

Curatorial Policy for Glasgow Botanic Gardens

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1. Foreword

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2. Definition of Terms

ABSCH: Access and Benefit-Sharing Clearing House Mechanism

ArcGIS: geographic information systems utilised to create geospatial maps of the collections at Glasgow Botanic Gardens

BG-BASE: database application designed to manage biological collections and utilised to document the collections at Glasgow Botanic Gardens.

CBD: Convention on Biological Diversity (1992)

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973)

Curatorial Staff: Members of staff at Glasgow Botanic Gardens who curate the plant collections

DNA: Deoxyribonucleic acid, the molecule of heredity in living organisms

EDRMS: Electronic Data and Records Management System

Horticultural Staff: Members of staff at Glasgow Botanic Gardens who cultivate and maintain the plant collections

ICBN: International Code of Nomenclature for Algae, Fungi and Plants (2012)

ICNCP: International Code of Nomenclature for Cultivated Plants (2009)

ITPGRFA: International Treaty on Plant Genetic Resources for Food and Agriculture (2009)

Management Team: Members of staff at Glasgow Botanic Gardens of grade five and above

Materials: plant propagules and specimens utilised within the collections

MTA: Material Transfer Agreement:

The Gardens: Glasgow Botanic Gardens

The Nagoya Protocol : The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (2010)

The Policy: Curatorial Policy for Glasgow Botanic Gardens (2016)

3. Introduction

Glasgow Botanic Gardens (hereafter referred to as 'the Gardens') is a botanic garden located in the West End of Glasgow and operated by the Land and Environmental Services department of Glasgow City Council. The Gardens' mission is to serve the people of Glasgow by *connecting people and plants through inspiration and education*. As a botanic garden of national and international importance, and a member of Botanic Garden Conservation International (BGCI), the Gardens hosts documented collections of plants for the purposes of conservation, display, education and research worldwide. The Gardens also recognises the importance of being exemplary, both nationally and internationally, in the ethical and environmentally sensitive cultivation of plants.

The Curatorial Policy (the Policy) shall be implemented in a mutually supportive manner with the Glasgow Botanic Gardens Management Plan 2011-2016 and successive management plans. The scope of the Policy is practices and procedures related to the curation and documentation of the collection conducted by all members of staff. Adherence to the Policy demonstrates the Gardens' commitment to and compliance with national and international legislative frameworks to which the Gardens are responsible. Adoption and communication of the Policy by staff members will ensure that the Gardens are developed in a manner which is consistent with the purpose of the Gardens and its

mission statement, makes the best use of the resources available and ensures that long-term planning facilitates continuity in the collections and continued success.

The Policy includes new priorities and procedures for the development of the collections which have been implemented to challenge staff members to develop the most accessible and valuable collections possible with the resources available. Attainment of targets will be used to quantify the success of the Policy and assess whether the purpose and mission of the Gardens are being served by the Policy. The Policy will be reviewed after an initial trial period.

4. Stakeholders and User Groups

The Gardens are maintained for our stakeholders and user groups and over 400,000 people visit the Gardens each year. The collections are managed both as a reference collection and as an example of horticultural excellence to establish a resource for multiple uses. Examples of current stakeholders and user groups are detailed below:

Conservation

conservation programmes, natural heritage organisations and botanical societies.

Display

artists, horticultural societies, members of the public and tourists

Education

adult education groups, colleges, schools and universities

Research

botanic gardens, MSc & PhD students, research institutes and researchers

5. Collections Overview

The collections at the Gardens have developed since its inception in 1817. Few specimens persist from the move to the current site at Kelvinside in 1839 but a number of thematic and specialist collections have evolved over time. Collections are dispersed across the 19.4 hectare site which includes two glasshouse complexes, namely the Kibble Palace and the Main Range, extensive propagation facilities and an arboretum. In 1989, three National Plant Collections were awarded by the National Council for the Conservation of Plants and Gardens (now known as 'Plant Heritage') to recognise the diversity of specimens and excellence in cultivation of Begonias, Tree Ferns (Dicksoniaceae) and Dendrobiums (species and hybrids). The environment in the glasshouse complexes is carefully managed to facilitate a number of different themes and simulate many geographical regions. Cultivation techniques, humidity and temperature ranges are managed by horticultural staff to promote the interpretation and representation of the habitats and environments in which plants grow worldwide. Outside the glasshouses, cultivation is limited only by the temperate

climate. The outdoor collections are truly cosmopolitan, with every continent (excluding Antarctica) represented. Outdoor collections are divided into a number of different thematic groups such as geographic (i.e. New Zealand bed), horticultural features (i.e. herbaceous border) or natural populations (i.e. the Wildflower Garden). The collections serve a wide variety of stakeholders and user groups and it is important that the Gardens maintains diverse, yet specialised, collections. The Gardens must be realistic as to how many collections it can cultivate, document and manage. The assignment of collection priorities helps to establish continuity and provide guidance as to which collections to develop.

Collections Priorities

It is important that the development of the collections and the acquisition of plants is conducted in accordance with the mission of the Gardens and is consistent with its specialisms. Three lists of acquisition priorities are detailed in descending order, List I having the highest priority. These lists are designed to guide curatorial staff in the acquisition of plant material and to ensure continuity in the collections for years to come. Each list has its own targets which are designed to challenge the curatorial team to develop compressive collections, of varying degrees of representation, that will be of national and international importance.

List I - To develop ex situ collections which represent 75% of known taxa and are of international importance to conservation, education, horticulture and research

- Arborescent Ferns *sensu* Braggins & Large (2009)
- Begoniaceae
- Taxa native to the Strathclyde region which have been assigned a Species Action Plan

List II - To develop ex situ collections which represent 50% of known taxa and are of national importance to conservation, education, horticulture and research

- *Dendrobium*
- Hymenophyllaceae
- Taxa native to Scotland (excluding the Strathclyde region) which have been assigned a Species Action Plan

List III - To develop comprehensive ex situ collections of national importance to education and horticulture

- *Bulbophyllum*
- Plants with a phytocultural heritage in the Strathclyde region
- *Sorbus*
- *Alnus*

Collections Targets

It is important that the collections are subject to targets which are aspirational and challenging. The targets listed below are designed to encourage all members of staff at the Gardens to strive to develop collections of national and international importance and to cultivate a systematic approach to improving the collections. The targets detailed below are set in parallel to collections priorities for *Lists I, II and III* and it will be the responsibility of the curatorial team to review attainment periodically and to update all other staff. Details of the collections targets are as below:

Target I: To develop a collection of Scottish native plants which is of national importance, is of benefit to the preservation of the flora of Scotland and contributes to target eight of the Global Strategy for Plant Conservation.

Target II: A minimum of 60% of new accessions each year are to be of documented wild origin in order to support conservation and research programmes.

Target III: A maximum of 20% of new accessions each year are to be cultigens in order to restrict the proportion of the collections dedicated to artificially selected varieties and to promote the cultivation of taxa of direct or indirect wild origin.

6. Acquisitions

The Gardens is committed to honouring the letter and spirit of the Convention on Biological Diversity (CBD), The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in the acquisition of plant material. The Gardens will work closely with the designated competent national authorities and national focal points for both the CBD and the Nagoya Protocol to ensure that our procedures are compliant and efficient. Staff members involved in the acquisition of plant material must adhere to the following policies and demonstrate a commitment to respecting the sovereign rights of states and the rights of communities, land-owners and stakeholders to biodiversity within their jurisdiction. The Gardens policy on the acquisition of plant material and/or traditional knowledge is detailed below:

Identification and Selection

The acquisition of plant material should be conducted in accordance with *Collections Priorities* and should address existing gaps in the collection or aim to expand collections of priority taxa. Horticultural staff and members of the management team may submit requests for plant material on an *ad hoc* basis which will be reviewed by curatorial staff or they may request plant material at the Acquisition Meeting, which will be held once a year. The

Curator is responsible for the final decision on plant material requests and the curatorial team is responsible for acquiring new plant material. The following must be adhered to in the acquisition of plant materials:

Nomenclature and classification systems must be checked against sources listed in *Nomenclature and Classification Standards* to ensure that the nomenclature employed is consistent with the International Code of Botanical Nomenclature for Algae, Fungi, and Plants (ICBN) and the International Code of Nomenclature for Cultivated Plants (ICNCP) and that it is appropriate for the plant material being assessed.

Wild origin plant material listed in appendix I, II or III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) must have an associated import certificate.

Wild origin plant material must have an internationally recognised certificate of compliance issued by the competent national authority of the state of extraction, which includes prior informed consent and mutually agreed terms from all parties which have exercised their rights to the plant material.

Cultivated plant material must be of documented origin and lineage, be bred from plant material compliant with the Nagoya Protocol and ITPGRFA and have full documentation of intellectual property restrictions (e.g. Plant Variety Right, Trade Marks or Patent Protection).

Living plant material (whole plants and vegetative propagules) imported from outside the EU must have a phytosanitary certificate from the responsible body in the country of origin and from HM Revenue & Customs. Living plant material imported from within the EU must have a EU Plant Passport authorised by the Animal and Plant Health Agency.

Source-specific requirements are detailed below:

Commercial

Plant material must be acquired from commercial sources on the Approved Suppliers List (*see Appendix I*) if available and if specimens are of adequate health and size and the appropriate documentation is available. Requests can be made to the Curator to add new commercial sources to the approved suppliers list, subject to assessment.

Donation

Donations may be accepted if the plant material is consistent with the *Collections Priorities*, if the material has the required documentation and if the donor is willing and able to complete the Donation form. The Gardens reserves the right to refuse donations with no explanation, cannot be held responsible for the short or long-term survival of the plant material and is entitled to transfer the plant material to a third party at its discretion.

Exchange

Seeds, spores and living plant material acquired via exchange with members of the International Plant Exchange Network (IPEN) must be accompanied by information regarding any applicable restrictions and the minimum data standards listed in the IPEN Code of Conduct (2003) (*see Appendix II*).

Seeds, spores and living plant material acquired from other botanic gardens, research institutes and universities which are not members of IPEN must be accompanied by a Plant Acquisitions Form signed by a responsible person at the donating institution.

Wild Origin

There is no dedicated plant exploration programme at the Gardens but staff who wish to participate in collecting trips will be supported by the management team in identifying external funding and collaborative partners.

A proposal for fieldwork must be correlated with *5.1 Collection Priorities*, list targeted taxa and be approved by the General Manager.

An agreement must be established with a botanic garden, research institute or university with dedicated quarantine facilities for that body to manage the quarantine process and to have specimens inspected by a Scottish Government-approved inspector prior to transfer of plant materials to the Gardens.

Ninety days prior to departure, all permits and permissions must be submitted to the Curator

for assessment and, if complete, will be deposited on the Electronic Document and Records Management System (EDRMS).

An internationally recognised certificate of compliance, including prior informed consent and mutually agreed terms, must be accessible on the Access and Benefit-sharing Clearing-house Mechanism (ABSCH) (*see Appendix II*) website 60 days prior to departure.

The expedition party must designate an acronym of three to five letters to identify the expedition, and expedition member(s) representing the Gardens must use a sequential numbering system for specimens starting at one.

Qualifiers, annexed to the collection number, should be used to denote specimens which have been divided between vegetative and reproduction material or specimens which need to be divided due to the identification of multiple taxa.

Plant material must only be harvested if such activities do not endanger the population or impede the population's ability to reproduce.

Each specimen must be identified with two labels, with both labels specifying the collector's name, the collector's number, any relevant qualifiers, the field name or a general description, and the date.

Collection notes should be entered in the required fields in the ACCESSIONS table in BG-BASE. The following fields must be recorded when collecting a wild origin

specimen: Field name or description, material type, provenance, genetic variability, time and date of collection, locality, altitude, habitat and associated plants.

A voucher specimen, with the collector's name, collection code and collection number, must be prepared for each sample acquired.

Expedition member(s) representing the Gardens should be prepared to participate in public engagement opportunities after the expedition in order to share their experiences and promote the benefits of plant exploration.

Quarantine Procedure

Living plant material from outside the UK must be quarantined and EU Plant Passports or import permits must be passed on to the Curator immediately.

Living plant material should be labelled with the following information: accession number, name, date of arrival and inspection date.

All foreign debris, growing mediums and soil, in addition to dead plant material, should be removed and disposed of in a dedicated disposal unit.

Living plant material must remain in quarantine for a minimum of six months for dormant or bulbous specimens and three months for all other types of living plant material.

Living plant material is not to be included in the collection until a member of the curatorial

team inspects the specimen(s) and approves a transfer into the collections.

7. Distribution

The Gardens is committed to supporting the development of other plant collections which are cultivated for non-commercial purposes and for the common good. All plant material transfer to other institutions will be done in accordance with the CBD, CITES, ITPGRFA and the Nagoya Protocol. Requests for DNA samples, living plant material, seeds, spores, or pollen can be made by contacting the Curator and submitting a Material Transfer Agreement (MTA) which is available at www.glasgowbotanicgardens.com. Members of the IPEN are exempt from the requirement to complete an MTA since they will be expected to adhere to conditions listed in the IPEN Code of Conduct (2003) to which they are signatories. The Gardens reserve the right to refuse, without explanation if necessary, material requests and to place restrictions on the use of plant material distributed from the Gardens. Conditions of use, which apply to all material obtained from the Gardens and their progeny and derivatives (hereafter referred to as 'materials'), are listed below:

Materials are to be utilised in a manner which is consistent with the CBD and the Nagoya Protocol

Material is not to be utilised for commercial purposes unless a second agreement with the Gardens has been agreed

The Gardens must be acknowledged as a source in publications which have utilised material supplied by the Gardens

The Gardens does not guarantee that all material is verified or accurately identified

Material may be transferred to a third party, but only if the conditions and restrictions under which it was supplied to the Gardens are also transferred

The recipient must maintain a record of receiving material from the Gardens and associated documentation

The recipient must indemnify and declare the Gardens unaccountable in the instance of expenses or liabilities incurred by plant material obtained from the Gardens

Commercial

The Gardens will supply plant material to a commercial enterprise only if a formal agreement between the commercial enterprise, the Gardens, the state of origin and local stakeholders can be reached which ensures that all benefits will be shared in a fair and equitable manner. The agreement must include a statement of intent from the commercial enterprise, mutually agreed terms between all parties and details as to the mechanisms established to facilitate the fair and equitable sharing of benefits between the parties.

Donation

The Gardens will supply plant material to a range of non-profit organisations including, but not restricted to, charities, community groups and horticultural societies providing that their intent for the material is non-commercial and they are willing to adhere to any restrictions imposed by the Gardens. Recipients are required to sign an MTA to formally accept all conditions and restrictions stipulated by the Gardens.

Exchange

The Gardens will publish annually an Index Seminum catalogue online and paper copies will be circulated to other Plant Network members in the British Isles. Each accession listed will be assigned an IPEN number and details of restrictions (if applicable) will be listed. Those wishing to acquire seeds or spores via the Gardens' Index Seminum programme can do so by completing the order form on www.glasgowbotanicgardens.com or by contacting the Curator.

Re-introduction

The Gardens will make available plant material for viable re-introduction projects supported by competent groups and organisations with the necessary technical expertise and resources. Such groups or organisations will be held responsible for the material and will be subject to the conditions and restrictions documented in the MTA.

8. Managing the Collections

One of the greatest assets a botanic garden holds is its plant records. At the Gardens, our collections are catalogued using BG-BASE, a database application designed to manage biological collections and the most widely used program for documentation of botanic gardens worldwide. The Gardens strive to hold records for each and every plant in the collection and store as much data as we can possibly capture.

Nomenclature and Classification Standards

Nomenclature and classification systems for plants are dynamic and are constantly being studied, reviewed and revised as the botanical community advances its knowledge of speciation in plants. Keeping plant names current at the Gardens facilitates accurate communication with the public and with conservation, scientific and educational communities and is a high priority of the curatorial team. At family level, a gradual transition to the Angiosperm Phylogeny Group systems will be introduced in 2016. Generic, specific and infra-specific classifications are reviewed by the curatorial team prior to plants being assigned an accession number and *The Plant List* is to be used as a primary reference. Other resources can also be utilised by the curatorial team if required. The decision as to whether there is sufficient evidence to support a name change is a subjective one and is at the discretion of members of the curatorial team.

Common names are to be documented for specimens which are native to the British Isles and the *New Flora of the British Isles* (2010) is to be used as a primary reference. Scottish or local common names may be documented instead of the common name listed in the *New Flora of the British Isles* (2010) if sufficient evidence is available in print; a record for each source must be included in the DS table. Decisions as to which common name to document is at the discretion of curatorial staff.

Accessioning

An accession number is a unique identifier for specimens and identifies the specimen in the Gardens and in the database. Accession numbers are a compound sequence of digits. Each accession number identifies a single plant or group of plants that are the same taxon, are the same propagule type, and were received from the same source on the same day. The accession numbers at the Gardens (detailed below) are composed of three digits which are assigned sequentially to each taxon within a single batch received, a further three digits assigned sequentially to each batch received and two digits which represent the year the plant was accessioned.

Acer acuminatum 001-001-16

Qualifiers are used to distinguish between individuals or groups of specimens assigned to a single accession number. Qualifiers distinguish between specimens in different locations. If multiple specimens are grouped

together in a contiguous arrangement the entire group is assigned a single qualifier.

Acer amamiense 002-001-16^{*A}

All plants entering the Gardens that have the potential to be used for conservation, education, research or prolonged display (more than one year) should be assigned an accession number. Non-accessioned specimens can be utilised for the following themes:

- Annuals for indoor display
- Bedding schemes
- Vegetables (non-research)

The following information is required to accession a specimen: Received name, material type, provenance, source, collection number and collector's name (if of wild origin). It is however encouraged that as much information as is available is provided to the member of the curatorial team who will accession the specimen. All accessions information is to be stored in the ACCESSIONS table on BG-BASE.

All necessary documentation (detailed in 6. *Acquisitions*) must be digitised and linked to the ACCESSIONS table on BG-BASE. Original paper copies of documentation should be stored in the Curator's Office.

Specimens already present in the collections which have either not been assigned an accession number or have lost their accession number and the original accession information cannot be found can be re-accessioned. Re-accessioning must also occur when seed or

spores (non-apomictic) are harvested, as they have arisen from sexual reproduction and the progeny may have considerably different characteristics from the previous generation.

Specimens to be re-accessioned due to lack of data are to be assigned the next three digits in sequential order and the suffix of '-001-XX'

Specimens to be re-accessioned due to sexual reproduction are to be assigned the next three digits in sequential order and the suffix of '-001-[Year]'. The final two digits should be assigned according to the year of accessioning.

All specimens, either accessioned or re-accessioned, should ideally be verified while in the collections. A target verification date should be assigned to each specimen at the point of accessioning or re-accessioning.

De-accessioning

De-accessioning is the process of removing specimens from the collection. Specimens should only be removed from the collection if it is necessary and approved by the Curator. Circumstances where de-accessioning is appropriate are:

Specimen is of no value to conservation, education, research or display

Superior wild origin plant material is introduced to the collection

Specimen has insufficient documentation and contravenes The Nagoya Protocol

Specimen is hazardous to the health of Gardens staff and/or members of the public

With the permission of the Curator, a specimen can be de-accessioned providing that:

Specimen is verified prior to de-accessioning

Specimen is assessed and available data recorded

Specimen must not be de-accessioned if categorised as 'near threatened', 'vulnerable', 'endangered', 'critically endangered' or 'extinct in the wild' in the IUCN Red List of Threatened Species.

Specimen must not be de-accessioned if found in fewer than five other collections on the BGCI Plant Search database.

Material which has been de-accessioned may be transferred to another collection providing that:

Plant material has no conditions attached to it that restrict the transfer of the plant material to a third party

Plant material is healthy and the risk of infection is low.

A Material Transfer Agreement is issued to the recipient and signed; it must also include any conditions stipulated by the source

Plant Record Data Management

Plant records are maintained at the Gardens to document the collections and the management of the collections. All records are hosted on BG-BASE and the curator is the nominated administrator of the application. All members

of staff have the right to access BG-BASE, and staff members who have received the relevant training can be assigned a login and edit the database. Members of the curatorial team may also utilise ArcGIS for mapping purposes but geospatial data should be stored on BG-BASE and exported to ArcGIS.

BG-BASE

BG-BASE has a total of 117 tables available for use. Activities at the Gardens use many but not all of these tables. Selections of the most commonly used tables are detailed below including which members of staff are responsible for their management.

Data pertaining to a single accession should be stored in the **ACCESSIONS** table. The **ACCESSIONS** table is employed for accessioning and includes original acquisition or collection information. The **ACCESSIONS** table is also used for assigning the current taxonomic classification to an accession. All documentation and permits associated with an accession should be referenced and stored on EDRMS. Curatorial staff are responsible for the **ACCESSIONS** table.

Data pertaining to individual or groups of specimens assigned a unique qualifier should be stored in the **PLANTS** table. The **PLANTS** table is employed for documenting the movement, health, phenology and monitoring of specimens associated with a unique qualifier. Both trained members of horticultural and curatorial staff are responsible for the **PLANTS** table. Members of horticultural staff are encouraged to update

records relating to collections that they manage as their first-hand knowledge of their collections is invaluable.

Data pertaining to nomenclature should be stored in the **NAMES** table. The **NAMES** table is employed to manage the composition of, status of and references for nomenclature. Both scientific names and common names are managed in the same record and are linked to the **ACCESSIONS** table via a name number, a unique identifier for each record in the **NAMES** table. Curatorial staff are responsible for the **NAMES** table.

Data pertaining to specific areas within the Gardens should be stored in the **LOCATIONS** table. The **LOCATIONS** table is employed to manage areas where specimens can be found in the Gardens. Specimens can be assigned to a particular area in the **PLANTS** table using an alphanumeric code which uniquely identifies each record in the **LOCATIONS** table. Curatorial staff are responsible for the **LOCATIONS** table.

Data pertaining to sources of specimens should be stored in the **PSOURCE** table. The **PSOURCE** table is employed to manage data related to sources of specimens such as source name, address and contact details. Accessions can be assigned a source in the **ACCESSIONS** table using a alphanumeric code which uniquely identifies each record in the **PSOURCE** table. Curatorial staff are responsible for the **PSOURCE** table.

Data pertaining to data sources (i.e. books, journals, unpublished manuscripts etc.) which

are either included in our library or utilised to manage the collections should be stored in the DS table. The DS table is employed to manage data related to data sources such as data source name, location and format. Data sources are documented for many different reasons. A data source may be a reference for a scientific name or a permit related to the collection of an accession. Curatorial staff are responsible for the management of records in the DS table which are utilised for managing of the collections. Members of staff who are involved in the management of the library are responsible for records in the DS table related to data sources included in the library.

Data pertaining to images of specimens should be stored in the IMAGES table. The IMAGES table is employed to manage data related to images of specimens such as accession number of specimen, location and image path. Curatorial staff are responsible for the IMAGES table.

Data pertaining to shipments of specimens to other institutions are stored in the SHIPMENTS table. The SHIPMENTS table is employed to manage data related to specimens distributed from the collections such as accession number, recipient number and date sent. Shipments are assigned a unique number to identify each specimen distributed and are linked to other specimens distributed in the same batch (shipped to the same institution, on the same day) by the invoice number. Invoices are generated and managed in the SHIP_INVOICE table.

ArcGIS

ArcGIS has been selected by the curatorial team as a platform for geospatial mapping of the collections at the Gardens. ArcGIS is used extensively within Glasgow City Council and base maps of the Gardens have already been created. Initial trials of the software have been conducted at the Gardens and the application has been installed on existing IT systems. The policy regarding the use of ArcGIS and geospatial mapping will be amended in later versions once protocols and procedures have been developed.

Documentation Management

Curation of the collection relies upon the appropriate and systematic storage of data and information so that it is accessible and informative for those who wish to use it for conservation, research, education or management of the collection. The Gardens are committed to maintaining associated documents for accessions while they are still being, or have the potential to be, cultivated and for a minimum of twenty years after de-accessioning or loss. The following document types are to be stored and linked to BG-BASE by the following means:

Agreements & Permits: must be digitised and stored on the EDRMS system utilising a clear naming convention that includes the title of the document and the date. A DS record must be created and documented in the ACCESSIONS table.

Digital Images: must be stored in the IMAGES folder of the drive which hosts BG-BASE utilising a clear naming convention that includes the scientific name and the date on which the picture was taken. An IMAGE record must be created for the digital image.

Geospatial files: must be stored in the GIS folder of the drive which hosts BG-BASE utilising a clear naming convention that includes a descriptive name of the file and the date the file was created.

Inventories: exported from BG-BASE must be stored in the OUTPUT folder of the drive which hosts BG-BASE utilising a clear naming convention that includes a descriptive title and the date the inventory was created.

References: cited on BG-BASE must be deposited in the Gardens' library or accessible online. A DS record must be created for the reference.

Data Access and Sharing

The Gardens is committed to facilitating access to its data and sharing information for the benefit of conservation, education, horticulture and research. It does however reserve the right to limit access to data that is deemed sensitive. Individuals or organisation who wish to request access to our data should complete the Data Access and Sharing form and submit it to the Curator either by email or via www.glasgowbotanicgardens.com.

Evaluation and Monitoring

Data and information must be kept up-to-date in order to be relevant, and continual evaluation and monitoring is an important part of managing the collections. Botanic gardens perhaps face a greater challenge than colleagues in museums, libraries and archives as our collections are not static and are subject to morphological changes, self-propagation and senescence. Curatorial and horticultural staff can record data relevant to plant growth and development, phenology and taxonomy using BG-BASE. With the continual accumulation of data, each specimen will amass a valuable dataset, which in turn can be converted into information for our conservation, research, educational and horticultural users and stakeholders.

Stocktaking is a process by which specimens are checked to assess whether their information is correct and updated as necessary. Horticultural staff are encouraged to continually stocktake collections they are responsible for, documenting changes using the PLANTS table. Horticultural staff are best placed to stocktake their own collections as they have the greatest knowledge of their collection and their data is first-hand - which ensures accuracy. Curatorial staff are also responsible for stocktaking but will conduct audits of collections or locations. Each collection or location must be audited at least once every three years. Curatorial staff are also available to assist horticultural staff stocktake their collection and input data if they are not a BG-BASE user. Horticultural staff who are not BG-BASE users can submit data via the New

Locations form or the Dead form. It is important that stocktaking is thorough yet not burdensome due to the size of the collection. Curatorial and horticultural staff are recommended to follow the minimum data standards for stocktaking listed below. Horticultural staff may also recommend that curatorial staff perform data capture (detailed below) on a specimen if all diagnostic characters for identification are present or if they wish for a phenological event to be documented.

Data capture is a process by which the maximum data available about a specimen is recorded. In addition to the data recorded via routine stocktaking, data capture facilitates a more detailed assessment of specimens. It is advisable that specimens are selected for data capture based on the presence of diagnostic characters for identification or the occurrence of a phenological event. Curatorial staff are responsible for data capture but horticultural staff are encouraged to recommend specimens for data capture. Data capture may also include images which must be documented in the IMAGES table.

Verification is a process by which the nomenclature assigned to a specimen is assessed to ascertain whether the classification employed is correct and current. Curatorial staff, or taxonomists with expertise in the taxon assessed, can conduct verification and material can be submitted to curatorial staff by horticultural staff. Verifications can be recorded in the VERIFICATIONS table where details such as sample type, references

employed and the verifier are recorded. Verifications can be made on an *ad hoc* basis if all diagnostic characteristics are present but a genus-based technique is preferred. A description of the genus-based verification programme follows:

The Curator will designate one genus as a priority for verification

Herbarium specimens are to be prepared for a minimum of 90% of accessions assigned to the designated genus when diagnostic characteristics are present and stored in the herbarium cabinets.

When a minimum of 90% of accessions have been sampled, curatorial staff should conduct a review of specimens utilising appropriate literature and, if required, verified herbaria specimens loaned from other herbaria.

Verifications must be recorded in the VERIFICATIONS table and changes to nomenclature in the ACCESSIONS table.

Labelling

Labels are a vital communication tool in botanic gardens, providing visitors with information and identifying specimens which are documented in databases. The Gardens utilise three types of labels as detailed below:

Temporary labels: can be handwritten or printed and are used to identify specimens which are not on display. Labels can be handwritten or a request by horticultural staff can be made to curatorial staff for printed

labels. Temporary labels must include the following information:

Accession number, source, name, barcode (if printed)

Display labels: are to be printed, using a black background and white text ranging in font size from 10 - 28. The following forms of display labels are currently utilised at the Gardens:

Economic display labels - 10 × 15 cm in height and length are to be used on specimens with an economic value nominated by the Education Officer. Economic display labels will feature the following fields from the ACCESSIONS table in BG-BASE:

Accession number, name, common name (if applicable), description

Tree Display labels - 2.54 × 10.16 cm in height and length are to be used on specimens which are designated as a 'tree'. Tree display labels will feature the following fields from the ACCESSIONS table in BG-BASE:

Accession number, name, common name (if applicable), family, range

Standard display labels - 2.54 × 7.62 cm in height and length are to be used on all specimens with the exception of those designated as 'trees' and those nominated for an economic label by the Education Officer. Standard display labels will feature the following fields from the ACCESSIONS table in BG-BASE:

Accession number, common name (if applicable), family, range

Reserve labels: are to be engraved metal strips 1.5 × 4.00 cm in height and length which are used on shrubs and trees. Back-up labels must be placed in a discreet position to ensure that the specimen can be identified if the display label is lost.

9. Conclusions

The authors believe that adoption of the Policy by all members of staff will take time and allowances should be made while new procedures are introduced. Many of the procedures detailed in the Policy are currently adhered to and few changes to current standards will be necessary. It is important however that the spirit of the Policy is adopted by all members of staff as the Gardens pursue excellence in conservation, display, education and research.

Appendix I - Forms and Guidance

The following forms and guidance are discussed in the Policy and are to be used by curatorial and horticultural staff alike to assist in management of the collections. All of the items detailed below are available from the Curator's Office or www.glasgowbotanicgardens.com.

Forms

Acquisitions

Acquisition Agreement Form

Plant Donation Form

Cultivation

Data Access and Sharing Form

New Label Request Form

New Location Recording Form

De-accession Form

Distribution

Material Transfer Agreement

Guidance

Approved suppliers list

Guide to data recording for horticulturalists

Guide to creating plant labels

Appendix II - References

The following references are discussed in the Policy or are listed for further information.

Access and Benefit-Sharing Clearing-House. Secretariat of the Convention on Biological Diversity. Web. 16 Feb. 2016. <<https://absch.cbd.int/>>.

Botanic Garden Conservation International - German Regional Office. "International Plant Exchange Network (IPEN)." *Consortium of Botanic Gardens in the EU* (2003): 1-13. Web. <<http://www.botgart.uni-bonn.de/ipen/conduct.pdf>>.

Brickell, C.D., ed. "International Code of Nomenclature for Cultivated Plants." International Society for Horticultural Science (2009). Web. <http://www.actahort.org/chronica/pdf/sh_10.pdf>.

CITES Secretariat. "Convention on International Trade in Endangered Species of Wild Fauna and Flora." (1973): 1-16. Web. <<https://www.cites.org/sites/default/files/eng/disc/CITES-Convention-EN.pdf>>.

Food and Agriculture Organization of the United Nations. "International Treaty on Plant Genetic Resource for Food and Agriculture." (2009): 1-55. Web. <<ftp://ftp.fao.org/docrep/fao/011/i0510e/i0510e.pdf>>.

McNeill, J., ed. *International Code of Nomenclature for Algae, Fungi and Plants*. Oberreifenberg, Germany: Koeltz Scientific, 2012. Print/web. <<http://www.iapt-taxon.org/nomen/main.php>>.

Stace, C. *New Flora of the British Isles*. Cambridge: Cambridge University Press, 2010. Print.

Secretariat of the Convention on Biological Diversity, Montréal. "Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity." *Convention on Biological Diversity* (2010): 1-25. Web. <<https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf>>.

United Nations. "Convention on Biological Diversity." (1992): 1-28. Web. <<https://www.cbd.int/doc/legal/cbd-en.pdf>>.