AGENDA ITEM NO. 7

BRISTOL CITY COUNCIL
DOWNS COMMITTEE
29th January 2015

Report of: **Service Director, Environment and Leisure**

Title: Tree Avenues on the Downs: management and replacement tree planting

Ward: **N/A**

Officer Presenting Report: Richard Ennion, Environmental Improvement Manager

Contact Telephone Number: 0117 9222001

RECOMMENDATION:

1. Management strategy for tree avenues

Replant trees when they are removed (with catch up planting to allow for historic losses);

Replant trees at a spacing within rows equivalent to the modal spacing (or most frequent distance between trees);

2. Species choice for avenue planting

Beech to be replaced with beech (*Fagus sylvatica*);

Lime to be replaced with small leaved lime (*Tilia cordata*);

Holm oak (at the water tower) to be replaced with holm oak (*Quercus ilex*);

Horse chestnut (where inter-planted with lime) to be replaced with small leaved lime (*Tilia cordata);*

Horse chestnut (where dominant species in an avenue) to be replaced with three new species of tree: tulip tree (*Lirodendron tulipifera),* Hungarian oak (*Quercus frainetto)*and Indian horse chestnut (*Aesculus indica*) each to be planted in single species avenues, and

Mixed species avenues should not be established or perpetuated, in that these are visually less harmonious: replacement planting in mixed avenues should be the most common tree within a row (excepting species change as above).

Summary

A clear policy is set out for continuing management of tree avenues on the Downs and for their replacement planting.

The significant issues in the report are:

This report only makes recommendation for existing tree avenues; it does not address the planting or replacement of other 'non-avenue' trees on the Downs which will be subject to a future report.

Avenues of trees are a significant landscape feature on the Downs;

Horse chestnut, which comprises a significant proportion of some avenues, is susceptible to disease and hence not considered a suitable for replacement planting; alternate species are recommended: Hungarian oak, Indian horse chestnut and tulip tree.

Lime and beech are considered sustainable species and will continue to be planted i.e. they are not currently prone to catastrophic disease.

Some 60 trees are required to replace trees that have been removed over time in the tree avenues.

1. Policy

Downs Management Plan for Clifton and Durdham Downs 2012 – 2017
Excerpt. Section 3.7.1:

> 'Avenue Plantings': In order to retain the tree avenues it will be necessary to replant at some time. It is possible to replant gaps created in the existing avenues where trees have been lost. This would mean using the existing tree species as replacement. However, they can look odd if the ages (sizes) and types of trees in an avenue are significantly different. The alternatives are to fell and replant in situ or to plant a replacement avenue beside the existing ones. The existing trees to be removed as they become unstable.
>
> Prepare a tree-planting plan for the Downs to include options for replanting within existing avenues or new species to fill gaps within existing avenue planting and / or phased felling and replanting of the horse chestnut avenues'.
>
> The Downs is within a designated Conservation Area and supported by a Conservation Enhancement Statement.
>
> Active management of the avenues is deemed necessary to conserve

and enhance the landscape character of the Downs.

2. Consultation

2.1. Internal

John Williams, Area Manager North
Andrew Gordon, Heritage Planning and Partnership Officer
Becky Belfin, Nature Conservation Officer
Richard Goldthorpe, Landscape Architect
Phil Burton, Arboricultural Officer

2.2. External

Mandy Leivers, Avon Gorge and Downs Biodiversity Education Officer
Jack Penrose, FOD + AG
Chris Westcott, Natural England

3. Context

3.1. Downs Committee have considered options for the management of existing trees and options for tree planting on three separate occasions in the last four years, as below with paraphrased key notes / resolution (see Appendix 1 for full minutes):

1st February 2010 'Horse Chestnut Diseases'

It is important to plant a range of species to avoid future losses, but also important to keep the character of the landscape: that a new planting scheme for the Downs to be focussed on new avenue plantings with a range of species when existing horse chestnut trees are lost.

The community and business are to be invited to sponsor tree planting.

Trees (should) continue to be removed once they are dead or once they become dangerous.

22nd November 2010 'Replacement Tree Planting on the Downs'

That a plan is consulted on which looks to agree the future tree planting species composition for the Downs avenues: to include visual detail of proposals.

That a range of tree species in keeping with the character of the

Downs are adopted for future avenue planting to diversify the current species mix of trees.

10th September 2012 'A Tree Planting Plan for Clifton and Durdham Downs'

Support for the development of a tree planting plan for Clifton and Durdham Downs.

Subject to further discussion a community tree planting event be organised for 2012/13.

3.2. The existing tree avenues on the Downs can be summarised as follows (see Appendix 2a for detail):

i. Tree species overall is dominated by three main species of large-type trees (20 metres plus at maturity): lime, horse chestnut and beech.

ii. Tree species composition within avenues is variable. These include a) predominantly single species avenues (beech or lime), b) two alternate species avenues (lime and horse chestnut) and c) mixed species avenues.

iii. Tree spacing within avenues is variable. Some avenues comprise evenly spaced trees (e.g. the horse chestnut avenues where trees are spaced 20 metres apart), but more typically spacing within avenues is variable and somewhat ad hoc, ranging from 13 to 20 metres (even allowing for gaps due to losses). Gaps are prevalent in some avenues where removed trees have not been replanted; some 60 missing trees have been identified.

iv. Tree age (and hence tree size where species are the same) within avenues is generally similar. The exception is where there has been some recent re-planting, although this is generally limited

v. The lime and beech are relatively young: 40-80 years and are in generally good condition and are expected to continue to contribute to the character of the Downs for some years to come.

vi. Horse chestnut trees are beginning to fail due to a combination of age and / or disease. The prevalent disease is horse chestnut bleeding canker of which the causal agent is most often due to a bacterial pathogen, *Pseudomonas syringae* pv *aesculi,* Ref. Forest Research http://www.forestry.gov.uk/fr/infd-6kybgv. Horse chestnut bleeding canker does seem to affect younger trees to a greater degree, but any tree can recover and there is no general advice to remove a tree once infected.

In addition, horse chestnut are also being attached by a leaf miner *Cameraria ohridella* and whilst this can cause severe damage to horse chestnut leaves on an annual basis, and discolouration and defoliation before normal autumn leaf-fall, on its own the pest does not significantly impair trees' health, and they will usually flush normally the following spring, Ref. Forest Research http://www.forestry.gov.uk/horsechestnutleafminer.

4. Proposal

4.1. The proposal is to:

a) recommend a strategy for management and regeneration of the tree avenues;

b) recommend a palate of tree species to enable a definitive choice of species or combination of species to be planted in any one location;

c) promote sponsorship to attract funds necessary to replant c. 60 locations where trees are missing from existing avenues and to agree a strategy to seek funding as trees are lost in the future.

4.2. Strategy for the management and replacement / regeneration of the tree avenues

The existing avenues are all single row avenues – typically planted either side of a road; the exception being the avenue of beech which crosses Durdham Down between Ladies Mile and Rockleaze.

In considering how to regenerate / plan for future tree losses in avenues, there are three main options:

a) Replace trees when and from where they are removed;
b) Fell the whole avenue and replant with new trees in the same place, or
c) Plant a new row (creating a double row) of trees some distance and parallel to the existing row.

In this case option a) is recommended. Option b) and c) would be preferred if the object was to maintain visual consistency over any other consideration by planting trees at one time to achieve equal size over time. Option a) is considered more pragmatic in that it allows for the retention of existing trees where these have useful life expectancy (which even for some horse chestnut may be decades). Further, a replacement planting within row policy would avoid having to use valuable space to accommodate a new row of trees with the inevitable dilemma of when to remove the existing row

which will progressively become more disjointed without replacement planting.

Recommendation: replant trees when they are removed (with catch up planting to allow for historic losses)

Tree spacing within avenues is generally variable – see Appendix 2b. There does not appear to have been a firm intent to space trees evenly when avenues where first planted or to adhere to a particular pattern of spacing (e.g. the option to space trees more closely towards road junctions, which is a technique to give the impression of speed which can encourage drivers to slow down). The exception is where horse chestnut has been planted in single species avenues where trees are spaced around 20 metres (perhaps planted one chain apart). Given this variability, it is recommended that the mode (most frequent tree spacing within an avenue) be adopted to determine what constitutes a gap suitable for replacement planting. As trees are lost in the future, then typically they will be replaced in the same position, but where trees are closer spaced than the modal spacing then guidance should be used to decide whether to forgo replacement planting to achieve a more even spacing within the row.

Recommendation: replant trees at a spacing within rows equivalent to the modal spacing (or most frequent distance between trees)

4.3. <u>Strategy for tree species to enable a definitive choice to be made (via consultation) of which species or combination of species should be planted in any one location</u>

It is accepted that having a greater variety of tree species within avenues would increase resilience e.g. lower the impact of disease affecting any one species. Clearly, though, planting 'too many' species of tree would result in disharmony and a lower landscape quality. Equally, if new species of tree are planted in avenues on the Downs they should compliment the landscape character.

It is not necessary(or easily possible) to choose replacement trees that are the same as existing trees, rather the task is to choose trees that broadly match their shared and significant characteristics, viz:

Existing trees planted in avenues are:

- large type trees (capable of achieving a height of 20 metres or more),
- deciduous

- generally colour yellowish in Autumn (as opposed to vivid reds for example)
- are green leaved and not variegated

Clearly, reflecting the variety of species planted, there is considerable variation including crown form, flowering and fruit production, bark colour / pattern and whether native or not.

In proposing suitable replacement trees these **must** be capable of good growth on the rather thin alkaline to neutral soils.

Further, choice of tree has been filtered to exclude species that are invasive, produce suckers, are susceptible to litter / debris and loss of branches, those susceptible to disease.

Some species proposed are 'tried and tested', whereas others, particularly Indian horse chestnut, which would be a good proxy for horse chestnut, are more risky (potential susceptibility to disease).

Tolerance of wind exposure has also been taken into account, in that some species are intolerant of exposure.

Further, some species have not been suggested because they are already 'over represented' in Bristol and are not currently a character tree on the Downs, an example is London plane.

Table 1 Potential suitable replacement trees for avenue planting on the Downs

Species	Positive attributes	Concerns
Sycamore *Acer pseudoplatanus*	Tolerates air pollution Thrives in most soils Withstands wind exposure Easy to establish and grows quickly Majestic tree when mature Naturalised if not native tree Tried and tested	Image problem - perceived as a 'weed' Rather dull when young Sap falling onto vehicles
Indian horse chestnut *Aesculus indica*	Good proxy for horse chestnut (*Aesculus hippocastanum*) Judged a more refined tree than the horse chestnut – cleaner-cut and more elegant foliage with longer	Little tested in Bristol May prove susceptible to chestnut blight

	more slender flowers Majestic tree when mature Orange / yellow autumn foliage Tolerates chalky (alkaline) soils well Believed immune from chestnut blight.	
Beech Fagus sylvatica	Rich copper autumn foliage Native Majestic when mature Does reasonably well in most reasonably fertile, well drained soils. Tried and tested	Struggles in drought prone soils Struggles in exposed locations
Black walnut *Juglans nigra*	Large tree with broadly pyramidal crown Abundance of nuts over a long period. Rough barked from young age Grows on most soils	Nuts adjacent to the road may be a problem (but conkers already accepted) Thin soils will limit growth
Tulip tree *Lirodendron tulipifera*	Stately pyramidal tree with light grey corky bark Flowers early summer Outstanding autumn colour: soft yellow to gold Indifferent to air pollution Bee friendly Can be fast growing particularly in south-west	Not recommended for exposed sites Thin soils will limit growth
Hungarian oak *Quercus frainetto*	Large tree with broad, rounded crown. Long, distinct deeply lobed leaves Fissured bark and large dark green leaves boldly cut and regularly lobed.	Few specimens in Bristol Drier soils will limit growth *Quercus robur* grafted root stock may sprout from the base

	Generally vigorous growth Recommended avenue tree Will tolerate chalky soils Selected as probably more resilient than English oak to climate change affecting the UK	
Holm oak *Quercus ilex*	Evergreen Recommended to replant in front of the water tower only	Not generally recommended – for use in front of the water tower only
English oak *Quercus robur*	Familiar and much loved native tree Typically rugged branchy large tree with hard grey fissured bark Long lived tree Excellent for wildlife	Not ideally suited to thin alkaline soils on the Downs (but will grow) – which probably explains why it has not been widely planted
Small-leaved lime *Tilia cordata*	Large tree broadly oval crown, small heart shaped leaves. Creamy white flowers in July Good for avenues Bears air pollution Bee friendly	Slowish grower Thin soils and exposure will limit growth

See Appendix 3 for data sheet and images for each tree proposed (excluding commonly encountered trees already present on the Downs)

Recommendations (see Appendix 4 for map illustration):

Beech to be replaced with beech (*Fagus sylvatica*);

Lime to be replaced with small leaved lime (*Tilia cordata*);

Holm oak (restricted to the water tower) to be replaced with holm oak (*Quercus ilex*);

Horse chestnut (where inter-planted with lime) to be replaced with small leaved lime (*Tilia cordata);*

Horse chestnut (where dominant species in an avenue) to be replaced with three new species of tree: tulip tree (*Lirodendron tulipifera),* Hungarian oak (*Quercus frainetto)* and Indian horse

chestnut (*Aesculus indica), to be* planted in single species avenues.

Mixed species avenues should not be established or perpetuated, in that these are visually less harmonious: replacement planting in mixed avenues should be the most common tree within a row (excepting species change as above).

Choosing determinedly international tree species, including from mainland Europe, Asia and North America may be useful in promoting visitors to the Downs.

4.4. Strategy for sponsorship funding for tree planting

It has previously been agreed that sponsorship (private individuals or business) should be encouraged to fund replacement tree planting (current charge £275 per tree – to buy, plant, protect and water a standard sized tree).

Currently, there are around 60 vacant tree planting sites across all avenue on the Downs – see Appendix 5. Subject to a strategy being agreed for avenue management and species choice (as above), then active pursuit of sponsorship can take place (seeking £16,500 to plant and establish 60 trees).

Alternatives / supplement to, sponsorship funding includes funds held by the Neighbourhood Partnership, including ring fenced funds for tree planting (via s106 payments).

Before agreeing final locations, it will be necessary to undertake detailed site checks to ensure that e.g. underground services are not a constraint (recent work by Bristol Water will be relevant).

Once locations are accepted, it is suggested that available planting sites are marked on site using with subtle sign inviting sponsorship and that this be in addition actively promoted via the council's on-line tree sponsorship arrangements.

TreeBristol is now offering sponsors the option of a small metal plaque (100 mm x 50 mm) which is attached to the metal tree guard used to protect the newly planted tree for the first three years. The option of a plaque may encourage greater interest from both the public and business in choosing to sponsor a tree on the Downs. The plaque is removed along with the guard around three years' after planting. The cost of the plaque is passed on to the sponsor; currently £25. Downs Committee can decide whether they wish to see such plaques promoted on the Downs in support of a tree

sponsorship promotion. See Appendix 6 for sample plaque as sponsored by a business.

5. Other Options Considered

The option not to have a plan to determine, manage and restore the tree avenues has been rejected. A plan is necessary to guide the planting of individual trees within a strategy that ensures consistent design and purpose.

A significant number of alternatives are available reflecting choice of whether to e.g. replant within avenues or fell and replant avenues, or plant mixed species within avenues, or select other species of trees. Some options are detailed above, including a rationale.

The most pressing decision is what tree species should be used to replace horse chestnut. A clear recommendation to use three new (to the Downs) species is given above. But clearly, other species could be selected (from the Table given or indeed other species). For example, Hungarian oak is suggested over English oak in that this species is expected to perform better on the alkaline soils and be more resilient to climate change.

6. Risk Assessment

No formal risk assessment has been undertaken. However, consideration of risk has formed part of the proposal. For example, selecting only trees suited to the soil conditions , but then selecting species more likely to succeed) and proposing a wider variety of trees to increase resilience in the tree population. However, the recommendations are not without risk, for example Indian horse chestnut is suggested because it is a good proxy for horse chestnut, but this species may be susceptible to the same disease (currently it appears immune). The risk mitigation plan for this choice is to plant more limited numbers of this tree as such any failure would be less felt.

7. Public Sector Equalities Duties

Before making a decision, section 149 Equality Act 2010 requires that each decision-maker considers the need to promote equality for persons with the following “protected characteristics”: age, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex, sexual orientation. Each decision-maker must, therefore, have due regard to the need to:

i) Eliminate discrimination, harassment, victimisation and any other conduct prohibited under the Equality Act 2010.

ii) Advance equality of opportunity between persons who share a relevant protected characteristic and those who do not share it. This involves having due regard, in particular, to the need to --

- remove or minimise disadvantage suffered by persons who share a relevant protected characteristic;

- take steps to meet the needs of persons who share a relevant protected characteristic that are different from the needs of people who do not share it (in relation to disabled people, this includes, in particular, steps to take account of disabled persons' disabilities);

- encourage persons who share a protected characteristic to participate in public life or in any other activity in which participation by such persons is disproportionately low.

iii) Foster good relations between persons who share a relevant protected characteristic and those who do not share it. This involves having due regard, in particular, to the need to
- tackle prejudice; and
- promote understanding.

8. Legal and Resource Implications

8.1. Legal

The Clifton and Durdham Downs (Bristol) Act 1861 provides that the Downs should remain as a place for the resort and recreation of the citizens of Bristol, and that a committee should be appointed to manage them. The recommendations of this report are within the powers conferred by this statute.

8.2. Financial

(a) Revenue:

(b) Capital

Financial advice provided by Mike Allen. Business Partner.

8.3. Land

The land is under the control of the Downs Committee.

8.4. Personnel

Not applicable

Appendices:

Appendix 1 Minutes previous DC meeting
Appendix 2a Tree Avenues – existing (map)
Appendix 2b Tree Avenues - spacing and species data
Appendix 3 Tree Images and key data (courtesy of www.barcham.co.uk)
Appendix 4 Tree Avenues - proposed
Appendix 5 Missing trees in avenues (map)
Appendix 6 sample tree sponsorship plaque

LOCAL GOVERNMENT (ACCESS TO INFORMATION) ACT 1985

Background Papers: None

Minute 1st February 2010

DWN
20.1/10 HORSE CHESTNUT DISEASES
The committee considered a report of the Strategic Director, Neighbourhoods (agenda item no. 5) providing an update on the current situation with regard to Horse Chestnut Diseases.

The following main issues were noted during the debate:-

- It was important to plant a range of species to avoid the future loss of avenue plantings, however it was also important to keep the character of the landscape.
- No trees had been identified for the planting scheme at this stage but proposals would be subject to consultation including the Downs Committee and other arboricultural organisations.
- To help with limited resources the TreeBristol campaign sought support from local residents, community groups and businesses through initiatives including 'sponsoring a tree' (in terms of funding) and 'planting a tree' (manpower).
- The cost of a young tree was in the region of £400 (depending on the species). Nurseries will usually replace a tree which subsequently dies before reaching maturity providing a 3 year watering programme has been followed.

RESOLVED –

(1) that both the Rangers and The Arboricultural team continue their watching brief on horse-chestnuts on the Downs and in the Bristol area;
(2) that a new planting scheme for the Downs be focussed on new avenue plantings with a range of species when existing horse-chestnut trees are lost.
(3) This is to avoid the future loss of new avenues if new diseases get established in the UK which may affect different tree species;
(4) that a walk around the Downs be arranged for Members of the Committee in July 2010 to look at the existing tree avenues and to discuss proposals drawn up by the Senior Arboricultural Officer and the Downs Ranger for replacement planting; and
(5) that trees continue to be removed once they are dead, or once they become dangerous.

Minute 22nd December 2010

DWN
10.11/10 REPLACEMENT TREE PLANTING ON THE DOWNS
The committee considered a report of the Director of Neighbourhoods (agenda item no. 10) considering an outline scheme for replacement tree planting on the Downs for wider public consultation.

The following main issues were noted during the discussion:-

- The plans to be used for the public consultation exercise would be far more detailed and visual than the ones circulated to the Committee.
- The injection process referred to by Councillor Stone for the prevention/management of Horse chestnut bleeding canker would cost approximately £120 per tree per year and was not tried and tested. The Senior Arboricultural Officer advised that it would be far better to diversify the future replacement of the trees on the Downs avenues, whilst keeping the existing character. Much was being done to keep blight to existing trees to a minimum eg mulch circles around the base of the trees
- It was felt that replacement tree planting on the avenues should be considered more widely to include the whole of the Downs and possibly city-wide. It was clarified that a city wide approach would require input/resource from the City Development Directorate but would be explored and reported back to the Committee.

RESOLVED –

(1) that the principle to replace trees within the existing avenues as and when trees die or become dangerous and need to be removed be agreed;
(2) that a plan is consulted on which looks to agree the future tree planting species composition for the Downs avenues;
(3) that a range of tree species in keeping with the character of the Downs are adopted for future avenue plantings to diversify the current species mix of trees; and
(4) that the public be offered the opportunity to sponsor new trees through TreeBristol.
(5) that a city-wide strategy for replacement tree planting be explored by the Senior Arboricultural Officer in consultation with officers from City Development and a report be brought back to the Committee

Minute 10th September 2012
DWN
50.9/12 A TREE PLANTING PLAN FOR CLIFTON AND DURDHAM DOWNS

The committee considered a report (agenda item no. 4) on a proposal to develop and produce a tree planting plan for Clifton and Durdham Downs.

In discussion, there was general support for work taking place to produce a tree planting plan. It was agreed, however, that this should be seen as, and developed as a tree management and planting plan, and submitted to the next meeting for the committee's consideration / discussion. Whilst, in general there was no objection to replacing trees which had been lost, very careful consideration would need to be given to new planting proposals (such as the suggestion that 60 trees might be planted as part of the commemoration of the Queen's diamond jubilee). It was noted that discussion with the Henleaze, Westbury-on Trym and Stoke Bishop neighbourhood partnership would be included as part of the further consultation.

Subject to the above comments, it was:

RESOLVED –

(1) that a tree management / planting plan for Clifton and Durdham Downs be produced; and

(2) that, subject to the further discussion, a community tree planting event between November 2012 and March 2013 be organised.

Crete Hill House
Hiatt Baker Hall
Hiatt Baker Hall
University Hall
Badock Hall
Wills Hall
University Of Bristol
Churchill Hall
Severn Sisters
Durdham Down
Durdham Down
Library
of Christ
WESTBURY
St. Christopher's
(Childrens Nursery)
Elton
Spire Bristol Hospital

AND
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Bristol City Council
Clifton and Durdham Downs
Appendix 2A

Legend

- Existing Tree Lines

N

ENVIRONMENT & LEISURE

Scale : @A3 1:4,522
Date: 13/01/2015

NEIGHBOURHOODS DIRECTORATE

Environmental and Leisure Services
Brunel House Phone: 0117 922 3719
St George's Road bristolparks@bristol.gov.uk
Bristol BS1 5UY www.bristol.gov.uk/parks

Bristol City Council
Clifton
and
Durdham Downs
Appendix 2A

Legend

- Existing Tree Lines

N

ENVIRONMENT & LEISURE

Scale : @A3 1:4,522
Date: 13/01/2015

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Appendix 2 b - spacing within tree avenues and number of missing trees per row (see Map in Appendix 2a)

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17a	17b	17c	17d	18	19	20	21	22	23a	23b	24	25a	25b	26
Average spacing m	16.1	31.3	16.1	16.5	19.8	13.8	16.3	**21.5**	24.5	65.0	27.4	21.9	23.6	18.8	18.8	14.8	20.8	16.4		28.7	24.2	21.7	**15.6**	15.1	16.3	22.6	**20.1**	16.0	18.1	18.7	18.7
Mode - spacing m	**13**	**21**	**21**	**13**	**21**	**14**	**14**	20	**21**	**21**	21	**18**	**21**	**21**	**16**	**12**	**20**	**21**	**0**	**20**	**21**	**19**	20	**15**	**14**	**20**	19	**15**	**16**	**16**	**17**
missing trees	**5**	**4**	**1**	**0**	**0**	**2**	**5**	**3**	**5**	**5**	**1**	**1**	**1**	**0**	**1**	**2**	**0**	**0**	**0**	**3**	**3**	**2**	**2**	**0**	**2**	**1**	**1**	**0**	**3**	**8**	**5**
of which stumps	2		1			1	2	3	4							1				1											
Species mix																															
lime	20			8		17	13			2	3	1	1	4	3	19						11		6	11	10	10	29	2		55
horse chestnut	14	7	11	4	9	8	5	11	15		1	5	3			11	6	15		6	22	9		4	9	6	5	3	1	1	
sycamore	1			1												1													4	2	1
beech																													34	37	
maple																3													1		
ash				1			1				1					3													2	2	1
birch									1		1																				
elm									1																						
London plane																					1							1			
hawthorn																															1
holm oak																							6								
Total no. trees in row	**35**	**7**	**11**	**14**	**9**	**25**	**19**	**11**	**17**	**2**	**6**	**6**	**4**	**4**	**3**	**37**	**6**	**15**	**0**	**6**	**23**	**20**	**6**	**10**	**20**	**16**	**15**	**33**	**44**	**42**	**58**
% 1st main tree species in row	**57%**	**100%**	**100%**	**57%**	**100%**	**68%**	**68%**	**100%**	**88%**	**100%**	**50%**	**83%**	**75%**	**100%**	**100%**	**51%**	**100%**	**100%**		**100%**	**96%**	**55%**	**100%**	**60%**	**55%**	**63%**	**88%**	**88%**	**77%**	**88%**	**95%**
	lime	**horse chestnut**	**horse chestnut**	**lime**	**horse chestnut**	**lime**	**lime**	**horse chestnut**	**horse chestnut**	**lime**	**lime**	**horse chestnut**	**horse chestnut**	**lime**	**lime**	**lime**	**horse chestnut**	**horse chestnut**		**horse chestnut**	**horse chestnut**	**lime**	**holm oak**	**lime**	**lime**	**lime**	**lime**	**lime**	**beech**	**beech**	**lime**
% 2nd main tree species in row	**40%**			**29%**		**32%**	**26%**		**6%**		**17%**	**17%**	**25%**			**30%**					**4%**	**45%**		**40%**	**45%**	**38%**	**33%**	**9%**	**9%**	**5%**	**2%**
	horse chestnut	**n/a**	**n/a**	**horse chestnut**	**n/a**	**horse chestnut**	**horse chestnut**	**n/a**	**birch**	**n/a**	**horse chestnut**	**horse chestnut**	**horse chestnut**	**n/a**	**n/a**	**horse chestnut**	**n/a**	**n/a**	**n/a**	**n/a**	**London plane**	**horse chestnut**	**n/a**	**horse chestnut**	**horse chestnut**	**horse chestnut**	**horse chestnut**	**horse chestnut**	**sycamore**	**sycamore**	**sycamore**

By Appointment
To Her Majesty The Queen
Specialist Container Tree Growers
Barcham Trees Plc, Ely

edition 2

Time for trees

A guide to species selection for the UK

Barcham
The Tree Specialists

AESCULUS indica
Indian Horse Chestnut

The Indian Horse Chestnut originates in the Himalayas, having been introduced to Britain in the 1850s and we are indebted to Henry Girling who very kindly gives us seed from the clonal selection Sydney Pearce from his garden to grow on. He has trained his Labrador to collect them!

A majestic tall tree, well suited to parkland and large estates, it has a rounded habit. It bears pyramidal panicles of pink flushed flowers in summer, while its foliage is bronze when young, turning glossy and dark green before changing to orange and yellow in autumn. It tolerates chalky soils well.

There has been increased incidence of what was thought to be Phytophthora bleeding canker on Horse Chestnuts, especially in the South East and Midlands of England. Research is ongoing but it is now believed the cause is a bacterium rather than a fungus, but feedback from arborists suggests Aesculus indica has immunity from the infection. However, it is not a common tree so the jury is out on this one.

Mature height: 10-15m


Shape of mature tree


Urban trees

Its deeply cut leaves make it the prettiest of the Chestnut family but annoyingly it sometimes sets flower on the terminal growing bud, making it difficult to grow straight. However this is our problem to resolve, not yours!

LIRIODENDRON tulipifera
Tulip Tree

Introduced from America in the late 1680s this stately tree is known as Whitewood in North America, where the timber is widely used in house interiors.

There are some tremendous specimens in the States that have grown to over 60 metres in height. As an aside, if you ever prune the young wood, take time to breathe in the sweetly fragrant sap.

A large and fast growing tree, it has a broad, pyramidal crown. The tulip shaped flowers, which appear only on older trees, are produced in June and July and are yellow-green with a band of orange at the base. It is deep rooted and wind resistant, and does well on most fertile soils.
A splendid subject for parks and large gardens. Apparently, excellent honey is derived from bees harvesting its flowers.

QUERCUS frainetto
Hungarian Oak

This stately tree was introduced from South East Europe in the late 1830s. There are some magnificent specimens at the National Trust's Anglesey Abbey in Cambridgeshire which coincidentally is a garden not to be missed if you are in the vicinity!

This is a large tree with a broad, rounded crown. Its fissured bark and large, dark green leaves, which are boldly cut and regularly lobed, makes this a most striking subject for parks and woodlands.

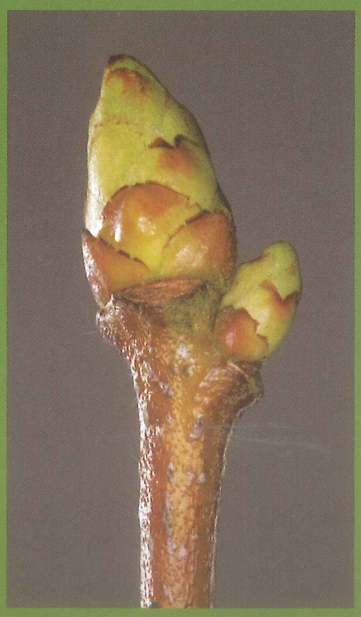
We also recommend it as an avenue tree. It does best on moist soils, but will tolerate chalky ones. The clone "Trump" retains a slightly improved shape at maturity.

ACER pseudoplatanus
Sycamore

A native of central and southern Europe, the Sycamore has long been naturalised in Britain. Its wood has been used for making innumerable small items from violins to wooden spoons. It is a very large tree, and very fast growing for the first 20 years. It is also one of the very toughest. Many of its cultivars are smaller, but equally as durable.

It tolerates air pollution and thrives in most soils, and is particularly useful for coastal sites where it can make an effective defence against strong winds and salt-laden air. Interestingly, recent work is now suggesting Sycamore is actually a native tree of the UK with both pollen and wood samples predating historical measures.

Native or not the environmental impact of common Sycamore should not be understated. It makes a wonderful host to a wide range of our wildlife and provides a refuge in landscapes that do not readily support any other species.



The success of this tree gives it an unfair tag of being rather a 'weed'. It is however an incredibly versatile plant that thrives in the most difficult of circumstances so it shouldn't be overlooked. Improved clones such as 'Negenia' are widely used on the continent as a street/verge tree as it forms a more regular crown shape at maturity.

JUGLANS nigra
Black Walnut

Introduced from native central and eastern America into Europe in 1629, this fast growing tree won the Award of Garden Merit in 2002. The national US champion stands at 44 metres high by 47 metres wide in Oregon so not one to be planted in restricted places.

It makes a large tree with a broadly pyramidal crown and is a very good choice for parkland settings. It produces an abundance of nuts over a long period, but they are rather difficult to extract from their very hard shells. Rough barked from a young age so easily distinguished from the smooth barked Juglans regia. It grows on most soils but thrives on deep loam.

JUGLANS regia
Common Walnut

A native of South Eastern Europe, Himalaya and China, this well known tree is highly prized for its timber. It makes a splendid and stately subject for parkland and avenue plantings, developing a broad crown at maturity and preferring full sun. Thought to have been in cultivation in the UK since Roman times.

Slow growing and of medium to large stature, this rounded Walnut has delightfully aromatic young foliage, from which a wine can be made, followed by a good crop of delicious nuts. Smooth barked when young, it thrives on most soils but does not favour waterlogged conditions.

TILIA cordata
Small-Leaved Lime

This well known native tree won the Award of Garden Merit in 2002 and remains a popular choice within our urban and rural landscapes. It is a good host to mistletoe for the more romantically inclined of you.

This large tree has a broadly oval crown, with small, heart shaped leaves, which are dark green on top and pale green beneath. Its creamy white flowers are produced in July. It is a relatively sedate grower, is good for avenues and parks, and bears air pollution very well. Like most Lime, it is also a fine candidate for pollarding or pleaching.

Hiatt Baker Hall

Hiatt Baker Hall

University Hall

Badock Hall

Wills Hall

University Of Bristol

Churchill Hall

Durdham Down

Severn Sisters

Durdham Down

Durdham Down

Spire Bristol Hospital

Library

of Christ

WESTBURY

St. Christopher's

(Childrens Nursery)

Ethos

Bristol City Council
Clifton and Durdham Downs

Appendix 4 Proposed Tree Avenues

Legend

Existing Tree Lines

<all other values>

Tree_Type

- Indian Horse Chestnut
- Beech
- Hungarian Oak
- Lime
- Tulip
- Areas

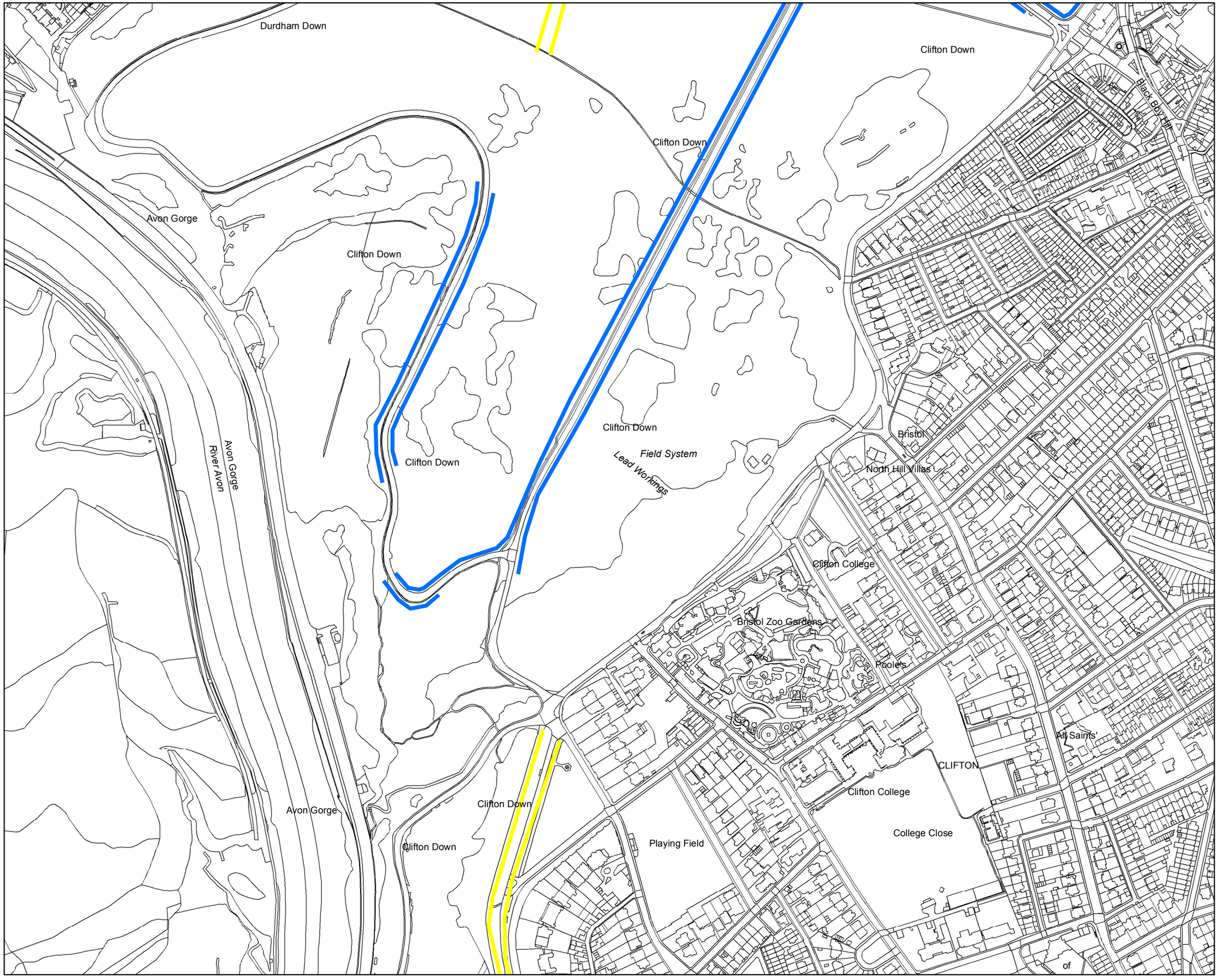
N

ENVIRONMENT & LEISURE

Scale : @A3 1:4,522
Date: 16/01/2015

NEIGHBOURHOODS DIRECTORATE

Environmental and Leisure Services
Brunel House Phone: 0117 922 3719
St George's Road bristolparks@bristol.gov.uk
Bristol BS1 5UY www.bristol.gov.uk/parks



Bristol City Council
Clifton and Durdham Downs

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Bristol City Council
Clifton
and
Durdham Downs
Appendix 5

Legend

Existing Tree Lines

Number of Trees Missing

Schedule

N

ENVIRONMENT & LEISURE

Scale : @A3 1:4,576
Date: 13/01/2015

NEIGHBOURHOODS DIRECTORATE

Environmental and Leisure Services
Brunel House Phone: 0117 922 3719
St George's Road bristolparks@bristol.gov.uk
Bristol BS1 5UY www.bristol.gov.uk/parks

Crete Hill House
Hiatt Baker Hall
Hiatt Baker Hall
University Hall
Badock Hall
Wills Hall
University Of Bristol
Trinity Theological
Trinity College
Churchill Hall
Pitch and
Severn Sisters
Durdham Down
Library
of Christ
St Christopher's
(Childrens Nursery)
Spire Bristol Hospital
AND
contract.contract_code IN ('TR0004')

Durdham Down
Avon Gorge
Clifton Down
Avon Gorge
River Avon
Clifton Down
Clifton Down
Clifton Down
Field System
Lead Workings
Clifton Down
Clifton Down
Avon Gorge
Clifton Down
Playing Field
Path (um)
Bristol
North Hill Villas
Black Boy Hill
Clifton College
Bristol Zoo Gardens
Poole's
All Saints'
CLIFTON
Clifton College
College Close

AND
contract.contract_code IN ('TR0004')

Bristol City Council
Clifton and Durdham Downs
Appendix 5

Legend

Existing Tree Lines

Number of Trees Missing

Schedule

ENVIRONMENT & LEISURE

Scale : @A3 1:4,576
Date: 13/01/2015

NEIGHBOURHOODS DIRECTORATE

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Appendix 6

Sample Tree Sponsorship Plaque

Shown actual size

Report: Tree Avenues on the Downs: management and replacement tree planting
Consultation responses

Friends of the Downs, Martin Collins

Comment	Response
[The report] appears to have made recommendations which combine attention to the need to preserve what is viable of the present planting and its contribution to the landscape of the present and the immediate future, with a recognition of the inevitability of change due to ageing and disease and hence the best way to maintain and even enhance the avenues which delineate much of the Downs. In this way the legacy from historical planting is respected and preserved and should blend attractively with necessary innovation.	Noted
We are not familiar with the Indian Horse Chestnut (*Aesculus indica*) but from its description it seems the ideal replacement for gaps in the avenue along Saville Road. This always strikes me, in each season but especially in the spring and autumn, as one of the finest almost single species avenues that we have. Would we be right in supposing that the resistance of this species to Chestnut Canker is not proven and that the less conspicuous and shorter stretch along Westbury Park has been chosen for its introduction as a proving ground?	The current status of Indian Horse Chestnut (*Aesculus indica*) is that it is resistant to chestnut canker- but this may be because it is not widely planted. As such, the benefit of choosing this tree has been tempered by limited planting to counteract the risk of disease.
In the list of trees considered for use, little mention is made of their impact on biodiversity. Only the English Oak (*Quercus robur*), whose support of biodiversity is legendary, is so acknowledged. I appreciate that the soils are unsuitable for this species, but what is known of the Hungarian Oak (*Quercus frainetto*) as regards its encouragement or otherwise of attendant species? Will it enhance or diminish biodiversity or have little or no impact?	Hungarian oak as a non-native will inevitably be less attractive to UK wildlife. Its precise benefit to wildlife does not appear to have been quantified. It is expected to produce viable acorns which will be of benefit to wildlife.
The last two paragraphs on P1 Section2 "Species Choice for Avenue Planting" is slightly confusing. The penultimate paragraph ends with "…and" but without a follow-up, unless the follow-up is supposed to be the final paragraph? If this is the explanation, then there appears to be an internal contradiction. We would be grateful for clarification on this point.	Point clarified

Friends of the Downs, Richard Bland

Comment	Response
Excellent idea to have a policy	Noted
Generally all the avenues are 20m apart, and it is clear that successive generations have adopted this for c 200 years.	Accepted. The 'tree spacing within rows is variable'
No avenue is entirely single species because even with the disaster of Dutch Elm disease, trees of other species already in the avenue were retained. Thus the avenues all have trees that were planted at different times, a palimpsest of policy, which adds hugely to the interest of the Downs. The proposed policy of replanting as trees are removed will ensure this continues.	Note
The oldest trees are Common and Large leaf limes, one or two of which are 250 years old. Limes are both slow growing and very tough.	Noted
The oldest avenue is down Westbury Park road, and is Horse Chestnuts planted c 1860, which are increasingly having to be felled for disease.	Noted
The proposed alternatives to Horse Chestnuts are excellent- especially Hungarian Oak which is a very fine Oak indeed, and I know of none in Bristol. Tulip trees are fine, and quite frequent in the city. The Indian Horse Chestnut is rare in the city, not attacked by the chestnut leaf miner, and better than the feeble Red chestnut that has also been used on the Downs. There are three Black walnuts on the Downs on the Old Stoke Road, but they are a north American species, and the English Walnut is at least as good.	Noted. The University of Bristol have confirmed that they have a Hungarian oak growing well in their Stoke Bishop campus – planted as a small tree and now 10-years old with no signs of stress or disease.
One small leafed lime on circular road planted c 1980 to replace Elms has died in the past year, and it is not clear why. Perhaps the cause of death should be established, because it is important that others of the large number planted at that time to replace elms are not going to die as well.	This will be reviewed but is assumed to be due to the circumstances of this tree rather than the species being unsuitable
Holm Oak is a pest species in the Gorge, as they are planted by Jays and Squirrels in huge numbers, and shade out all the native species. A huge effort has been made to eradicate them. The Holm oaks around the water tower were originally planted as screening for the reservoir,	A number of comments have been received about not replanting holm oak at the Water Tower. Downs Committee will be advised of alternative species including e.g. Lucombe oak (*Quercus x hispanica* 'Lucombeana'), or Algerian

but they can't screen the tower itself. They are also dominating parts of the woodland on the Zoo banks, and their dense shade ensures that nothing grown underneath them. I think they should not be replanted	oak (*Quercus canariensis)* – both semi-evergreen and suitable for calcareous soils, also Deodar cedar (*Cedrus deodara)* or coast redwood (*Sequoia sempervirens)* - see below.
When the Chesterfield Hospital was built a sum of £4000 was guaranteed to replace trees lost through the development at sites beyond the hospital. This has not as far as I know been used as yet	This will be investigated.

Natural England, Chris Westcott

Comment	Response
Tree planting is considered an OLD (Operations Likely to Damage the special interest of an SSSI) – as such SSSI consent is required.	Further discussion required with Natural England to determine whether formal consent is required. It is understood that consent would not be required if no new trees are planted (the proposal is to replace existing trees where within and immediately adjacent to the SSSI)
Replacement of trees off either side of circular road should be given very careful consideration – my initial suggestion would be to contemplate not replacing.	The option not to replant in this area will be presented to Downs Committee for consideration. The current recommendation is to maintain the same tree cover in this area – replacing with small leaved lime.
I'm also slightly concerned re the idea of planting Hungarian Oaks and the chance of them being spread into the Gorge as Holm Oaks have been so prolifically. Are they similar to Turkey Oaks which are a real problem on many SSSI's and thankfully not so much in the Gorge.	The literature relating to Hungarian oak does not describe a problem of invasive seed. It is expected to produce viable acorns which will be of benefit to wildlife. This question will be subject to further research
A move away from planting holm oak would be good. I think that more thought should be given to re replanting along Circular Rd Gorge side edge and adjacent to the species rich areas of Downs grassland – longer term replanting in these locations or planting more trees which aren't currently present could be detrimental to interest of the grassland the potential ability to restore areas.	Noted- and response as above

Avon Gorge and Downs Wildlife Project, Mandy Levers

Comment	Response
Support for choice of Indian horse chestnut and tulip tree.	Noted

Prefer not to see holm oaks planted at the water tower reflecting concerns about invasive seed affecting the Avon Gorge.	Accepted – as above
Agree with your recommendation for 'the filling in gaps approach' as the best way to manage the replacement, especially for the beech and lime.	Noted
The lime avenues along Ladies Mile and Circular Road consist of a variety of different lime species, cultivars and varieties. This has been a fantastic resource for our guided walks on the Downs. Is it possible to keep the lime avenues but suggest that the interest is maintained by use of cultivars and varieties?	The proposal is to replace with small leaved lime. The option to plant a variety of lime will be presented to Downs Committee for consideration.

Bristol City Council – landscape Design, Richard Goldthorpe

Comment	Response
Support recommendations	Noted

Bristol City Council – Tree Team, Philip Burton

Comment	Response
An avenue on Westbury Park would be far more visually attractive than a [single species] line as proposed. [Suggestion that] tulip trees be planted on the [West] and East side of Westbury Park, with the option of extending back to the Clay Pit Road junction.	The option to plant this arrangement will be presented to Downs Committee for consideration.
The Westbury Park footpath is known locally as the tree-lined walk and relished for its woodland feel. Mixed species planting here might be a better option to retain that feel, and will enable more appropriate species choice for the areas either side of the path prone to flooding.	The recommendation is to plant tulip trees either side of the path. The option to plant a mixture of species will be presented to Downs Committee for consideration
The literature suggests that Hungarian Oak is extremely sensitive to the presence of lime in the soils	The literature is contradictory – some certainly reference an intolerance of lime – but most do not. The University of Bristol has confirmed that Hungarian oak is growing well on their site which is immediately adjacent to the Downs.
Holm Oaks around the water tower ideally should be replaced with something fast growing, tall and evergreen to provide a screen. Possibly Deodar cedar (*Cedrus deodara)* or coast redwood (*Sequoia sempervirens)*	Noted. The choice of species to replace the holm oak requires more consideration