Living Plant Collection Policy
Polisi Casgluargyfer y Casgliad Byw

1. **INTRODUCTION**

This Policy applies and has relevance to the whole of the Garden inclusive of the farm estate and NNR (taken together as 'the Garden').

The national and international context of botanic gardens, across issues as diverse as the environment, climate change and quality of life, means that each needs to have in place a Living Collection Policy (LPC) that guides its holdings. In the case of young botanic gardens in early phases of development, it is particularly important that broad scope and flexibility are provided for within the policy. Additionally the requirements of national and international legislation must be recognised and numerous inter-related policies and conventions need to be taken into consideration. Through the demonstration of careful and effective stewardship, botanic garden collections can be passed on to successive generations in ways that measurably contribute to conserving biodiversity, extend our understanding of plant science, and increase the benefits that can be derived from plants.

2. **PURPOSE, AIMS AND OBJECTIVES**

The purpose of this Policy is to ensure that the Garden's Living Plant Collection (LPC) is well managed now and in the future, ensuring that all plants cultivated are fit for purpose and meet the needs of everyone who interacts with them. Overall it aims to ensure that the right plants are being grown in the right place, and are held in the right conditions, for all who need to use them.

In keeping with other botanic gardens from around the world the Garden's LPC Policy has been designed to take account of the following essential considerations:

- National and international context, stakeholders and user groups.
- Quality and standards of information, targets and review process.
- Collection types.
- Landscape, heritage representation, design and display.
- Acquisition, transfer, disposal and deaccession.

These will be dealt with in more detail below.

Key objectives of the policy are to ensure that the Living Plant Collection:

2.1. Integrates with and fulfils the wider strategic purposes and agenda of the Garden guided by its core mission and plans.

2.2. Is provided with a long term planning and continuity framework, protecting it from short-term pressures and changes.

2.3. Has all available resources co-ordinated and directed towards it to create the richest LPC possible (defined by total numbers and diversity).

2.4. Is fit for purpose in all its roles, so that it can make a contribution to research, education, conservation, training and inspiring.

2.5. Develops and is maintained and managed to best practice international standards.

2.6. Is as accessible as possible (physically and intellectually), contributing to enriching quality of life and increasing visitor numbers by the provision of a beautiful landscape for recreation.

2.7. Recognises and responds to the possible implications of climate change by making the best possible use of the microclimates, glasshouses, and protected cropping space.

2.8. Safeguards the verification, accuracy and integrity of its contents.

2.9. Acts as a framework for reviewing holdings, and prioritising resources and effort.

2.10. Can be responsive and realistic in relation to financial and other constraints and imperatives.

Enables allocation of resources and priorities in ways that are pragmatic, sustainable, and adaptable to changing needs.

Part 1 National and international context, stakeholders and user groups.

1. **NATIONAL AND INTERNATIONAL CONTEXT**

NBGW operates within a set of national and international policies, acts, guidelines, action plans and legislative frameworks, including those produced by the Welsh Government and as currently set out in the programme for Government 2011-2014
http://wales.gov.uk/about/programmeforgovernment/?lang=en

National and international policies of particular relevance to the Living Plant Collection are as follows.

2. **THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD) http://www.cbd.int/convention/text/**

The purpose of the CBD is the:

- Conservation of biological diversity
- Sustainable use of biodiversity
- Fair and equitable sharing of the benefits arising from biodiversity

NBGW strives to set the highest standards of compliance within the spirit and law of CBD, when acquiring, transferring or using living plant material. Areas of compliance will include:

- Permission to collect
- Material Access Agreements
- Material Transfer Agreements (including plant release forms)
- Scrutiny before acceptance of plant gifts from unregulated/non- compliant sources
- Storage of documentation and access agreements for a suitably long term period
- Storage of CBD transfer (plant release) forms for a suitably long term period
- Benefit and information sharing with donor countries

Other areas of direct relevance of CBD to the work of NBGW (and other botanic gardens) include the following Articles:

- Development of national strategies (Article 6a)
- Identification and monitoring (Article 7)
- *In situ* conservation (Article 8)
- *Ex situ* conservation (Article 9)
- Sustainable use of the components of biodiversity (Article 10)
- Research and training (Article 12)
- Public education and awareness (Article 13)
- Technical and scientific cooperation (Article 18)

The opportunities and responsibilities that these Articles bring are largely the responsibility of the Horticulture Team and will ensure that the LPC is managed appropriately and accordingly, and can be used to promote them.

3. **GLOBAL STRATEGY FOR PLANT CONSERVATION (GSPC)**

The purpose of the GSPC is the conservation of plants for which 16 outcome targets were set (see http://www.cbd.int/gspc/targets.shtml). Those of particular relevance to the Garden are:

3.1. Ensure that the LPC meets the international standard of accurate scientific and taxonomic naming, e.g. The Plant List and the RHS Plant Finder. (Contributes to Target 1).

3.2. Promote integrated conservation programmes (such as Welsh Native Plants) and the integration of research into conservation collections and reintroduction programmes (contributes to Targets 3 & 8).

3.3. Investigate the cultural requirements of plants in the LPC and document findings (contributing to Targets 7 & 8).

3.4. Grow as many Welsh endangered species as practicable and contribute to PlantNetwork's Target 8.

3.5. Collaborate with DEFRA and others in raising awareness of alien invasive species with the public and the horticultural trade (Target 10).

3.6. Co-operate with the Education Team and others by making plant material available to support education in its widest context (contributes to Target 14).

3.7. Use the LPC as the basis for training staff, students and volunteers, as well as the visitors, in the science and practice of horticulture and related disciplines (contributes to Target 15).

3.8. Use the LPC as the basis for taking part in networks at all levels thereby promoting the highest standards of plant cultivation and use (contributes to Target 16).

4. **PLANT DIVERSITY CHALLENGE**

This is the UK response to the GSPC and relates to many initiatives in the UK such as the UK Biodiversity Action Plan and Species and Habitat Action Plans that followed. The report is laid out in the same order as the GSPC. Within the British context there are a number of actions that are relevant to the LPC amongst those listed by the European Consortium of Botanic Gardens. These are briefly outlined:

4.1. Target 3 - integrating *in situ* with *ex situ* conservation and developing this with Target 8 (listed as ongoing action).

4.2. Target 8 - collecting and storing vascular plants (in collaboration with the Millennium Seed Bank of the Royal Botanic Garden Kew) and reintroducing them as determined by the Biodiversity Action Plan (listed as an ongoing action).

4.3. Target 8 - developing methodologies for the *ex situ* conservation and reintroduction of bryophytes (listed as an ongoing action).

4.4. Target 8 – developing scientific and horticultural expertise for the *ex situ* conservation of vascular plants and reintroductions (listed as high priority additional work).

4.5. Target 8 – researching the *ex situ* conservation of lichens and their reintroduction (listed as high priority additional work).

4.6. Target 8 – developing an integrated inventory of living plant and fungal collections for our collection, cross-referenced to those of others (listed as high priority additional work).

4.7. Target 8 – developing protocols and guidelines for conservation programmes to release the potential contribution from specialist plant societies, nurseries and gardeners (listed as medium priority work).

4.8. Target 8 – developing collections to ensure that adequate genetic diversity of each species is maintained to support restoration programmes (listed as lower priority or long-term additional work).

4.9. Target 9 – improving the *ex situ* holdings of the genetic diversity of crop wild relatives native to UK and of UK crop landrace material (listed as high priority additional work).

4.10. Target 9 – planning appropriate *ex situ* conservation of minor food crop and? socio-economically valuable species native to the UK (listed as lower priority long-term additional work).

4.11. Target 15 – promoting training in whole plant biology at all educational levels, in particular to deliver more people trained in field identification (listed as high priority additional work).

The above targets provide an important steer for the nature and content of the Garden's LPC.

NOTE: As yet there has been little consideration of the potential role of the Garden in relation to bryophyte and lichen conservation. This is likely to remain resource constrained.

5. **THE INTERNATIONAL AGENDA FOR BOTANIC GARDENS IN CONSERVATION**

This agenda, which is constantly evolving, provides a global framework for the development of botanic garden policies and programmes relevant to biodiversity conservation. By signing up to the International Agenda (IA) to support the aims and objectives of it through the LPC, the Garden will:

5.1. Maintain and develop the LPC to a standard of maintenance and development and to a degree of accessibility (physically and intellectually) to meet the main elements of the global mission as listed in 1.4.1 of the IA.

Elements of the IA most relevant to the LPC are:

5.2. Help set agreed levels and standards in plant diversity conservation, integrating techniques in *ex situ* and *in situ* conservation.

5.3. Maintain genetically diverse and accessible samples of the world's plant species in our collections.

5.4. Develop and implement best practices in plant conservation for botanic gardens.

5.5. Use horticultural knowledge and expertise to promote the sustainable use of plant genetic resources.

5.6. Develop and maintain plant genetic resource collections, especially of:

- Threatened plants of economic importance
- Wild plants of economic importance, including crop relatives
- Cultivars, prime cultivars (land races) and semi-domesticated plants

5.7. Facilitate and provide access to the LPC for *bona fide* users.

Other strategies, action plans and conventions impact the collection policy of NBGW and these have been taken into consideration in the formation of the LPC Policy. Relevant documents are the:

- Action Plan for Botanic Gardens in the European Union
- European Plant Conservation Strategy and Planta Europa
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

6. **CLIMATE CHANGE AND GLOBAL WARMING**

There is now little doubt that the world's climate is changing and becoming more erratic. It is not possible to predict the long-term effects and impact on the LPC but it is important that this Policy reflects the possibilities, as indicated by the latest international thinking. In its core mission and imperative of long-term sustainability in the way in which it uses resources, the Garden must:

- Take into account the relative benefits versus detriments of growing plants in controlled environments (green houses).
- Look for new opportunities for cultivation (benefits of climate change).
- Whilst avoiding radical change, increase awareness of possible local implications for the LPC by trying to identify groups of plants that may require relocation and initiating a re-propagation programme for possible plant redistribution.
- Collaborate with others to identify species likely to be threatened in the wild by climate change/global warming and initiate or join with appropriate conservation programmes.
- Be aware, record, and report any new infestations of pest and diseases not normally associated with the LPC, contributing to their mapping, monitoring and study.

7. **STAKEHOLDERS AND USER GROUPS**

The LPC exists to be used and is both an important part of Wales' national heritage and provides an internationally valuable reference collection. The LPC Policy reflects the diverse expectations and demands as well as particular uses placed on the LPC by internal and external users and stakeholders including:

Internal stakeholders and users

- Science staff for studies and reference across a range of fields including molecular evolution and developmental studies etc

- Horticulture staff for study of e.g. reproductive biology, cultivation technique and husbandry
- Conservation programmes, e.g. NNR
- Placement student studies and projects at undergraduate placement, MSc, and PhD levels
- Higher Education student training visits
- Schools and education programmes
- Lifelong Learning resource users

External stakeholders and users

- Science community including universities and other botanic gardens
- Conservation community such as the Countryside Council for Wales
- The external horticultural community, , e.g. allotment holders, garden clubs, horticultural societies, amateur gardeners, and parks departments
- Wales Government, Carmarthen County Council, and other collaborative stakeholder partners whose use links to mutual or their own particular strategic and developmental or promotional agendas
- Artists and those using the LPC for creative inspiration
- Students who visit the Garden personally or casually
- Public visitors – local, national and international

Use of the LPC by the above mentioned is diverse and includes the following.

8. **RESEARCH AND CONSERVATION**

The LPC supports research and conservation programmes. The Curator and Horticulture team in the Garden will aim for the highest standards of cultivation, representation and liaison to support this by:

8.1. Cultivating as wide a range of plants as possible within the parameters of this Policy, our ambient climate and environment /soil conditions, and available resources.

8.2. Liaising closely with science users to ensure the LPC meets their needs as far as possible, discussing new requirements – provision of space, resources, and plant material at different growth stages etc- as appropriate.

8.3. Maintaining the highest standards of record keeping possible.

8.4. Where appropriate and in conjunction with others, e.g. the professional horticultural community, striving to maximise the range, value, and standards of benefits derived from the LPC and all other collections (photos, herbarium vouchers, DNA, seed for banking).

9. **EDUCATION AND TEACHING**

Education is core to the Garden's mission. This Policy recognises the importance of the LPC and the Horticulture Team in providing plant material to support this endeavour on the following terms:

9.1. Good two-way communication on educational needs is fostered and encouraged.

9.2. Suitable material is provided in response to needs, and regular dialogue with course providers ensures realistic expectations, good standards, and efficient service.

9.3. Adjustments to the LPC, for example loss of taxa that may affect course delivery, are notified and the implications discussed so as to identify and agree substitutes.

9.4. For resource efficiency, ensuring that cultivation for teaching is undertaken in line with requirements and avoiding waste, and that needs/holdings are regularly reviewed for this reason.

9.5. Where there is a regular demand on or for individual plants, ways of meeting this are suitably established.

9.6. Where it adds value to teaching, the acquisition of new material for that purpose is factored into horticultural priorities.

10. **INTERPRETATION**

The interpretation of new and existing plantings will always aim to provide for the widest possible audience using diverse, appropriate, and engaging media to add to the visitor experience and contribute to the Garden's mission.

Interpretation should be designed and achieved through collaboration between staff from across the Garden, including Education, Horticulture, Science, and Marketing. Horticulture in particular has a significant contribution to make and it should be recognized that it may sometimes lead or drive the interpretive process.

Currently much of the interpretation has been designed around existing plantings. As the Garden continues to mature and develop, new plantings should increasingly be designed and planned in conjunction with interpretation. Increasingly therefore:

- Horticultural staff will be encouraged and expected to liaise with interpretation staff, communicating in advance any impending changes to plantings and sharing ideas for interpretation.
- Interpretation staff will be encouraged and expected to liaise closely with horticultural staff and to discuss their requirements for plants/plantings to complement, support, and promote interpretation.

11. **VISITING PUBLIC AND SPECIAL INTEREST GROUPS**

NBGW is a significant and iconic visitor attraction and recreation space. The LPC, along with the landscape and infrastructure, constitutes 'the Garden' and therefore its maintenance and quality are paramount in serving the needs of the visiting public. The Living Plant Collections are the lynch pin creating the Garden and increasing visitor numbers is a vital component of a viable and sustainable botanic garden. This Policy recognises that a poorly maintained LPC will have negative impacts well beyond the reputation of the horticultural staff. In recognising the importance of the visiting public the horticultural staff will:

- Create areas of the Garden where, in keeping with the overall LPC Policy, the primary focus is floral displays (recognising that these may not be in regular or fixed positions, but will instead vary through seasons and years).
- Maintain the plantings to the highest possible standard within available resources.
- Work closely with Facilities Management, helping to maintain an infrastructure that supports and enhances the plantings at the highest possible standard within available

resources, as well as recognising the potential detrimental impact of plantings on structural elements which may need to be managed carefully.

Part 2 Standards of Information – Targets and Review

A botanic garden collection is only as good as the information attached to the plants in it. The quality, integrity, accessibility, and way in which that information is used are paramount. This Policy identifies the critical importance of good plant records in the Garden's LPC and their value to its use and proper management. Elements to be covered include:

- Minimum standards for collecting new plants
- Minimum standards of record keeping once any plant is in cultivation
- Publication and accessibility of information
- Review and suitability of recording systems (and new technologies) to improve effectiveness of record keeping
- Security and integrity of records

1. **MINIMUM STANDARDS FOR COLLECTING NEW PLANTS**

The quality and extent of field and other data associated with plants in the LPC determine and impacts on their value and usefulness. Where possible the following data with a voucher specimen should be obtained:

- Source (e.g. whether wild collected or taken from cultivation)
- Field Name (meaning local vernacular name/s)
- Type of material (part of plant i.e. seed, cutting or etc)
- Provenance (locality of original genetic material)
- Genetic variability (from field observation at time of collection)
- Collector's name/expedition name or code
- Collector's number
- Date of collection
- Country
- Locality (meaning specific geographic location)
- Altitude
- Longitude/latitude
- Habitat (from field observation at time of collection)
- Associated plants (from field observation at time of collection)
- Description of material (appearance from field observation at time of collection)
- Images of material and/or collecting locality
- Ancillary information (such as local use, abundance, IUCN category)

2. **MINIMUM STANDARDS OF RECORD KEEPING ONCE ANY PLANT IS IN CULTIVATION**

Checking and monitoring plants on a regular basis with a periodicity of stock-take suitable to the subject are essential. A background annual pattern of stock-take provides a basis for most collections, with more regular monitoring for newly planted or susceptible individuals ranging to

three-yearly checking of established woody plants. These checks should be conducted, in all cases, to appropriate standards and include:

- Current location
- Number of plants
- Condition (important for maintaining health of collection and ascertaining propagation requirement and remedial treatments)
- Date and name of person/department responsible for update of record

Achieving this level of stocktaking is aspirational as it is resource- intensive. The Garden will aim to achieve its monitoring by complementing the Horticulture team expertise with volunteer effort, and by exploring and harnessing appropriate new technologies.

3. **PUBLICATION AND ACCESSIBILITY OF INFORMATION**

The importance of published and accessible records of plant holdings purposes is recognised. Given resource constraints, the dynamic nature of living collections and changes in technologies, a published hard-copy catalogue is not envisaged. Instead the ambition is for a majority of the Garden's catalogue to be accessible on-line, and 'live', with any sensitive information being appropriately restricted.

The use of new technologies will increasingly be embraced by the Garden for:

- Systems to map the LPC
- Techniques of remote updating
- Touchpad technology for stocktaking
- Barcode and reader for labels
- Risk management/hazard evaluation e.g. trees, toxic plants
- Links to plant sales, interpretation, and other topical interests

Ensuring all data are stored in compatible formats, with robust and regular agreed security backup protocols adhered to will be an expected part of the LPC Policy implementation. Such matters form part of the Garden Wide Risk Register and are recognised in the Garden's Business Continuity Planning and procedures.

4. **TARGETS**

The use of targets to prioritise and audit work on the LPC is clear and these also provide bench marks to review and drive up standards where necessary. Targets should not become an end in their own right and instead should be regarded as guide. Many outside influences beyond control of the Curator may radically affect targets, for example extreme weather and resource constraints, so a suitable degree of flexibility in setting and assessing targets is essential.

Any target setting for the LPC needs to be in context with the types of collection and needs to recognise the diversity of attention and/or special management that may be required for its different elements. In considering any target a careful balance needs to be reached between acquiring new material and maintaining what we have to high standards – both vital considerations in curating the collection.

Accurate naming is paramount. As a young garden which has grown fast and already faced many resource challenges, verification of plant identification and naming are perceived as an area of potential weakness and a heavy reliance is placed on third parties to facilitate improvement in this.

Currently 83% of the LPC is not of wild origin, with 17% being of known wild origin. Little or no verification of the LPC has been undertaken.

New accessions should reflect the needs of the LPC and should be of a quantity that can be managed with the resources available. A modest increase of the LPC should result from this and will allow a balance between the capacity of nursery staff to raise new accessions and maintain existing collections against excessive losses.

Targets for the LPCover the next 10 years are to:

- Achieve an increase in verification each year
- Increase wild origin *ex situ* plantings from 17% to at least 25%
- Not to exceed 1,500 new accessions in any given year

5. **REVIEW**

When reviewing the LPC it is important that the plant records information is up-to-date; therefore stock taking is a vital prerequisite (as mentioned in 2 above). The routine rolling review should aim to cover:

- Number of living families, genera, species, taxa, accessions and individual plants
- Per cent wild origin
- Per cent verification
- Number of new taxa and new accessions
- Number of IUCN-listed species and taxa
- Number of taxa deaths and accession deaths

Key families within the LPC should be identified with the aim of a Collections Audit of these being undertaken every five years. By doing this LPC trends will become evident over a period of time so that long-term impacts such as those due to climate change can be taken into account in developing the Policy. As with audits in other spheres, a suitable approach would be to identify a sub-set of key families and genera for this. These are yet to be identified and agreed.

6. **VERIFICATION**

The level of plant verification in the Garden needs to be substantially improved. Verification is important because visitors, general public, students, educators, researchers and others rely on plants being correctly named. Reputational risk is inevitable if plants are found to be incorrectly named. Even with a target of just 1% verification per year an enormous impact and improvement would be made to the value of the LPC. However, it has to be acknowledged that the process of verification is resource intensive and can be slow, and for this reason priorities have to be set. Furthermore an interim stage may require the operation of different levels of verification, as the need for high level verification cannot be met from within current staffing. The Curator and other suitably experienced horticultural staff should be involved in the verification process. Additional

expertise and consultancy resource is not likely to be sufficiently available to make rapid progress and therefore priorities need to be identified.

Verification priorities are:

- Plants whose identity is unknown
- Plants that have only been identified to family or genus level
- Plants of conservation importance
- Groups that are important to NBGW for particular research interest (taxonomic or geographic)
- Individually important plants connected with a particular collector or important expedition if of interest
- Plants flowering for the first time
- Plants suspected of being incorrectly named

All the above categories may include plants of known wild origin, which will take priority over plants of unknown origin and/or cultivars.

7. **INFORMATION CAPTURE**

This is a sizable task, and the LPC can only benefit from recording as much information as possible. However, resource constraints mean it will be beneficial to prioritise, for example starting the process with plants of conservation importance and those which are of importance to the Garden for research and science. Information capture could include:

- Record of first flowering/fruiting of newly collected material.
- Photo of every wild origin accession at various stages linking to the database.
- Inclusion of any other data/information which will support the collection, such as horticultural notes on cultivation as well as use in landscape, hardiness etc.
- Possible future development of a reference herbarium of cultivated plants (resources do not allow consideration of this at present).

8. **LABELLING**

Labelling is vital to link all information held in the records with the plants themselves. Labels are a well-established and important means of imparting information to the public and indeed are likely to continue to be the main method for doing so. Labels are critically important for the curation of the LPC.

The current use and styles of labels at NBGW are currently as follows:

- Operational labels which are handwritten clearly for day-to-day use e.g. at seed sowing or when cuttings are taken.
- Nursery labels for germinated seedlings and rooted cuttings, which are white-printed bar coded labels.
- Primary Display Labels, which are green printed labels used for plants in their final destinations.

The content of labels within the LPC has as a minimum of the following information:

- Accession number
- Family
- Genus
- Species

Other information that may in future, if required, be used includes:

- Hybrid with parents (where appropriate)
- Subspecies, variety or cultivar (where appropriate)
- Section or subsection (where appropriate)
- Common name (see notes below)
- Collector's name and number
- Country or geographic region of origin
- Special codes, e.g. conservation status, wild origin, plant us.
- Natural source
- Verification

The limitation of label size, as well as the need for clarity and consistency overall, inevitably enforces brevity. Therefore in general more extensive interpretation should be offered by other means (see notes below).

Common names are frequently requested by the visiting public and lack of them is often remarked in visitor surveys. Whilst common names are desirable and suitable in some instances, more generally they introduce a series of difficulties, and particularly so in the bilingual environment of Wales. Therefore it is recommended that common names should be used where possible only on the following:

- All British natives
- European and North American trees and shrubs (using British common names)
- Any plants considered of garden or horticultural interest (where a common British name exists)

The limitations for displaying these on labels are:

- There may be many common names for the same plant
- The need to offer bilingual naming (a definite for Welsh indigenous plants), size limitation being the issue here
- But with no need to include common name where it is the same as the Latin name (e.g. Crocus).

The development of new technologies could alleviate many of the problems of what to include on labels. NBGW is actively looking in to the use of QR codes and other methods. With the spread of "Smartphone" technology it will increasingly be possible for visitors to access diverse information in a multi-layered way. It is envisaged that systems will gradually be developed to harness and enable embedding of QR codes on plant labels, and GPS-based or image recognition systems.

Part 3 Landscape, Design and Representation

1. **INTRODUCTION**

This part of the Living Plant Collections Policy concentrates on the visual and heritage value of the Garden, the use of cultivars and general aspects of collection display such as geographical representation.

2. **GENERAL LANDSCAPE**

While it is the scientific, conservation and education value of the LPC that is of utmost importance, it must be recognised that the historic landscape of the Garden is of immense and under-pinning value too. It must also be recognised that it may constrain new development. The modern plant collections are capable of enhancing the heritage landscape and elements of them are likely to develop in ways that reflect and take account of the history and historic plantings of the Middleton Hall estate. The significance of the visually attractive garden display in the overall context of the Regency landscape and lakes should not be forgotten as a strategic attraction for paying visitors.

In considering the landscape of the Garden the following should be noted:

- A number of floral rich areas should be included in the Garden, primarily designed with public amenity, visitor expectations, and landscape vistas in mind.
- When considering any change to the general landscape and context of the Garden, its designed historic heritage must be borne in mind.
- The historic working estate and garden plantings can provide narrative and direction for interpretation and for developments such as the heritage fruit collection.

3. **USE OF CULTIVARS**

Well documented wild origin plants and cultivated plants from other plant collections are at the core of a modern scientific botanical collection. However cultivars also have a role to play for:

- Creating attractive displays with diversity of interest.
- Teaching purposes since many are interesting from an evolutionary or plant breeding point of view, showing particular morphological features.
- Their historic and cultural purpose and context, for example by linking to Welsh nurserymen, plant breeders or named after people and places in Wales.
- Being site-specific, i.e. historically associated with Middleton (e.g. Hornbeam), hornbeam, or with the Middleton brothers (Nutmeg, Pepper) or Paxton (designed landscape plantings).

On this basis the selection of cultivars is just as important as of wild origin material in order to tie in with the policy or mission of the Garden. By setting out the criteria for selection, this Policy determines which plants should or could be grown.

4. **REPRESENTATION**

Within the framework of the LPC Policy a “Representation Policy” provides guidelines for layout and display of plants on the ground.

Two of the most obvious approaches are taxonomic representation (where species from e.g. the same genus are grouped together for comparison) or geographic representation (where plants from the same geographical region are grouped together). Other options may include interpretative planting or climate change groupings. The term 'ecological planting' is occasionally used to describe a 'geographical' or 'phytogeographical planting'. However, it would be better to consider these as quite distinct and an ecological planting should simply refer to ecological niches and habitat types. Any or all of these different planting representations may be used as need and utility dictates, but care should be taken in distinguishing between and defining these different types when used.

Unless planting is undertaken for specific interpretation or taxonomic purposes, e.g. the Apothecary's Garden or APG3, the preferred approach to representation should be an advance on the geographical model and feature species of ethno-botanical, conservation or education interest or a combination of these. All plantings should be designed with the potential for interpretation in mind, and consultation with interpretation and education staff is expected.

Any plantings that have a strong representational component likely to be linked to research, conservation or education should be reviewed critically with this in mind. The aim will be every five years to co-ordinate a widely collaborative consultation on the collections with other departments and relevant interest groups amongst the Garden staff.

Representational themes for NBGW are listed in Appendix 4. Future initiatives and funding or development opportunities may open avenues for new and different representational planting.

Part 4 Collection Types

As well as the main forms of botanic garden display representation (such as taxonomic and geographical representations) there may be specific types of collection that require careful attention or special management. Examples of these could include research collections, conservation collections, Welsh Rare Plant Project, or other native species and heritage or historic plants.

1. **RESEARCH COLLECTIONS**

The entire LPC should be regarded as a research resource potentially for use by colleagues and students internally and externally. As such it is vital that the highest standards of record keeping, verification and cultivation are maintained to ensure it and its individual component plants are fit for research purposes. Supporting the cultivation of plants for research is one of the most important uses of the LPC and ways in which it can do this are listed in Part 1 under stakeholders and user groups.

2. **CONSERVATION COLLECTIONS**

Conservation Collections are those which are held for the following reasons:

- As an insurance against loss or genetic erosion of the species in the wild
- Species for which there is the specific intention of recovery, reinforcement or re-introduction to the wild in the future
- Conservation research
- Education

- As part of a specific NBGW national or international programme

The targeting of species for such collections will be based on listed species that are categorised by the World Conservation Monitoring Centre (WCMC) but could include species that, though not yet of such status, could become so. Any Conservation Collections undertaken at NBGW should be prioritised. The following list, although not exhaustive, articulates a sound footing for such collections:

- Priority for species (within families and genera) that are historically and/or scientifically important to NBGW.
- Priority for rare, threatened, and vulnerable species where NBGW is considered the best place for *ex situ* conservation of that species.
- Priority to species listed in Welsh Biodiversity Action Plan and other UK BAP species as appropriate, Target 8 of the Global Strategy for Plant Conservation being a driver also.
- Priority for rare, vulnerable or threatened, naturally occurring relatives of hardy ornamental or otherwise useful plants.
- Wherever possible Conservation Collections should not exist in isolation from other conservation measures but should be integrated into a wider project that links different conservation techniques and other partners.

3. **HERITAGE OR HISTORIC PLANT COLLECTIONS OR LANDSCAPE FEATURES**

NBGW is the youngest National Botanic Garden in the UK and as such the plant collections that are establishing, based on the initial plantings, are in themselves making history. As well as this, the heritage landscape of Middleton Hall impacts today's landscape and collections and we need to be mindful of this. Specific collections that are being developed and are core to NBGW are the:

- Mediterranean Collections in the Great Glasshouse
- Apothecary Garden
- APG3 Representational Collection in the Double Walled Garden
- Woods of the World and Welsh Woods matrix
- Wild Garden (formerly the Prairie Garden)
- Welsh Natives Collection
- Meadows and Grassland Restoration Collections (British Native)
- Middleton and East India Company Collections
- Sustainability Collections
- Heritage Horticulture and Food Plants Collections

Other collections are largely ornamental and further collection development is part of the overall Horticulture Strategy Plan (work in progress).

Part 5 Acquisition, Transfer, Disposal and Deaccession

1. **INTRODUCTION**

To ensure the development of a collection that fulfils the criteria described above, plants need to be acquired. This can include gathering plants or seeds on fieldwork at home or abroad, obtaining seed from Index Semina or bringing in plants from other collections. All these methods of acquisition

require policies and protocols to create an orderly process, ensure that priorities are followed avoiding confusion or duplication, and ensure statutory compliance. Equally important, systems to move plants out of collections to elsewhere, to dispose of or sell plants (for example through gift or commercial sales of propagated material), or to deaccess completely are required.

2. **FIELDWORK**

Fieldwork provides an important opportunity to acquire new plants for the LPC. This however needs to be planned carefully to ensure compliance with CBD and sufficient funding for the undertaking. Fieldwork would commonly entail a two year lead-in time. As it is an important method of fulfilling the targets and objectives set out in this Policy, well-conducted fieldwork as an integral part of the strategic planning process will help to avoid duplication and enable priorities to be determined.

- A proactive approach to analysing gaps in the LPC should be taken by the Curator and any fieldwork organised accordingly.
- Staff should be trained in collecting techniques and where possible encouraged to participate in fieldwork.
- Minimum standards of field recording should be adopted as outlined in this Policy.
- Funding such fieldwork needs to be done creatively, for example obtaining grants and funding from external sources.
- Staff should be encouraged to be collaborative in undertaking fieldwork with staff from the host country and from other appropriate institutions.
- Fieldwork presents valuable opportunities for public engagement and publicity. Liaison with the Head of Communications on this should be sought at an early stage to promote reach to the widest possible constituency.
- Any staff from NBGW on fieldwork expeditions must abide by CBD, CITES, phytosanitary legislation and any local laws governing the collection and exchange/transfer of plant material. Appropriate care must be taken to evidence written permissions and provide an audit trail of documentation for collecting trips and collected materials.

3. **INDEX SEMINUM**

Many botanic gardens produce an Index Seminum as one of their main missions. The problem of acquiring plants from these catalogues is that garden-gathered seed is frequently of hybrid or unknown origin and therefore is of limited value for research. Nonetheless when a species cannot be obtained by any other means and is being used purely for display, interpretation or education purposes, it may be acceptable to obtain plants by this means.

4. **OTHER SEED AND PLANT CATALOGUES**

It is highly unlikely that plants from commercial catalogues will be of well documented wild origin, or if and where such plants are from wild origin the likelihood of compliance with CBD may be uncertain. Such material is therefore best avoided. However, legitimate commercial plant sales can be obtained for specific purpose in areas such as plant display, education or interpretation, each case being judged on its merits.

5. **ACQUISITION**

With the increased interest in biodiversity and conservation, changes in science and specific international policies such as CBD and the GSPC necessarily lead to a method of prioritising acquisitions that take these factors into consideration.

Using these criteria acquisitions may be for any of a variety of distinct purposes:

- Specific research projects
- Conservation projects or interest
- Education and interpretation in the widest sense
- Teaching purposes
- Historic collection or significance

A system of coding the collection accordingly will enable gaps in the LPC to be properly explored, and priority for future acquisitions and targeting of species to be determined.

6. **POLICY FOR SHORT-TERM STORAGE AND SOWING OF SEED**

The storage and sowing of seed need to be informed by guidelines for best practice. Where quantities of seed are received from wild origin and viability is uncertain, it is clearly wasteful to sow all seed at once if only a few plants are required (unless there are only a few seeds). However due to the unknown viability and storage requirements of much wild origin material, it is important to sow as much as is needed and for any "surplus" seed to be adequately stored (if necessary, by a competent body elsewhere) or gifted to other *bona fide* organisations.

At times seeds storage may be needed to:

- Provide optimal storage conditions while waiting for correct season for sowing
- Allow for repeat sowings of short-lived species
- Insure against loss of an entire sowing
- Allow for additional sowings or gifting if there are plenty of seeds within an accession and adequate numbers sown already

It is essential where plants are being raised for specific projects that there is a sensible balance between numbers sown and numbers stored for the future. A regular, organised programme for re-sowings of short-lived species needs to be agreed between the nursery team leader and team leaders in the Garden.

Where short-lived or annual plants have their seed collected in the Garden, it is important that such material is re-accessioned as second generation. This is necessary to ensure that the material (previously wild origin) is re-designated as *cultivated from* known wild origin source. Such practice recognises that differences and genetic drift will arise for example, through open pollination with other sources, or because of the restricted gene pool held. Furthermore, due to open-pollination, verification of re-sows will be necessary.

7. **MATERIAL TRANSFER PROTOCOLS**

7.1. Material transfer of plants governed by regulation

Any material governed by regulation that is transferred elsewhere will, as a matter of usual protocol, be accompanied by a Material Transfer Agreement of the standard format (see Appendix 2)

8. **SALES**

8.1. No plant material governed by CBD regulation will be prepared for sale.

8.2. Sales of any plant material governed by Plant Breeders Rights[1] will respect and comply with those requirements.

8.3. Any plant materials sold by the Garden for commercial purposes will be prepared in accordance with best practice horticultural standards and due care and respect for consumer rights.

8.4. The Garden will work with the Volunteers to encourage a code of practice in relation to any sales organised by and through the Volunteer body. These sales will be deemed to fall outside the Garden's area of responsibility.

9. **DEACCESSIONS**

Given the threats to plants and their habitats, modern thinking in botanic gardens is that the important genetic diversity of wild origin material should not be deaccessed. If a plant must be deaccessed then the following cascading procedure should be undertaken:

- Capture as much information about the plant as possible, e.g. final verification, photograph(s), herbarium specimen, DNA sample – in an ideal scenario.
- Offer plant to other *bona fide* botanic gardens.
- If no botanic garden wants it, then offer back to country of origin.
- If no other botanic garden or country of origin wants it, and it has no IUCN threat category, then the plant can be deaccessed.
- If the plant has an IUCN category and no other botanic garden or country of origin wants it and if the plant is cultivated in less than five gardens (this can be found from BGCI), then it must be kept.

LIST OF LINKS and APPENDICES

LINK - List of articles of the Convention on Biological Diversity governing the collection
http://www.cbd.int/convention/text/

LINK - List of Targets of the Global Strategy of Plant Conservation 2011 – 2020
http://www.cbd.int/gspc/targets.shtml

LINK - National Council for the Conservation of Plants and Gardens
http://www.nccpg.com/

APPENDIX 1 – List of Plants Held

To follow

APPENDIX 2 – Materials Transfer Agreement

[1] Plant Breeders Rights are the legal statutes and instruments governing the rights of the breeder to a royalty or licence payment.

To follow

APPENDIX 3 – Accession/disposal/deaccession

To follow

APPENDIX 4 – Representational Themes

To follow