Duchess Park

10% of the UK's wildlife species are threatened with extinction -

Bee Orchid on Duchess Park

- with 60% having declined over the past 50 years

(2013 State of Nature Report)

History and Natural History

Volume 4 – Natural History Records (Flora)

(A work in progress at June 2017)









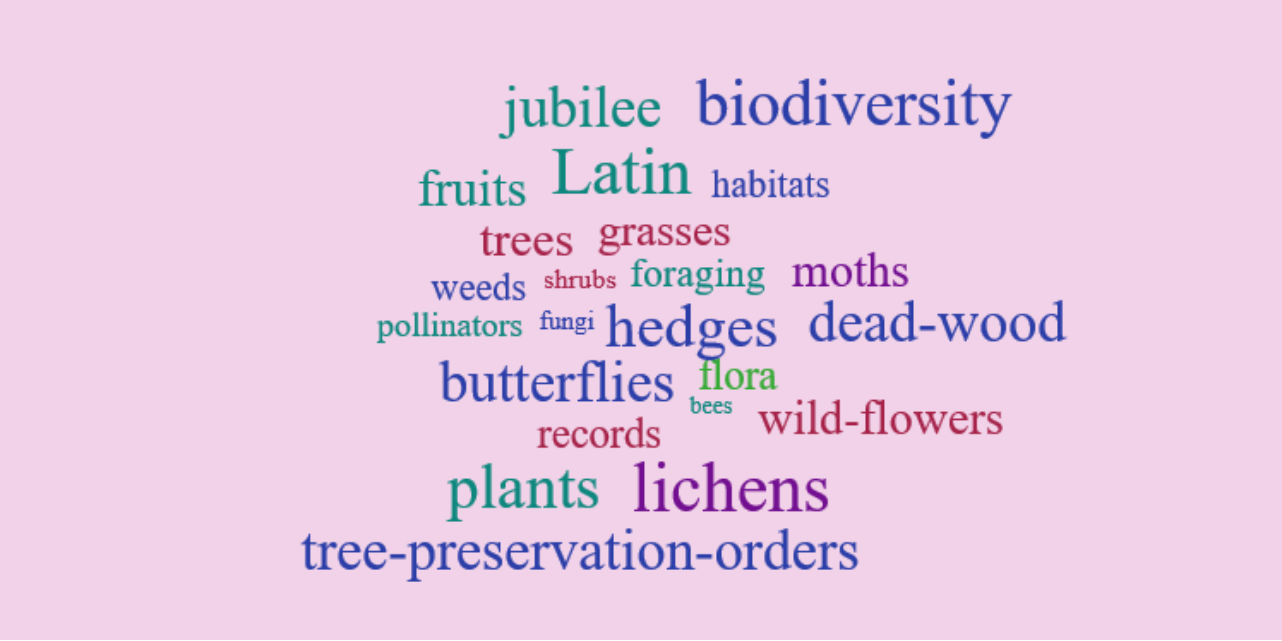







David Cudby

Contents of Volume 4



Chapter Eight – Plants and grasses

To date the species of wild flowers and grasses at Duchess Park have been recorded opportunistically without a complete systematic survey. A better approach and one which we hope to use is to take defined areas of the site in turn and make systematic and statistically valid records both as a snapshot and over time to monitor the impact of the chosen maintenance and management approach.

Table 5 is an ongoing piece of work and represents the record for the period 2009 – 2014. Plants and grasses are listed alphabetically by common name rather than in family groups. Table 6 shows the relationship between some of these plant species and broad groups of bees.

Some small areas of the site have been planted with a wildflower seed mix from Emorsgate Seeds to both enhance the site visually and for pollinators and act as an experiment which if successful could be extended to other selected areas of the site. Three areas, each about 25 m^2 were seeded in October 2012. The spots chosen are all adjacent to hedges and are on Areas E1 and E3. The composition of the seed mix is given in Table 8.

Table 5 - Plants and Grasses

			Location	*Date*
Bee Orchid	*Ophyrs apifera*	 *@DP 3/7/13*	*In rough grass in garden* 566081, 262198 *E1 multiple plants beside path*	*03/07/13* *14/5/16*
Bird's-foot Trefoil	*Lotus corniculatus*		*E2, E3*	*02/08/09*
Black Horehound	*Ballota nigra*		*E1, E3*	*19/07/09* *02/08/09*
Black Knapweed	*Centaurea nigra*		*E2*	*02/08/09*
Black Medick	*Medicago lupulina*		*E1* *In lawn in garden* 566081, 262198	*02/08/09* *05/06/12* *annually*

Table 5 - Plants and Grasses

			Location	*Date*
Black Nightshade	*Solanum nigrum*		*E2*	*02/08/09*
Bladder Campion	*Silene vulgaris*		*E1*	*02/08/09*
Bluebell *The single plant found shows many characteristics of the native bluebell. Narrow leaves, curved petals, yellow pollen and strong aroma. However the flowers are not entirely on one side of the stem, which gives the characteristic drooping appearance as shown in the picture. So there may be some hybridisation here with slight characteristics of the Spanish interloper.*	*Hyacinthoides non-scripta*		*F (one plant)*	*30/4/14*
Blue Fleabane	*Erigeron acer*		*C1*	*8/10/15*
Bramble	*Rubus fruticosus agg.*		*A1, A2* *E1, E2* *F*	*9/8/14* *02/08/09* *05/09/12* *22/11/11*
Bristly ox-tongue	*Picris echioides*		*C1* 565865, 262436	*14/07/12*

Table 5 - Plants and Grasses

			Location	*Date*
Broomrape Many host specific parasitic plants. As they have no chlorophyll, they are totally dependent on other plants for nutrients. Example from C1 growing in meadow grass. Examples found at 566081, 262198 growing adjacent to sweet peas. Examples from E1 growing in patches of vetch.	*Orobanche*	 @DP  @DP  @DP	*C1* 565838, 262410 Garden 566081, 262198 Several on E1	*29/05/11* *06/07/14* *25/7/15*
Bush vetch	*Vicia sepium*		Garden 566090, 262196	*10/06/12*

Table 5 - Plants and Grasses

			Location	*Date*
Cocksfoot	*Dactylis glomerata*		*C,D*	*2001*
Comfrey	*Symphytum officinale*		*E3*	
Common Agrimony	*Agrimonia eupatoria*		*E2*	*02/08/09*
Common Bent	*Agrostis capillaris*		*A2*	*2001*
Common Centaury	*Centaurium erythraea*		*C1*	*10/7/15 2016*

Table 5 - Plants and Grasses			*Location*	*Date*
Common cleavers	*Galium aparine*		*E3*	
Common Dog Violet	*Viola riviniana*	 @DP	*E2*	*14/03/11*
Common Knapweed	*Centaurea nigra*		*D1*	*04/07/14*
Common Mallow	*Malva sylvestris*		*C2, D2, E1, E2*	*03/07/14*
Common Mouse-ear	*Cerastium fontanum*		*E2*	*02/08/09*

Table 5 - Plants and Grasses			*Location*	*Date*
Common Nettle	*Urtica dioica*		*E2* *A3, C1, D1, E1, E2, E3, F*	*02/08/09* *15/06/12*
Common Poppy	*Papaver rhoeas*		*E2* *D2*	*11/06/11* *03/07/14*
Common Restharrow	*Ononis repens*		*E1*	*02/08/09*
Common Sorrel	*Rumex acetosa*		*C3*	*27/07/14*
Common Teasel	*Dipsacus fullonum*		*D1*	*19/07/09*

Table 5 - Plants and Grasses

			Location	*Date*
Common Toadflax	*Linaria vulgaris*		*E2* *C1* *D1* 566085, 262422	*02/08/09* *02/11/11* *02/11/11, 10/06/12*
Common Vetch	*Vicia sativa ssp.sativa*		*C1* 565893, 262401	*12/7/12*
Cow Parsley	*Anthriscus sylvestris*		*F*	*22/4/14*
Cowslip	*Primula veris*	 @DP  @DP	*E1, E3* *E1* *C1* *D1* *D2* *E3*	*16/4/15* *7/4/17* *19/5/16* *7/4/17* *8/4/17* *8/4/17*

Table 5 - Plants and Grasses

			Location	*Date*
Creeping Cinqfoil (Creeping tormentil)	*Potentilla reptans*		*E2* *D2* 566081, 262198 (garden)	*02/08/09* *21/07/14* *5/6/17*
Creeping Thistle	*Cirsium arvense*		*E3*	*02/08/09*
Cuckoo Pint (Lords and Ladies)	*Arum maculatum*		*F* *E2*	*04/04/12* *25/07/14*
Curled Dock	*Rumex crispus*		*E3* *D1*	*02/08/09* *08/07/14*
Daisy	*Bellis perennis*		*F* *C1,E1*	*04/04/12* *17/04/15*
Dandelion	*Taraxacum officinale agg.*		*E1*	*02/08/09*

Table 5 - Plants and Grasses

			Location	Date
Dog's Mercury	*Mercuralis perennis*		*E2*	*02/08/09*
False brome	*Brachypodium sylvaticum*		*E3*	
False oat-grass	*Arrhenatherum elatius*		*A2, C, D, E1*	*2001*
Fat hen	*Chenopodium album*		*E1*	*27/7/14*
Field Bindweed	*Convolvulus arvensis*		*E1* *D1*	*02/08/09* *04/07/14*

Table 5 - Plants and Grasses

			Location	Date
Field Scabious	*Knautia arvensis*		*E1* *D1* *A2* *G*	*02/08/09* *18/07/13* *04/07/14* *09/08/14* *8/10/15*
Forget-me-not	*Myosotis (species not identified)*		*F*	*04/04/12*
Garlic Mustard	*Alliaria petiolata*		*E3*	*02/08/09*
Germander Speedwell	*Veronica chamaedrys*	 @DP	*E1* *566048, 262330* *D2*	*05/06/12* *10/6/16*
Goat's Beard	*Tragopogon pratensis*	*seed head* 	*E1, E2*	
Goldenrod (probably a garden escapee)	*Solidago sp.*		*E2* *D1*	*02/08/09* *27/06/14*

Table 5 - Plants and Grasses			*Location*	*Date*
Green alkanet	*Pentaglottis sempervirens*		*E3*	
Ground-ivy	*Glechoma hederacea*		*E2* *F*	*02/08/09* *04/04/12*
Hairy Tare	*Vicia hirsuta*		*E1*	*05/06/09*
Hare's-foot clover	*Trifolium arvense*		*C1* 565851, 262471 D1	*29/06/12* *04/07/14*
Hedge Bindweed	*Calystegia sepium*		*F*	*04/07/14*
Hedge woundwort	*Stachys sylvatica*		*E3*	

Table 5 - Plants and Grasses			*Location*	*Date*
Hedgerow Crane's-bill	*Geranium pyrenaicum*		*D2*	*10/6/16*
Hemlock	*Conium maculatum*		*E1* *E1* 566015, 262365	*19/07/09* *15/06/12*
Herb-Robert	*Geranium robertianum*		*E3* 566081, 262198 (garden)	*21/07/14* *22/04/17*
Hogweed	*Heracleum sphondylium*		*C1,* 565850, 262462 *D1,* 566069, 262421	*15/06/12*
Hybrids of St John's Wort	*Close to Hypericum maculatum*		*E3* *D2*	*02/08/09* *10/7/14*

Table 5 - Plants and Grasses			*Location*	*Date*
Ivy	*Hedera Helix*		*E2*	*21/10/10*
Ladies Bedstraw	*Gallium verum*		*E3*	*19/07/09*
Lesser Swine-cress	*Coronopus didymus*		*E2*	*02/08/09*
Mugwort	*Artemisia vulgaris*		*E1*	*02/08/09*
Oilseed rape	*Brassica napus ssp.oleifera*		Garden 566090, 262196	*10/06/12*
Old Man's Beard	*Clematis vitalba*		*E3*	

Table 5 - Plants and Grasses

			Location	*Date*
Opium Poppy	*Papover somniferum*		*E2* *D1* 565977, 262412	*02/08/09* *14/07/12*
Oxeye Daisy	*Leucanthemum vulgare*		*E3* *D1* 565986, 262374 *C2* 565876, 262429 E1	*02/08/09* *06/06/12* *07/06/12* *04/07/14*
Perforate St John's Wort	*Hypericum perforatum*		*D1, E1* *E1, E3* *C1, D1, E1, E3, F* *A2*	*19/07/09* *02/08/09* *30/6/11* *09/08/14*
Prickly Lettuce	*Lactuta serrolia*		*E1*	*05/06/09*
Ragwort	*Senecio jacobaea*		*E2, C1* *C1, D1, E3* *C1* *C1* *C1, E1, E2, D1*	*19/07/09* *30/06/11* *12/07/12* *19/07/13* *25/7/15*
Red Bartsia	*Odontiles vernus*		*E1, E2*	*19/07/09* *02/08/09*

Table 5 - Plants and Grasses			*Location*	*Date*
Red Clover	*Trifolium pratense*		*C1, C2, E1, E3* *D1* *D2*	*02/08/09* *10/10/10* *05/06/12* *27/06/14* *10/6/16*
Red Goosefoot	*Chenopodium rubrum*		*E2*	*02/08/09*
Ribwort plantain	*Plantago lanceolata*		*D2, E1*	*23/07/14*
Rough Chervil	*Chaerophyllum temulum*		*E2*	*02/08/09*
Selfheal	*Prunella vulgaris*		*E1*	*02/08/09*

Table 5 - Plants and Grasses

			Location	*Date*
Scarlet Pimpernel	*Anagallis arvensis*		*D2*	*04/07/14*
Smooth Hawksbeard	*Crepis capillaris*		*C3* 565945, 262459 *D1* 565955, 262476	*28/06/12*
Smooth Tare	*Vicia tetrasperma*		*E3*	*02/08/09*
Soft (or Dove's Foot) Crane's-Bill	*Geranium molle*		*E1 566043, 262320*	*05/06/09 05/06/12*
Spear Thistle	*Cirsium vulgare*		*E3*	*02/08/09*
Snowdrop	*Galanthus (varieties)*	 	*A1, D2*	*23/2/15*

Table 5 - Plants and Grasses			*Location*	*Date*
		 *@DP*		
Stone-parsley	*Sison amomum*		*E3*	*19/07/09*
Sun Spurge	*Euphorbia helioscopia*		*E1, E2*	*02/08/09*
Sweet Violet	*Viola adorata*	 *@DP*	*E2* *F*	*02/08/09* *14/03/11* *8/4/17* *04/04/12*
Thorn-apple	*Datura stramomium*		*E2*	*02/08/09*

Table 5 - Plants and Grasses			*Location*	*Date*
Three-veined Sandwort	*Moehringia trinervia*		*E2*	*02/08/09*
Timothy	*Phleum pratense*		*C,D*	*2001*
Upright Hedge-parsley	*Torilis japonica*		*E1, E3*	*02/08/09*
Vervain	*Verbena officinalis*		*E3*	*02/08/09*
Viper's-Bugloss	*Echium vulgare*		*D2*	*21/07/14*

Table 5 - Plants and Grasses

			Location	Date
White Bryony *(Male flowers shown in pictures and female flowers are on separate plants. All parts poisonous)*	*Bryonia dioica*	   *@DP*	*E2*	*11/06/11*
White Campion	*Silene alba*		*E1* *C1*	*05/06/09* *05/06/12* *19/5/16*
White Clover	*Trifolium repens*		*E1, E3 566005, 262366*	*02/08/09* *05/0612*
White Dead-nettle	*Lamium album*		*F*	*04/04/12*
Wild Basil	*Clinopodium vulgare*		*E2*	*02/08/09*

Table 5 - Plants and Grasses

			Location	Date
Wild Carrot	*Daucus carota*		*E1* *E1*	*02/08/09* *25/7/15*
Wild Mignonette	*Reseda lutea*		*E1* *D1*	*05/06/09* *02/08/09* *27/06/14*
Wild Oat	*Avena fatua*		*E3*	*02/08/09*
Woolly Thistle	*Cirsium eriophorum*	  *@DP*	*E1* *E1* *E1 widely*	*02/08/09* *23/07/14* *25/7/15*
Yarrow	*Achillea millifolium*		*E1* *C1*	*02/08/09* *20/11/11*
Yellow Meadow Vetchling	*Lathyrus pratensis*		*E2* *D1*	*02/08/09* *08/07/14*

Table 5 - Plants and Grasses

			Location	*Date*
Yorkshire-fog	*Holcus lanatus*		*E1*	*05/06/09*

Thank you to David Barden for initiating and producing the original plant list and offering his botanical knowledge and advice.

Unwanted weeds

There have been concerns about the presence of nuisance weeds - A number of species exist which can be harmful either to animals, property or the environment by way of their invasive or toxic nature. These are likely to be covered either by the Weeds Act 1959 or by the Wildlife and Countryside Act 1981.

Legal position

Injurious weeds - five weeds are classified under the Weeds Act 1959: common ragwort (*Senecio jacobaea*), spear thistle (*Cirsium vulgare*), creeping or field thistle (*Cirsium arvense*), broad-leaved dock (*Rumex obtusifolius*) and curled dock (*Rumex Crispus*). It is not an offence to have these weeds growing on your land and species such as ragwort have significant conservation benefits. However they must not be allowed to spread to agricultural land, particularly grazing areas or land which is used to produce conserved forage. Enforcement notices can be issued following complaints requiring landowners to take action to prevent the spread of these weeds.

Invasive plants – These are weeds not covered by the Weeds Act such as Japanese knotweed, giant hogweed and Himalayan balsam. It is an offence under section 14(2) of the Wildlife and Countryside act 1981 to "plant or otherwise cause to grow in the wild" any plant listed in Schedule nine, Part II to the Act. This includes Japanese knotweed. It is not an offence to simply have it growing in your garden or on your land and there is no specific legal requirement to control it if it is (unless doing so forms part of a legally binding contract or agreement with another party).

See http://www.naturalengland.org.uk/ourwork/regulation/wildlife/enforcement/injuriousweeds.aspx

Value of the Duchess Park flora to insects

Bees - Working with the book *Plants for Bees* by Kirk and Howes, Table 6 categorises plants that have been recorded as present on Duchess Park and which are useful to bees.

Table 6 – Duchess Park wild plants useful to bees

Plant name	Useful to: Honey bees	Short tongued bumblebees	Long tongued bumblebees	Solitary bees	Found on Areas; A	B	C	D	E	F	G	Garden
Bird's-foot Trefoil	+	+	+	+					+			
Black Horehound			+						+			
Black Knapweed	+	+	+	+					+			
Black Medick	+	+							+			
Bramble	+	+	+	+					+			
Bush Vetch	+	+	+	+								+
Common Agrimony	+	+	+	+					+			
Common Poppy	+	+	+	+					+			
Common Toadflax	+	+	+	+			+	+	+			
Common Vetch	+	+	+	+			+					
Creeping Thistle	+	+	+	+					+			
Dandelion	+	+	+	+					+			
Field Scabious	+	+	+	+					+			
Forget-me-not	+	+	+	+						+		
Garlic Mustard	+	+	+	+					+			
Germander Speedwell	+	+	+	+					+			
Goldenrod	+	+	+	+					+			
Hairy Tare	+	+	+	+					+			
Hare's-foot Clover	+	+	+	+			+					
Hogweed	+	+	+	+			+	+				
Hybrids of St John's Wort	+	+	+	+					+			

Table 6 – Duchess Park wild plants useful to bees

Plant name	Useful to: Honey bees	Short tongued bumblebees	Long tongued bumblebees	Solitary bees	Found on Areas; A	B	C	D	E	F	G	Garden
Ivy	+	+		+					+			
Musk Mallow	+	+	+	+					+			
Oxeye Daisy	+	+	+	+			+	+	+			
Perforate St John's Wort	+	+	+	+			+	+	+	+		
Red Bartsia		+	+	+					+			
Red Clover	+	+	+	+			+		+			
Smooth Hawksbeard	+	+	+	+			+	+				
Smooth Tare	+	+	+	+					+			
Soft Crane's-bill	+	+	+	+					+			
Spear Thistle	+	+	+	+					+			
Vervain	+	+	+	+					+			
White Bryony	+	+	+	+					+			
White Clover	+	+	+	+					+			
White Dead-nettle	+	+	+	+						+		
Wild Carrot	+	+	+	+					+			
Wild Mignonette	+	+	+	+					+			
Woolly Thistle	+	+	+	+					+			
Yarrow	+	+		+			+		+			
Yellow Meadow Vetchling	+	+	+	+					+			

Butterflies and moths - Working with information found on the UK Butterflies website www.ukbutterflies.co.uk/foodplants.php Tables 7a and 7b correlate butterfly species and food plant species found on Duchess Park.

Table 7a – Duchess Park wild plants useful to butterfly and moth larva

Plant name	Used by:	Found in areas: A	B	C	D	E	F	G
Bird's-foot Trefoil	Common Blue					+		
Cocksfoot	Large Skipper			+	+			
	Meadow Brown							
	Ringlet							
	Speckled Wood							
Common Bent	Meadow Brown	+						
Common Nettle	Comma	+		+	+	+	+	
	Peacock							
	Small Tortoiseshell							
Common Restharrow	Common Blue					+		
Garlic Mustard	Orange Tip					+		
	Small White							
Musk Mallow	Painted Lady					+		
Ragwort	Cinnabar Moth	o		o	o	o	o	
Thistles	Painted Lady					+		
Timothy	Small Skipper			+	+			
Wild Mignonette	Large White					+		
	Small White							
Yorkshire Fog	Small Skipper					+		
	Speckled Wood							

Table 7b – Duchess Park wild plants and shrubs useful to adult butterflies

Plant name	Used by:	Found in areas: A	B	C	D	E	F	G	Garden
Bird's-foot Trefoil	Common Blue					+			
	Large Skipper								
	Painted Lady								
	Small Skipper								
	Small White								
Black Knapweed	Brimstone					+			
	Comma								
	Common Blue								
	Large Skipper								
	Large White								
	Meadow Brown								
	Painted Lady								
	Small Skipper								
Bramble	Comma	+				+	+		
	Large Skipper								
	Meadow Brown								
	Orange Tip								
	Ringlet								
	Small Skipper								
	Small Tortoiseshell								
	Speckled Wood								
Daisy	Small White						+		

Table 7b – Duchess Park wild plants and shrubs useful to adult butterflies

Plant name	Used by:	Found in areas: A	B	C	D	E	F	G	Garden
Dandelion	Brimstone					+			
	Large Skipper								
	Large White								
	Orange Tip								
	Peacock								
	Small Skipper								
	Small Tortoiseshell								
	Small White								
	Speckled Wood								
Field Scabious	Large Skipper					+			
	Large White								
	Small Tortoiseshell								
Ivy	Comma				+	+	+		
	Painted Lady								
	Small Tortoiseshell								
Privet	Comma					+			
	Large Skipper								
	Meadow Brown								
	Painted Lady								
	Peacock								
	Ringlet								
	Small Tortoiseshell								
	Speckled Wood								
Ragwort	Common Blue	o		o	o	o	o		
	Large White								
	Meadow Brown								
	Painted Lady								
	Peacock								
	Ringlet								
	Small Tortoiseshell								
	Small White								
	Speckled Wood								
Red Clover	Painted Lady			+		+			
	Small Skipper								
	Small White								
Selfheal	Brimstone					+			
	Meadow Brown								
Thistles	Brimstone					+			
	Comma								
	Common Blue								
	Large Skipper								
	Large White								
	Meadow Brown								
	Painted Lady								
	Peacock								
	Ringlet								
	Small Skipper								
	Small Tortoiseshell								
	Small White								
Vetches	Brimstone			+		+			+
	Common Blue								
	Large Skipper								
	Orange Tip								
	Small Sipper								
Yarrow	Large Skipper			+		+			
	Meadow Brown								
	Peacock								

The recorded range and frequency of occurrence of particular flora species around the discreet areas of Duchess Park as reflected in the tables above is the result of incomplete surveys. More surveying must be done. A more thorough survey of the site's flora may reveal more about the occurrence and distribution of plants useful to a range of bees and butterflies. Opportunities clearly exist within Duchess Park to identify, support and develop habitats that are beneficial to insects, particularly pollinators. Ragwort is included as an important food plant for larva and adults even though it is considered an undesirable plant.

Wild flower planting

The components of the mixture used in the 2012 Jubilee trial plantings are listed in Table 8.

Table 8 – wildflower mix used experimentally in Areas E1 and E3	**Potentially in flower[1]**

[1] Flowering periods suggested by Readers Digest Wild Britain – Wild Flowers ISBN 978-0-276-44213-1

%	Latin name	Common name	Mar	April	May	June	July	Aug	Sept	Oct	Nov
2.5	*Achillea millefolium*	Yarrow									
7.5	*Agrimonia eupatoria*	Agrimony									
6	*Alliaria petiolata*	Garlic Mustard									
5	*Centaurea nigra*	Common Knapweed									
2	*Clinopodium vulgare*	Wild Basil									
8.5	*Gallium album*	Hedge bedstraw									
11	*Geum urbanum*	Wood Avens									
7.5	*Leucanthemum vulgare*	Oxeye Daisy									
2.5	*Plantago lanceolata*	Ribwort Plantain									
2.5	*Primula veris*	Cowslip									
10	*Prunella vulgaris*	Selfheal									
10	*Silene dioica*	Red Campion									
7.5	*Silene vulgaris*	Bladder Campion									
5	*Stachys sylvatica*	Hedge Woundwort									
5	*Torillis japonica*	Upright Hedge Parsley									
7.5	*Vicia cracca*	Tufted Vetch									

Little things seem nothing, but they give peace, like those meadow flowers which individually seem odourless but all together perfume the air. ~ Georges Bernanos

Chapter Nine – Fungi

Many fungi grow around the site and more work is needed to identify some of them.

Table 9 - Fungi

			Location	Date
Common Ink Cap	*Coprinus Atramentarius*			
Shaggy Ink Cap, Lawyers Wig	*Coprinus Comatus*		*D1*	*2/11/11*

Chapter Ten – Trees, hedges and shrubs

Work by organisations such as Trees for Cities, The Forestry Commission and Natural England lists the benefits of growing trees in urban/suburban areas. The benefits include;

- Tree planting helps to create new habitat for our native fauna
- Trees and green spaces improve property prices by as much as 15%

Table 10 - Trees, hedges and shrubs (within Duchess Park or forming the boundary)

			Location	Date
Ash	*Fraxinus excelsior*		*C1, C2, D1, D2, E1, F (total 44 new planting, three mature and two young self sown)*	*2/11/12*
Apple	*Malus domestica*		*D2, E1, F*	*8/10/13*

Table 10 - Trees, hedges and shrubs (within Duchess Park or forming the boundary)

			Location	Date
Beech	*Fagus sylvatica*		*C2*	
Birch	*Betula pendula*		*B, C2, F*	
Bullace	*Prunus domestica insititia* subspecies		*F*	*4/08/14*
Common Larch	*Larix decidua*		*Many on southern boundary*	
Copper Beech	*Fagus sylvatica 'Atropunicea'*			
Cotoneaster	*Cotoneaster lacteus*	 *@DP*	*F*	
Damson	*Prunus domestica* subsp. *insititia*		*A1, D1*	*27/07/14*

Table 10 - Trees, hedges and shrubs (within Duchess Park or forming the boundary)

			Location	Date
Dog Rose (found both with pink and white flowered examples)	*Rosa Canina*		*E1,* 566017,262314 *E2*, 566033,262288	*15/06/12 10/6/16*
Dogwood	*Cornus sanguinea*		*C2*	
Elder	*Sambucus nigra*		*A2, A3, E1, E2, F*	
Elm	*Ulmus minor var. vulgaris*		*On southern boundary*	
Field Maple	*Acer campestre*		*C2, D2*	
Greengage	<u>*Prunus domestica*</u> subsp. *italica* var. *claudiana*.		*A1, A2, A3*	*27/07/14*

Table 10 - Trees, hedges and shrubs (within Duchess Park or forming the boundary)

			Location	Date
Guilder Rose	*Viburnum opulus*		*A2, C2*	
Hawthorn	*Crataegus monogyna*		*Widespread in hedges and scrub areas*	
Hazel	*Corylus avellana*	 	*A1*	*27/7/14*
Holly	*Ilex aquifolium*		*Widespread in hedges*	
Hornbeam	*Carpinus betulus*		*C1, D1* *(Replaced diseased Ash <u>and</u> added to the number of trees on site)*	*27/1/17*

Table 10 - Trees, hedges and shrubs (within Duchess Park or forming the boundary)

			Location	Date
Mirabelle Plum	*Prunus domestica* subsp. *syriaca*	  	*Roadside adjacent to wooden gate and No 12*	
Norway Spruce	*Picea abies*		*Roadside at No 22* 566069,262225	*16/12/12*
Oak	*Quercus robur*		*C2*	
Plum	*Prunus domestica*			
Privet (Poisonous)	*Ligustrum Vulgare*	 *@DP*	*E1*	
Scots Pine	*Pinus sylvestris*		*C2 and Many along southern boundary*	

Table 10 - Trees, hedges and shrubs (within Duchess Park or forming the boundary)

			Location	Date
Sloe (Blackthorn)	*Prunus spinosa*		*Widespread in hedges and present in E2*	
Spindle tree	*Euonymus europaeus*		*Widespread in hedges and group plantings*	
Stag's horn sumach	*Rhus typhina*		*D2*	
Sweet Briar (Eglantine)	*Rosa rubiginosa*	 	*E3*	*4/11/14*
Sycamore	*Acer pseudoplatanus*		*E2, E3, F*	
Turkish hazel	*Corylus colurna*	 	*Roadside at No 14 and on E3*	

Table 10 - Trees, hedges and shrubs (within Duchess Park or forming the boundary)

			Location	Date
Walnut	*Juglans regia*		*D1, F*	
Whitebeam	*Sorbus aria*		*C2*	
Wild cherry or Gean	*Prunus avium*		*C2*	

Notes:
During the course of developing Duchess Park something like 1000 meters of mixed hedge has been planted along road and garden boundaries. The hedging includes hawthorn, holly, spindle tree, blackthorn (sloe), maple and hazel.
There has also been quite extensive dense mixed planting in patches around the site as well as a variety of trees.

A man has made at least a start on discovering the meaning of human life when he plants shade trees under which he knows full well he will never sit. D. Elton Trueblood

To mark the Diamond Jubilee in 2012 three specimen trees were planted on Duchess Park together with the addition of seats, and bulb and wildflower seed planting.

The trees and their map references are:

Common Beech (Fagus sylvatica) (565865, 262372)

Black Walnut (Juglens regia) (565979, 262469)

Holly (Ilex aquifolium Pyrimidalis) (566064, 262256)

Trees and shrubs on Duchess Park and their usefulness to bees

Working with the book *Plants for Bees* by Kirk and Howes, Table 11 categorises trees and shrubs that have been recorded as present on Duchess Park which are useful to bees.

Table 11 – Duchess Park trees and shrubs that are useful to bees

Plant name	Useful to: Honey bees	Short tongued bumblebees	Long tongued bumblebees	Solitary bees	Found on Areas; A	B	C	D	E	F	G	Gardens and hedges
Apple	+	+	+	+				+		+		+
Cotoneaster	+	+	+	+						+		
Holly	+	+							+			+
Plum , Mirabelle Plum, Damson, Bullace and Greengage	+	+	+	+	+			+	+			+
Privet	+	+	+						+			
Sycamore	+	+	+	+					+			

Dead wood and its value

Dead wood is of great value to wildlife particularly invertebrates, small mammals and birds. The site developers made a significant effort to create wood piles on Areas A1 and A3. By natural processes of decay there are also random dead trees and bushes for example on Areas C2, E2, E3 and F (see Appendix 3). The temptation is to simply clear this away as part of routine maintenance activities but efforts should be made to create additional dead wood piles.

Foraging

Damsons, greengages, apples, blackberries, Mirabelle plums, bullace, walnuts, sloes and rose hips all grow wild on the site and may be enjoyed with a sharing attitude so that others may enjoy some too.

Tree Preservation Orders (TPOs)

Local Planning Authorities/District Council's are given powers to serve TPO's under the Town & Country Planning Act and there are guidelines for their use. It is common practice to serve TPO's when there is a known or likely threat that trees with amenity value will be removed or inappropriately cut e.g. new development or changes of land use. TPO's are not usually served on trees that are currently being well managed and retained by their owners. The LPA's can serve TPO's swiftly if trees later become under a known threat of removal, and are deemed worthy of a TPO.

The following plans show areas on and around Duchess Park that are currently covered by TPOs

Duchess Dr, Newmarket, Suffolk CB8, UK
East Cambridgeshire
District Council
Date: 15/10/2015
Scale: 1:5,566
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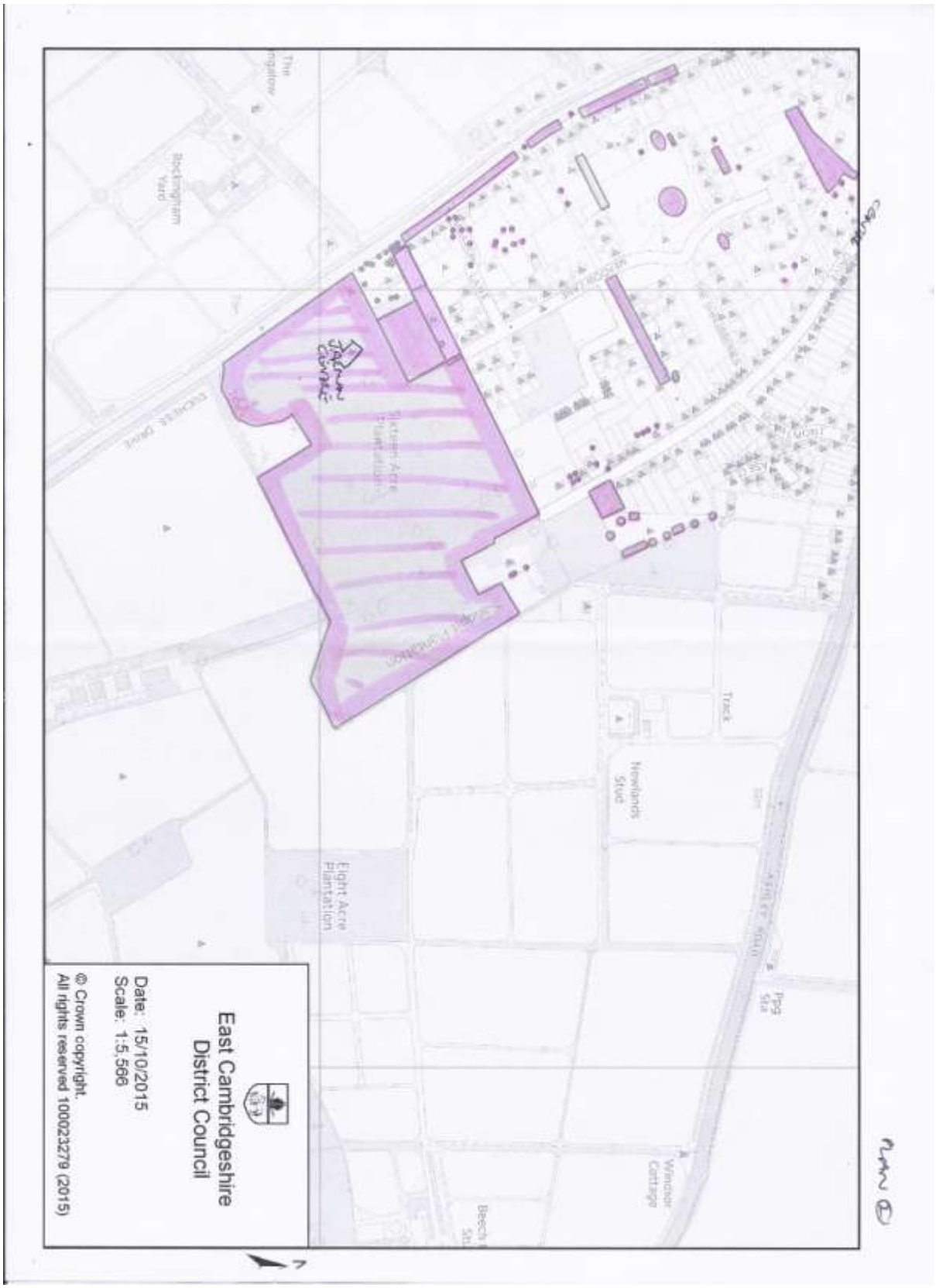
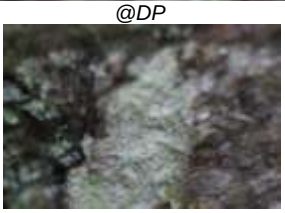


How are TPOs initiated? All requests for a TPO, from an elected representative, a member of the public or an interest group, should be sent to the relevant local Planning Office for consideration. Additionally the Department itself may initiate TPOs as a result of a planning application, the Development Plan process or in response to any threat.

Chapter Eleven – Lichens

More can be done to identify lichens on the site. Possible substrates are a bit limited to wood and trees.

Table 12 - Lichens

		Location	Date
Grey species is probably of the genus Parmelia and the yellow of the genus Xanthoria	 @DP	*E2*	*14/03/11*
	 @DP	*E2*	*14/03/11*
Probably Leconora genus	 @DP	*F*	*22/10/13*
	 @DP	*F*	*22/10/13*
	 @DP	*F*	*22/10/13*
Possibly Parmotrema chinense	 @DP	*F*	*22/10/13*

	 @DP	*F*	*22/10/13*
Possibly Xanthoria parietina	 @DP	*E2*	*22/10/13*
	 @DP	*E2*	*22/10/13*

The following short list is just the species recorded on 14/5/16 during a short walk around the scrub area E2 [2]

Amandinea punctata
Arthonia punctiformis
Arthonia radiata
Candelaria concolor
Evernia prunastri
Hypotrachyna revoluta s. str.
Lecanora chlarotera
Lepraria incana
Melanelixia subaurifera
Parmelia sulcata
Phaeophyscia orbicularis
Physcia adscendens
Punctelia jeckeri
Punctelia subrudecta
Ramalina farinacea
Xanthoria parietina

Also the following lichenicolous fungi:
Illosporiopsis christiansenii
Xanthoriicola physciae

[2] Indentified by lichen specialist Mark Powell during a Wildlife Recorders' Day as part of The Cheveley Parish Biodiversity Audit

Appendix 1

What wild flowers might we find?

Perhaps this might be regarded as a hypothetical question. Who really knows what has grown on this land in the past, how environmental changes and management practices have impacted on the past flora, what has been introduced, naturally or by man-made activity in more recent times. Any list will be very speculative, not very scientific, but a bit of fun.

Anyway, I cannot resist the question. Taking a nice compact little book, *Wild flowers of Britain and Europe, by David Sutton* as a convenient source I have listed below all those wild flowers mentioned in that book where Duchess Park appears to be in the geographical range and broadly fits a habitat described for that plant. The result, I feel, is a checklist of what we might go looking for and the number of species on the list relative to the number we have recorded as present indicates the remaining scope for observational work, systematic or opportunistic.

It should be said that we have records of plants growing on Duchess Park that don't appear in David Sutton's book. So it's all a bit imprecise. That's nature for you.

Plants are grouped (see shading) in their botanical families.

Species that might be present on Duchess Park		Observed and recorded
Fat-hen	Chenopodium album	
Redshank	Polygonum persicaria	
Black-bindweed	Fallopia convolvulus	
Sheep's Sorrel	Rumex acetsolla	
Broad-leaved Dock	Rumex obtusifolia	
Common Chickweed	Stellaria media	
Greater Stitchwort	Stellaria holostea	☺
Common Mouse-ear	Cerastium fontanum	☺
White Campion	Silene alba	
Red Campion	Silene dioica	☺
Traveller's-joy	Clematis vitalba	
Common Poppy	Papaver rhoeas	☺
Shepherd's-purse	Capsella bursa-pastoris	
Field Penny-cress	Thlaspi arvense	
Charlock	Sinapsis arvensis	
Wild Radish	Raphanus raphanistrum	
Meadow Saxifrage	Saxifrage granulate	
Bramble	Rubus fruticosus	☺
Agrimony	Agrimonia eupotoria	☺
Wood Avens	Geum urbanum	
Silverweed	Potentiilla anserina	
Tufted Vetch	Vicia cracca	
Common Vetch	Vicia sativa	☺
Meadow Vetchling	Lathyrus pratensis	☺
Black Meddick	Medicago lupulina	☺
White Clover	Trifolium repens	☺
Red Clover	Trifolium pratense	☺
Common Bird's-foot-trefoil	Lotus corniclatus	☺
Kidney Vetch	Anthyllis vulneraria	
Wood-sorrel	Oxalis acetosella	
Meadow Crane's-bill	Geranium pratense	
Herb-Robert	Geranium robertianum	
Common Stork's-bill	Erodium cicutarium	
Common Milkwort	Polygala vulgaris	
Dog's Mercury	Mercurialis parennis	☺
Sun Spurge	Euphorbia helioscopia	☺
Common Mallow	Malva sylvestris	☺
Perforate St John's-wort	Hypericum perforatum	☺
Common Dog-violet	Viola riviniana	☺
Field Pansy	Viola arvensis	
Enchanter's-nightshade	Circaea luletiana	
Rosebay Willowherb	Chamerion angustifolium	
Broad-leaved Willowherb	Epilobium montanum	
Cow Parsley	Anthriscus sylvestris	☺
Ground-elder	Aegopodium podagraria	

Species that might be present on Duchess Park		Observed and recorded
Hemlock	Conium maculatum	☺
Hogweed	Heracleum sphondylium	☺
Upright Hedge-parsley	Torilis japonica	☺
Wild Carrot	Daucus carota	☺
Scarlet Pimpernel	Anagallis arvensis	☺
Cowslip	Primula veris	
Primrose	Primula vulgaris	
Common Centaury	Centaurium erythraea	
Lady's Bedstraw	Galium verum	☺
Cleavers	Galium aparine	
Hedge Bindweed	Calystegia sepium	
Field Bindweed	Convolvulus arvensis	
Field Forget-me-not	Myosotis arvensis	☺
Common Comfrey	Symphytum officinale	
Bugle	Ajuga reptans	
Selfheal	Prunella vulgaris	☺
Common Hemp-nettle	Galeopsis tetrahit	
Hedge Woundwort	Stachys sylvatica	
White Dead-nettle	Lamium album	☺
Red Dead-nettle	Lamium purpureum	
Ground-ivy	Glechoma hederacea	☺
Bittersweet	Solanum dulcamara	
Great Mullein	Verbascum thapsus	
Common Figwort	Scrophularia nodosa	
Common Field-speedwell	Veronica persica	
Common Toadflax	Linaria vulgaris	☺
Red Bartsia	Odontites verna	☺
Greater Plantain	Plantaga major	
Ribwort	Plantaga lanceolata	
Moschatel	Adoxa moschatellina	
Teasel	Dipsacus fullonum	☺
Field Scabious	Knautia arvensis	☺
Common Valerian	Valeriana officinalis	
Harebell	Campanula rotundifolia	
Daisy	Bellis perennis	☺
Common Cudweed	Filago vulgaris	
Mugwort	Artemesia vulgaris	☺
Yarrow	Achillea millefolium	☺
Tansy	Tanacetum vulgare	
Scentless Mayweed	Tripleurospermum inodorum	
Oxeye Daisy	Leucanthemum vulgare	☺
Common Ragwort	Senecio jacobaea	☺
Groundsel	Senecio vulgaris	
Spear Thistle	Cirsium vulgare	☺
Common Knapweed	Centaurea nigra	☺
Lesser Burdock	Arctium minus	
Smooth Sow-thistle	Sonchus oleraceus	
Cat's-ear	Hypochoeris radicata	
Goat's-beard	Tragopogon pratensis	☺
Common Dandelion	Taraxacum officinale	☺
Ramsons	Allium ursinum	
Lords-and-Ladies	Arum maculatum	☺
Common Twayblade	Listera ovata	

Appendix 2

Short glossary of common names and Latin used in plant names

Just a few interesting examples that shed a little light on plant common and Latin names.

Term used in plant name	Historical relevance or Latin meaning
Wort	Signifies that the plant was used medicinally or in food
Alba, album	White or blank
Arvense	Of farmed or cultivated land
Fruticosa	Shrubby
Hirsuta	Hairy
Lanceolata	Lance shaped
Maculatum	Spotted
Millifolium	Having narrow serrate leaves and small usually white florets
Nigra	Black
Oderata	Perfumed or fragrant
Officinale	Used in medicine or by herbalists
Perennis	Perpetual, continuous
Pratensis, pratense	Of a meadow
Purpureum	Purple
Repens	Spreading, creeping
Rubus	Red or brambles
Solanum	Solace, referring to narcotic properties
Sylvatica	Pertaining to forests
Verna	To do with Spring
Vicia	Vetch
Vulgaris, vulgare	Common

Useful source of information on Latin names - http://davesgarden.com/guides/botanary/

Appendix 3

Improving Duchess Park Biodiversity

Biodiversity in an area occurs at a number of levels.

1. Variety/number of different habitats present
2. Variety of species present in each of those habitats
3. Genetic variation within a species (not always visible but includes variations not arising because of the environment (e.g. size of the individual due to availability of food) or accident/random events (e.g. a lost limb due to attack by another animal)

Aspects of biodiversity that are most easily influenced by us are conserving or expanding existing habitats and creating new habitats, also actions that support existing species or encourage greater numbers of those particular species.

Initiatives that are capable of assisting the Duchess Park **flora** directly and fauna indirectly and therefore the total number of species and individual members of a particular species include the following:

- The things that we grow in our gardens

  Obviously this is a matter of personal choice. We may not immediately think of our garden planting as part of biodiversity or that planting different things adds to biodiversity. A wider range of garden plants, shrubs and trees provides greater opportunities for insects, particularly the all important pollinators. Birds can benefit from some fruits directly but the greater diversity of insects will benefit the birds and possibly bats too.
  If you would like to know more about which garden flowers are most likely to attract pollinating insects then these links to videos produced by the Laboratory of Apiculture and Social Insects (LASI) at the University of Sussex are very interesting and I recommend them;
  https://www.youtube.com/watch?v=4u2LeTPGo9w
  https://www.youtube.com/watch?v=stMgzQ1_kVA
  https://www.youtube.com/watch?v=I8BgUjl0ayU

  Also here is the link to the Insect Pollinators Initiative website;
  http://www.lwec.org.uk/activities/insect-pollinators-initiative

- Planting and maintaining trees around the Open Spaces

  Trees are a major feature of an ecosystem and influence what insects, birds and mammals will take advantage of the area. Thinking particularly about The Residents of Duchess Park we have the opportunity to influence what is planted outside our gardens. As the future management of the Open Spaces will be in the hands of The Residents, the way in which existing trees are maintained, planned replacement and additional tree planting is in our hands. Tree pests and diseases are increasingly problematic and result from increased international trade in trees and effects of climate change.

  Good practice is reflected in the following brief guidance:
  - Long term planning – transforming the urban or rural landscape, take the 10, 50 and 100 year view.
  - Regarding the impact of the current and anticipated pests and diseases. Apart from the general point about only planting trees with known and trusted provenance, there are two other critical pieces of guidance.
  - Tree planting is only the beginning, the aftercare is critical. For example newly planted trees must have grass removed to reduce competition for water and nutrients (a circle 1 metre in diameter is ideal) and for the first year or two the trees must be watered through the summer.
  - If planning a new planting, then diversity is critical to minimising the impact of pests and diseases. Planting numbers of new tress all of the same kind or replacing a tree with the same type as the existing trees may not be ideal. A rule of thumb, is as follows:
    - Don't plant more than 10% of the same species
    - Don't plant more than 20% of the same genera
    - Don't plant more than 30% of the same family
    - For example when planting a new copse, hedgerow or woodland;
      - If planting English Oak (Quercus robur) – not more than 10%
      - Not more than 20% in total of the Quercus genera such as English Oak, Pin Oak and Turkey Oak
      - Not more than 30% of the same Family e.g. oaks, beech, chestnut

- Management of Open Space grass areas

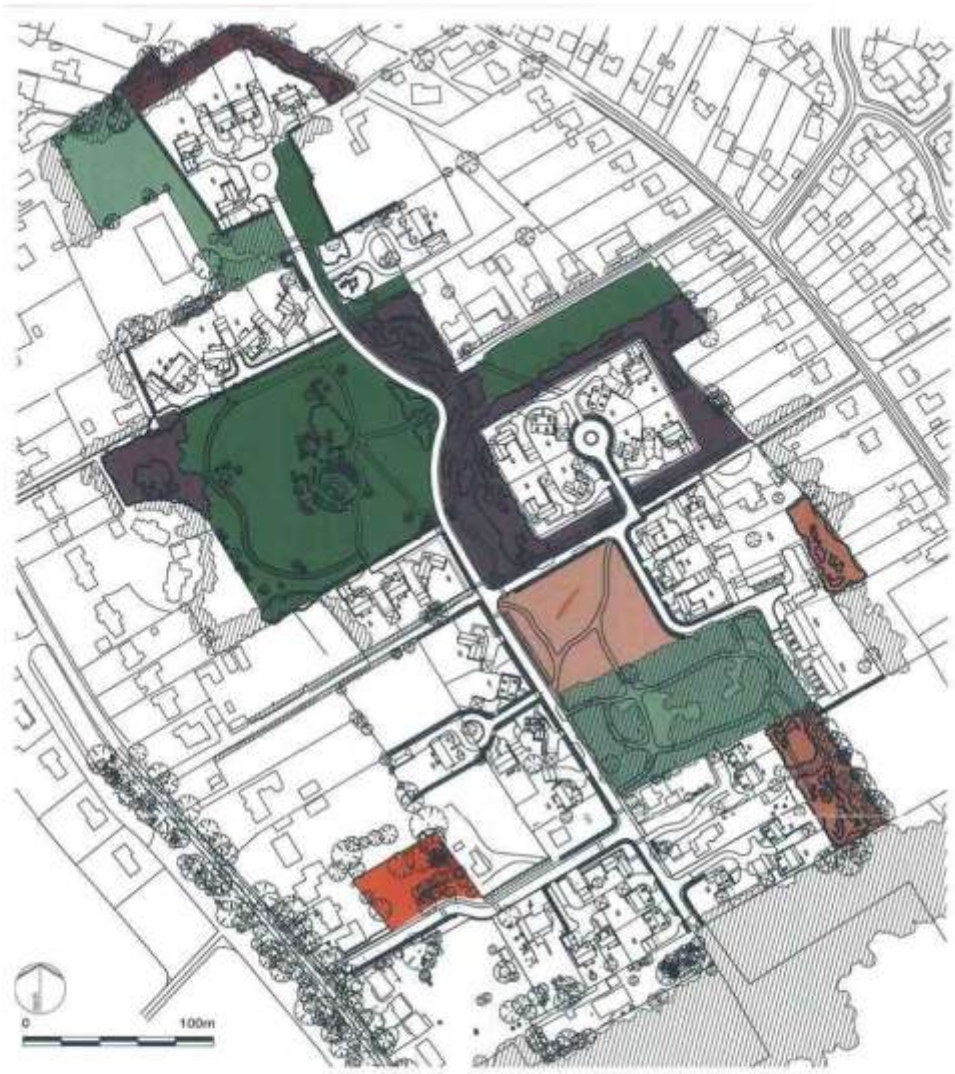
  The diversity of plant species at Duchess Park depends greatly on three aspects of the Open Space areas which are grassland. Grassland is the majority of the site and a great influence on what grows and may be enjoyed, but also the animals that will be found. These three factors are:
    - Maintaining the extent of the grass areas.
    - The length of the grass. A variety or mosaic of grass areas of different length is ideal.
    - The frequency and timing of grass cutting and what is done with the mowings. Removing the mowings removes nitrogen, giving wild flowers more opportunity against the dominating grasses.

In a recent article in The British Bee Journal (Published in conjunction with BBKA News, December 2014), Francis L W Ratnieks provided an article titled *Helping Bees in Urban Gardens and Parks*. A significant piece of research carried out by the Laboratory of Apiculture and Social Insects (LASI) at the University of Sussex.
The research was carried out in Brighton where the local authority agreed to leave some areas of grass uncut. LASI monitored the uncut areas and normally cut areas and found that, *The long grass area had about fifty times as many insects as the short grass area.* This resulted from the fact that plant species already present in the grass areas were allowed to flower.

Restating something important from Volume 1

- What the local authority planners expected

Based upon surveying what existed prior to the sites development for housing, the planning authority commissioned a report to indicate the potential of the site for its ecological value as well as its housing value. Those landscape proposals are set out in the plan below and form the basis of subsequent thinking by the developers and more importantly, by the owners of properties on Duchess Park when taking a responsible long term view of site management.



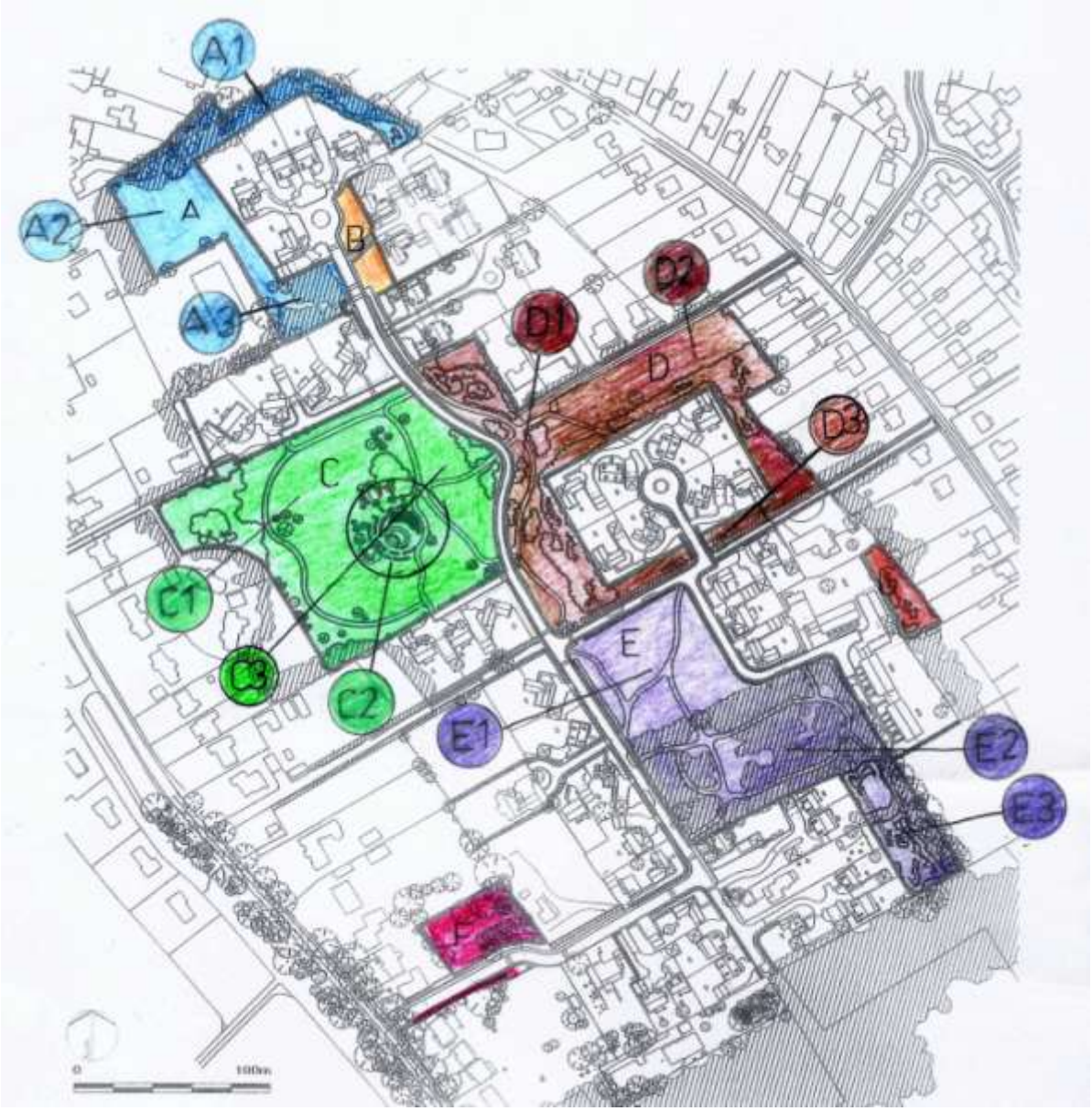
Key

Landscape Proposals

- Closed woodland with 70% Trees & Shrubs and 30% Grass. Mixed Native Woodland (Ash, Maple & Hazel). Species for visual & wildlife benfits and which help to define the site boundary.
- Open woodland with 30% Trees & Shrubs and 70% Grass. Mixed Native Woodland (Ash, Maple & Hazel). Copse planting at selected locations, species for visual & wildlife benfits and which help to define the site boundary.
- Grassland Mosaic - remaining open & uncluttered, with copse planting, trees and enhancement of species-rich grassland.
- Proposed scrub to complement existing species rich grassland.
- Existing Orchard will be managed to enhance it's value. This area is valuable for invertebrates and nesting birds.
- Existing mosaic of scrub and grassland. This area will be managed to enhance its botanically rich value for invertebrates, birds and mammals.
- Existing Species-rich Grassland. This area will be managed to enhance its botanically rich value for invertebrates, birds and mammals.

Appendix 4

Annotated plan of the site (schematic, pathways only indicative)



Generic map references for use with early records:		
A1	565879, 262629	Crescent Boundary
A2	565849, 262630	Courtside
A3	565850, 262567	Foragers' Gap
B	565904, 262578	The Lawns
C1	565834, 262437	Warren Hill View
C2	565876, 262429	Kid's Space
C3	565936, 262457	Broad Sweep
D1	565976, 262418	Long Sweep
D2	566054, 262508	Narrow Stroll
D3	566077, 262417	Hedgerow
E1	566029, 262349	The Meadow
E2	566077, 262303	The Copse
E3	566148, 262269	Quiet Corner
F	565937, 262205	The Old Orchard
G	566151, 262387	Gated Patch

Appendix 5

Duchess Park Site Maintenance Approach

The plan below shows the proposed cutting frequencies.

In addition to the cutting schedule above, the maintenance contractor is expected to maintain hedges, planted areas and tress in the public open spaces. It is hoped that this maintenance regime will provide a good balance between aesthetic and wildlife considerations as well as being affordable for the property owners upon whom the costs will eventually fall.

The proposed maintenance will give a mixture of habitats to encourage a diversity of flora and fauna:

- short grass (access paths and visual transition areas)
- longer grass (meadow grass)
- existing scrub and newly planted shrubby areas
- existing trees and new tree planting
- play area

Some limited experimental native wildflower seeding has been carried out on areas E1 and E3.

Acknowledgements

1. *Unless otherwise stated, pictures have been taken from free internet sites*
2. *@DP signifies photograph taken at Duchess Park*
3. *David Barden for his plant survey results in 2009*
4. *David and Sue Cogger for their valuable contribution to the bird list*
5. *Sinnika Wood for her valuable observations of bees and butterflies*
6. *Google Earth for aerial views*
7. *Ann and Ron Fort, Howard Jones and Greg Axtell for photographs of the area prior to development of Duchess Park*
8. *Cheveley Parish Council for its financial support for the Jubilee Planting Scheme*
9. *Darley Stud and David Wilson Homes for their support for the Jubilee Planting Scheme*
10. *Duchess Park Residents for their help with installing the Jubilee Seating and Planting*
11. *Henry and Ollie Wisbey for help with the wildflower seed planting*
12. *John Pearman for sharing his photograph of siskins on a feeder*
13. *East of England Apples & Orchards Project for identifying apple trees on The Old Orchard*
14. *Michael Symons and Cheveley.net for historic pictures of Cheveley Park*
15. *David Holland for records of flora particularly in Area E3*
16. *Mark Powell for lichen records on E2*

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23. Plants for Bees, WDJ Kirk & FN Howes, ISBN 978-0-86098 271-5
24. Guide to common grasses, Field Studies Council ISBN 978-1-85153-248-3
25. A Sting in the Tale, Dave Goulson, ISBN 978-0-22409-689-8
26. A World without Bees, Alison Benjamin and Brian McCallum, ISBN 978-0-85265-131-5
27. More than Honey – a film by Markus Imhoff
28. Wild Flowers of Britain and Europe, David Sutton, ISBN 1-84330-506-2

Useful websites

1. Birds www.rspb.org.uk
2. Bats www.bats.org.uk
3. Wild plants www.bsbi.org.uk
4. Entomology www.royensoc.co.uk
5. Trees http://www.british-trees.com
6. Fungi http://www.britmycolsoc.org.uk/
7. Lichens http://www.britishlichens.co.uk/index.html
8. Reptiles and Amphibians http://www.herpconstrust.org.uk/
9. British mammals www.mammal.org.uk
10. Bees http://www.buzzaboutbees.net/index.html
11. Bees, wasps and ants recording society www.bwars.com
12. Bumblebee Conservation Trust www.bumblebeeconservation.org.uk
13. Butterflies www.butterfly-conservation.org
14. Butterflies www.ukbutterflies.co.uk
15. Wildlife recording www.naturescalendar.org.uk
16. Newmarket Local History Society http://www.newmarketlhs.org.uk
17. Cheveley Park Stud http://www.cheveleypark.co.uk/
18. Cheveley Parish Council http://www.cheveley.org
19. Photographs of Cheveley Village and Cheveley Park www.cheveley.net/

20. Plantlife http://www.plantlife.org.uk/