A Plant Conservation Strategy for the Caribbean Region

I: Introduction

This Plant Conservation Strategy for the Caribbean region is a contribution to the achievement of the Global Strategy for Plant Conservation (GSPC), adopted by the U.N. Convention on Biological Diversity (CBD) for the period 2011-2020 (Convention on Biological Diversity, 2012), and currently being developed to provide a set of plant conservation actions linked to and in support of the Global Biodiversity Framework (2022-2030) of the Convention.

The Strategy recognises the Vision of the GSPC that '*Without plants, there is no life. The functioning of the planet, and our survival, depends upon plants. The strategy seeks to halt the continuing loss of plant diversity*' and accepts the importance of reversing its loss.

Furthermore it acknowledges and incorporates the 2050 Vision Statement of the Global Biodiversity Framework, namely, '*By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people*.'

The Strategy was first developed in draft by the participants at the 2nd Botanical Bridges Congress - the Congress of Caribbean and Central American Botanic Gardens, hosted by the Jardín Botánico Nacional de La Habana, Cuba on 2-5 April, 2018. It was subsequently edited and developed and was finalized and approved by the participants of the 3rd Botanical Bridges Congress, hosted by the Leon Levy Native Plant Preserve, Bahamas National Trust, Eleuthera, Bahamas, 14-18 November, 2022.

Botanic gardens and other botanical institutions and organisations in the Caribbean region have been active in plant conservation for several decades. Today, for example, there are over 220 botanic gardens in the countries and territories in the Caribbean region (BGCI figures: https://gardensearch.bgci.org/). Amongst botanic gardens, the first Caribbean botanic gardens workshop was held in Grand Cayman in 1996, followed by a second in Barbados, 1997 and a third in Jamaica, 1998. The Conservation Action Plan for Botanic Gardens in the Caribbean Islands (Burbidge & Wyse Jackson, 1998) was subsequently published in 1998.

The Caribbean Botanic Gardens for Conservation Network was established in 2002 and three Caribbean Botanic Garden Conferences were held, in Miami, U.S.A. in 2002, in San Ignacio, Cayo, Belize in 2005 and La Habana, Cuba in 2008. In 2016 a new network, the Caribbean & Central American Botanic Garden Network was establish, which has to date held three congresses, in Panama City, Panama in 2016; La Habana, Cuba in 2018 and Eleuthera, Bahamas in 2022.

The Strategy contains a series of 20 targets to be achieved by 2030. It is emphasized that the outcome-oriented Caribbean targets for the period 2022-2030 should be viewed as a flexible framework within which national and / or regional targets may be developed, according to national

priorities and capacities, and taking into account the differences in plant diversity and conservation needs between different countries and territories.

The Strategy emphasizes the need for capacity building throughout the region for plant conservation. It stresses the urgent need to mobilize the necessary financial, technical and human resources and strengthen capacity and partnerships in order to achieve the targets of the Strategy.

It invites a wide range of institutions, organizations and other stakeholders to provide sustainable support to help the achievement of the objectives of the Strategy and to engage in undertaking the necessary plant conservation actions to achieve the targets. Furthermore, it invites relevant international organisations and other institutions that are situated both within and beyond the Caribbean region to develop partnerships with Caribbean organisations to collaborate and support their efforts in plant conservation.

It acknowledges the support given by many institutions in the region, especially amongst botanic gardens, as well as international bodies such as Botanic Gardens Conservation International and the Global Partnership for Plant Conservation to help develop this Strategy and invites their assistance in its implementation and ongoing monitoring.

It suggests that the regular Botanical Bridges Congresses should play an important role in monitoring progress towards the achievement of the Strategy and invites the Caribbean and Central American Botanic Garden Network's Secretariat, currently hosted by the Naples Botanical Garden, Naples, Florida, U.S.A., to assist in this monitoring.

While the Strategy addresses the plant kingdom with a main focus on higher plants, and other well-described groups such as bryophytes and pteridophytes, other bodies may consider developing conservation strategies for other groups such as algae and fungi (including lichen-forming species). Conservation strategies for these other groups have not been incorporated into the 2030 targets outlined.

The Caribbean region is defined for the purposes of this Strategy as those countries, territories and other lands that lie adjacent to or within the Caribbean Basin, including all the Caribbean islands and the countries of Central and South America with significant coastlines on the Caribbean Sea. Although falling beyond the Caribbean region, the Strategy also includes the island of Bermuda due to the island's botanical, climatological, historical and cultural ties to the Caribbean region.

The Caribbean region includes a wide range of sovereign nations, as well as territories of countries that lie largely outside of the region. This includes territories of France, the Netherlands, the United Kingdom and the United States. This Strategy may also be useful to guide plant conservation in those territories, and inform national authorities on regional priorities.

II: Objectives of the Strategy

Objective I: Plant diversity is well understood, documented and recognized.

Objective II: Plant diversity is urgently and effectively conserved and used in a sustainable and

equitable manner.

Objective III: Education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on earth is promoted.

Objective IV: The capacities and public engagement necessary to implement the Strategy have been developed.

III: Targets to be achieved by 2030

1) Understanding and documenting plant diversity

1. Ensure that comprehensive, up-to-date and widely accessible floristic, taxonomic, distribution, conservation status and threat information is available for all wild [native, introduced and invasive] plant species in the Caribbean region.

2. Complete National Plant Red Lists for all Caribbean countries as required to guide conservation action.

3. Complete the identification and documentation of the important areas for plant diversity in all Caribbean countries.

4. Undertake a climate change vulnerability assessment for important areas of plant diversity and the plant species they contain in the Caribbean region in order to implement protection, mitigation and adaptation measures to safeguard those species and ecosystems identified as at risk from climate change.

5. Research on plant diversity, plant-based ecosystems, conservation biology, conservation horticulture and traditional and local plant knowledge undertaken in the Caribbean region as required to support the achievement of the objectives of the Strategy.

2) Conserving plant diversity and using it sustainably

6. Include at least 50% of the threatened plants of the Caribbean in *ex situ* collections.

7. Develop, implement or participate in recovery and restoration programmes for 10% of critically endangered species.

8. Ensure that at least 70% of threatened plants are included and conserved in protected areas.

9. Regulate and manage the known invasive and potential invasive species that threaten plant species and native plant ecosystems in all Caribbean countries.

10. Promote the use of economic incentives to help halt the loss of plant diversity; to eliminate detrimental economic incentives that threaten wild plant diversity and to support sustainable management of forests, other ecosystems and production lands.

11. Ensure that no native plant species in the Caribbean are threatened by local, national or international trade or unsustainable harvesting.

12. National and regional legal frameworks for the protection of Caribbean plant diversity are reviewed and strengthened as required to ensure the achievement of the targets of this Strategy.

13. Develop region-wide and national programs for the restoration / rehabilitation of ecosystems with appropriate native species, to support plant conservation and carbon sequestration.

14. Develop models of benefit sharing to support local communities, based on native plant diversity, to help eliminate poverty, enhance local economies, food security, health care and the conservation of traditional knowledge.

15. Indigenous and local knowledge, innovations and practices associated with plant resources maintained or increased in the Caribbean region, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.

16. Plant conservation is incorporated into regional and national biodiversity conservation and sustainable development actions and plans, including for the achievement of the Sustainable Development Goals and the targets of the post-2020 Global Biodiversity Framework.

3) Promoting education & awareness about plant diversity

17. Incorporate education and awareness about plants and native plants and their habitats in particular into national schools' curricula

18. The importance of plant diversity and the need for its conservation incorporated into communication, education, citizen science and public awareness programs at national and regional levels.

4) Capacity building for plant diversity

19. Strengthen and support effective regional networks and partnerships to achieve and monitor progress towards the objectives and targets of the Caribbean Plant Conservation Strategy.

20. Capacity building and resource mobilization opportunities established or strengthened at national, regional and international levels to support the development of those institutions needed for the achievement of the targets of this Strategy.

IV: Rationale for the Strategy

The importance of plants as an essential resource for the planet is widely understood. Plants are a vital component of the world's biological diversity and represent the basis for most terrestrial ecosystems. In addition, cultivated plants and many wild plant species have substantial economic and cultural importance, providing food crops (including vegetables, root crops, cereals, fruits and seeds), aromatics and spices, intoxicants, beverages, fibres and canes, waxes, latex and resins, dyes and tannins, oils, fuels and fuel wood, timbers, medicines and pharmaceuticals, forage and pasture, ornamentals, religious and ceremonial uses, bee plants, invertebrate food, poisons and a multitude of environmental uses.

Plants play a vital role in maintaining the planet's basic environmental balance and ecosystem stability and provide an irreplaceable component of the habitats for the world's animal life. In addition, plant diversity acts as an essential carbon sink to help address and reduce the impacts of climate change.

There are known to be in the region of 400,000 plant species worldwide but of urgent concern is that some 100,000 of these plant species are now threatened with extinction in the wild. Unless effective measures for their conservation are put in place during the coming decade(s) up to two thirds of the world's plant species are predicted to become threatened or extinct by end of century.

The threats faced by plant species are many and complex and some threatening factors combine to make conservation actions even more challenging. Threats include unsustainable agriculture, tourism, climate change, deforestation and industrial developments; population growth, unsustainable over-collecting, natural disasters such as volcanic eruptions, hurricanes, droughts and wildfires, some of these exacerbated by climate change; pollution, political conflicts and wars, invasives, ecological and biological threats, including ecological isolation and small plant population inviability; salinization and desertification and many other factors.

The importance of a broad botanical community combining their resources and approaches to implementing a strategic plan to safeguard the plant resources of the Caribbean region is obvious. This community's efforts can be linked with actions undertaken by governments and other stakeholders at all levels to help ensure that the objectives, goals and targets of this Strategy for Plant Conservation in the Caribbean region can be achieved.

V: Technical rationales for the targets

Elements of these technical rationales were developed by participants in meetings held at the Botanical Bridges Congress (2022). Users of the Strategy are encouraged to make use of the technical rationales, for example by adapting them to guide the development / updating and promotion of plant conservation strategies and actions, and by taking into account specific priorities and circumstances in their own countries and territories.

Objective I: Plant diversity is well understood, documented and recognized.

1. Ensure that comprehensive, up-to-date and widely accessible floristic, taxonomic, distribution, conservation status and threat information is available for all wild [native, introduced and invasive] plant species in the Caribbean region.

To achieve this target it is likely that a range of new online national, regional and international databases will be needed, or existing ones enhanced, to provide the scientific and other information that will underpin effective conservation action. Databases such as the World Flora Online (WFO) - (http:/www.worldfloraonline.org), the WFO Plant List (https://wfoplantlist.org/plant-list) and those databases maintained by Botanic Gardens Conservation International - (https://www.bgci.org/resources/bgci-databases/) such as Plant Search (https://plantsearch.bgci.org/); Garden Search and the Global Tree Portal) will also be helpful.

Comprehensive information required in support of plant conservation can include, inter alia, a wide variety of data including:

- invasive species lists for each country and territory;
- inventories of economic plant cultivars and wild relatives of economically important plants;
- information on the cultivation and propagation of native plant species;
- status and distribution information on native, introduced, and naturalized plants.

2. *Complete National Plant Red Lists for all Caribbean countries as required to guide conservation action.*

The IUCN Red List Categories and Criteria provide a robust framework for this target and enable comparison of threats across a variety of spatial and temporal scales. In some countries and territories, lists of rare or threatened plant species have been developed which may not necessarily follow the IUCN Red List Categories and Criteria, but they can provide the necessary data to enable the identification of species requiring conservation and the prioritization of plant conservation actions.

3. *Complete the identification and documentation of the important areas for plant diversity in all Caribbean countries.*

The most important areas for plant diversity can be identified according to criteria including endemism, vulnerability of species and habitats, species richness, genetic variability patterns and/or uniqueness of habitats, including relict ecosystems, also taking into account the provision of ecosystem services. These areas should be identified at national and local levels. Protection can be assured through effective land management, including, but not limited to, protected areas. The key challenge will be to ensure that appropriate management measures are supported that maintain and enhance plant diversity. Threats to consider when designing effective management will vary in different regions/on different sites but should include the threats posed by climate change.

To date, many countries, including in the Caribbean region have taken steps to identify important areas for plant diversity and have ongoing programmes that are addressing conservation issues as well as documenting sites. Some important areas for plant diversity fall within officially protected areas though this figure varies considerably between countries. The percentage of important areas for plant diversity protected does not necessarily mean the site is maintained in good condition. Well-managed important areas for plant diversity will contain the largest, most resilient populations of species and numerous microhabitats; they provide staging posts for migration and a reservoir of genes for evolution; they will therefore be the core of any landscape-scale conservation schemes to mitigate the impacts of climate change.

Worldwide efforts to define Important Plant Areas and Key Biodiversity Areas can provide a valuable measure of baselines and progress towards the achievement of this target. An Important Plant Area (IPA) is a natural or semi-natural site exhibiting exceptional botanical richness and/or supporting an outstanding assemblage of rare, threatened and/or endemic plant species and/or vegetation of high botanic value. In describing IPAs, the word 'plant' encompasses algae, fungi, lichens, liverworts, mosses, and wild vascular plants. IPAs are a site-based approach for the conservation of plants at a national level, and forms a subset of Key Biodiversity Areas (KBAs) around the

world. Other approaches in countries that identify important areas for plant diversity that have not identified IPAs or KBAs could also be applied to monitoring.

4. *Undertake a climate change vulnerability assessment for important areas of plant diversity and the plant species they contain in the Caribbean region in order to implement protection, mitigation and adaptation measures to safeguard those species and ecosystems identified as at risk from climate change.*

Climate Change Vulnerability is defined by the Intergovernmental Panel on Climate Change (IPCC) as the susceptibility of a species, system or resource to the negative effects of climate change and other stressors, and includes three components: exposure, sensitivity, and adaptive capacity.

- Exposure is the amount and rate of change that a species or system experiences from the direct (e.g., temperature, precipitation changes) or indirect (e.g., habitat shifts due to changing vegetation composition) impacts of climate change;
- Sensitivity refers to characteristics of a species or system that are dependent on specific environmental conditions, and the degree to which it will likely be affected by climate change (e.g., temperature or hydrological requirements); and
- Adaptive capacity is the ability of a species to cope and persist under changing conditions through local or regional acclimation, dispersal or migration, adaptation (e.g., behavioral shifts), and/or evolution.

Climate Change Vulnerability Assessments (CCVAs) are emerging tools that can be used as an initial step in the adaptation planning process. A CCVA focuses on species, habitats, or systems of interest, and helps identify the greatest risks to them from climate change impacts. A CCVA identifies factors that contribute to vulnerability, which can include both the direct and indirect effects of climate change, as well as non-climate stressors (e.g., land use change, habitat fragmentation, pollution, and invasive species).

The process of completing a CCVA includes the synthesis of existing information about the target species or system, confidence levels in those data, and identification of knowledge gaps. A CCVA combines this background information with climate projections to identify the specific elements of exposure, sensitivity, and adaptive capacity that contribute to the overall vulnerability of the species or system. There is no standard method or framework to conduct a CCVA, and a variety of methods are being implemented at government, institutional, and organizational levels. Because of this, interpretation of CCVA results should carefully consider whether and how each of the three components of vulnerability (exposure, sensitivity, and adaptive capacity) were evaluated, if non-climate stressors were included in the assessment, how uncertainty is presented, the geographic location covered by the assessment, and whether the entire life cycle of a target species was evaluated, particularly for those that are migratory. Generally, the approach chosen should be based on the goals of practitioners, confidence in existing data and information, and the resources available (e.g., financial, personnel). (Rationale based on information provided by the Intergovernmental Panel on Climate Change).

5. *Research on plant diversity, plant-based ecosystems, conservation biology, conservation horticulture and traditional and local plant knowledge undertaken in the*

Caribbean region as required to support the achievement of the objectives of the Strategy.

Research in many aspects of conservation biology, methodologies and practical techniques for conservation are fundamental to the successful conservation of plant diversity. Relevant techniques, for example in conservation horticulture, are being developed and used by many individuals and institutions around the world and methodologies developed in one place may well have useful applications elsewhere. However, these are not necessarily known about or accessible. The aim of this target is to ensure that useful information and technologies are shared amongst the global community and that information gaps are identified, so that they can be filled with newly generated knowledge.

As plant conservation needs and available resources vary from country to country, it is important to ensure that information, technical guidance and case studies are provided in the languages spoken in the Caribbean region, are freely available, and cover a range of circumstances. Each target of the Strategy will have its own set of information and research needs. Hence, this target is considered 'cross-cutting' and applicable to other targets. As progress is made towards each target it is important to ensure that the relevant lessons learned are shared and practical guidance on how to implement the target is made available to others.

Key areas where the development of methodologies and techniques are required include:

- How to integrate in situ and ex situ conservation.
- How the information that has been developed on how to grow threatened plants in 'protected' environments (ex situ) can be used to help conserve them in their native habitats;
- How to reduce threats and ensure that threatened plants are maintained within ecosystems, especially in the face of changing climates;
- How to balance increasing demands for plant-based products harvested from the wild with conservation of the species that provide them.

<u>Objective II: Conserving plant diversity and using it sustainably</u>

6. *Include at least 50% of the threatened plants of the Caribbean in ex situ collections.*

Ex situ conservation is defined as the conservation of plant diversity outside its natural habitat. It plays a valuable and often essential complementary role to in situ conservation by providing a safety "back up" and an insurance policy against extinction in the wild. Ex situ conservation can be performed by a diversity of methods: seed conservation including freeze drying, cryopreservation, in vitro culture, living collections (such as in botanic gardens and arboreta), field genebanks. One key element is identifying the most efficient and effective (including cost-effective) methods for each species. The assumption is that effective conservation of threatened species ex situ will include their availability to support in situ conservation, restoration and recovery programmes and to ensure that their genetic variability is included in ex situ holdings.

It is expected that conservation practitioners developing or managing ex situ collections will give urgent attention to ensuring that as much as possible of the genetic diversity of species being conserved are included in such collections and holdings.

This target aims to achieve a comprehensive programme of ex situ conservation that complements in situ conservation, through the development of genetically representative collections and measures that strengthen responses to the impacts of climate change, unsustainable land use and overharvesting of plant resources. Common objectives for ex situ and in situ approaches should be identified and activities coordinated between the two to ensure an integrated approach at a national level. In all cases, the development of exemplary recording systems and plant records for ex situ conservation collections must be fostered and maintained. Lists of priority species for inclusion in conservation and ex situ collections should be developed, to ensure that no species are overlooked in the development of conservation actions.

It is expected that the 50% target for ex situ collections will be exceeded in some countries and territories in the Caribbean region but in others the target may be difficult to achieve, mainly due to existing lack of capacity and / or in areas of high plant diversity.

Significant progress has been made by some countries and territories in the Caribbean region in ex situ conservation, but those with high biodiversity still face great challenges. In the absence of updated global, regional and national lists of threatened species, and with different lists in use, it may be difficult to measure the achievement of this target.

Ex situ collections should be both accessible and duplicated and should preferably be in the country of origin. Purpose-oriented and transparent regulations for accessing ex situ collections should be developed and made publicly available in order to facilitate and increase the use of ex situ collections, e.g. for recovery and restoration and other uses of plant genetic resources.

Enhanced seed banking of rare or threatened plants seed and other propagules can play an important part in achieving the goal set in this target, especially for (orthodox) seed that can be stored for extended periods in low temperature and reduced moisture conditions. For species with recalcitrant seeds that cannot be stored under such conditions alternative strategies for their conservation must be developed.

7. *Develop, implement or participate in recovery and restoration programmes for 10% of critically endangered species.*

Recovery plans may include the incorporation of species and their habitats in national level biodiversity conservation or action plans. Understanding the most efficient and effective means for ex situ conservation and criteria and needs for in situ recovery and management plans, will require extensive conservation biology research, including the development of innovative approaches, such as assisted migration, to face the global changes expected.

Planning is an essential precursor to species conservation action. A species recovery plan serves as a road map for species recovery. It outlines the path and tasks required to restore and secure self-sustaining wild populations. It is generally a non-regulatory document that describes, justifies, and schedules the research and management actions necessary to support recovery of a species or multiple species. Such plans may consist of actions that are targeted towards individual plant species, populations or collections of species, and may form a component of the management plans for individual or networks of protected areas or other natural habitats. Species recovery plans may be developed by a wide range of

governmental and non-governmental agencies. However, it is expected that they will be widely agreed by the relevant stakeholders responsible for or undertaking the conservation action.

The achievement of this target should be interpreted to include the conservation of the genetic diversity of the species included in recovery and restoration programmes.

8. *Ensure that at least 70% of threatened plants are included and effectively conserved in protected areas.*

The achievement of this target should be seen as a step towards the effective in situ conservation of all threatened species. "Conserved in situ" is understood to mean that biologically viable populations of these species occur in at least one protected area or the species is effectively managed outside the protected area network, through other in situ management measures. Effective conservation needs to consider (i) the genetic diversity of the species and (ii) ecosystem function and resilience to such threats as climate change, for example, by determining whether the protected area network includes corridors, altitudinal gradients, or the presence of multiple habitats to facilitate species movement. The target should also be interpreted to allow for significant habitat and ecological restoration to enable its achievement. Many endemic species are by definition vulnerable, and should be treated as a priority, a sub-target of ensuring all endemics are found in at least one conservation area, or are covered by species plans may be useful.

Many protected areas do not have well-articulated management objectives of any kind – let alone specific ones relating to protecting species. The progress on this target has been limited by a lack of baseline information. It will be important to move from conserving 70 per cent in situ to the conservation of 100 per cent. Therefore, the actions underpinning this target will remain essential beyond 2030, as the current target is only a milestone towards the objective of halting the loss of plant diversity

9. *Regulate and manage the known invasive and potential invasive species that threaten plant species and native plant ecosystems in all Caribbean countries.*

This target addresses biological invasions that threaten plants, plant communities and associated habitats and ecosystems. It is especially relevant to targets sites that are important for their native plants diversity. The target combines both the invasion by the alien species (plant, animals or micro-organisms) and the reactions of ecosystems or habitats into which they are introduced (i.e. there is not always a negative reaction by the ecosystem).

This target should be considered as a step towards developing management plans for all types of major biological invasions. Management plans should be designed (using the ecosystem approach) to redress damage done to plants and/or their communities and to restore ecosystem functions, goods and services. This requires that target ecosystems/habitats be defined, in this case as "important areas for plant diversity". There is an urgent need to recognize that climate change will enhance the spread and impact of invasive alien species. Hence, future work on this target should ensure that there is adequate preparedness and that management plans should include options for adaptation to climate change.

Regulation of invasive species may include legal instruments that seek to prevent the importation, dissemination and cultivation of known or potentially invasive species and organisms. The undertaking of weed risk

assessments at national levels and by individual institutions that maintain living plant collections (such as botanic gardens) will be important to help identify and prevent new biological invasions. These will be particularly important when imports of new ornamental and other plants are being considered and to help identify dangerous new pests and diseases.

It is clear that in order for this target to be achieved there is a need for significant public awareness campaigns and public involvement in control and management measures.

10. *Promote the use of economic incentives to help halt the loss of plant diversity; to eliminate detrimental economic incentives that threaten wild plant diversity and to support sustainable management of forests, other ecosystems and production lands.*

Substantial and widespread changes to incentives, including subsidies, are required to ensure sustainability. Ending or reforming incentives, including subsidies, that are harmful to plant diversity is a critical and necessary first step that would also generate net socio-economic benefits. In addition, the creation or further development of positive incentives for the conservation and sustainable use of plant diversity, and plant ecosystems, provided that such incentives are in harmony with the Convention on Biological Diversity and other relevant international obligations, could also help in the implementation of the Strategy by providing financial or other incentives to encourage actors to undertake actions which would benefit plants.

11. *Ensure that no native plant species in the Caribbean are threatened by local, national or international trade or unsustainable harvesting.*

The collection of certain rare, endemic or commercially desirable plant species for trade both nationally and internationally poses a major threat to their survival in the wild, and to the genetic diversity of species that are unsustainable harvested or traded. This is especially the case where their habitat itself might be threatened or where the species occur naturally in low numbers. This target focuses on those species of wild flora that are:

(i) currently threatened by international trade, and
(ii) may become threatened in the near future due to high levels of international trade. Species of wild flora endangered by international trade include but are not limited to species listed on the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The target is consistent with the main purpose of the CITES Strategic Vision: “No species of wild flora subject to unsustainable exploitation because of international trade”.

In the Caribbean region, the main plant species that may be threatened by trade or unsustainable harvesting include plants of interest for the horticultural industry, such as cycads, orchids and succulents. Locally, some plant species are unsustainably harvested to support traditional medicinal, herbal and other uses too. Various trees, such as some tropical hardwood species are also threatened, and sometime this trade is exacerbated through international trade, where precious timbers such as mahogany can obtain high prices in the international market. Locally the harvesting of trees for fuel and lumber can also be unsustainable and can impact vulnerable or rare species.

Traditionally the plants covered by CITES have been ornamentals (such as orchids and cacti) threatened by commercial collecting from the wild for gardens and greenhouses. However, more attention is now being focused on the major commercial groups of internationally traded species such as timbers and medicinal plants. International monitoring and control of the trade in threatened plants through CITES is today the principal means of international cooperation and monitoring of plant trade. CITES allows trade in plant species that can withstand current rates of exploitation, but prevents trade in those that face extinction. International trade in species of wild flora, in addition to threatening survival of species, may be detrimental for the local use and fair sharing of benefits from utilization of species. This target is important in that its implementation, monitoring and review is through synergy with the Plants Committee of CITES.

12. *National and regional legal frameworks for the protection of Caribbean plant diversity are reviewed and strengthened as required to ensure the achievement of the targets of this Strategy.*

This target aims to support activities by a range of stakeholders, including the botanical community, environmental organisations and local and national authorities to ensure that adequate legal protections are in place to safeguard native plant diversity and natural habitats and to provide the enabling conditions where conservation actions can thrive.

13. *Develop region-wide and national programs for the restoration / rehabilitation of ecosystems with appropriate native species, to support plant conservation and carbon sequestration.*

This plant conservation element places native species and biodiversity at the centre of ecological restoration efforts. Particularly important for carbon sequestration is the restoration of native forests. Planting schemes solely or primarily to achieve carbon sequestration and for commercial forestry can have detrimental impacts on biodiversity, especially where they involve exotic monocultures which displace native species and create low-value landscapes for biodiversity.

In the context of this target, a definition of a restored ecosystem is one with a persistent capacity to provide ecosystem services through the conservation, recovery and maintenance of appropriate native biodiversity in a rehabilitated habitat.

14. *Develop models of benefit sharing to support local communities, based on native plant diversity, to help eliminate poverty, enhance local economies, food security, health care and the conservation of traditional knowledge.*

It is also assumed that this target includes the integration of social and environmental considerations, such as the fair and equitable sharing of benefits and the participation of indigenous and local communities along at the supply chain. This element also focuses on respecting and securing the plant species and knowledge base of plant resources used to secure livelihoods, food security and health care, especially for indigenous and local communities. This measure is incorporated to ensure that future generations accessing these resources can continue to benefit from their sustainable use.

The target should be implemented consistent with the Convention on Biological Diversity's programme of work on Article 8(j) and related provisions. This target may, in the long run, help local and indigenous communities to adapt to emerging environmental challenges such as climate change.

The development and adoption of appropriate policies and actions to facilitate efficient and effective international and other exchange and transfer of plant materials, expertise and knowledge is urgently needed in many countries and territories to support conservation, research benefit sharing and sustainable use of plant diversity. Constraints in facilitating access, exchanges, and collaboration between institutions to support cooperative programmes, particularly at international levels, has slowed progress considerably in achieving plant conservation priorities in many countries.

It is understood and expected that this element will be achieved in full compliance with the principles and terms of the Nagoya protocol and its associated codes and guidelines, as well as national legislation and regulations adopted in accordance with the Nagoya Protocol at national levels. The achievement of this target must also be undertaken in accordance with the agreed processes under CITES for trade for scientific exchange and research purposes.

15. *Indigenous and local knowledge, innovations and practices associated with plant resources maintained or increased in the Caribbean region, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.*

This Target focuses on respecting and securing the knowledge base of plant resources, including scientific knowledge, used to secure livelihoods, food security and health care, especially for indigenous and local Communities. This measure is incorporated to ensure that future generations accessing these resources can continue to benefit from their sustainable use. The target should be implemented consistent with the Convention on Biological Diversity's programme of work on Article 8(j) and related provisions. As with target 14, this element may, in the long run, help local and indigenous communities to adapt to emerging environmental challenges such as climate change.

16. *Plant conservation is incorporated into regional and national biodiversity conservation and sustainable development actions and plans, including for the achievement of the Sustainable Development Goals and the targets of the post-2020 Global Biodiversity Framework.*

It is widely recognized that the values of plant diversity are not widely reflected in decision-making. The objective of this element is to ensure that the diverse values of plants and opportunities derived from their conservation and sustainable use are recognized and reflected in all relevant public and private decision-making. For example, numerous studies, at various scales, have illustrated the economic value of plant diversity and the ecosystem services it underpins. Including the values of plant diversity in national and local development and poverty reduction strategies and planning processes and into nation accounting, as appropriate, and reporting systems, places plants into the same decision framework as other goods and services, and would help give it greater visibility amongst policy-makers and contribute to the "mainstreaming" of plant diversity issues in decision-making processes. Reflecting the values of plants in the planning processes of governments at all levels, including economic, financial, spatial planning, and the

application of strategic environmental assessment, will help internalize the costs and benefits of the conservation and sustainable use of plant diversity in decision-making. [Based on the Technical Rationale for Aichi Target 2]

Objective III: Promoting education & awareness about plant diversity

17. *Incorporate education and awareness about plants and native plants and their habitats in particular into national schools' curricula*

Plants are often under-represented in the conservation debate and neglected in efforts to engage the public in environmental action. Furthermore, increasing urbanization is resulting in a growing disconnect between people and nature, especially noticeable among young people. It is therefore of fundamental importance to enhance the inclusion of plants, habitats and environmental conservation into national schools' curricula.

18. *The importance of plant diversity and the need for its conservation incorporated into communication, education, citizen science and public awareness programs at national and regional levels.*

There is an urgent need to effectively communicate the value of plant diversity to all relevant sectors, including indigenous and local communities, young people, the business sector, media and policy makers. There is also a need to refocus a communication strategy to address livelihoods, ecosystem products and services. Implementation of this the target will also require the engagement of both the informal and formal education sectors at all levels, including primary, secondary and tertiary education.

It is clear that key messages for a communication / marketing plan for this target will require the incorporation of plant conservation into national climate change communication strategies, and into other relevant resource management documents or strategies.

Objective IV: Capacity building for plant diversity

19. *Strengthen and support effective regional networks and partnerships to achieve and monitor progress towards the objectives and targets of the Caribbean Plant Conservation Strategy.*

Networks supporting plant conservation activities provide the means to share experiences, exchange data, encourage professional development and build the capacity of the plant conservation community. Many different models exist for such networks, ranging from informal, sometimes transient efforts to share information or cooperate on specific projects, to large national and international associations with paid staff and secretariats. Building strong national networks involving all these key players will often be pivotal in successful implementation of this Strategy.

It is expected that the Caribbean and Central American Botanic Gardens Network will play an important role in supporting, guiding and monitoring the achievement of the targets of this strategy, supported by a range of international organizations, such as Botanic Gardens Conservation International, the Global Partnership for Plant Conservation and major botanic gardens in several countries beyond the Caribbean region. Generating support for in-person meetings to allow

conservation practitioners to meet and share knowledge and expertise between countries and territories throughout the Caribbean region will be important.

20. *Capacity building and resource mobilization opportunities established or strengthened at national, regional and international levels to support the development of those institutions needed for the achievement of the targets of this Strategy.*

In the context of this target, 'capacity' is defined as the process by which individuals and organizations will have obtained, improved, and retained the skills, knowledge, tools, equipment, and other resources needed to achieve the objectives of their national plant conservation strategies and goals. Capacity building can also include a conceptual approach toward social and behavioural change, and the removal of obstacles that lead to infrastructure development allowing the achievement of the stated goals. Significant capacity building can also be supported, encouraged and facilitated through the development of training networks.

Note:

Some of the text included in the technical rationales has been adapted from those of related targets included in the Global Strategy for Plant Conservation (2011-2020); from 'The Development of a post-2020 Global Strategy for Plant Conservation as a component of the Global Biodiversity Framework' (CBD/SBSTTA/24/INF/20 - 3 February 2021), and from other sources.

VI: Some specific actions for Caribbean region's Botanic Gardens

I: Understanding and documenting plant diversity

- Ensure that data on all ex situ plant collections in botanic gardens in the region are available online.
- Develop and maintain a comprehensive and accessible on-line database on botanic garden resources, facilities, services and experience of relevance to plant conservation.
- Duplicate threatened species holdings amongst a number of collection holders to support the development of meta collections and as insurance against the loss of collections through disasters.
- Develop infrastructure to share research, information, guidance and case studies in the languages spoken in the Caribbean region in a freely available format covering a range of circumstances.

II: Conserving plant diversity and using it sustainably

- Develop a programme for individual botanic garden responsibility for the conservation of priority species in their own regions / countries.
- Establish and document national ex situ collections of threatened economic plants, including cultivars and their wild relatives.
- Promote, establish and strengthen programs in botanic gardens throughout the region on the conservation of traditional knowledge about plants and their uses

III: Promoting education & awareness about plant diversity

- National/regional training programs in environmental education established for botanic garden staff
- Botanic garden education facilities established in each country.
- Botanic garden environmental education programs for schoolchildren, university students and their teachers created throughout the Caribbean region.

IV: Capacity building for plant diversity

- Maintain an accessible overview on botanic gardens and other organisations in the Caribbean region, in particular identifying their activities and roles in plant conservation and environmental education.
- At least one effective botanic garden operating in every country in the Caribbean with staff and capacity for plant conservation and environmental education.

VII: Reference

Burbidge, B. and Wyse Jackson, P.S. (Eds) (1998). *Conservation Action Plan for Botanic Gardens of the Caribbean Islands*. Botanic Gardens Conservation International, Botanic Gardens Conservation International, London, U.K. Pp. 36.

Convention on Biological Diversity (2012). Global Strategy for Plant Conservation: 2011-2020. Botanic Gardens Conservation International, Richmond, UK.