

Jubilee Pasture Plant Monitoring Report February 2022 - February 2023

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(Any views expressed are those of the author and not anyone else involved with the Jubilee Pasture project)

Introduction

Jubilee Pasture is a small triangle of land on the road half-way between Bugthorpe and Kirby Underdale. The Jubilee Pasture project is a community project to transform this site into a special place for people and wildlife, commemorating The Queen's Platinum Jubilee 2022. Further information about Jubilee Pasture, including the project plan, is available at <https://www.bugthorpevillage.co.uk/jubileepasture>.

One of the five aims of the Jubilee Pasture project (Appendix I) is 'To encourage existing plant species of conservation value and to introduce additional plant species of conservation value.' Monitoring of the plant species present is therefore important, both to know what the existing species were, and to determine whether any introduced species have established. Surveys with this purpose were undertaken by the author.

A second aim of the project is 'To create habitats for, and provide food for, invertebrates, birds, mammals, amphibians and fungi'. No records of these groups have been made. For invertebrates and fungi, this is due to lack of expertise. For vertebrates, this is because most records would be of minimal value since, while vertebrates may feed, breed or overwinter at Jubilee Pasture, the site is too small to have a significant impact on even their local populations. However, some records would be of value; for example, presence of a bat roost prior to any installation of bat boxes. If anyone would like to add any species records for Jubilee Pasture, please contact the author.

This report summarises the results of monthly plant surveys in the first year of the project, February 2022 to February 2023. It describes the plant communities found, assesses their potential conservation value, and discusses the implications for the future management of the site. The author welcomes any comments or corrections in relation to the species identifications or management aims.

Appendix II is a discussion of how the subjective assessment of plant species' conservation value has been determined, and how this has influenced the plan for Jubilee Pasture.

Method for plant species monitoring

Vascular plant species surveys of Jubilee Pasture were conducted near the end of each month from February 2022 to February 2023. Each survey recorded all vascular plant species in flower, excluding grasses, sedges and rushes (and with inconsistent records for trees). Any species which had not previously been identified was also recorded, including grasses, sedges, rushes and trees, and also ferns and horsetails. Mosses, liverworts and lichens were not recorded. Details are provided in the survey spreadsheet on the website. At the time of first recording, it was noted whether the species was introduced as part of the Jubilee Pasture project, probably present naturally, or probably planted historically. If introduced as part of the project, the source was recorded.

After several surveys, it became apparent that distinct plant communities are present in different parts of the site. The communities are combinations of species which are characteristic of particular physical conditions (e.g. wet soil, shade) or types of disturbance (e.g. cutting), found together in a particular area. In the UK, vegetation has been classified into numerous communities with formal descriptions (the National Vegetation Classification system) but in this context, the term is used informally. The distinct communities have been described as:

- 1) meadow
- 2) pond/beck edge
- 3) wooded area

- 4) hedge and adjacent vegetation
- 5) roadside
- 6) water main access point
- 7) mown footpath
- 8) area near the road bridge over the beck.

Each species was then recorded as occurring in one or more of these locations.

In cases where species identification was not certain, this was recorded and will be verified if possible. If the plant was only identified to genus, this was recorded as 'further id required'.

Due to time constraints, no measurement of species abundance was recorded. Comments about this in the results are based on the author's subjective assessment.

Results

A total of 108 vascular plant species was recorded, excluding non-native species in an area previously planted near the beck. 101 were identified to species level, of which 9 were of uncertain identification. Of the 108 species, 79 were not planted as part of the Jubilee Pasture project and were probably present naturally or, in the case of the mature trees, possibly planted many years ago. (These include some non-native species, most notably a probable garden-escape honesty (*Lunaria annua*)). Of the 29 planted species, 3 supplemented existing populations. Fourteen were at least partly sourced from local 'wild' populations rather than donated from gardens or purchased from commercial suppliers.

In addition to the species which were introduced as plants, seed from Lower Derwent Valley Nature Reserve and seed within green hay from a local species-rich meadow were introduced. The exact composition of these seed sources isn't known, and any species present may, or may not, establish. We will see in future monitoring if this has further increased the number of plant species, and the abundance of some already present.

A total of 63 species were recorded as flowering, excluding trees and shrubs, and non-natives which had been planted previously. Flowers were seen in every survey except for December 2022 and January 2023. By the April survey (25/4/22), there were 11 non-planted species, including cuckoo flower (*Cardamine pratensis*), lesser celandine (*Ranunculus ficaria*), and dog's mercury (*Mercurialis perennis*) in moderate abundance. By June (23/6/22) there were 26 non-planted species in flower. On 13th July, the meadow area where new trees hadn't been planted was cut ready for spreading green hay to introduce new meadow species as seed. Species still flowering in high or moderate abundance at this time included black knapweed (*Centaurea nigra*), meadowsweet (*Filipendula ulmaria*) and great burnet (*Sanguisorba officinalis*). These species continued to flower in low numbers in the uncut area until early October. Ten species were recorded flowering 3/10/22, but in low abundance.

Visually, the site was dominated by tall grasses throughout the summer. Apart from abundant tall meadowsweet, the wildflower species would probably only be noticed by people who walked through the site.

The following section describes the plant communities as they became apparent from the surveys, listing some of the key species present along with comment on their botanical significance. Some of the plants introduced to these areas through the year are also mentioned. The full results spreadsheet is available on the website referred to above. The potential conservation value of the communities and management implications are discussed separately, in the subsequent section.

Plant communities identified at Jubilee Pasture

Meadow

The meadow area is characterised by presence of 'positive' meadow indicator species¹ (i.e. species which are typically found in meadows of high botanical value) and the absence of 'negative' meadow indicator species (i.e. species which are now very widespread so their presence in a meadow does not contribute to biodiversity even at the local scale, and which are highly competitive so they often dominate the plant community when they are present).

Focusing on non-grasses, positive meadow indicator species found to be reasonably abundant included cuckoo flower (*Cardamine pratensis*), ribwort plantain (*Plantago lanceolata*), pignut (*Conopodium majus*), meadowsweet (*Filipendula ulmaria*), meadow vetchling (*Lathyrus pratensis*), lesser stitchwort (*Stellaria graminea*), black knapweed (*Centaurea nigra*), tufted vetch (*Vicia cracca*) and great burnet (*Sanguisorba officinalis*). Common sorrel (*Rumex acetosa*), a 'neutral' species, was moderately abundant.

Grass species are an important indicator of a meadow's botanical significance. Next year, more effort will be made to identify grasses, sedges and rushes, and assess their relative abundance. To date, the following species have been identified: Yorkshire fog (*Holcus lanatus*), false oat grass (*Arrhenatherum elatius*), sweet vernal grass (*Anthoxanthum odoratum*), creeping bent (*Agrostis stolonifera*), meadow foxtail (*Alopecurus pratensis*), timothy (*Phleum pratense*), cocksfoot (*Dactylis glomerata*) and compact rush (*Juncus conglomeratus*).

New common-but-desirable meadow species were introduced by planting seedlings grown from seed collected at the Lower Derwent Valley National Nature Reserve. These included lady's bedstraw (*Gallium verum*) and oxeye daisy (*Chrysanthemum leucanthemum*). In part of the area, native broadleaved trees were planted: grey willow (*Salix cinerea*), rowan (*Sorbus aucuparia*), wild cherry (*Prunus avium*), silver birch (*Betula pendula*), field maple (*Acer campestre*) and an oak species (assumed to be *Quercus petraea*). These were a collection supplied by the Woodland Trust.

Pond/beck edge

The species near the beck are distinct from those of the meadow, even where the latter is grassland. There were no 'positive' indicator species of a meadow plant community, but various very common species of fertile disturbed ground, including several 'negative' meadow indicator species such as broad-leaved dock (*Rumex obtusifolius*), creeping thistle (*Cirsium arvense*) and bramble (*Rubus fruticosus* agg.) were recorded.

Comfrey (*Symphytum officinale*), wild angelica (*Angelica sylvestris*) and water figwort (*Scrophularia aquatica*) were also found. These species are characteristic of waterside vegetation.

Wooded area

This is referred to as a wooded area rather than a wood because, given its small size, it is characterised by a tree canopy but strongly influenced by the environmental conditions of the 'edges'. A significant proportion of this corner of Jubilee Pasture was dominated by a mature horse chestnut (*Aesculus hippocastanum*). Other large trees include sycamore (*Acer pseudoplatanus*) and aspen (*Populus tremula*). The large aspen were surrounded by many aspen suckers of varying ages, both growing out into the meadow area and under the canopy. Elder (*Sambucus nigra*) and an unidentified *Prunus* species were small trees species growing in this area. These species are of no particular botanical significance but create a valuable habitat for other species.

The understory was dominated by very common species of low botanical interest: ivy (*Hedera helix*, growing as ground cover), nettle (*Urtica dioica*) and cleavers (*Galium aparine*). Red campion (*Silene dioica*)

¹ The identity of positive and negative indicator species has been taken from 'A step-by-step guide to upland hay meadow restoration in the North Pennines', North Pennines AONB Partnership (2009). Although Jubilee Pasture is not an upland meadow so some species in the list were not applicable, whether or not a present species was 'positive' or 'negative' is unlikely to differ between the meadow types.

was a fairly abundant flower. Species characteristic of woodland included dog's mercury (*Mercurialis perennis*), lords-and-ladies (*Arum maculatum*) and enchanter's nightshade (*Cicuta lutetiana*), and a fern tentatively identified as male fern (*Dryopteris filix-mas*). Although characteristic of woodland, these species colonise new woods quite readily and so are not ancient woodland indicators.

As part of the Jubilee Pasture project, early in 2022 volunteers cleared an area of ivy, nettles and cleavers in order to plant native woodland flower species including violets (*Viola* sp.), primrose (*Primula vulgaris*) and bluebell (*Hyacinthoides non-scripta*).

Hedge and adjacent vegetation

The hedge itself was primarily blackthorn (*Prunus spinosa*) but contained other typical hedgerow species such as dog rose (*Rosa canina* agg.). Species found which are characteristic of this type of habitat included hedge woundwort (*Stachys sylvatica*), greater stitchwort (*Stellaria hobstea*), bugle (*Ajuga reptans*) and crosswort (*Cruciata laevipes*).

Hogweed (*Heracleum sphondylium*), cow parsley (*Anthriscus sylvestris*) and bramble (*Rubus fruticosus* agg.) and the non-native rosebay willowherb (*Chamaenerion angustifolium*) were also present. Although these species can be a negative presence, they were not dominant here.

Roadside

Several species were found only in this area, including sand spurrey (*Spergularia rubra*) (possibly lesser sea spurrey *Spergularia marina*²), silverweed (*Potentilla anserina*), creeping cinquefoil (*Potentilla reptans*) and greater plantain (*Plantago major*). In the context of Jubilee Pasture, these species are not considered to be of botanical significance.

Water main access point

This area is very small but was distinguished from the surrounding meadow because work at the access covers created bare soil which supported a species not found elsewhere. This was prickly sow thistle (*Sonchus asper*), which is not of botanical significance.

Mown footpath

This area is small but characterised by regular mowing by the council. White clover (*Trifolium repens*) was found here but not in the meadow area. This can be considered a negative meadow indicator species, in contrast to other clover species.

As part of the Jubilee Pasture project, snowdrop (*Galanthus nivalis*) and winter aconite (*Eranthis hyemalis*) have been planted beside the footpath where it runs through the newly planted trees. Although these species are not native, they are widely naturalised (but not invasive) in the local landscape. Cowslips (*Primula veris*) have been planted at the road end of the footpath.

Area near the road bridge over the beck

Prior to pond construction, this area was dominated by meadowsweet (*Filipendula ulmaria*). Other species characteristic of damp habitats were also present, including water figwort (*Scrophularia aquatica*) and wild angelica (*Angelica sylvestris*), alongside very common species including creeping thistle (*Cirsium arvense*) and great willowherb (*Epilobium hirsutum*).

Following construction of the pond, this area was cleared and covered with subsoil. Native shrubs (hazel (*Coylus avellana*), guelder rose (*Viburnum opulus*), alder buckthorn (*Frangula alnus*), goat willow (*Salix caprea*) and dogwood (*Cornus sanguinea*)) were planted and the area sown with seed from the Lower Derwent Valley National Nature Reserve.

2 Found inland where roads have been salted.

Potential conservation value of the plant communities and management implications

In this section, management is discussed in relation to the project aim of increasing the conservation value of the plants growing at Jubilee Pasture. However, this is aligned with two other project aims: creating habitats and providing food for other species such as invertebrates, and creating an area where residents and visitors can enjoy the flora and fauna of the site. The focus on plants in this report reflects how existing plant communities provides a starting point for achieving all the aims of the project. All the project aims (Appendix I) will be considered when putting the management principles into practice.

Meadow

Analysis of soil samples taken from the meadow area showed it to be of low fertility (P index <1), and this soil has probably been undisturbed for many decades. Together with the positive meadow indicator species listed above, this suggests the area has great potential, in time, to be a species-rich wet meadow. Such plant communities are now rare due to changes in agricultural practice³. This area could therefore be of conservation value, contributing to the local botanical diversity and supporting other species such as insects.

To achieve this, the project needs to increase the abundance of the existing wildflowers relative to grasses, and to increase the number of meadow plant species. Additional species have been introduced as seed and small plants but ongoing improvement is highly dependent on the management of this area. Flowers must be allowed to seed and there must be some disturbance to allow those seeds to contact the soil for germination. This is achieved in a traditional hay meadow by cutting and grazing i.e. cutting the grassland when key species have seeded, allowing the cut material to dry *in situ* so the seeds are shed, and following hay baling by grazing so the animals' hooves push the seeds into the soil and create small bare areas. If grazing is not possible at Jubilee Pasture, then these processes should be mimicked as closely as possible using mechanical means⁴.

Part of this area has now been planted with native broad-leaved trees. This will lead to a change in the herbaceous vegetation, partly due to the different management the vegetation will receive (due to the difficulty of cutting between the trees and removing the vegetation), and due to the changing soil and light conditions caused by the growing trees. Pignut is found primarily in this area, possibly due to the influence of the adjacent wooded area, so it will be important to consider the effect on this species. Overall, it is hoped that the new trees will have a net positive effect on biodiversity by creating a woodmeadow⁵.

Aspen suckers will need to be cut to prevent them overtopping the slower-growing newly planted trees.

Pond/beck edge

Although the area alongside the beck is now mostly short vegetation (apart from an area planted by the neighbouring residents), there was scrub and small trees there at least until 2009 (as recorded on Google Maps street view). The woody species were cleared and at the start of the Jubilee Pasture project they had been replaced by the species described above. This differing history accounts for the difference between the grassland in the areas defined as the meadow area and beck edge area. With the creation of the pond, some of this area was cleared again. We will see next year how many of these species re-establish, and how many new ruderal species appear as a result of the new disturbance.

Management should attempt to remove negative indicator species to prevent them becoming dominant and excluding species which contribute more to the biodiversity of the site. Once there will be no further mechanical disturbance (as will be caused by positioning of large stones around the pond), additional native species characteristic of pond edge and stream-side habitats will be introduced. Some comfrey plants and

3 There are many resources to find out more about meadows, their decline and their importance e.g. www.magnificentmeadows.org.uk and www.floodplainmeadows.org.uk.

4 Various organisations have provided guides for management to restore hay meadows e.g. Natural England Technical Information Note TIN063.

5 See www.woodmeadowtrust.org.uk.

seed of wild angelica and figwort were collected for re-introduction. Although not of particular conservation value to the wider area, this will increase the biodiversity of the site.

Wooded area

The largest mature trees are on the boundary and it seems that the wooded area has been formed by younger trees being allowed to grow in the corner of the site. This may be why the only understory species characteristic of woodlands that are found here, are species which quickly colonise new areas.

The trees provide valuable habitat and they should not need any management to enhance this. To achieve the project's aim of encouraging plant species of conservation value, the focus will be on the ground flora. It is hoped to establish native woodland flowers like bluebells, which are very slow to colonise new woods without assistance. If multiple species are introduced, that will increase the chance that some find conditions suitable for them to persist. The results of the initial plantings will be monitored and followed with further plantings if appropriate. It is likely that ongoing management of existing species of low value, like ivy, nettles and cleavers, will be required to allow the less competitive species to survive.

While additional ground flora species will increase the biodiversity of the site, since this wooded area is very small, any species which do establish will not contribute significantly to the biodiversity of the local area. However, unlike most woods in the parish, this site is accessible to the public so it can serve as a local example of what woodland flora can be like.

Hedge and adjacent vegetation

The species here are commonly found in other hedges and verges in the area. They do not, therefore, contribute significantly to the conservation value of the site within the landscape. However, the species all add to the biodiversity of the site itself and are not likely to spread to the exclusion of other species. Past management (annual/biannual hedge cutting) should therefore continue in order to maintain this plant community.

Roadside

Within a metre of the road, the vegetation is influenced by regular council cutting, road construction materials, gritting/salting and disturbance by traffic driving on the verge. This has led to a distinctive plant community. This is assumed to be common along many roadsides, and likely to persist just within this area of Jubilee Pasture. No management is planned to either enhance or reduce it.

Water main access point

This is a very small area noted only because, until pond construction, it was the only area of disturbed ground. It does not require targeted management.

Mown footpath

Since this area is the result of East Riding of Yorkshire Council mowing, and walkers' footfall, it provides minimal opportunity for increasing conservation value. However, it is part of the site that people can readily access, so flowers can be planted adjacent to the path to increase the chance of them being appreciated by visitors. For low-growing species such as snowdrops and aconites, the surrounding grass should be cut short over winter to increase the distance over which the flowers can be seen.

Area near the road bridge over the beck

Since this area was bare soil after pond construction, species of conservation value were selected to re-vegetate it. Ongoing management is likely to be required to ensure that the planted species are not dominated by self-seeded or re-establishing competitive species such as creeping thistle, broad-leaved dock and bramble. Protection of planted shrubs against herbivores such as deer may be required.

Appendix I Jubilee Pasture Project Aims

Extract from the Jubilee Pasture Plan available at www.bugthorpevillage.co.uk/jubileepasture

Developments of the site will be consistent with, and seek to achieve, the following aims:

1 To create an area where the residents of Bugthorpe, Kirby Underdale and nearby villages, and visiting walkers and cyclists, can enjoy the flora and fauna of the site and benefit from the surrounding landscape.

The site will be visually attractive, in keeping with it being in the countryside rather than a garden, and will allow for people to walk throughout the area.

2 To encourage existing plant species of conservation value, and to introduce additional plant species of conservation value.

Species will be native and within their natural range, with some exceptions for non-invasive historically naturalised species such as wild-type snowdrops (not cultivars). Wherever possible, seed and plant material will be obtained from non-commercial local sources to help maintain genetic diversity.

3 To create habitats for, and provide food for, invertebrates, birds, mammals, amphibians and fungi.

This will be achieved through vegetation management, creation of a pond and consideration of microhabitats such as dead wood.

Fertilisers (synthetic or organic) and insecticides will not be used. Herbicides will only be used as method of last resort.

4 To educate people, especially children, about the nature and history of the local area.

This will be achieved through an information board and through organised activities.

5 To commemorate HM The Queen's Platinum Jubilee of 2022.

This will be marked by an inscribed bench.

Appendix II What is a plant species of 'conservation value'?

The Jubilee Pasture project will achieve its aims (Appendix I) by encouraging some plant species and discouraging others, amongst other activities. The aims require managing plants according to the following qualities:

- 1) their aesthetic value to people (first aim)
- 2) their conservation value (second aim)
- 3) their role in supporting other species (second and third aims)
- 4) their educational role (fourth aim).

In this context, 'conservation value' does not mean classified as 'rare' by any organisation; the term is being used in a more general sense, similar to 'ecological value'. The author thought this particular concept is worth discussing since it has been a key driver for choices made in the project plan, but it is complex and may mean different things to different people.

While it is uncontroversial to consider species to be of differing conservation value, there is no objective measure of this. Many inter-related factors could be considered and balanced against each other. To illustrate the ideas that informed decision-making at Jubilee Pasture, here I discuss three criteria which might be considered to determine a plant species' 'conservation value' in a given location: its contribution to plant biodiversity, its contribution to biodiversity of animals and fungi, and whether it is, in some sense, 'natural' in the location.

This is neither a full description of the decision-making processes in planning and managing Jubilee Pasture, nor a comprehensive discussion of the philosophy and practice of conservation. It is intended to encourage people to think about the relative merits of the many explicit and implicit choices that are made in a project like this.

Does the species contribute to local and regional plant biodiversity?

The biodiversity of an area is the variety of species inhabiting that area, and the genetic diversity within them. The variety exists at a range of scales, from local to international. Biodiversity at the local scale depends on individuals and small-scale projects like Jubilee Pasture. They can take impacts on biodiversity into account when deciding how land will be managed. This is important, whether we benefit from the services provided by ecosystems formed from many species (e.g. pollination, flood regulation), or we believe that each species has intrinsic value.

In addition to increasing biodiversity in our own area, we can help ensure that the species in our local area complement those found in other local areas so they contribute to biodiversity at a regional scale. To illustrate this point, consider the meadow area of Jubilee Pasture. We could clear the existing plants, sow it with a commercially-sourced meadow mix and manage it to produce a spectacle of flowers each summer. This might be considered good for biodiversity because it would increase number of plant species locally. Every parish in a region could find a site where they could do the same. This would be better for biodiversity than these areas all being occupied by very widespread species like rough grasses, nettles, docks and creeping thistles (even though these species might have conservation value according to other criteria). However, it misses two opportunities to increase biodiversity at the regional scale. First, no consideration has been given to the local conditions and what species might do well in one area but not in another. One site may have unusual soil conditions which means it can support a few species not found elsewhere. That is valuable even if it means local biodiversity is low. Second, within-species genetic diversity has not been considered. Widespread use of a few commercial sources of seed may reduce local adaptations or make populations more vulnerable to new threats of disease or climate change, for example.

With this in mind, one criterion for species of 'conservation value' at Jubilee Pasture is whether the species' presence contributes to biodiversity in this way. Jubilee Pasture does not support any nationally rare plant species so it is not contributing to biodiversity at that scale. However, due to its soil conditions and past management, the meadow area supports wet meadow plant species which are not widespread in the parish, or neighbouring parishes. By aiming to increase their populations, and increase species richness

using seed sourced from old species-rich meadows found within 20 miles, we hope to make some contribution to biodiversity beyond just the local scale.

Does the species contribute to biodiversity of animals and fungi?

In addition to a plant's contribution to plant biodiversity, it can contribute to overall biodiversity, with the benefit of further potential intrinsic value and provision of ecosystem services. This arises from the resources it provides for other species. High conservation value might arise from providing an abundance of resources, or providing resources for species which themselves are considered to be of high conservation value.

Animals and fungi, with some exceptions, are directly or indirectly dependent on plants to provide molecules they need for their own growth and reproduction. Direct plant-animal relationships vary from large herbivores eating whole leaves and stems from many species of plant, to minute insects which feed within the plant tissue of the leaf of a particular species, and to animals which feed on nectar and benefit the plant by facilitating pollination as they do so. Different species of fungi may feed on dead plant tissue, parasitise living plants, or form close mutually-beneficial relationships with plant roots.

In addition to providing food, plants can provide habitat, either as individuals (e.g. a tree providing a structure for a nesting bird, or hosting a beetle living in its bark), or as vegetation (e.g. multiple grass plants supporting a spider's web, or scrub providing cover for a rabbit warren).

Since no surveys of animals or fungi have been undertaken at Jubilee Pasture, it is not possible to determine whether there are any plant species which have notable conservation value due to a particular relationship with other species. However, two general points might be applied. First, the mature trees probably provide valuable resources by virtue of their size and structure, which although it might not be species-dependent, makes those existing individuals of high conservation value according to this criterion. Second, species which provide pollen or nectar for insects might be deemed of higher value than those which do not. In the meadow area, this could mean increasing the abundance of wildflowers relative to grasses, and in the wooded area it could mean increasing their abundance relative to the non-flowering ground-cover ivy (mature ivy as found climbing trees is a valuable late-season nectar source).

It should be noted that many species which rank well in conservation value by this criterion, would not do so by other criteria. For example, creeping thistle is a good source of nectar for bees and butterflies, and nettles are a caterpillar food source for several butterfly species. However, they rank low by the 'biodiversity' criterion because they grow well in conditions which are widespread, and they can reduce plant diversity by outcompeting many other species.

Are we restoring species that would be there naturally?

This question is an attempt to articulate the idea that value is sometimes attached to species which have a natural association with an area. First we need to consider what is meant by 'naturally present' in this context, taking this to be a subset of 'native' species.

Botanists distinguish between species which were present in the UK before the last ice-age or arrived without human assistance afterwards, species which were introduced by people in 'ancient' times and species introduced by people in 'modern' times (often taken to be from the 1500s). Only the first of these three groups are referred to as 'native' even though many others (e.g. common poppy and sycamore) are culturally accepted as part of the British countryside.

The project aim "To encourage existing plant species of conservation value, and to introduce additional plant species of conservation value" is followed by the specification that "Species will be native and within their natural range, with some exceptions for non-invasive historically naturalised species such as wild-type snowdrops (not cultivars)".

It has been taken as a basic premise that native species have higher conservation value, while allowing for some species whose presence was considered to contribute significantly to another sub-aim of the project i.e. being visually attractive. These native species may also form the base of a more biodiverse and resilient ecosystem than non-native plants, which have not evolved with the native animals and fungi. However, some non-native species which provide abundant resources, as discussed above, could further enhance biodiversity. In a garden, this might be prioritised but within the countryside at Jubilee Pasture, this benefit was outweighed.

The specification above assumes inherent value in a species not only being 'native', but also 'within its natural range'. Of the many UK native species, only a subset are suited to the soil and climate conditions of Jubilee Pasture. Of those, which might have been found here 'naturally'? While species' identity as native is easy to establish from botanical organisations, their 'natural' as opposed to 'recorded' distribution is not. In practice, this means consideration should be given to their historical presence in the (non-natural) local landscape. This has not been relevant to decisions made at Jubilee Pasture to date.

It is important to recognise that while a species might be native, it is probably not meaningful to describe the plant community in which it grows as 'natural'. Every plant community in the UK has been influenced by the activities of people for thousands of years, whether through deliberate interventions like replacing forest with food crops or eliminating large predator species, or through unintended effects such as acidification by acid rain or release of invasive species. At a site as small as Jubilee Pasture, either removing all further human intervention, or trying to re-create a community that might have existed after the last ice-age, could be considered of high conservation value by the 'natural' criterion. However, it is likely to reduce local and regional biodiversity. Contrary to any preference for 'natural', in the wooded area at Jubilee Pasture, we are introducing human intervention to an apparently unmanaged habitat to try to increase the plant species diversity of the ground flora.

Although hay meadows are composed of native plant species, they only became a widespread feature of our landscape with the development of agriculture. Over centuries, many species became primarily associated with this type of plant community and so were dependent on human management. After the second world war, people had the ability and motivation to increase productivity in many meadows. They were fertilised, re-seeded, and cut several times per year for silage rather than once for hay. This greatly reduced the number of plant species, and the associated biodiversity. In addition to loss of biodiversity, it may also be argued that an aspect of our cultural heritage has been lost with the decline of species-rich meadows. In a landscape where 'natural' has little meaning, it is appropriate to focus on these other values of species-rich meadows, and the contribution that Jubilee Pasture could make to them.