

Conservation, Preservation and Demonstration: the What, Why and How of National Plant Collections

The PlantNetwork and Plant Heritage event looking at National Plant Collections (NPC) took place at Upton House on 26th September 2019. The day sought to introduce the NPC Scheme, managed by Plant Heritage, to those interested in starting a collection or to anyone who has recently taken on the management of such a collection.

Plant Heritage and the National Plant Collection Scheme

Vicki Cooke and Lucy Pitman of Plant Heritage introduced Plant Heritage (PH) and the NPC Scheme, stressing that with a loss of 75% of specialist nurseries in the last 20 years, many plants are being lost from cultivation, particularly cultivars. This represents a loss of genetic biodiversity and historical diversity which the NPC Scheme was established to prevent. The Scheme has a very wide remit and hence permits collections based on a geographic location, a particular period in history, or even around a particular person e.g. plant breeder, hunter etc. The Scheme operates through the Conservation Team at PH, with regional coordinators operating across 5 regions with local coordinators then providing on-site support. There is two stage process when applying to become a NPC holder: an initial one page statement of intent which is assessed by the Plant Conservation Committee (a panel of independent experts from across the horticultural industry) and then, if successful, a full application which can be made immediately or developed over time if the collection needs more work. The full application process requires that an accurate plant records system is in place and that succession planning is acknowledged.

There are three collection categories (Scientific is a fourth but is a subset of Reference – used for research):

- Reference Collection: ideal for big collections as needs to contain representation from 75% of a defined group or genus.
- Historic Collection: an historical link either by breeder, hunter, original owner, link to history of site etc.
- Horticultural Collection: has the widest scope as requires only a horticultural link.

There is an award available to NPC holders and recognising outstanding contribution to the scheme or a collection. There is also scope to be involved in geographically dispersed collections – suitable for organisations or network with dispersed gardens and invaluable for protecting very rare plants or those at risk of climate change loss. The NPC Scheme is linked to other PH schemes and programmes such as the Threatened Plant Programme (to identify

and preserve threatened plants), Plant Guardians (can operate at an individual plant level) and the Plant Exchange (exchanging seeds and plants) – all aim to conserve rare plants.

The Art of Correct Recording

Rupert Wilson, of the RHS, introduced an important aspect of the NPC Scheme – the need to keep accurate and up-to-date records. Not only are plant records needed for a NPC, allowing easy and correct identification of often very similar plants, but can also be useful for a number of other reasons including use in planning applications, monitoring theft and P&D checks.

A plant record should include the following basic information: what the plant is, where it is in the collections, geographic origin (especially if species or variety) and a date of accession (when entered the collection). It is also important to link to the location of the plant in the collection – where is it growing now? A label on the plant ensures the correct identification of the plant and can list its name, origin and accession number (which is linked to the record database – most commonly a digital format but previously could be a card index or record book).

There are a number of databases that can be used, with choice depending on the amount of detail needed, size of collection/s, cost and complexity of database. Small collections can use an Excel or Access based system (provided it is understandable to others, isn't affected by changes to operating systems and has capacity to record a variety of information) but larger collections need more specialist software. Rupert introduced Demeter - since replaced by the cloud-based system Persephone which is free to NPC holders - IrisBG, BG-Base, Brahms, Emu and even ArcGIS. All allow additional data to be recorded such as reliable, peer-reviewed data that can be used to validate records e.g. references from Plant Finder or e-floras.

Curation of Plant Collections

Barry Clarke curates two types of collections: personal collections and collections at his workplace (Sir Harold Hillier Gardens), and is able to provide a unique perspective on what is required of NPC holders. Barry emphasised the need to be passionate about your NPC – collecting and caring for your favourite plants ensures the process is easy and enjoyable!

Barry introduced his five personal collections which vary in size and the length of time he has managed them. He also introduced the 14 NPCs held by the Hillier Gardens – the largest collections by one single organisation – all of which are horticultural collections.

Key curation points made were:

- It is always a good idea to get the collection/s verified by experts so invite them to visit and offer advice: most experts are only too happy to come along!

- Consider the size and scale of your intended collection, and the amount of effort (and space) required to maintain it. For instance, *Metasequoia* is a monotypic genus with about five cultivars/varieties while *Cornus* is a very large and variable genus.... Others might be large genera but many might be tropical and hence difficult to grow in the UK! This sets a natural boundary for your collection.
- Plants need to be checked regularly to ensure that they are growing well (right plant, right place), have enough space, inspect for P&D – record outcomes of checks/surveys.
- It always good practice to map location of plants on a map as well as in database (if no mapping function) and with labels.
- A database helps to ensure consistent recording, is easier to communicate to Plant Heritage and others – Persephone is useful therefore.
- Decide the level of detail you want to include in the records – from basic to more detailed and complete information. Provenance is an important aspect – recording where the plant/s were obtained, especially if wild collected (ensure paperwork in place and expedition/collection number included on all records/labels).
- Link records to data sources on cultivation of plants – if internet, ensure it is a reputable website/organisation. Use of herbaria can be very helpful as can sending specimens to an appropriate herbarium (usually RHS) – or create your own!
- The importance of plant labels cannot be stressed enough! White on a black background does not detract too much from the plant.
- Don't forget to propagate to keep the collection at a viable level – consider approaches such as aeroponics to encourage rooting.
- Exhibit your collections – Plant Heritage usually has stands at major shows.

Why bother with a plant collection?

Stephen Herrington, from Leonardslee Gardens, introduced the NPCs he has had responsibility for in his career including the historic collection of tree ferns at Glasgow Botanic Gardens and a scientific collection of Begoniaceae, while a collection at Nymans brought together a variety of different plants named for Nymans, the owners of Nymans or the garden team. This latter collection reinforced the Spirit of Place of Nymans, adding to its distinctive look and feel – a key driver for having a NPC at a heritage site. So if setting up a collection from scratch, consider the history and cultural significance of the garden which will host the NPC as well as what grows well there (right plant, right place) – and what interests you/the person most likely to care for the collection. It is also important to consider what else is growing in the garden – will the NPC fit aesthetically and provide continuity (i.e. will a specific skill set be required to manage it or differing interests as the team changes). Finally, ensure correct identification of plants in collection.

Will Ritchie, of the National Botanic Garden of Wales, provided practical steps for starting and managing a NPC:

- Ensure that the NPC is a group of plants you are passionate about, especially if it is in your own garden, and is of a manageable size and scope with substantial but reasonable representation. A stable taxonomic group also simplifies the process – less of a need to update/change records regularly or source new labels!
- Identify reliable data sources for reference information – monographs are invaluable
- Build connections with specialists: monograph authors, societies, cultivar registrars
- A collection is not static and can be used to create new cultivars so build links to nurseries and growers
- Operate due diligence and ensure plants are obtained legally (avoid ebay!)
- Keep all paperwork and passport information
- Build familiarity with CITIES, invasive plant lists and other important legislation
- Disperse plants to other gardens/collections through exchange schemes to help build resilience for collection – and update records when material leaves collection
- P&D likely to be an issue as most NPCs consist of closely related plants so operate strict plant reception, quarantine and inspection criteria – and links to local plant health officer
- Data are powerful so the more information collected the better but ensure minimum data quality standards and avoid complexity wherever possible
- Use and contribute to herbaria
- Utilise online communities to share information and aid identification
- Record propagation protocols – what works and what should be avoided – to share with the community and ensure longevity of collection
- Carry out stock-takes at different times of the year so not miss different life stages
- Safeguard against loss by having multiple examples of each specimen
- Publicise your collection – shows, social media etc. to generate interest and share resources

John David, Head of Horticultural Taxonomy at the RHS, emphasised the key driver for the creation of the NPC scheme – a lack of support for the conservation of cultivated plants. It is important to be aware of legislation affecting plants to ensure a resilient plant collection:

- The Convention of Biological Diversity (CBD), 1993: intended to conserve and promote biodiversity in a fair and equitable way. Not legislation but forms basis for subsequent legal binding statutes. Most countries have signed up to it but not USA.

Considers invasive alien species and management to prevent invasion (40% of invasives introduced by horticulturists) – UK and EU legislation on invasive species.

- Aichi Targets, 2011-2020: Global Strategy for Plant Conservation. Includes targets that enforce conservation of cultivated plants (predominantly crops) to maintain genetic diversity, although difficult to obtain data for this. Places in situ conservation above ex situ conservation (growing recognition that geographically dispersed specimens useful?)
- Nagoya Protocol and Access and Benefit Sharing (ABS) which focuses on sharing genetic resources. Can pursue someone who has removed genetic resources from one country to another without permission but does not cover propagation or sale, although research and development is included. Not retrospective so only after November 2014 and does not impact on PBR. Importance if records – keep for 20 years.
- CITES protects endangered flora and fauna from trade and other uses. This means that import/export certificates are required for plants appearing in appendices/annexes.
- Brexit – complicates the process as need plant passports but also UK will need own system for Nagoya

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