Monographs No. 1: 40 – 55. Durrell Wildlife Conservation Trust, Jersey.
- Hardman, C. (2009). *Invasive Plants of the Turks and Caicos Islands*. Unpublished MSc thesis Imperial College, London. Available online at: www.iccs.org.uk/MSc-thesis.htm [Accessed 12 November 2009].
- Howard, R. (1974 – 1989). *Flora of the Lesser Antilles: Leeward and Windward Islands*. 6 volumes. Arnold Arboretum, Harvard University.
- IUCN (2001). *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge. Available online at: www.redlist.org [Accessed 12 November 2009].
- (2009). IUCN Red List of Threatened Species. Version 2009.2. www.iucnredlist.org [Accessed 12 November 2009].
- Jones, M. (2008). *Distribution and Conservation of Montserrat's Endemic Flora*. Unpublished MSc Thesis Imperial College, London. Available online at: www.iccs.org.uk/MSc-thesis.htm [Accessed 12 November 2009].
- Kairo, M.T., Bibi, A., Cheesman, O., Haysom, K. & Murphy, S. (2003). *Invasive Species Threats to the Caribbean Region: a report to The Nature Conservancy*. CABI Bioscience, Egham.
- Kingston, N. & Waldren, S. (2003). The plant communities and environmental gradients of Pitcairn Island: the significance of invasive species and the need for conservation management. *Ann. Bot.* 92: 31 – 40.
- & —— (2005). A conservation appraisal of the rare and endemic vascular flora of Pitcairn Island. *Biodivers. Conserv.* 14: 781 – 800.
- Manco, B. N. (2010). Lessons from the Caicos Pine Scale. In: M. Pienkowski, O. Cheesman, C. Quick & A. Pienkowski (eds), *Making the Right Connections: a conference on conservation in UK Overseas Territories, Crown Dependencies and other small island communities, Grand Cayman 30th May to 5th June 2009*, pp. 274 – 278. UK Overseas Territories Conservation Forum, www.ukotcf.org.
- McGowan, A., Broderick, A. C., Clubbe, C., Gore, S., Godley, B. J., Hamilton, M., Lettsome, B., Smith-Abbott, J. & Woodfield, N. K. (2006). *Darwin Initiative Action Plan for the Coastal Biodiversity of Anegada, British Virgin Islands*. Available online at www.seaturtle.org/mtrg/projects/anegada/ [Accessed 12 November 2009].
- Meyer, J. Y. (2000). Preliminary review of the invasive plants in the Pacific islands (SPREP Member Countries). In: G. Sherley (tech. ed.), *Invasive Species in the Pacific: a technical review and draft regional strategy*. South Pacific Regional Environment Programme (SPREP).
- Millennium Ecosystem Assessment (2005). Available online at: www.millenniumassessment.org/ [Accessed 12 November 2009].
- Phillips, S. J., Anderson, R. P. & Schapire, R. E. (2006). Maximum entropy modelling of species geographical distributions. *Ecological Modelling* 19: 231 – 259.
- Pienkowski, M. W. & Quick, C. (2010). Measures of performance by 2009 of UK Overseas Territories (& Crown Dependencies) and UK Government in implementing the 2001 Environment Charters or their equivalents. In: M. Pienkowski, O. Cheesman, C. Quick & A. Pienkowski (eds), *Making the Right Connections: a conference on conservation in UK Overseas Territories, Crown Dependencies and other small island communities, Grand Cayman 30th May to 5th June 2009*, pp. 59 – 114. UK Overseas Territories Conservation Forum, www.ukotcf.org.
- Plantlife International (2004). *Identifying and Protecting the World's Most Important Plant Areas*. Plant Life International. Available online at: www.plantlife.org.uk/international/plantlife-ipas.html [Accessed 12 November 2009].
- Stringer, C. (2009). Dealing with South Atlantic invasions: a new regional approach to invasive species. *Aliens* 28: 38 – 44. Available online at www.issg.org/pdf/aliens_newsletters/A28.pdf [Accessed 12 November 2009].
- UKOTs Online Herbarium (2009). <http://dps.plants.ox.ac.uk/bol/UKOT/Home/Index> [Accessed 12 November 2009].
- Varnham, K. (2006). *Non-native species in UK Overseas Territories: a review*. JNCC Report No 372. Joint Nature Conservation Committee, Peterborough, UK. Available online at: www.jncc.gov.uk/default.aspx?page=3634 [Accessed 12 November 2009].
- Waldren, S., Kingston, N., Smyth, N., Warren, J. & Warren, C. (2005). Integrated plant conservation on Pitcairn Island, south-central Pacific Ocean. *BG Journal* 2: 22 – 24.
- Williams, S. (2009). *The Identification and Conservation of Important Plant Areas: a case study from the Turks and Caicos Islands*. Unpublished MSc Thesis Imperial

- College, London. Available online at: www.iccs.org.uk/MSc-thesis.htm [Accessed 12 November 2009].
- Wyse-Jackson, P. & Kennedy, K. (2009). The Global Strategy for Plant Conservation: a challenge and opportunity for the International Community. *Trends Pl. Sci.* 14: 578 – 580.
- Young, R. P. (ed.) (2008). *A Biodiversity Assessment of the Centre Hills, Montserrat*. Durrell Conservation Monograph No 1. Durrell Wildlife Conservation Trust, Jersey. Available online at: www.durrell.org/Conservation/Where-we-work/Caribbean-Islands/ [Accessed 12 November 2009].