

A POLICY TOWARDS ORCHID CONSERVATION IN JAMAICA



Prepared by
The National Environment and Planning Agency
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LIST OF ACRONYMS

CDC	Conservation Data Centre
CITES	Convention on International Trade in Endangered species
IOJ	Institute of Jamaica
IUCN	The World Conservation Union
JCDT	Jamaica Conservation and Development Trust
JOS	Jamaica Orchid Society
NEPA	National Environment and Planning Agency
NRCA	Natural Resources Conservation Authority
OPC	Orchid Policy Committee
SRC	Scientific Resource Council
UWI	University of the West Indies
WLPA	Wild Life Protection Act

1.0 INTRODUCTION

The orchid family, **Orchidaceae** can be considered to be one of the more successful families of the plant kingdom. It is estimated that there are approximately 30,000 described species worldwide and more are being discovered annually. In Jamaica, over 220 species have been recorded, of which approximately 60 are considered to be endemic. However, the possibility exists that more species will be discovered.

Threats

The main threat facing Jamaica's threatened and endangered orchids is the destruction or alteration of their habitats caused by land clearing for:

- Housing
- Hotel and agricultural development
- Mining for bauxite and/or limestone and,
- Harvesting of forest products for timber, fuel wood, fish pots, yam sticks and fence posts.

Collection by orchid enthusiasts for both the local and international trade is thought to be the second greatest threat to the island's orchid species. Trade in specimens of endangered or rare orchid species collected from the wild continues to concern many plant conservationists. Given the present status of Jamaica's orchids, the Government of Jamaica has taken steps to regulate their trade and to protect their habitats through enacting legislation thereby fulfilling its obligations under some environmental Conventions.

CITES

One such convention is the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) of which Jamaica became a Party in 1997. This Convention is an international treaty that regulates international trade and ensures sustainable utilization of species of wild fauna and flora through the use of a permit system and enactment of domestic legislation. Designated national Scientific and Management Authorities administer the permit system. The Scientific Authority is an independent body of local scientists, which advises the Management Authority on the trade in endangered species and ensures that specimens traded, will not be detrimental to the species survival. The Natural Resources Conservation Authority (NRCA) is Jamaica's designated Management Authority and is responsible for issuing permits and certificates for species included in the CITES Appendices I, II and III.

Most orchids in the world are listed under CITES Appendix II and nine species are listed in Appendix I. Jamaica has no orchid species included in Appendix I but all species are listed under Appendix II of the Convention. Appendix II plants are considered endangered, and as such, the international trade is regulated by CITES and trade in the taxa would require a permit or certificate. Both CITES and The Endangered Species (Protection, Conservation and Regulation of Trade) Act, 2000 provide exemption for artificially propagated seeds and pollen (including pollinia), cut flowers, seedlings or tissue cultures obtained *in vitro*, in solid or liquid media, transported in sterile containers.

Conservation

There have been increased efforts in the areas of *ex-situ* and *in-situ* conservation locally with the use of tissue culture showing great potential for *ex-situ* conservation. Over the past years, the Scientific Research Council (SRC), the University of Technology and an orchid entrepreneur have collaborated in research activities, resulting in some local orchid species being artificially propagated. This technology has increased the availability of orchids to plant enthusiasts, thus discouraging the over-exploitation of some wild orchid species. *In-situ* conservation is being addressed through:

- The expansion of the system of Protected Areas;
- The establishment of two private orchid sanctuaries; and
- The proposed amendments of the Wild Life Protection Act and The Endangered Species (Protection, Conservation and Regulation of Trade) Act, 2000.

It was in fulfilment of Jamaica's obligation to CITES that in 1994, an Orchid Policy Committee (OPC) was commissioned by the NRCA to formulate a comprehensive orchid policy. Subsequently, an Orchid Policy Committee was established. The Orchid Policy Committee was comprised of representatives from the Institute of Jamaica (IOJ), University of the West Indies (UWI), Jamaica Conservation and Development Trust (JCDDT), Conservation Data Centre (CDC), Jamaica Orchid Society (JOS), commercial exporters and the NRCA.

2.0 LEGAL FRAMEWORK

2.1 Regional and International Obligations

As a Party or signatory to the following Conventions and Protocol, Jamaica is obligated to the Articles and needs to ensure that the resolutions are adhered to at the national level and that national legislation is enacted or strengthened.

2.1.1 *The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)*

The Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) is an international treaty, which entered into force on July 1, 1975 and is administrated by the United Nations. It was established because of the need to protect wild species from over utilization through international trade. The Convention regulates international trade in specimens of wild plants and animals, using a trade control system of permits, certificates and export quota. Trade in plants and animals should not be detrimental to the survival of the species and must be sustainable.

There are three categories of protection for animal and plant species which are contained in Appendices I, II and III. Appendix I include species threatened with extinction and for which trade must be subjected to particularly strict regulation and authorized only in exceptional circumstances. Appendix II includes all species, which may become threatened unless trade in specimens of such species is subject to strict regulation in order to avoid unsustainable utilization. An export permit issued by the country of origin must accompany the export of any species included in Appendix II. Appendix III includes all species which any Party identifies as being subject to regulation within its jurisdiction, and needs the co-operation of other Parties in the control of its trade.

Jamaica became a Party to this Convention on June 22, 1997. Each Party is required to implement CITES through domestic legislation and polices. Resolution Conference 10.3 of the Convention dictates that all Parties designate Scientific Authorities independent from Management Authorities. These Authorities have been designated under Section 13 of The Endangered Species (Protection, Conservation and Regulation of Trade) Act, 2000. The Natural Resources Conservation Authority is designated the Management Authority of CITES.

2.1.2 *The Convention on Biological Diversity*

The Convention on Biological Diversity (CBD) entered into force on December 1993. Jamaica ratified this Convention on January 6, 1995. The three main objectives of the Convention are:

- The conservation of biological diversity
- Sustainable use of its components and,
- The fair and equitable sharing of the benefits that are gained through the use of genetic resources.

2.1.3 *The Protocol concerning Specially Protected Areas and Wildlife in the Wider Caribbean*

The Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean (SPA-W), which entered into force on May 2000, is a Protocol of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena de Indias, Colombia, March 1983). Jamaica is a signatory (January 18, 1990) only, to the Protocol and plans are underway for ratification. The Protocol requires Parties to establish specially protected areas in order to protect and preserve rare and fragile ecosystems, threatened or endangered species, implement appropriate measures to prevent and control pollution and also to develop and apply environmental impact assessments (EIAs).

The Protocol also addresses the establishment, planning and management of protected areas and the implementation of national measures for the protection of wild flora and fauna. There are three Annexes to the Protocol. The family **Orchidaceae** is included in Annexes I and II.

2.2 National Legislation

2.2.1 *The Wild Life Protection Act, 1945*

The Wild Life Protection Act provides legal protection for only animal species with special focus on hunting and collecting, and on the discharge of pollution into wildlife habitats. The provisions of the Act are being reviewed and drafting instructions will be prepared for the inclusion of plants.

2.2.2 *The Watershed Protection Act, 1963*

The Watershed Protection Act seeks to protect the ecological integrity of the island's twenty-six watersheds.

2.2.3 *The Natural Resources Conservation Authority Act, 1991*

The Natural Resources Conservation Authority Act establishes the NRCA as the primary environmental agency responsible for the management, conservation and

protection of Jamaica's natural resources. The Act provides the legislative framework for the designation of national parks and protected areas and the establishment of an Environmental Permit and Licence System for certain prescribed categories of activities.

The Permit and Licence System is a mechanism to ensure that all developments meet the required standards in order to minimize negative environmental effects and that sustainable development is achieved. Some of the categories of activities which fall under this System include the clear cutting of forested areas of three hectares and over on slopes above 25°, felling of trees and land clearing of ten hectares or more for agriculture, introduction of species of flora, fauna and genetic material, ecotourism projects and mining and mineral processing.

2.2.4 *The Endangered Species (Protection, Conservation and Regulation of Trade) Act, 2000*

The Endangered Species (Protection, Conservation and Regulation of Trade) Act fulfils Jamaica's obligation under CITES and provides for the protection and conservation of endangered wild plants and animals by regulating trade in:

- (a) The exportation of specimens that are derived from indigenous Jamaican animals or plants;
- (b) The exportation and importation of specimens that are derived from animals or plants which:
 - (i) are threatened with extinction and are or may be affected by trade;
 - (ii) may become so threatened if international trade in specimens of such species is not subject to strict regulation; and
 - (iii) require or are likely to require protection or the cooperation of other States in order to prevent or restrict exploitation.
- (c) The importation of animals or plants, the introduction of which has or is likely to have an adverse effect on the habitats and species of indigenous Jamaican animals or plants; and
- (d) The exportation or importation of specimens that are difficult to distinguish from specimens referred to in paragraphs (a), (b), or (c).

The Scientific and Management Authorities for CITES are designated under this Act. Under Section 16 of the Act, three functions of the Scientific Authority are to:

- Advise the Management Authority on policy relating to trade in endangered species of wild fauna and flora;
- Advise the Management Authority on whether any species is vulnerable, threatened, at risk, endangered, extirpated or extinct; and
- Advise the Management Authority on suitable measures to be taken to limit the granting of export permits (annual export quota).

The Natural Resources Conservation Authority has been designated Jamaica's Management Authority for the Convention under Section 13 of the Act. The functions of the Management Authority are specified in Section 15. Under Section 15 of the Act, the Management Authority is responsible for the issuing of CITES permits and certificates and must consult with the Scientific Authority on the scientific aspects of the implementation of the Convention.

2.2.5 The Town and Country Planning Act, 1957

The Town and Country Planning Act established the Town Planning Department to regulate the development of lands island-wide. Under Section 25 of the Act, Tree Preservation Orders can be issued for the preservation of trees, groups of trees or woodlands. It is an offence to cut, destroy trees, groups of trees or woodlands in areas declared under a Tree Preservation Order. Under the Tree Preservation Order, provision may be made to ensure the replanting of trees or any part of a woodland area, which is felled in the course of permitted forestry operations. The Minister may make regulations under this Act with respect to the form of Tree Preservation Orders and the procedures for the submission and confirmation of such Orders.

2.2.6 The Forest Act, 1996

The new Forest Act established the Forestry Department as the Government agency with responsibility for the administration and management of forests. The Minister may by order, subject to affirmative resolution, declare any Crown Lands or private lands (subject to written application from the owner), Forest Reserves. On such reserves, it is an offence to fell, cut or burn trees and/or remove any forest produce. However, the Forest Conservator may grant licences and permits as may be prescribed for the harvesting of timber on Crown Lands, processing of timber forest products, removal of dead or damaged timber, research activities, recreational facilities for parks, roads, trails, camp grounds, picnic sites and any other purpose approved by the Conservator.

2.2.7 The Jamaica National Heritage Trust Act, 1985

The Jamaica National Heritage Trust Act was established in order to promote the preservation of our national monuments, anything designated as protected national heritage and to record any precious objects or works of art to be preserved and to identify and record any species of botanical or animal life to be protected.

2.3 Other Policy Documents

2.3.1 *National Biodiversity Strategy and Action Plan, 2003*

A multi-sectoral Biodiversity Steering Committee developed a National Biodiversity Strategy and Action Plan (NBSAP) as a requirement of Article 6(a) of the Convention on Biological Diversity. Article 6(a) states that each Party of the Convention should develop national strategies plans and programmes for the conservation and sustainable use of biological diversity or adopt relevant existing strategies, plans and programmes.

The NBSAP provides a comprehensive framework, which recognizes the components of biodiversity and ensures the sustainable use of biodiversity in Jamaica. This incorporates *inter alia* the following obligations of the Convention:

- Institute measures to develop or maintain the necessary legislative and/or regulatory provisions for the protection of threatened species;
- Facilitate access to genetic resources by national legislation;
- Regulate and manage the collection of biological resources from natural habitats for *ex-situ* conservation purposes;
- As far as possible, introduce procedures requiring EIAs of proposed projects, which may have a significant adverse effect on biodiversity and where appropriate allow public participation; and
- Provide for the effective participation in biotechnological research and fair and equitable sharing of benefits arising from the commercial utilization of genetic resources especially by countries providing genetic resources.

2.3.2 *System of Protected Areas Policy, 1997*

The Policy for Jamaica's System of Protected Areas includes the goals of the protected area system, types of protected areas, roles and responsibilities, legal framework, the process for establishing protected areas, a two year implementation plan, and a list of proposed protected area sites. The types of protected areas proposed are national nature reserves, national parks/marine parks, natural landmarks/monuments, habitat/species management areas, national protected landscapes/seascapes and managed resource-protected areas. The Policy has identified over one hundred and fifty proposed protected area candidates.

2.3.3 *Watershed Policy, 1999*

The Green Paper no. 2/99, '*Towards a Watershed Policy for Jamaica*', identifies the essential elements of national watershed management with a view to increasing water supply and conserving biodiversity. The draft policy covers:

- Watershed problems, past interventions and current international trends in watershed management
- The major challenges facing the country with respect to watershed management and,
- The key principles and strategies to address those challenges.

2.3.4 *National Forest Management and Conservation Plan, 2001*

The National Forest Management and Conservation Plan was prepared by the Forestry Department as a requirement of the Forest Act. In accordance with Section 16 of the Forest Act, 1996, the plan outlines the following:

- A statement of the forest resource management and conservation policy
- An inventory and description of forest lands
- Provisions for the protection, conservation and production of forest resources
- Proposals for the protection of watersheds, soil, water, wildlife and other forest resources
- The economic objectives for the sustainable development of wood-based industries in Jamaica
- Programmes for social forestry, community development and forest – related education and,
- Proposals for implementation.

Strategies include incentives and investments, critical emphasis areas, reforestation and forest development, institutional arrangements, public awareness and community development.

3.0 STATUS OF ORCHIDS

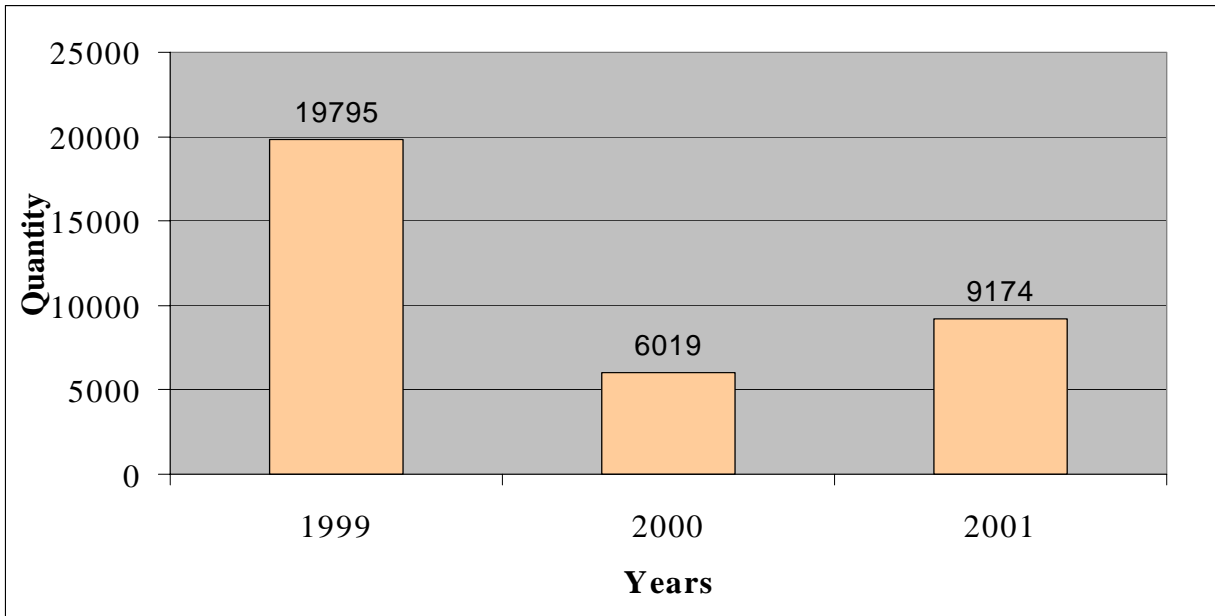
There is a tremendous market for orchids worldwide, and trade in wild, endangered and rare orchid species continues to concern many plant conservationists. In Jamaica, there are over two hundred and thirty (230) species of which approximately sixty (60) are endemic and include *Broughtonia sanguinea*, *Broughtonia negrilensis*, all species of the genus *Lepanthes* and *Dendrophylax barrettiae*. There is insufficient data to determine the status of orchids in Jamaica, but according to local botanists, the family is threatened and requires protection.

At present, there are two orchid sanctuaries, Schwallenburg Sanctuary and Martin's Hill Orchid Sanctuary located in St. Ann and Manchester respectively. These sanctuaries function as rescue centres and were established in order to relocate orchids from lands designated to be mined as well as lands under threat by the operations of West Indies Alumina Company (WINDALCO), (formerly known as Alcan Jamaica Limited). The Schwallenburgh Orchid Sanctuary is the larger of the sanctuaries (on 1.6 hectares) and has approximately fifteen thousand (15,000) plants representing fifty-eight (58) species and thirty (30) genera, whereas the Martin's Hill Orchid Sanctuary (on 0.4 hectares) has approximately thirty thousand (30,000) plants representing one hundred and one (101) species and seventy-two (72) genera. The orchid sanctuaries are owned and managed by WINDALCO since the 1990's.

The conservation and sustainable use of Jamaica's orchid population have included seed culture and meristem propagation. There are approximately twenty-four (24) species being grown by horticulturists, such as *Prosthechea (Encyclia) cochleata*, *Prosthechea (Encyclia) fragrans*, *Broughtonia sanguinea* and *B. negrilensis*. *Broughtonia sanguinea*, *Brassavola cordata*, *Oncidium pulchellum* and *Tolumnia (Oncidium) triquetrum* are widely used in hybridization. With the assistance of the Scientific Research Council and the orchid industry, the use of tissue culture technology is being used in the artificial propagation of some species. These methods should result in an increase in the availability of native orchid species for commerce, thereby reducing collection from the wild. In addition, other conservation measures (Section 4.0) will need to be addressed in order to maintain Jamaica's orchid populations.

The majority of Jamaica's orchid species are listed in CITES Appendix II and the remainder in Appendix I. Despite this protection, illegal trade still exists. International trade in orchids is ranked second in terms of endangered species being traded. Jamaica exported orchids with quantities varying from 19,795 in 1999 to 6019 in 2000 to 9174 in 2001 (**Figure 1**). The most frequent species traded include *Broughtonia sanguinea*, *Oncidium triquetrum* and hybrids of the genera *Broughtonia*, *Phalaenopsis*, *Brassavola*, *Cattleya* and *Dendrobium*.

Figure 1: Graph showing total number of orchids legally exported from Jamaica (1999 – 2001)



4.0 LEGAL AND CONSERVATION GAPS

The issues relating to sustainable use of orchids are:

- Lack of an inventory of orchid species and their abundance and distribution
- Slow process to protect and manage critical wildlife habitats
- Difficulty in identifying orchids not in flower
- Lack of plant rescue centres
- Lack of awareness by developers on orchid conservation and,
- Habitat destruction and illegal harvesting.
- Exclusion of plants from the Wild Life Protection Act
- Lack of a collection policy
- No export quota system
- Inadequate monitoring and regulatory mechanisms
- The cost of repatriation of illegal shipments
- The need for domestic trade regulations.

Domestic trade in orchids does not fall under the jurisdiction of CITES or any existing legislation. However, it is envisaged that with the development and enactment of regulations under the Endangered Species (Protection, Conservation and Regulation of Trade) Act, illegal trade and uncontrolled harvesting of orchids will be addressed.

5.0 GOALS AND STRATEGIC DIRECTIONS

5.1 Goal 1 *Conserve Jamaica's Orchid Species and their Habitats*

5.1.1 *In-situ conservation*

Strategic Directions

- Conduct biannually an island-wide orchid survey to include members of the NRCA, Institute of Jamaica, Department of Life Sciences, U.W.I., Jamaica Orchid Society and other resource personnel.
- Establish Habitat/Species Management Areas (equivalent to IUCN Category IV) where the ecosystems are healthy and a number of species present are threatened by proposed habitat alteration such as development or mining.
- Rehabilitate degraded orchid habitats and promote the recovery of endangered orchid species through the development and implementation of Management/Recovery Plans.
- Develop legislation for the establishment of areas to facilitate conservation of orchids and other species especially in areas that are zoned for development such as bauxite and quarry mining, road construction and buildings.

5.1.2 *Ex situ conservation*

Strategic Directions

- Develop and review regularly, guidelines for rescue centres.
- Establish at least two rescue centres to house plants illegally exported and repatriated to Jamaica, for example, at the Hope Botanical Gardens and the Mason River Reserve.
- Establish and maintain a gene bank of endangered species.
- Encourage the artificial propagation of orchid species from seeds and tissue culture by commercial growers such as the granting of tax exemptions for imported materials used in the artificial propagation of wild orchids from seeds (**Annex 1**).
- Develop and institute cooperative agreements between private landowners and the Government for the purposes of plant conservation and land restoration.

- Re-establish decimated orchid populations by cultivating and propagating plants in nurseries for reintroduction.
- Maintain and expand the orchid collection at the Hope Botanical Gardens.

5.2 Goal 2 *Ensure Sustainable Use of Orchids*

5.2.1 *Regulatory Framework*

Strategic Directions

- Complete amendments of the Wild Life Protection Act (WLPA) to incorporate the protection of endangered and endemic orchid species and establish quota restrictions on commercial species. A periodic review of the orchids on the protected list should be conducted for nomenclature changes, addition or deletion of species.
- Legislate the Nursery Inspection Form under the domestic trade regulations of the Endangered Species Act (**Annex 2**).
- Develop a field collection policy to prevent the over-exploitation of wild orchids and incorporate into the domestic legislation.
- Develop a registration process for commercial exporters and nurseries.
- Establish and implement an allowable annual trade quota system for international trade to cover registered and non-registered exporters (**Annex 3 – Native Orchid Export List**).
- Develop regulations governing artificial propagation of wild species for Appendix I and Appendix II of the Trade in Endangered Species Act.
- Develop exemption certificates in accordance with the Endangered Species Act for persons trading in personal effects.

5.3 Goal 3 *Promote and Facilitate Research and Training*

5.3.1 *Training and Research*

Strategic Directions

- Develop and institute training programmes for the identification of orchid species for National Environment and Planning Agency (NEPA) staff, Customs Officers,

Taxonomists, Protected Areas Rangers, Plant Quarantine Officers and other relevant persons involved in the issuing of permits and security at sea and airports.

- Conduct and support research for artificial propagation of Jamaica's native orchid species.

5.4 Goal 4 Public Education and Awareness

Strategic Directions

- Develop and implement a public education awareness programme on the conservation of orchids and on the relevant resolutions of CITES.
- Educate developers, visitors and commercial exporters on conservation issues, CITES Resolutions (**Annex 4**), the Definitions and Guidelines for Export (**Annex 5**) the Native Orchid Export List, Export Procedures and NRCA's Environmental Permit and Licence System.
- Encourage individuals to purchase orchids from commercial growers, rather than collecting from the wild.
- Provide information on the method of processing plants for export to the electronic and print media, Ministry of Agriculture, Horticultural Societies and libraries.
- Continue to erect posters at airports, hotels and wildlife attractions in order to promote public awareness.
- Develop and disseminate an Orchid Expertise List (these persons should be able to accurately identify orchid species, have working experience in the areas of Orchid conservation and/or bioengineering).
- Formulate and publicise a Procedures Manual for exporting orchids.
- Continue to establish a photographic and herbarium collection of native orchid species in collaboration with the Institute of Jamaica.

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GLOSSARY

Artificial propagation:	plant grown by humans from seeds, cuttings, spores or other propagation in controlled conditions.
Bulb	a body composed of circular, concentric leaf bases, all attached to a disc-like or dome-like stem, generally with buds in their axils.
CITES Appendix I:	includes species threatened with extinction for which trade must be subject to particularly strict regulation and only authorized in exceptional circumstances.
CITES Appendix II:	includes species that are not necessarily now threatened with extinction but may become so unless trade is strictly regulated.
Endangered species:	a taxon is endangered when it is facing a very high risk of extinction in the wild in the near future.
Endemic:	restricted to a certain region or part of a region.
Export:	to take or cause to be taken out of Jamaica or the waters thereof.
Ex-situ conservation:	the conservation of components of biological diversity outside their natural habitats.
Extinct:	a species that no longer exists when there is no reasonable doubt that the last individual has died.
Extirpated:	a species that no longer exists in the wild in a particular place.
Fauna:	any member of the animal kingdom other than man, whether alive or dead.
Flora:	any member of the plant kingdom, whether alive or dead.
Habitat:	the place or type of site where an organism or population naturally occurs.
Habitat Species Management Area:	areas of land and/or sea managed mainly for conservation through management intervention to ensure the maintenance of habitats of specific species.

Import:	bringing in, causing to be brought in, or the introduction of a specimen into Jamaica by air or water otherwise than in transit or by trans-shipment.
Indigenous:	the plants and animals that are native to the island or country.
In-situ conservation:	the conservation of ecosystems and natural habitats and the maintenance and reworking of viable populations of species in their natural surroundings.
Meristem:	a group of cells that is capable of dividing indefinitely and whose main function is the production of new growth.
Monopodial:	branching at one primary axis, with the youngest branches arising at the apex.
Orchid plant:	for purposes of export: <ul style="list-style-type: none"> • Sympodial form - a viable unit consisting of no more than four pseudobulbs or a bulb or a central mass. • Monopodial form - four canes.
Plant specimen:	a plant, a plant reproductive material, any article wholly produced by or from or otherwise wholly derived from a single plant, any readily recognizable part of a species or any derivative thereof.
Pseudobulb:	a thickened internode for storage of water and food reserves.
Ramicaul:	the leafy stem of some sympodial orchids.
Re-export:	the export of a specimen which has previously been imported, whether or not the specimen is in the same form as at the time of importation.
Rescue Centre:	a temporary or permanent holding facility, which rescues confiscated protected animals, in order to protect, rehabilitate and release said species as well as to house animals no longer suitable to exist in the natural environment.
Rhizome:	a horizontally creeping underground stem which bears roots and leaves and usually persists from season to season.

Sanctuary/Reserve:	includes any piece or parcel of land declared by the Minister having jurisdiction under the Wild Life Protection Act or Forest Act.
Species:	any species, subspecies, or geographically separate population thereof (CITES).
Spore:	a small, usually unicellular, reproductive body, from which a new organism arises, produced by some plants, fungi, bacteria and protozoa.
Sympodial:	growth form of a plant or part of a plant whose main axis arises not from growth of an apical bud, but from that of a lateral branch which also stops growing after a while, growth continuing from a lateral bud near the apex.
Threatened:	a species whose population is not yet low enough to be in immediate danger of extinction, but faces serious problems. If these problems affecting the species are not resolved, it is probable that the species will become endangered.
Tissue culture:	a method of asexual propagation to produce clones of a particular plant in large quantities. Meristem cells are grown in nutrient solutions in laboratory flasks until they have recognizable roots and leaves. They are then transplanted into a suitable potting medium. The process is called meristem culture.
Trade:	includes domestic trade, export, re-export, import and introduction from the sea.
Vulnerable:	a taxon is vulnerable when it is facing a high risk of extinction in the wild in the medium-term future.
Watershed:	the area of land that delivers run off water, sediment, and dissolved substances to a river.

ANNEX 1 - NAMES OF IMPORTED MATERIALS

LIST OF MATERIALS AND EQUIPMENT

Amonium nitrate - NH_4NO_3
Amonium sulphate - $(\text{NH}_4)_2\text{SO}_4$
Potassium nitrate - KNO_3
Calcium chloride - $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$
Calcium phosphate - $\text{CaH}_4(\text{PO}_4) \cdot 2\text{H}_2\text{O}$
Magnesium sulphate - $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$
Potassium phosphate - KH_2PO_4
Ferrous sulphate - $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$
Iron Chelate - $\text{Na}_2\text{F} \cdot \text{DTA}$
Boric acid - H_3BO_3
Magnanese sulphate - $\text{MnSO}_4 \cdot 4\text{H}_2\text{O}$
Zinc chloride - ZnCl_2
Potassium iodide - KI
Sodium molybdate - $\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$
Copper sulphate - $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
Cobalt Chloride - $\text{CoCl}_2 \cdot 5\text{H}_2\text{O}$
Indoleacetic acid - Auxin
Naphthalenelacetic acid - Auxin
Kinetin - Cytokinin
Glycine - Amino Acid
Vitamin B₁ - Thiamine
Vitamin B₆ - Pyroxidine
Vitacmin B₁₂
Folic Acid
Niacin
Riboflavin
Sucrose - Sugar
Glucose - Sugar
Ribose - Sugar
Xylose - Sugar
Difco Peptone Powder
Agar powder - Gelling agent
Phytigel (Sigma) - Gelling agent
Sodium hypochlorite 5% (Clorox)
Calcium hypochlorite
Superthrive (vitamin)

EQUIPMENT AND OTHER MATERIALS

Pressure cooker – 40qt. or Autoclave
Measuring Balance
pH Meter
Measuring cylinders
Stove with heavy duty burners
Laminar Flow Hood
Glove Box
Veterinary Gloves – long sleeved
Surgical Gloves
Surgical scalpels & blades
Petri dishes
250ml Conical Flasks
500ml Conical Flasks
Flat sided quart bottles
Rubber stoppers
Gro lux fluorescent tubes
Corrugated poly-carbonate sheeting
50% Shade Cloth
73% Shade Cloth
2” Plastic pots
4” Plastic Pots
Plastic Utility Trays
Tree Fern Root
Styrofoam peanuts
Acrolite - Fine Styrofoam
Premier “Pro Mix”- Peat based growing medium
Sphagnum moss
Sponge Roc
Orchid Seedling mix – prepared growing medium
Plastic Labels
Avery 8160 Stick-on labels
N:P:K - 30:10:10 Fertilizer
N:P:K - 18:18:18 Fertilizer

ANNEX 3 – NATIVE ORCHID EXPORT LIST

SCIENTIFIC NAME	QUOTA/P/A	FORM
<i>Bletia florida</i>	100	ST
<i>Bletia purpurea</i>	100	ST
<i>Brassavola cordata*</i>	50	S
<i>Brassia caudata</i>	50	S
<i>Brassia maculata</i>	50	S
<i>Broughtonia sanguinea*</i>	100	S
<i>Campylocentrum micranthum</i>	50	M
<i>Campylocentrum pachyrrhizum</i>	10	M
<i>Cochleanthes flabelliformis</i>	50	S
<i>Coelia triptera</i>	100	S
<i>Cranichis diphylla</i>	5	ST
<i>Cranichis muscosa</i>	5	ST
<i>Dendrophylax barrettiae*</i>	10	M
<i>Dendrophylax funalis*</i>	10	M
<i>Dichaea glauca</i>	10	S
<i>Dichaea graminoides</i>	10	S
<i>Dichaea pendula</i>	10	S
<i>Elleanthus capitatus</i>	10	S
<i>Elleanthus linifolius</i>	10	S
<i>Elleanthus longibracteatus</i>	20	S
<i>Encyclia angustifolia*</i>	10	S
<i>Encyclia cochleata</i>	300	S
<i>Encyclia (Epidendrum) fragrans</i>	100	S
<i>Encyclia (Nidema) ottonis</i>	10	S
<i>Encyclia (Epidendrum) polybulbon</i>	50	S
<i>Encyclia pygmaea</i>	50	S
<i>Epidendrum anceps</i>	100	S
<i>Epidendrum bifarium</i>	20	S
<i>Epidendrum difforme</i>	50	S
<i>Epidendrum diffusum</i>	100	S
<i>Epidendrum jamaicense</i>	10	S
<i>Epidendrum nocturnum</i>	50	S
<i>Epidendrum nutans*</i>	50	S

Annex 3 contd.

SCIENTIFIC NAME	QUOTA/P/A	FORM
<i>Epidendrum ramosum</i>	10	S
<i>Epidendrum rigidum*</i>	20	S
<i>Epidendrum rivulare*</i>	10	S
<i>Epidendrum sintenisii</i>	10	S
<i>Epidendrum verrucosum hansenii</i>	10	S
<i>Epidendrum verrucosum verrucosum</i>	20	S
<i>Erythrodes hirtella</i>	10	ST
<i>Erythrodes plantaginea</i>	10	ST
<i>Eulophia alta</i>	10	ST
<i>Eurystyles ananassocomos</i>	5	S
<i>Habenaria monorrhiza</i>	10	ST
<i>Habenaria quinqueseta</i>	10	ST
<i>Harrisella porrecta</i>	5	M
<i>Homalopetalum vomeriforme</i>	10	S
<i>Ionopsis satyrioides</i>	10	S
<i>Ionopsis utricularioides</i>	50	S
<i>Isochilus linearis</i>	20	S
<i>Jacqiniella globosa</i>	10	S
<i>Jacqiniella teretifolia</i>	10	S
<i>Leochilus labiatus*</i>	10	S
<i>Lepanthes cochlearifolia*</i>	5	S
<i>Lepanthes divaricata*</i>	5	S
<i>Lepanthes interiorubra*</i>	5	S
<i>Lepanthes intermedia*</i>	5	S
<i>Lepanthes obtusa*</i>	5	S
<i>Lepanthes ovalis*</i>	5	S
<i>Lepanthes pulchella*</i>	5	S
<i>Lepanthes quadrata*</i>	5	S
<i>Lepanthes rotundata*</i>	5	S
<i>Lepanthes sanguinea</i>	5	S
<i>Lepanthopsis melanantha</i>	10	S
<i>Lycaste barringtoniae</i>	50	S
<i>Macradenia lutescens</i>	50	S
<i>Maxillaria alba</i>	20	S
<i>Maxillaria crassifolia</i>	50	S

Annex 3 contd.

SCIENTIFIC NAME	QUOTA/P/A	FORM
<i>Maxillaria purpurea</i>	50	S
<i>Maxillaria rufescens var. minor</i>	10	S
<i>Neocogniauxia monophylla</i> *	5	S
<i>Octadesmia montana</i> *	10	S
<i>Oncidium luridum</i>	200	S
<i>Oncidium pulchellum</i> *	100	S
<i>Oncidium tetrapetalum</i> *	200	S
<i>Oncidium triquetrum</i> *	50	S
<i>Phaius tankervilleae</i>	100	ST
<i>Pleurothallis alpestris</i> *	5	S
<i>Pleurothallis corniculata</i> *	5	S
<i>Pleurothallis delicatula</i> *	5	S
<i>Pleurothallis hirsutula</i> *	5	S
<i>Pleurothallis oblongifolia</i>	5	S
<i>Pleurothallis pruinosa</i>	5	S
<i>Pleurothallis racemiflora</i>	5	S
<i>Pleurothallis ruscifolia</i>	5	S
<i>Pleurothallis sertularioides</i>	5	S
<i>Pleurothallis uncinata</i>	5	S
<i>Polystachya concreta</i>	50	S
<i>Schomburgkia lyonsii</i>	50	S
<i>Spiranthes elata</i>	5	ST
<i>Spiranthes lanceolata</i>	10	ST
<i>Spiranthes speciosa</i>	20	ST
<i>Stelis micrantha</i> *	5	S
<i>Stelis ophioglossoides</i>	10	S
<i>Vanilla claviculata</i>	50	M
<i>Xylobium palmifolium</i>	20	S

KEY

- M = Monopodial
P/A = Per annum
S = Sympodial
ST = Sympodial Terrestrial
* = Endemic orchids

ANNEX 4 - CITES RESOLUTIONS

1. Artificially propagated hybrids of orchids species listed in Appendix I are exempted from CITES control, taking into account the provisions of Article VIII, paragraph 4, and Article I, paragraph (b) (iii).
2. Resolution Conf. 4.24 recommends that trade in seeds, spores, tissue cultures and cuts flowers of artificially propagated orchids not be controlled for plants included in Appendix II or III.
3. Resolution Conf. 5.14 recommends:
 - i) That non-technical identification materials be prepared and provided to port inspectors; this material should include a general key with illustrations and general descriptions of CITES plants, including references to differences between wild and artificially propagated specimens, lists of names of plants used in trade, and countries where they occur;
 - ii) That a second type of identification material including labeled, botanical quality black and white drawings and/or photographs of plants as they appear in trade also be prepared; the material should include detailed botanical descriptions of the species, indicating key diagnostic features, a list of countries where they occur, and references to further information or illustrations; and
 - iii) That the highest priority for the production of these materials be given to Appendix I plants and commonly traded taxa in Appendix II and are at risk, and that Parties and non-governmental organizations be urged to aid in the preparation of these materials as a high priority.
4. Resolution Conf. 6.18 specifies that pollen (including pollinia) and flaked seedling cultures are standard exemptions for Appendix II and III plants, in addition to seeds, spores, and tissue cultures as specified in Resolution Conf. 4.24 recommendations.
5. Resolution Conf. 9.18 rev. exempts flaked seedlings of orchid species listed in Appendix I from CITES controls, taking into account the provisions of Article VII, paragraph 4, and article 1, paragraph (b) (III), and agreeing to a derogation from Resolution Conf. 9.6 for this exemption.

ANNEX 5 - DEFINITIONS AND GUIDELINES FOR EXPORT

For the purposes of export:

- a. An orchid plant is composed of a single or branched, short or elongated rhizome to which all pseudobulbs (with or without leaves) are firmly attached and subject to the size restriction for each species.

Size restrictions for export:

- i. Sympodials – a viable unit consisting of no more than four pseudobulbs, a single bulb or a single central mass.
 - ii. Monopodial – a maximum of four canes (stems).
 - iii. Vandaceous species – no more than a single root system.
- b. An artificially propagated orchid is defined as one grown from seeds of the F1 (first generation) wild collected plants or from tissue culture. All plants collected from the wild and where the F1 generation is the subdivision of the parent plant are classified as wild plants and are subject to the prescribed quota on the Native Orchid Export List. Quotas will be designated as private or commercial. Private quota means quota allocated to non-registered exporters and commercial quota to registered exporters.

All CITES Conference Resolutions regarding the trade in plants and registration of nurseries where applicable to orchids must be adhered to including Resolution Conference 8.19 relating to the standard reference of Orchidaceae.