A Practitioners Guide to Achieving GSPC Targets 1 and 2 in Small Island Developing States

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Introduction

The aim of this document is to provide useful and practical information for non-specialists in the Caribbean for achieving Targets one and two of the Global Strategy for Plant Conservation (GSPC). A methodology is provided for the rapid production of Species Checklists and Candidate Red-Lists. Although some botanical/taxonomic understanding is needed to produce such checklists it is not a requirement for the compiler to be a botanist or taxonomist. The list will be produced through careful assemblage of plant species information from a range of sources.

GSPC Target 1: "*A widely accessible working list of known plant species, as a step towards a complete world flora*." This is based on the premise that in order to conserve a species we first need to know what it is and where it occurs. Despite having been studied botanically for several centuries with the production of many floras on groups of islands or single islands, the Caribbean remains botanically under-explored. Indeed, a botanical inventory is urgently needed to provide an accurate checklist and conservation assessment for the region.

GSPC Target 2: "*A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels*." Knowledge of species' conservation status will better enable more affective use and prioritisation of resources. Such assessments are carried out and organised by the World Conservation (IUCN) and showcased via the publication "*IUCN Red List of Threatened Species*." So far, a tiny proportion of Caribbean plant diversity has been evaluated by IUCN. Of those evaluated, 577 species (all plant groups) have been listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). This number is very likely to increase as the taxonomy impediment is reduced and more Caribbean plant species are assessed.

Producing a plant species checklist

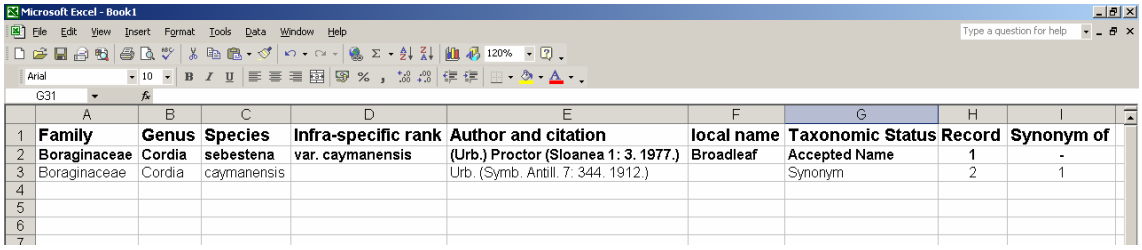
Before a candidate red list can be generated, a checklist of all known plant species for the area concerned must be produced. Essentially, the a checklist is formed of a 'core' list of accepted and non-accepted (synonyms) scientific names. It is important that the list comprises current taxonomic nomenclature from recent publications, databases and other sources (See '*Acquiring species data*' for more information).

Method

- Using a spreadsheet, database or similar, provide the following information for each species:
    - Family
    - Genus
    - Species
    - Infra-specific rank
    - Author and citation
    - Common and local name
    - Taxonomic Status

- Designate each name with a taxonomic status: “accepted” or “synonym” (non-valid name).

Fig 1. Spreadsheet showing basic checklist fields and demonstrating a system to refer synonyms to their accepted names



	A	B	C	D	E	F	G	H	I
1	**Family**	**Genus**	**Species**	**Infra-specific rank**	**Author and citation**	**local name**	**Taxonomic Status**	**Record**	**Synonym of**
2	**Boraginaceae**	**Cordia**	**sebestena**	**var. caymanensis**	**(Urb.) Proctor (Sloanea 1: 3. 1977.)**	**Broadleaf**	**Accepted Name**	**1**	**-**
3	Boraginaceae	Cordia	caymanensis		Urb. (Symb. Antill. 7: 344. 1912.)		Synonym	2	1
4									
5									
6									
7									

Producing the Candidate Species Red-list

Once the checklist of accepted names and their synonyms is complete, species-level information can be added, which will help prioritise those species in need of further assessment.

Method

1. Provide the following information for each species in the checklist:
    - current IUCN red-list status (the species may already be on the list)
    - range and distribution (i.e. hemisphere, continent, region, country)

2. Use the distribution information to eliminate species from the candidate red-list i.e.:
    - non-native/introduced species
    - species that are distributed beyond the Caribbean region
        - Exception: the species is on the IUCN red-list or known to be otherwise endangered

If a species is known to be introduced or its distribution is obviously very wide e.g. pan-tropical, tropical areas of the Americas or widespread throughout the Caribbean, it can be down-rated to least concern. Where distribution information is ambiguous, it is best to highlight the species for further research.

3. Narrow down the candidate species red list further by designating each of the remaining species to one of the following distribution classes:
    A. Single island endemic
    B. Sister island endemic (endemic to 2 islands)
    C. Island group endemic (species is native to a small island group e.g. the Turks and Caicos Islands)
    D. sub-regional endemic (species is restricted to a small area of a region/archipelago e.g. 2 or 3 island groups within the Bahamas
    E. Archipelago endemic (species native to the majority of a (bio)geographically distinct region e.g. the Bahama Archipelago or the Lesser Antilles)

4. Assign all species falling under distribution classes A, B or C candidate red list status

5. Species in distribution classes D and E will qualify for promotion to candidate species status if:
    - their habitat is restricted to higher elevations (above 700m)
    - the habitat in which they occur is rare and/or threatened
    - Any of the populations are infested by introduced pests and/or disease organisms

Locating and identifying Candidate Species Red List in the field

Locating and identifying candidate species will depend greatly upon the species-level information available. (See '*Acquiring species data for the checklist*' for more information).

Method

- Aim to provide the following for each species in the candidate red-list:
    - Life form and species description
    - local/common names
    - phenology (flowering time)
    - habitat preference
    - images
    - check herbaria for specimens

- Organise the candidate species into order of priority using the following system:
    1. easy to identify and assess in the field
    2. impeded by lack of easy field identification features; proceed as time/resources allow
    3. impeded by lack of easy field identification features at species level but recognisable at family level; collect flowering specimens and promote to 2 if possible or await further verification
    4. lack of easy field identification; deferred until resources available

    Issues:
    - species may not be in flower at the time of search
        - acquire phenology information, if not available make a note of species and check at other times of year
    - the species may belong to a genus/family having many species/varieties which closely resemble one another making identification very difficult
        - in which case, designate as 'awkward' genera/family in need of full taxonomic assessment by specialist

Acquiring species data for the checklist

Botanical information can be derived from the following sources:

- published and 'grey' literature
- local, regional and international herbaria
- field recordings and sitings
- Local knowledge

(See the '*Botanical Resources*' guide for more information).

Published Floras

- Where possible, published floras should be the first point of enquiry to establish a checklist.
- Relevant information outlined under the sections '*Producing a plant species checklist*' and '*Producing a candidate red list*' should be sort.
- A flora may be available at local, national and regional levels.
- Although the information available in all published floras is useful, the more recent the publication the better, especially those published since the 1970's.

Checklists and monographs

- Published checklists/monographs may be available at local, national and regional levels; or they may cover a particular locality and/or Habitat type.
- A monograph may cover one specific plant group, family or genus (for e.g. Orchidaceae of the Lesser Antilles or Vines and Climbing Plants of Puerto Rico and the Virgin Islands).
- Un-published checklists may be available. However, data quality may vary; employ efforts to 'clean' data and check against up-to-date botanical sources.

Other Publications

- If published floras/checklists are unavailable for the territory concerned, dendrology, ethnobotanical, tree and wild flower guides can provide useful information.
- Information quality may vary; employ efforts to 'clean' data and check against up-to-date botanical sources.

Internet resources

- Increasingly, botanical data is readily available via the internet.
- Many herbaria provide online catalogues of their botanical collections and may provide images of herbarium specimens
- Taxon-level information is also available for example, the '*Catalogue of Seed Plants of the West Indies'* database and RBG, Kew's '*World Checklist Series.'*
    - The data from these sources is up-to-date and to a very high standard and can be used to query other sources against.

- Electronic journals are available online and are a good source of botanical/conservation information for example '*the Journal of the West Indies*.'

UK Overseas Territories Plant Species Database

- Valuable information pertaining to species from the Caribbean UKOTs (i.e. Anguilla, British Virgin Islands, Cayman Islands, Montserrat and Turks and Caicos) will be available via the UKOT Species Database.
    - Although the database is not currently available over the internet, data-sets can be requested by email: ukotsinfo@kew.org.uk

Local Knowledge

- Local botanical knowledge is invaluable for identifying and locating target species in the wild.
- Aim to provide local/common names and images if available
- The following information can be gleaned from field personal, natural resource managers and conservation practitioners etc.
    - Extent of occurrence
    - Locations
    - Life form and species description
    - local/common names
    - phenology (flowering time)
    - habitat preference
    - ethnobotany
    - if it has been collected in the past (when, where and by whom)

Images/herb-specimens

- Obtaining images for some of the more obscure species can prove difficult; floras rarely display pictures of the species they describe and if they do, they are usually line drawings. In contrast, field guides frequently display colour images but may not include the less charismatic species/plant groups.
- Good results can be achieved on the World Wide Web, however, care must be taken to ensure that all images are what they say they are and from legitimate sources.
    - Botanic Garden websites
    - Google Images
    - Wikipedia
- Many larger herbaria are in the process of scanning their herbarium collections into high definition images.
    - These are usually available to download over the internet as lower quality jpg. Files. It may be possible to request the original files and have them sent on removable media.
- Herbarium specimens can be photographed using a good quality digital camera housed on a tripod. Close-up images can also be taken of the specimens for extra detail.

Glossary of terms used

Endemic	species occurs no-where else
Native	species is naturally found on the island but has wider distribution
Introduced	non-native, introduced for ornament or commerce