

Plant Heritage and the National Plant Collections of *Camellia*

For over 40 years, Plant Heritage has been recognised as the organisation that approves National Plant Collections®, living plant libraries that form a globally significant resource. Collection Holders curate, catalogue and cherish the diversity of cultivated plants throughout the UK and Ireland.

WHY CONSERVE CULTIVATED PLANTS?

Conservationists were becoming concerned about increasing pressures on wild habitats and loss of plant species, but the situation was not much better for cultivated plants. Britain is a nation of gardeners – our long history of collecting, breeding and growing plants giving us one of the most diverse garden floras in the world.

This involves an enormity of human effort and inventiveness that is wasted if the plants cease to be grown. Climate change, the advance of new pests and diseases, loss of gardens, a diminishing nursery trade and lack of knowledge in the general population all conspire to reduce the diversity of our garden flora. The Second World War resulted in the closure of many nurseries and reduced lists for the surviving ones and this pattern has continued as we continue to lose specialist nurseries.

FOUNDED WITH FORESIGHT

In October 1978, the RHS convened a conference bringing together over 100 representatives from botanic gardens, horticultural colleges, nurseries and private gardens and estates. They decided to create a national body, which eventually was named the National Council for the Conservation of Plants and Gardens (NCCPG). In 1980, the first National Plant Collections were created as part of a pilot project. By 1990 the number of National Collections had risen to 500, encompassing National Trust properties, council parks, nurseries and private gardens.



CAMELLIA 'AGNES OF THE OAKS'

JIM STEPHENS

In 2009 the NCCPG was renamed Plant Heritage, in a bid to improve public perception and better reflect the wide range of work being done to conserve the diversity of the nation's plants.

THE NATIONAL PLANT COLLECTIONS

National Plant Collections (NPCs) are living reference libraries where all the plants in a genus or group can be seen together, compared and researched. The plants collected from around the world by plant hunters or bred by the head gardeners on country estates are as much a part of our history as our stately homes and art.

Plants grown in National Collections hold important, genetically diverse material which could become a vital resource for plant breeding, combating diseases, adapting to climate change and containing chemicals for new medicines. These plants also carry the historic cultural legacy of plant collectors and breeders who built such a rich horticultural landscape. Having these plants part of a registered conservation scheme ensures that they will be a resource for generations to come.



CAMELLIA 'DAINTY'

JIM STEPHENS

Plant collections are expected to provide a 'gold standard' for identification, care and knowledge of their respective plant group. They are also required to be available for the public to see – either by appointment, on special open days or as part of a garden open to the public.

When funding for botanic gardens and parks is under threat, the need to earmark, support and conserve these collections becomes more urgent. A collection holder can become the authority/expert on a plant group, able to provide advice, conduct research and be a resource for others.

In the early days of Plant Heritage, invitations were made to gardens which were known to hold large collections of a particular genus. These then became the first NPCs. The aim was to work towards a comprehensive coverage of a genus if not there already – generally set at 75% of what was commercially available for that genus. Mount Edgcumbe's *Camellia* collection was one of the first National Plant Collections in 1981.

A CONTINUOUS EVOLUTION

Just as plants evolve, so has Plant Heritage. The expectation to hold a set percentage of the plants in cultivation in their chosen genus or plant group sometimes meant that collections had to be unreasonably large in order to fill this requirement, and became increasingly difficult to maintain.

A major change to the criteria for awarding National Plant Collections was introduced in 2013, allowing for more flexibility and smaller, more manageable collections. New categories were introduced giving the National Plant Collections clearer parameters:

- **Historic collections** conserve plants united by a common association, for example iris cultivars introduced by a specific breeder, or the *Camellia* collection at Heligan of cultivars introduced there before 1920.
- **Horticultural collections** contain plants of aesthetic or functional value. These can include collections such as the *Betula* cultivars or the *Camellia* (autumn & winter flowering)
- **Reference collections** provide a comprehensive representation of all the plants in a particular group, a resource for both research and horticulture.

The change allowed applicants to consider a more focussed scope within a genus, for example; cultivars introduced before a certain date or bred by a certain person, taxonomic groupings such as a certain subsection or Group, or geographical range. Collections could also be more closely tied to a place, such as the collection of *Hemerocallis* (collected by Lady Carew-Pole), held at the ancestral family home of the Carew Pole's at Antony House, Cornwall.

AGILE FUTURE

We now face financial constraints, climate change and threat from pests and diseases, which means we must remain agile if we're to overcome these challenges and continue the valuable work that the founders began in the 1970s.

When some of our earliest collections were established, their long-term future hadn't always been considered and as a result we are losing old collections, which may hold the last known specimens of some cultivars or species. We now look at succession planning – putting a plan in place to preserve collections when the original holder can no longer continue - as a priority at the outset of new collections, to ensure the future of the plants is safeguarded. Some examples of succession plans are moving collections to a new home, or ensuring that collections held in institutions recognise the value of the plants they have and the connection to the estate, to guarantee that when one head gardener retires,

the work is continued by the next generation of horticulturists.

Plant Heritage has also been developing new ways of conserving plants, such as dispersed collections – held jointly by several Collection Holders in different locations. For example, Judy Barker's Hardy *Chrysanthumum* collection is spread over 3 sites and collection holders; Bristol Zoo's dispersed National Collection of *Calendula* allows over 40 different community groups to care for different plants in the collection, including schools and care homes. Dispersed collections are also ideal for members of plant societies, who may be keen to join forces to conserve a specific group of plants, as is being undertaken by the Suffolk Group of Plant Heritage with an historic collection of *Narcissus*. Members are each growing a few cultivars bred by the noted breeder Rev George Engleheart to keep his legacy and plants alive.

Dispersed collections offer a way to safeguard large genera by spreading the collection around multiple sites. They offer increased insurance against pests, diseases or weather (by distance or local environment). They also make plant conservation more accessible and allow assessment of how plants grow in different soils and environments.

PLANT RECORDING AND DATABASES

A consideration when having a collection dispersed across many sites or collection holders is how to manage the plant records. Aggregating plant records data from many different gardens can be challenging. There is rarely a consistent method of storing records and slight errors in spelling and punctuation or in recording synonyms, are compounded when dealing with thousands of records.

From the early days of accepting handwritten lists of plants, we have since developed standards for plant recording and labelling, which should include as a minimum; a unique identifier for each plant in the collection (accession number), the full name, date acquired and the source of the plant.

Now that electronic recording is standard we recommend the use of a horticultural database. Plant records can be stored and linked to images, cultural information, research relating to that plant, map locations and much more



CAMELLIA 'MATTIE COLE'

JIM STEPHENS

besides. Large datasets can be stored consistently and shared with interested parties. Plant Heritage has a plant recording database, called Persephone, designed by and for collection holders, which is free to use for those holding NPCs. Collections in botanic gardens, RHS gardens and the National Trust use their own databases, making information accessible and shareable, and enables the use of big datasets to determine conservation priorities.

In conjunction with any photographs and herbarium specimens linked to the plants, the data on NPCs can also be seen as part of a collection's legacy. Even if the collection eventually goes, if the data is kept safe, that is an invaluable resource for future growers and plant researchers – it is as important to have a succession plan for your data as your plants!

THE THREATENED PLANTS PROGRAMME

Though it is common now for gardens and organisations to have their own databases, there is no central point of information for all cultivars in the UK. As such, it can be difficult for collection holders to make decisions on whether plants are of conservation interest and to have an idea of what should be grown and prioritised.

With this aim in mind, Plant Heritage began the Threatened Plants Programme, which aims to identify, find, assess and conserve cultivars which have become rare in Britain and Ireland and are worthy of conservation.



CAMELLIA 'OLGA CARLYON'

JIM STEPHENS

We combine data from the RHS Plant Finder (which shows availability of plants through hundreds of UK nurseries, from 1987 to the present) with records from our National Collections, Plant Exchange and Plant Guardian schemes, as well as cultivar lists from botanic and historic gardens in the UK and Ireland.

Inspired by the International Union for Conservation of Nature's assessment framework for conservation of wild species, it is an objective system that uses the same categories of threat, but uses criteria appropriate to cultivated plants. For cultivars introduced prior to 2005, if they are no longer listed in the RHS Plant Finder, or not consistently listed by at least one nursery per year over the past five years, they will appear as **threatened in cultivation**.

A further assessment of conservation status can be made thus: if a cultivar can no longer be found growing in UK or Irish gardens it would be considered **critically endangered in cultivation**; **endangered in cultivation** plants exist at one or two remaining sites; **vulnerable in cultivation** plants exist at three or more locations.

WORKING WITH SPECIALISTS

Working with specialist plant groups or NPC holders has proved invaluable. The TPP can provide the raw data on plants in a particular group that may be threatened. Those with specialist knowledge can then say whether certain plants are synonyms, or widely available

overseas, or perhaps just not worthy of conservation effort. Once plants of conservation priority have been identified, then we can make moves to ensure that they are represented in a National Plant Collection.

We are always seeking plant lists from additional locations, referees to recommend conservation priorities, and Collection Holders and Plant Guardians to grow them.

The TPP uses the names in the style of the Royal Horticultural Society's Horticultural Database, accessible online at <http://apps.rhs.org.uk/horticulturaldatabase>

NATIONAL PLANT COLLECTIONS OF *CAMELLIA*

There are seven NPCs that specifically cover the genus of *Camellia* with some overlap, but just how complementary they are is looked at below.

The collections largely cover different taxonomic groupings. There is a collection of *C. japonica*, one of *C. reticulata*, two of *C. sasanqua*, *hiemalis* and \times *vernalis*, one of *C. \times williamsii* cultivars, one historical collection of *Camellia* introduced to Heligan pre 1920 and the Mount Edgcumbe collection, which is by far the largest and aims to have a broad cross section of all camellias.

National Collections are required to hold three plants of each taxa. However, to prevent collections of large shrubs (such as *Camellia*) and trees becoming unwieldy, this is reduced to one, with evidence of propagation to ensure against losses. To have a collection dispersed in another location would also provide an insurance in case of loss of plants. As an ideal, we would like to see at least three locations for a plant that is no longer available commercially

There are approximately one thousand *Camellia* cultivars represented in the seven National Plant Collections.

Though all the collections are all covering the same genus, as far as I am aware they were all set up independently. We often don't know how much communication goes on between collection holders – some are very active, others less so, so there was likely no 'masterplan' to ensure that all plants in the genus are included or that plants are backed up in other locations. Perhaps due to the historic difficulty in sharing and comparing plant lists.

USING TPP DATA TO PRIORITISE *CAMELLIA* CULTIVARS

For a full assessment of camellias in cultivation in the UK we would need to assimilate more garden data (which often means wading through sheaves of handwritten plant lists) and look at more nursery suppliers and cross checking with cultivar registries.

However, from the Threatened Plants Programme's records of plants that have ever been listed in the RHS Plantfinder, plants in NPCs, those in RHS gardens, many National Trust gardens and various other historic and botanic gardens, we have identified 1,704 *Camellia* cultivars grown in the UK. For cultivar names that don't appear on the RHS Horticultural Database, we checked against the *Camellia* register. Only 87 names were in neither.

From the data we have, we can say that 89% (1,517) of these can still be found, either growing in a garden or a NPC or in commercial circulation. This is a high percentage in comparison to other plant groups we have looked at – perhaps a testament to the popularity and longevity of this genus!

Of the 1,704 cultivars we know about, 51% are assessed as Threatened in Cultivation (868), which means that they pre-date 2005, and are not (or only very intermittently) available commercially.

THREATENED *CAMELLIAS*

Of these 868 camellia cultivars classed as Threatened in Cultivation, 22% of them (194) have specimens growing at three or more sites.

Those with only one or two known growing locations are considered Threatened/Endangered in Cultivation – this counts for 56% (487) of all threatened cultivars. These are the plants for which we would want to make sure that the garden manager is aware that this is one of the last known specimens in the UK.

THREATENED *CAMELLIAS* IN NATIONAL PLANT COLLECTIONS

Across the seven NPCs, 280 cultivars are unique to these collections and are not known to be found anywhere else. 154 threatened cultivars are duplicated across more than one collection, though only six are replicated in three collections.



CAMELLIA 'THOMAS CORNELIUS COLE' JIM STEPHENS

Around the UK there are 205 Threatened cultivars not in any NPC, leaving them vulnerable to loss (only 16 of these are replicated at three sites).

This leaves 11% (187) cultivars that we know to have existed in the UK that can't be found (full list available on request) – cultivars such as 'Cornish Pink', on sale till the mid-1990s, 'Harlequin', once grown in, but now lost from a National Collection and 'Golden Wedding', available commercially up until 2015. It may well be that readers of this article will know of some of these missing cultivars – if so we would love to hear from you. If you have one of these growing



CAMELLIA 'LAURA SCHAFER' JIM STEPHENS

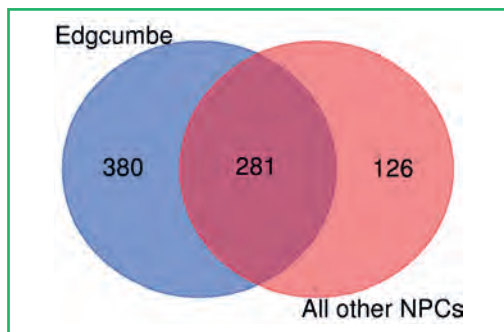


FIG.1 CAMELLIAS IN THE NPC AT EDGECUMBE, COMPARED WITH OTHER NATIONAL PLANT COLLECTION HOLDINGS

yourself, you could register as a Plant Guardian for it, and be a part of one of our garden plant conservation schemes.

CAMELLIAS AT EDGECUMBE

Edgumbe has by far the largest amount of camellia cultivars in its collection, with 661. Of these, 281 are duplicated in at least one other NPC.

The collection holds 391 threatened cultivars: 65% of all threatened camellia cultivars known to still be alive. Of these, 238 are not held by any other NPC. Taking into account the data we have from other gardens as well, there are 159 cultivars that as far as we know are only held by Edgumbe.

Whoever spotted Mount Edgumbe's potential back in 1981 made a prescient judgement – 40 years later it retains its position as the foremost collection of camellias in the UK. However, in our interconnected world, it no longer can exist in isolation, but is part of the wider garden plant conservation scene. Though it is the most comprehensive collection, there are 126 cultivars held in other NPCs that are not represented at Edgumbe, which shows the value of having a number of collections for a genus.

IN CONCLUSION

With over 1,700 cultivars known to be grown in the UK it is unlikely that any one garden can aim to have a comprehensive collection of the whole genus. However, considering the numbers involved, and that only 11% of cultivars we know about can no longer be found (to the best of our knowledge), it suggests that there is pretty good coverage of the genus in the UK.

For the 205 threatened cultivars in gardens around the UK but not in NPCs, we would like to see an effort to place these within a National Plant Collection as this ensures a more structured approach for their long term conservation. Many garden managers I suspect may be unaware that they hold the last known accession of a cultivar in the UK. It is the role of Plant Heritage to support collection holders in building their collections and identifying plants at risk, and we would be happy to work with collection holders to source cultivars threatened by lack of commercial availability to add to their collections.

The current *Camellia* collections broadly cover the taxonomic groups within the genus. If National Plant Collections wanted to target any future propagation, they could make a particular effort to duplicate unique holdings in one of the other NPCs (if they were in a position to take more accessions), or with a registered Plant Guardian, or at least provide an on-site backup for these.

Cornwall as a county holds the vast majority of National Plant Collection accessions only 20 accessions in NPCs are uniquely held outside of the county and the geographic proximity could facilitate a dispersed collection of *Camellia* cultivars within the county.

The data we have also come with the usual caveats – plants die, lists get out of date, identification errors occur, synonyms slip through. We value the work that collection holders and specialist plant societies do to further identify and catalogue the location or availability of plants and welcome further collaboration in this area.

If any members of the RCM have *Camellia* cultivar lists not already included in this brief survey, we would love to see them – it would give us a more complete picture of *Camellia* conservation in the UK and help our collection holders prioritise the plants in their care.

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