

ORCHID CONSERVATION POLICY JAMAICA

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LIST OF ACRONYMS

CBD	Convention on Biological Diversity
CDC	Conservation Data Centre
CITES	Convention on International Trade in Endangered species of Wild Fauna and Flora
EIA	Environmental Impact Assessment
IOJ	Institute of Jamaica
JBI	Jamaica Bauxite Institute
JCDT	Jamaica Conservation and Development Trust
JNHT	Jamaica National Heritage Trust
JOS	Jamaica Orchid Society
MOF	Ministry of Finance and Planning
MOAF	Ministry of Agriculture and Fisheries
NBSAP	National Biodiversity Strategy and Action Plan
NEPA	National Environment and Planning Agency
NPF	Nature Preservation Foundation
NRCA	Natural Resources Conservation Authority
OPC	Orchid Policy Committee
OPM	Office of the Prime Minister
RADA	Rural Agricultural Development Authority
SPAW	The Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region to the Cartagena Convention
SRC	Scientific Research Council

TCPA Town and Country Planning Act
UTECH University of Technology
UWI University of the West Indies
WINDALCO West Indies Alumina Company
WLPA Wild Life Protection Act
WPA Watershed Protection Act

1.0 INTRODUCTION

Jamaica's orchids are facing a number of threats, even while various conservation efforts are underway. In 1994, as a part of its preparation to become a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and given the existing significant international trade in Jamaican orchids, an Orchid Policy Committee (OPC) was established by the NRCA to formulate a comprehensive national orchid policy. The committee comprised representatives from the Institute of Jamaica (IOJ), University of the West Indies (UWI), Jamaica Conservation and Development Trust (JCdT), Conservation Data Centre (CDC), Jamaica Orchid Society (JOS), commercial exporters and the NRCA.

The development of this Policy was conducted through a public consultative process involving the general public, government entities with portfolio responsibility for the conservation and/or management (???) of orchids, local organisations and international donor agencies. Stakeholders consulted included government agencies, including the Ministry of Agriculture and Fisheries, the Forestry Department and the Ministry of Youth and Culture. Public consultations were also held in;

- Kingston (OPM, March 25, 2010)
- Manchester (Parish Library, March 23, 2010)
- Montego Bay (RADA office, March 30, 2010)

Subsequently, the draft text was revised to reflect the issues and concerns raised at the public consultations.

This policy incorporates the main points of the many comments received on the Green Paper.

Threats

The main threat facing Jamaica's 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 of orchids for both the local and international trade is thought to be the second greatest threat to the island's orchid species. While there is much anecdotal information, there is very little scientific data on the impact of collecting on the populations of the various species. However, with the listing of Jamaica's orchids in Appendix II of CITES (for species considered to be endangered), the Government of Jamaica has taken steps to regulate the international trade in orchid species and to protect their habitats by enacting legislation, namely the Endangered Species Act, thereby fulfilling some of the critical requirements CITES.

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 (UTECH) 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;
- establishment of two private orchid sanctuaries; and
- enforcement of the Endangered Species (Protection, Conservation and Regulation of Trade) Act, 2000.

There are also amendments proposed to the Wild Life Protection Act (WLPA) which will address *in situ* conservation.

Background

The orchid family, **Orchidaceae** is considered to be one of the largest and most diverse of flowering plants. It is estimated that there are approximately 30,000 described species

worldwide, with the majority of the species occurring in tropical regions, and more are being discovered annually. In Jamaica, orchids occur at varying altitudes, from the coastal areas to the mountains, with some, such as several species of *Lepanthes*, occurring above 900 metres (Gloudon and Tobisch, 1995). 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.

Orchids are both ground dwelling (terrestrial) or attached by roots to a supporting structure (epiphytic). Species growing on rocks are termed lithophytes.

Most orchids in the world are listed under CITES Appendix II and nine species are listed in Appendix I (those threatened with extinction). Jamaica has no orchid species included in Appendix I but most species are listed under Appendix II of the Convention. International trade in the taxon would therefore 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.

Jamaica became a party to CITES 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.

2.0 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 twenty (220) species of which approximately sixty (60) are endemic, including

Broughtonia sanguinea, *Broughtonia negrilensis*, all but one 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, Schwallenberg Orchid 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 Schwallenberg 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 have been 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*, *Tolumnia (Oncidium) pulchella* and *Tolumnia (Oncidium) triquetra* are widely used in hybridization. With the assistance of the SRC and the orchid industry, tissue culture technology as well as artificial propagation from seed and development of improved cultivars (which are more desirable for horticultural use) are 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.

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; 6,019 in 2000; 9,174 in 2001; 7,823 in 2002; 2,070 in 2003; 2,869 in 2004; 12,769 in 2005; 6,446 in 2006; 3268 in 2007; 5760 in 2008; 10231 in 2009 and 8462 in 2010 (Figure 1). It is also important to note that the

majority of orchids traded internationally are artificially propagated (approximately 90 %) when compared to those taken from the wild (Figure 2). The most frequently traded Jamaican species include *Broughtonia sanguinea* and *Tolumnia triquetra*. Locally developed hybrids of the genera *Broughtonia* and *Brassavola* are also exported.

Figure 1: Graph showing total number of orchids legally exported from Jamaica (1999 – 2010)

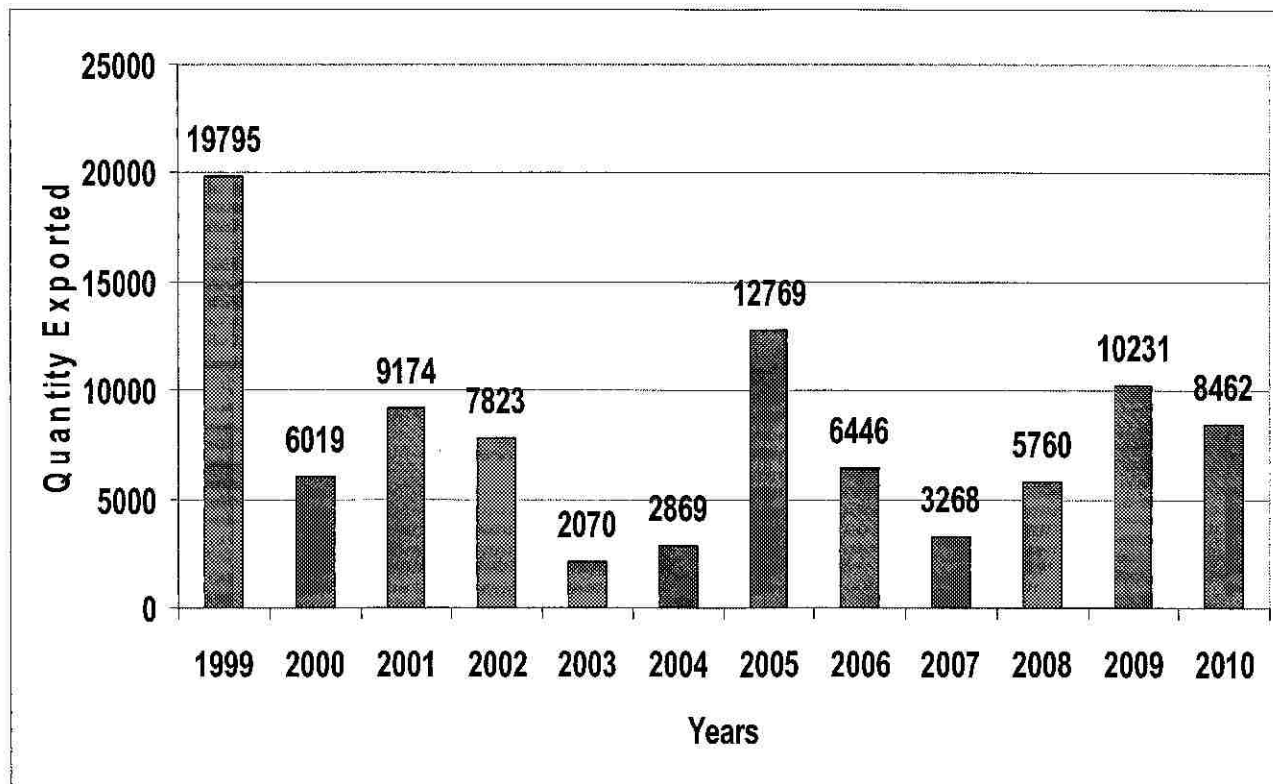
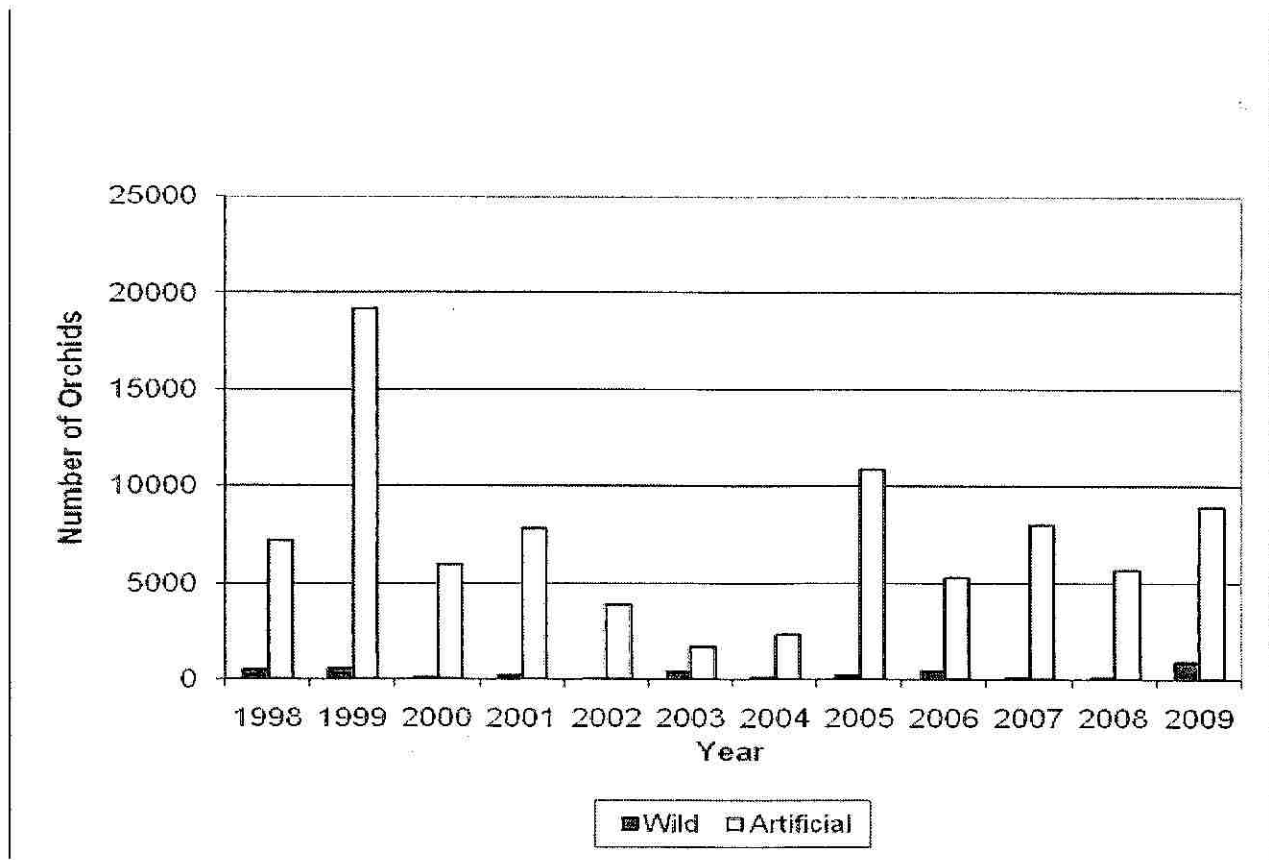


Figure 2: Graph showing export of wild and artificially propagated orchids from Jamaica 1998-2009



3.0 LEGAL FRAMEWORK

International

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

3.1.1 *The Convention on International Trade in Endangered Species of Wild Fauna and Flora*

The Convention on International Trade of Endangered Species in 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 quotas. 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 includes 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. Jamaican orchids are mainly found in Appendix II. of CITES.

Jamaica became a Party to this Convention on June 22, 1997. Each Party is required to implement CITES through domestic legislation and policies. 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.

3.1.2 *The Convention on Biological Diversity*

The Convention on Biological Diversity (CBD) entered into force on 29 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.

The general provisions and objectives of this Convention have been taken into account in the National Biodiversity Strategy and Action Plan prepared in relation to the implementation of the CBD.

3.2 **Regional**

3.2.1 *The Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region*

The Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region (SPA-W), which entered into force on May 2000, is a Protocol to 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. However, as a signatory to this Protocol, Jamaica has given its commitment to honour the spirit of the Protocol which requires that Parties 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.

3.3 National

3.3.1 *The Natural Resources Conservation Authority Act, 1991*

The Natural Resources Conservation Authority (NRCA) 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. Among the categories of activities which fall under this system are the clearing and or 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. Under this system the NRCA has the power to conserve and protect habitats of important and endangered orchid species.

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

The Endangered Species (Protection, Conservation and Regulation of Trade) Act fulfils one of Jamaica's obligations 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 National Scientific and Management Authorities for CITES are designated under this Act. Under Section 16 of the Act, the functions of the Scientific Authority include advising the Management Authority on:

- policy relating to trade in endangered species of wild fauna and flora;
- whether any species is vulnerable, threatened, at risk, endangered, extirpated or extinct; and
- 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.

3.3.3 *The Wild Life Protection Act, 1945*

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

3.3.4 *The Watershed Protection Act, 1963*

The Watershed Protection Act (WPA) seeks to protect the ecological integrity of the island's twenty-six watersheds. Of significance to the conservation of Orchids are Sections 7 and 8 of the Act which provide for the prohibition of fires and the felling, barking or destruction of any tree or the clearing of vegetation in watershed areas, respectively.

3.3.5 *The Town and Country Planning Act, 1958 (amended 1999)*

The Town and Country Planning Act (TCPA) established the Town and Country Planning Authority and local planning authorities 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 down, top, lop or wilfully destroy trees, groups of trees or woodlands in areas declared under a Tree Preservation Order except with the consent of the local authority. Under the Tree Preservation Order, provision may be made to ensure the replanting of trees or any part of a woodland area, which are 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.

3.3.6 *The Forest Act, 1996*¹

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.

3.3.7 *The Jamaica National Heritage Trust Act, 1985*

The Jamaica National Heritage Trust (JNHT) 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.

3.4 **Policies and Plans**

3.4.1 *National Strategy and Action Plan on Biological Diversity in Jamaica (National Biodiversity Strategy and Action Plan), 2003*

A multi-sectoral Biodiversity Steering Committee developed a National Strategy and Action Plan on Biological Diversity in Jamaica (National Biodiversity Strategy and Action Plan) 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 adopts relevant existing strategies, plans and programmes.

¹ The Forest Act is currently being updated.

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.

3.4.2 *Policy for Jamaica's System of Protected Areas, 1997*

This Policy 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 some of which are known orchid habitats.

3.4.3 *Draft 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 and the Watershed Protection Act

are being reviewed with emphasis being placed on the establishment of an effective framework for Watershed Management:

3.4.4 *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. It is currently being updated.

3.4.5 *National Forest Policy*

The draft *Jamaica Forest Policy 2013* outlines a vision, principles, and goals for the island's forestry sector. It addresses national priorities for forests, including conservation, protection and reforestation of forest ecosystems as well as the need for forests to be supportive of rural livelihoods and uses. The draft Policy highlights those priority areas outlined in the 2001 Forest Policy that should be continued, as well as new areas for regulation under the Forest Act, 1996, and identifies new objectives and measures to be taken by the Forestry Department.

4.0 GAPS IN CONSERVATION AND SUSTAINABLE USE OF ORCHIDS

There are many issues (gaps) as it relates to the conservation and protection of orchids and ultimately the sustainable use of these resources. These include but are not limited to:

- lack of an inventory of orchid species and their abundance and distribution;
- slow process to protect and manage critical wildlife habitats (The process of policy/legislation development and designation is a slow one and can take many years); .
- lack of persons trained in orchid identification (The list of orchid experts in Jamaica is very limited) ;
- insufficient number of properly managed plant rescue centres (Presently there are no plant rescue centres run by the government and the existing ones are not maintained);
- lack of general awareness by developers on orchid conservation;
 - There is a general lack of awareness on orchids and the need to conserve them. This can be an issue particularly as it relates to groups that impact the most on the orchid population (developers, illegal traders etc.)
- habitat destruction;
- illegal harvesting;
- omission 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; and
- 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 an orchid survey triennially to include members of the NEPA, IOJ, Department of Life Sciences, UWI, JOS, Forestry Department and other resource personnel.
- Mention development of domestic Legislation (see implementation plan)

Declare additional protected areas under the NRCA Act 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, *inter alia* 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.
- Encourage the use of Development Orders and Conservation Areas to protect orchid habitats.

5.1.2 *Ex situ conservation*

Strategic Directions

- Develop and review regularly, guidelines for rescue centres.
- Establish at least three rescue centres to house plants illegally exported and repatriated to Jamaica, for example, at the Hope Botanical Gardens, Mason River Reserve and Cinchona.

In addition, rehabilitate the bauxite orchid sanctuaries at Schwallenberg and Martin's Hill to serve as rescue centres and tourist attractions.

- 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 collection of native orchid species (especially the lowland and coastal forms) 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 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 quota system for international trade of species collected from the wild to cover registered and non-registered exporters (Annex 3 – Native Orchid Export List).
- Develop regulations governing artificial propagation of wild species in the second schedule of the Endangered Species (Protection, Conservation and Regulation of Trade) Act 2000 (Endangered Species Act) .
- Develop exemption certificates in accordance with the Endangered Species Act for persons exporting personal or household effects.

5.3 *Goal 3 Promote and Facilitate Research and Training*

5.3.1 *Training and Research*

Strategic Directions

- Develop documentation, including pictures, colour illustrations and associated training materials, and institute training programmes for the identification of orchid species for NEPA staff, Customs Officers, Taxonomists, Protected Areas Rangers, Plant Quarantine Officers, Forestry Department Officers, and other relevant persons involved in the issuing of permits and security at sea and airports.
- Conduct and support research for artificial propagation, identification and classification of Jamaica's native orchid species.

- Develop and maintain an electronic database or clearinghouse to include but not be limited to spatial data, statistical data on species in trade, sanctuary locations and any research on species.

5.4 Goal 4 *Public Education and Awareness*

Strategic Directions

- Develop and implement a public education and awareness programme for civil society including students 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.
- Develop and publish information on the value of native species in order to 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 to be included in an electronic database or clearing house (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.

- Expand the photographic and herbarium collections of native orchid species in collaboration with the Institute of Jamaica and other relevant institutions.

6.0 INSTITUTIONAL ARRANGEMENTS

The National Environment and Planning Agency (NEPA) in the Ministry of Water, Land, Environment and Climate change will have overall co-ordinating responsibility and will work in partnership with the Ministry of Health, the Ministry of Agriculture and Fisheries, the Ministry of Industry, Investment and Commerce, the Ministry of Tourism and Entertainment, the Ministry of Youth and Culture, other government partners, NGO's and the private sector in administering the Policy.

7.0 IMPLEMENTATION PLAN

Goal	Strategic Direction	Activity	Lead Agency	Years					
				2010	2011	2012	2013	2014	2015
Conserve Jamaica's orchid species and their habitats <i>In-situ</i> conservation	Triennial orchid survey	<ul style="list-style-type: none"> Orchid surveys conducted at two sites every three years 	NEPA Partners: UWL, IOJ, Forestry, JOS			√		√	
	Declaration of protected areas	<ul style="list-style-type: none"> Identify site for declaration as protected area Engage land owners in discussion regarding proposed declaration of protected area Conduct discussions with the Ministry with responsibility for Environment regarding declaration of protected areas 	NEPA Partners: Ministry with responsibility for Environment			√		√	
	Rehabilitation of orchid habitats	<ul style="list-style-type: none"> Identify orchid habitats for rehabilitation Identify and source species for re-introduction Establish pilot plot within an orchid habitat 	NEPA Partners: Forestry, JBI, JOS		√		√	√	√
	Legislative development	<ul style="list-style-type: none"> Prepare drafting instructions for regulations under the Endangered Species Act Develop regulations for domestic trade under the Endangered Species Act 	NEPA Partners: Ministry with responsibility for Environment		√		√		
Development Orders and Conservation Areas	<ul style="list-style-type: none"> Prepare guidelines and policies for inclusion in Development Orders and the review of all applications 	NEPA		√		√		√	√

Implementation Plan contd.

Goal	Strategic Direction	Activity	Lead Agency	Years					
				2010	2011	2012	2013	2014	2015
Conserve Jamaica's orchid species and their habitats <i>Ex-situ conservation</i>	Guidelines for rescue centres	<ul style="list-style-type: none"> Amend the guidelines for rescue centres to include plants 	NEPA		✓			✓	
	Establish and rehabilitate rescue centres	<ul style="list-style-type: none"> Rehabilitate centres at Hope Gardens, Mason River and Cinchona Gardens Rehabilitate the rescue centres at Schwallenberg, St. Ann and Martin Hill, Manchester which are owned by the bauxite company 	NEPA Partners: IOJ, NPF, MOAF, Forestry,	✓	✓	✓	✓	✓	✓
	Establish gene banks	<ul style="list-style-type: none"> Prepare an issues paper and project proposal for the establishment of a gene bank Identify funding sources for establishment of gene banks Establish pilot project on gene banks 	SRC Partners: NPF, Forestry		✓	✓			
	Artificial propagation	<ul style="list-style-type: none"> Establish a regime for the propagation of orchid species Conduct discussions with Ministry with responsibility for Environment and Ministry of Finance regarding tax exemption for imported materials Commence artificial propagation of orchid species with selected stakeholders 	NEPA Partners: SRC, Ministry with responsibility for Environment, MOFPS			✓			
	Develop cooperative agreements	<ul style="list-style-type: none"> Develop cooperative agreements between NEPA and the Forestry Department and Bauxite Companies 	NEPA	✓	✓				

Implementation Plan contd.

Goal	Strategic Direction	Activity	Lead Agency	Years					
				2010	2011	2012	2013	2014	2015
Conserve Jamaica's orchid species and their habitats <i>Ex-situ conservation</i>	Re-introduction of species	<ul style="list-style-type: none"> Prepare proposal for the re-introduction of orchid species in protected areas 	NEPA Partners: UWI, IOJ, Forestry, JOS		√				
	Orchid collections	<ul style="list-style-type: none"> Identify sites of rare and endangered species for collection Conduct collection of rare, endangered and endemic species 	NPF, MOAF Partners: NEPA, JOS			√	√		
Ensure sustainable use of orchids <i>Regulatory Framework</i>	Amendment of legislation	<ul style="list-style-type: none"> Develop drafting instructions for WLPA to include quotas for orchids 	NEPA Partners: Ministry with responsibility for Environment, Scientific Authority				√		
	Legislation for domestic trade	<ul style="list-style-type: none"> Develop regulations for domestic trade, field collection, artificial propagation of species listed in Appendix 2 of CITES, annual quota system and exemption certificates under the Endangered Species Act 	NEPA Partners: Ministry with responsibility for Environment, Scientific Authority		√				
	Registration of exporters and nurseries	<ul style="list-style-type: none"> Register commercial exporters and nurseries 	NEPA		√				

Implementation Plan contd.

Goal	Strategic Direction	Activity	Lead Agency	Years					
				2010	2011	2012	2013	2014	2015
Promote and Facilitate Research and Training <i>Training and Research</i>	Identification of orchid species	<ul style="list-style-type: none"> Develop training programme for identification of orchid species 	NEPA Partners: UWI, IOJ, JOS		✓				
	Artificial propagation of native orchid species	<ul style="list-style-type: none"> Conduct a workshop on artificial propagation (growing) techniques 	NEPA JOS Partners: JAMPRO, SRC,		✓	✓			
Public Education and Awareness	Electronic database on orchids	<ul style="list-style-type: none"> Develop electronic database on orchid species 	NEPA Partners: IOJ			✓			
	Public education and awareness programme	<ul style="list-style-type: none"> Develop a public education and awareness programme to educate on: <ul style="list-style-type: none"> conservation of orchids; relevant resolutions of CITES; purchasing from informal and commercial growers; method of processing plants for export; and orchid expertise listing. Develop procedures manual for exporting orchids Expand photographic and herbarium collection of native orchid species Design a webpage illustrating Jamaican orchids 	NEPA Partners: IOJ, JOS, Jamaica Horticultural Society, Scientific Authority		✓	✓	✓		

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.
- Conservation Areas: areas of outstanding landscape beauty, areas of outdoor recreational potential and areas of special scientific interest due to the presence of unique fauna and flora, areas with vulnerable watershed and areas of forestry will be conserved and developments within these areas will be severely restricted.
- Development Orders: a legal document which is used to guide development in the area to which it applies. It includes zoning plans and statements and must speak to amongst other things amenities which include game and bird sanctuaries, open space, communal parks and any declared protected and/or conservation area.
- 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.
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:	all naturally occurring plants and animals, not introduced by man, into a designated region or part of a region.
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 for confiscated protected animals or plants, in order to protect, or rehabilitate such specimens. The facility may also house animals no longer able to exist in the natural environment.
Rhizome:	a horizontally creeping underground stem which bears roots and leaves and usually persists from season to season.

- Species:** the major subdivision of a genus or subgenus, regarded as the basic category of biological classification, composed of related individuals that resemble one another, are able to breed among themselves.
- 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 species whose population is facing a high risk of extinction in the wild in the immediate future (IUCN).

Watershed: the area of land that delivers run off water, sediment, and dissolved substances to a river.

ANNEX 1 – IMPORTED MATERIALS FOR ARTIFICIAL PROPAGATION OF ORCHID SPECIES

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
Manganese 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
Vitamin B₁₂
Folic Acid
Niacin
Riboflavin
Sucrose - Sugar
Glucose - Sugar

Annex 1 contd.

Ribose - Sugar

Xylose - Sugar

Difco Peptone Powder

Agar powder - Gelling agent

Phytigel (Sigma) - Gelling agent

Sodium hypochlorite 5% (Clorox)

Calcium hypochlorite

Superthrive (vitamin)

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

Annex 1 contd.

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 LIST²

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 caudate</i>	50	S
<i>Brassia maculate</i>	50	S
<i>Broughtonia sanguinea*</i>	100	S
<i>Campylocentrum micranthum</i>	50	M
<i>Campylocentrum pachyrrhizum</i>	100	M
<i>Cochleanthes flabelliformis</i>	50	S
<i>Coelia triptera</i>	100	S
<i>Cranichis diphylla</i>	5	ST
<i>Cranichis muscosa</i>	100	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>Encyclia (Epidendrum) sintenisii</i>	10	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

The Native Orchid Export List is to be reviewed annually.

Annex 3 contd.

SCIENTIFIC NAME	QUOTA/P/A	FORM
<i>Epidendrum nocturnum</i>	50	S
<i>Epidendrum nutans</i> *	50	S
<i>Epidendrum ramosum</i>	10	S
<i>Epidendrum rigidum</i> *	20	S
<i>Epidendrum rivulare</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>Jacquiniella globosa</i>	10	S
<i>Jacquiniella 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 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 cut 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 flasks 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 flasks 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).
- 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.