Marston Meadows, Oxford

Report for the Rare Plants Group of the Ashmolean Natural History Society of Oxfordshire and the New Marston Wildlife Group

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Figure 1: '*Litle Millponde lotte meade*', Marston Meadows, 2011

Summary

There are 11 plants on the draft Rare Plants Register (RPR) to be found in the meadows adjacent to the Cherwell River in the New-Old Marston area within the New Marston Meadows SSSI boundaries. There are a further three plants on the draft RPR which are outside the SSSI but are within a Local Wildlife Site. Six species on the National Red Lists and four UKBAP Priority plant species are present. Thus there is a total of 14 draft RPR species in the whole area that forms a green north-south ribbon through the centre of Oxford. The whole green corridor of meadows adjacent to the Cherwell through Oxford is a Conservation Target Area. There are management issues relevant to all the rare plants species found.

The importance of the Marston Meadows Area and the Rare Plants Register

The Rare Plants Register (RPR) is an initiative of the Ashmolean Natural History Society of Oxfordshire (ANHSO) following Botanical Society of the British Isles guidelines and has involved voluntary surveying by botanist members of the Rare Plants Group of the ANHSO throughout the county over the last six years, with the aim of locating and assessing the populations of the plant species that are now rare.

Plants are designated as 'locally scarce', and have a place on the register, if they have 10 or fewer sites in the county (old Oxfordshire, Vice County 23) or if they have more than 10 Oxfordshire sites, but are rare or scarce nationally. The Register is in writing-up stage at the moment, but the number of plants qualifying for the register in Oxfordshire and Vice County 23, is currently approximately 380.

Marston Meadows, adjacent to the Cherwell river in Oxford, form an important green link between the Special Area of Conservation (SAC) meadows of Yarnton West Mead and Pixey Mead to the north-west and Magdalen and Iffley Meadows to the south. New Marston Meadows SSSI (designated 1993) contains 44.42 ha of fields that were designated either as good examples of lowland neutral grassland, NVC (National Vegetation Classification) community MG4, Meadow Foxtail – Great Burnet (*Alopecurus pratensis-Sanguisorba officinalis*) flood meadow, or as variants of a valuable, more swampy, meadow or grazed-meadow type and one on slightly higher ground which is a drier community most similar to NVC community MG5, Crested Dog's-tail – Knapweed (*Cynosurus cristatus – Centaurea nigra*). Most meadows, currently, have hay meadow management with aftermath grazing, but some are summer grazed to varying intensities. Palaeochannels (that is, old waterways) cross quite a few fields, and wetter communities with rare plants are mostly in these regions.

The Great Burnet – Meadow Foxtail meadow community (MG4) is largely restricted to lowland river floodplains or stream sides in England. It is considered to have high biodiversity value, as stands are species-rich and may support rare vascular plants. It is now a rare biotope with less than 1500 hectares estimated as remaining nationally (Jefferson & Pinches 2011). Oxfordshire holds a significant area of the remaining such meadows.

The importance for rare plants, at a County level, of the meadow areas just north of the Victoria Arms pub has been recognised over the last few years with the designation of two fields as 'Almonds Farm and Burnt Mill Fields Local Wildlife Site' (50E15).

Maps of the area are presented in Appendix 1. All meadow numbers quoted refer to the numbering system used by Natural England (NE) and are detailed on these maps.

History of Land Management

Most of the fields that are botanically varied and interesting, are currently regularly flooded by the River Cherwell in winter and are cropped for hay in summer. These fields will never have been ploughed but will have been 'lot meadows', most belonging to Marston village (Old Marston) e.g. SSSI meadows 49, 50A, 50B, 51, 53, 54, 55, 57, 5, 48A, 48B, 46X, 46Z. Some interesting meadows are on slightly higher ground and show relic ridge and furrow patterns, indicating that they were arable strip cultivated at some time in the past on the open field system, even though they are diverse hay meadows now (meadows 52, 56, 46Y). Nearly all these meadows have historical documents relating to them. The ridge and furrow patterns on some meadows today are identical to those indicated on the Thomas Langdon map produced for Corpus Christi College in 1605, which indicates the cultivated strips (sellions) that the college owned; therefore there is no doubt the ridges represent the old strips. On this map the fields are all named and it is obvious from the use of 'lot'

in the names that hay meadow management was in operation in some, see Figure 2. For example 'Southe Moore Lotte meadowe' named on the 1605 map was a long field adjacent to the Cherwell, which is now divided up by hedgerows into the current meadows 51 to 58. This field name has an even longer history, as the earliest mention of it is in a deed dated 1349 from Oriel College as just 'Southmore'. From the Oriel 1349 document come also the names 'Litle mellepount' and 'Muchele mellepount', which had become 'Litle Millponde Lotte Meade' and 'Greate Millponde Lotte Meadowe' by 1605 (Clark, 1925). These two meadows today are numbers 50A, 48A & 48B and are presumed to have been hay meadows at that time. The mill associated with the millpond is long gone and the location of the millpond is not obvious today. Meadows 48C and 48E appear on the Langdon map as 'Brookes borow Lot meade' presumably hay meadows, but I suggest that the use of the word 'borow' is connected with the hollow containing a temporary pond in 48E. The soils in these meadows are very peaty, and turf may have been removed in the past. The Langdon map does not cover meadows 46Z, 46Y, 48E and 46X but it is assumed that all of these were floodplain hay meadows and the ridge and furrow evident on 46Y indicates past arable before becoming a species-rich hay meadow sometime after 1605 (See Hall & McDonald; 1985, McDonald, 2011 for further information on the history of Lot meadows in the Oxford area).

As regards the history of the important meadows outside the SSSI (the Local Wildlife Sites), Burnt Mill Field (Oxford City Council) is noted to be part of 'Normore Lotte Meadowe' belonging to Marston Village on the 1605 Langdon map, so is likely to have always been a floodplain hay meadow that was never ploughed. Almonds Farm meadow (Oxford City Council) on higher ground to the east (on the first terrace of the Cherwell River and just north of the Victoria Arms pub) is noted to have relic ridge and furrow, indicating past arable strip cultivation. On the Langdon map these patterns are identical to that seen on the ground today and the site was part of a very large open arable field belonging to Marston village known as 'Colterne Fielde'. The specific part of the field with the important bank and flush areas just to the north of the Victoria Arms pub was then known as 'Alesworth Furl Stache'. From the presence of a very large population of Strawberry Clover, *Trifolium fragiferum*, in this meadow today (a species which rarely tolerates hay meadow management), I consider it is very likely to have been grazed, as today, for a long time, maybe since Inclosure and the demise of the common arable.

Arable strip cultivation in the whole area was probably discontinued at some time in the 1600s and Inclosure seems to have happened by 1661 (Clark, 1925) with pasture replacing arable, so the slightly higher ground fields have been either grazed pasture or hay meadow for possibly as much as 340 years (46Y, 52, 56, Almonds Farm meadow). The Tithe Map of 1846 reveals all the field names after Inclosure. One meadow (56 – part of the arable 'Sutton Fielde' in 1605, but 'Hill Ground' by 1846) is reported by local inhabitants to have been ploughed briefly within living memory (in approximately 1978). This meadow is ridge and furrow on higher ground above the flood plain and has a drier community (MG5) with much Yarrow, *Achillea millefolium,* and Hawkbits (*Leontodon* sp.) but there are lower-lying parts with significant patches of Great Burnet. One very small meadow (centre SP52272 07909 – I have called this Arlington Drive meadow, but it was known as 'Little Ground' in 1846) adjacent to 56 and the Marston Brook, has a mainly diverse flora containing significant amounts of Great Burnet and approximates to MG4 vegetation, but is on

old ridge and furrow. This is currently not included in the SSSI or even designated as a LWS.

Meadows 46Z, 46X, 48A and 48B seem to have been Lot (i.e. hay) meadows in 1605, but are not now cut for hay. They are currently lightly summer grazed, with very wet plant assemblages. Meadows 48A and 48B opposite the University Parks were planted up with exotic and hybrid Willows and Poplars as a 'Salicetum' by the University owners from 1958-1960. Many of these Poplars and Willows still survive as large mature trees and some support notable insects and rare fungi.

Not all meadows in the Cherwell corridor area are of SSSI or LWS standard. Some have either been 'improved' in the past or are now heavily grazed, such that they now have a reduced diversity flora of a very common type seen in permanent pasture. These meadows are all summer grazed. Most of the SSSI meadows are farmed by Mr Blackburn, the tenant at Park Farm, who cuts the hay and runs a combination of horses and cattle on the aftermath and on the summer-grazed meadows. In the 1960s and 1970s this farm was a mainly dairy concern (information from local inhabitants). Other tenants operate a similar management.

Recently there have been concerns about water lying too long on some of the meadows adjacent to the river and consequent visible spread of sedge/swamp communities at the expense of MG4 communities. The worst example of this currently seems to be in meadow 54. Many of the ditches draining between the meadows to the Cherwell had become silted up and it was thought that this was contributing to water 'pooling' on some of the meadows and not draining away quickly enough in spring. This stimulated grant-aided ditch cleaning arranged by Natural England on an experimental scale in 2009 between meadows 49, 50A and 50B.

Hay-cut in the SSSI meadows has been required by NE to be delayed until July of each year. Occasionally bad weather in July has meant that some hay meadows actually have not been cut until August. It was thought that this late cutting was promoting the dominance of Meadowsweet, *Filipendula ulmaria*, in some meadows. Following advice from the Floodplain Meadows Partnership, in an experimental attempt to reverse the trend of dominance of coarse sedges and Meadowsweet, a derogation has been put in place by NE for an earlier hay cut in some meadows. Thus for meadows 49, 50A, 50B, the hay was cut early on 23rd June 2010. This was actually before the flowering and seeding period of Devil's-bit Scabious, *Succisa pratensis*, and Pepper Saxifrage, *Silaum silaus*. Wetter conditions prevailed during July and it was observed that these two species re-grew well and successfully flowered and set abundant seed before the aftermath grazing started in September.

Of the rare plants discussed in this report only Snake's-head Fritillary, *Fritillaria meleagris*, is associated with MG4 vegetation. In 2007, the exceptional summer flooding in July meant that most of the meadows adjacent to the Cherwell were under water at the peak of plant growth. No hay cut or any aftermath grazing was possible in these meadows for that year. Whilst meadow flora are adapted to surviving winter flooding, this event under summer conditions leads to anoxia in the soil and death of any species not adapted to swamp conditions, i.e. certain species of typical MG4 community such as Great Burnet and Yellow Rattle, *Rhinanthus minor*. It can take as much as five to ten years for a sward to recover from such a single catastrophic event.

With the spread of wetter, more swamp-type communities, I estimate that currently there are only **4.38 ha** of typical MG4 vegetation left within the SSSI (9.9% of the total SSSI area).

I have not been able to access the meadows at the northern end of the area adjacent to Marston Ferry Road, but hope to do so in 2011, now that the Oxford Preservation Trust has purchased some of them.

Since the early seventeenth century there have been numerous hedgerows planted in the whole area, composed mainly of Hawthorn, Ash and Willows with some Midland Hawthorn, Crab Apple, Spindle and Oak but with considerable amounts of Blackthorn present. This last shrub has been recently found to support good populations of rare Brown Hairstreak Butterfly, *Thecla betulae*. Surveys over the past six years by Butterfly Conservation show the numbers of eggs continue to increase, meaning the whole area is now a valuable resource for this species.

Historical Plant Records

As well as the rare plants mentioned in this report, Druce (1886), who obviously spent much time botanising in Marston Meadows, mentions the following species for the area that are on the current Draft Rare Plants Register. These have not yet been re-found in my study (and are most likely lost):

Anagallis tenella	Bog pimpernel
Samolus valerandi	Brookweed
Cardamine amara	Large bitter-cress
Catabrosa aquatica	Water whorl-grass
Butomus umbellatus	Flowering Rush
Pimpinella major	Greater Burnet-saxifrage
Apium graveolens	Wild Celery
Ranunculus lingua	Greater Spearwort

Less rare plants that seem to have declined markedly in the meadows since the days of Druce are, for example, Quaking Grass, *Briza media,* described as ‘plentiful in Marston fields’ by him in 1886 (none found in any meadow there today, although it is recorded for meadow 56 up to 1980 in the TVERC [Thames Valley Environmental Record Centre] database). Other examples are the ditch/river-edge plant Arrowhead, *Sagittaria sagittifolia* (none found today) and the ditch plant Yellow Loosestrife, *Lysimachia vulgaris* (one tiny clump in a silted-up ditch found in the meadows in 2010). The Marsh Arrow-grass, *Triglochin palustre*, and Marsh Valerian, *Valeriana dioica*, mentioned by Druce (which have just been removed from the draft RPR because they occur in more than 10 sites), are found in Almonds Farm meadow in two small clumps associated with the flushes there, but nowhere else. Devil’s-bit Scabious, *Succisa pratensis,* is scarce, being found in only two SSSI meadows (50B and 49) and in one of the two flush areas in Almonds Farm meadow. Cowslips, *Primula veris,* are very scarce in the whole area, with a small population being confined to only about five ridges in the northern part only of meadow 56, which has MG5 vegetation. Occasional plants of Early Marsh Orchid, *Dactylorhiza incarnata,* have been found in a couple of meadows; this uncommon species has only recently been removed from the draft RPR.

Six Plants with National Status currently in the area

These are the species on the Vascular Plants Red Data List for Great Britain (see Cheffings and Farrell, 2005) and also the UK Biodiversity Action Plan Priority species (see http://www.ukbap.org.uk/newprioritylist.aspx)

Oenanthe fistulosa	Tubular Water-dropwort	National Red list as Vulnerable, also UKBAP Priority Species
Stellaria palustris	Marsh Stitchwort	National Red list as Vulnerable, also UKBAP Priority Species
Juncus compressus	Round-fruited Rush	National Red list, Near Threatened
Fritillaria meleagris	Fritillary	National Red list, Vulnerable
Sium latifolium	Greater Water-parsnip	National Red list Endangered, also UKBAP Priority Species
Blysmus compressus	Flat-sedge	National Red list Vulnerable, also UKBAP Priority Species

Recording and Interest in the Area

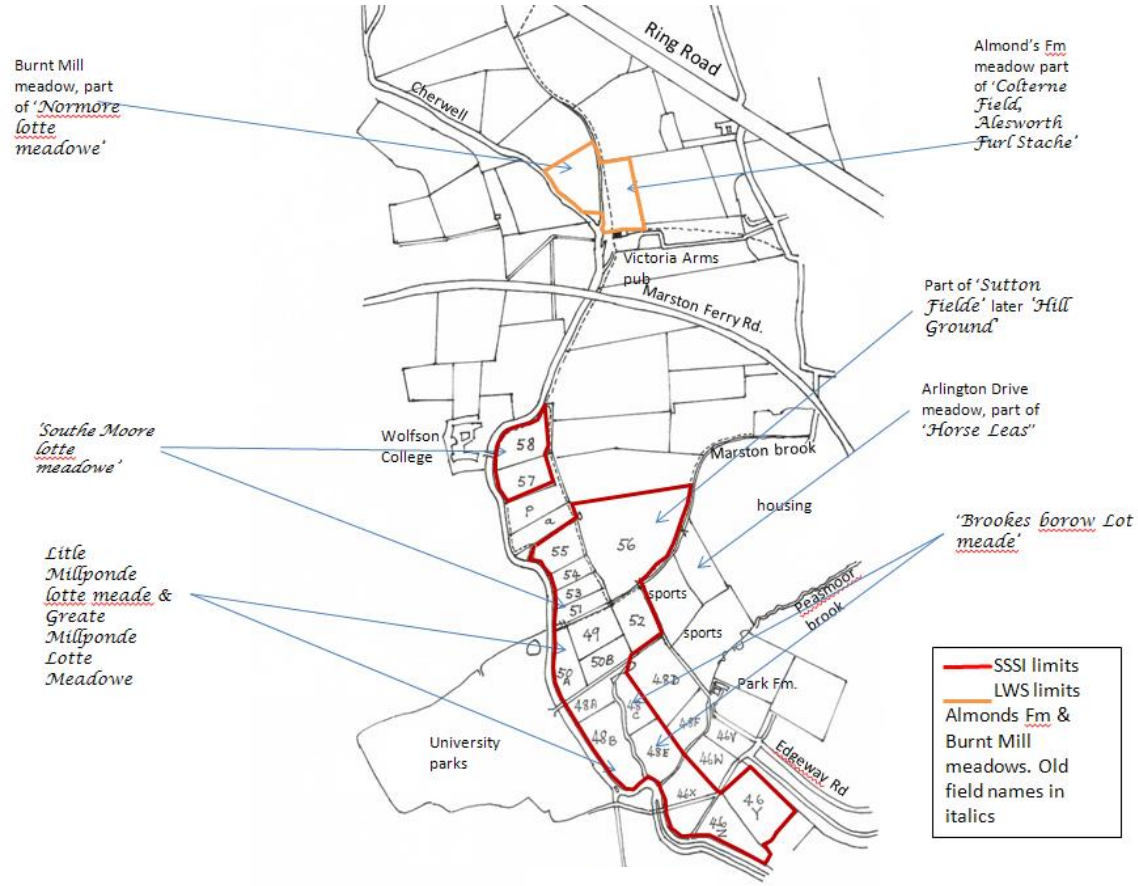

Figure 2: Map showing limits of the New Marston Meadows SSSI and their meadow numbers with the position of Almonds Farm and Burnt Mill Fields LWS.

I first surveyed plants in all these meadows on a temporary contract for the then Nature Conservancy Council (NCC) in 1978 under the name J. A. Allen (1978). There was an extensive survey of the vegetation of the SSSI meadows by EN (English Nature, now Natural England) in 1992 and I am grateful to Natural England and TVERC for access to this unpublished data. Alison McDonald has recorded and monitored the Wolfson Meadows 57 & 58 for some years. Gwyneth Hanson has also recent quadrat data on these Wolfson Meadows, particularly meadow 57. The Floodplain Meadows Partnership has permanent quadrats which they monitor in other SSSI meadows (50A-54). The New Marston Wildlife Group (NMWG) have regular walks to appreciate the flora of these meadows and has monitored two particular SSSI meadows by means of belt transects (50B & 51) to see the effect of nearby ditch cleaning (initiated by Natural England) on the sward composition. I have monitored the Rare Plants of the meadows in detail during 2009 and 2010 and I have general plant occurrence data for these years on all SSSI meadows recorded by Natural England meadow number. For maps explaining the meadow designations and numbering, see Appendix 1.

Alison McDonald and I have initiated the setting-up of a local Floodplain Meadows Study Group under the auspices of the ANHSO in March 2011. In the Marston

Meadows area this group hopes to carry out monitoring of the Wolfson meadows alongside the study already set up in meadows 50B and 51 by the NMWG.

A spreadsheet of my records of the rare plants found in the Marston Meadows over the last two years is in Appendix 2 and has been lodged with TVERC.

The Rare Plants in the SSSI meadows

The calculated Ellenberg Indicator values for each species giving an idea of their preferences for nitrogen (N) moisture (F) soil or water pH (R) and light (L) are inserted after each name. See Hill, M.O. and others (1999).

Bladder-sedge, *Carex vesicaria,* (N4, F10, R5, L8)

This was recognised from the southern SSSI meadows for the first time in 2010. A small population of a few clumps was found in the south section of meadow 46X in the low-lying palaeochannel area and in the zone with much Marsh Stitchwort.

Fig-leaved Goosefoot, *Chenopodium ficifolium,* (N7, F6, R6, L7)

A small number of plants of this annual germinated in meadow 50A in 2010 on mud excavated from the adjacent ditch. The area of meadow with these plants was not cut for hay this year (the farmer considered it too weedy therefore worthless for hay) so many Fig-leaved Goosefoot plants were able to set seed. This population will be monitored to see if it survives hay-meadow cutting when/if re-instated, but it is considered unlikely to persist without soil disturbance.

Slender spike-rush, *Eleocharis uniglumis,* (N4, F9, R7, L8)

This is difficult to find and identify if not in flower, but significant populations of it were found in 2010 in SSSI meadows 48E, 46Z, 51. In 2011 it was additionally found in meadow 55.

Snake's Head Fritillary, *Fritillaria meleagris*, (N4, F8, R7, L8)

Surveys in April 2010 and 2011 revealed small numbers of this species in SSSI meadows 50A, 49 and 55, which is a more extensive distribution than was expected. The maximum number of plants seen was 15 plants in meadow 50A, from which typical MG4 vegetation has been more or less lost, the meadow becoming dominated by tall Meadowsweet, probably due to too much waterlogging, as this species has a competitive advantage in such conditions. The last previous record for Fritillary in some of these meadows was my survey of 1978, so these populations are hanging on. The alien, Orange Balsam, *Impatiens capensis* is increasing in SSSI meadows 50A, 50B and 49 along ditch lines and out into meadow vegetation. Here it possibly could affect the population of Snake's Head Fritillary by competitive shading. In 50A it is remarkable that the Fritillary plants seem to have survived extensive soil disturbance and dumping of ditch cleaning silt in 2009. The plants pushed up through this material and successfully flowered in 2010and 2011.

Bifid Hemp-nettle, *Galeopsis bifida,* (N6, F5, R6, L7)

One plant was found in SSSI meadow 50B in 2010 on mud excavated from the nearby ditch in 2009. This area was not cut for hay in 2010 but if hay meadow management

is re-instated, possibly this species will not be able to survive here unless the cutting time is very late.

Round-fruited Rush, *Juncus compressus,* (N5, F8, R7, L8)

Only identifiable in fruit, a small population (12 plants) was found in 2010 fruiting in the eastern end of meadow 46Z, which has light grazing by stock in the summer but quite a lot of goose grazing round the year. This goose grazing is beneficial in keeping the sward short in parts nearest the river, but much of the meadow away from the river is becoming dominated by Reed Canary-grass, *Phalaris arundinacea*, and coarse sedges. Round-fruited Rush may still persist in other grazed non-SSSI meadows from which it was previously recorded in 1992, but current heavy grazing pressure (e.g. in non–SSSI meadow 48D) prevents fruiting and thus recognition. EN (English Nature, now Natural England) records indicate this species was in SSSI hay meadow 46Y in 1992, and I found it there in a survey in 2002, but my searches of this meadow in 2010 did not re-find it.

No hay cut happened to 46Y in 2009 and also grazing was extremely light with few horses. In summer 2010 the vegetation was seen to be tall and rank with little floristic diversity and thus was unsuitable for Round-fruited Rush. Possibly lack of hay cutting and insufficient aftermath grazing had been happening for more than one year prior to 2010. Cutting with hay removal did happen in late summer 2010 and the sward looked better in 2011, but remains dominated by dense tussocky grasses with reduced overall floristic diversity. Conditions may once again become more favourable for Round-fruited Rush, if adequate hay cutting at the proper time continues, although insufficient aftermath grazing may still be an issue.

Tubular Water Dropwort, *Oenanthe fistulosa,* (N6, F7, R7, L7)

Significant populations of this were found in 2010 in SSSI meadows 46Z, 46X, 48E, 50B, 53, 54 and 57. Some of these are in palaeochannel areas and it is also possible that this species has increased along with the meadows remaining wetter for longer and consequent loss of MG4 populations.

Tasteless Water-pepper, *Persicaria laxiflora (mitis),* (N9, F8, R6, L7)

A small population of this annual has been seen regularly between 2008 and 2010 in a winter waterlogged and trampled shady area under a copse of Grey Poplar trees in meadow 50A. After nearby ditch cleaning work in 2009, a very large number of tasteless water-pepper plants germinated in 2010 on the mud excavated from the ditch which was spread mostly over the surface in nearby meadow 50A, with small amounts of the mud spread also in 50B. Obviously this indicates a species with a long lived seed-bank.

The plants were intermixed with a much larger population of the commoner species with hot-tasting leaves - Water Pepper, *Persicaria hydropiper*. Not all areas of meadows with these Tasteless Water-pepper plants were cut for hay in 2010, so many plants were able to set seed. This population will be monitored to see if it survives hay-meadow cutting when/if re-instated, but it is likely to depend on periodic disturbance in the future for successful seed germination.

Strawberry clover, *Trifolium fragiferum,* (N6, F7, R7, L8, S2)

This was recognised from these meadows for the first time in 2009 and 2010 in the wet summer-grazed SSSI meadows 46Z and 48E and the non-SSSI summer-grazed meadow 48D. Further north, there is a large population on the wet bank in Almonds Farm meadow discovered in 2009. This is a species that is adapted to waterlogged soils and continual grazing, so would not persist if the management were to change to hay cutting.

Marsh Stitchwort, *Stellaria palustris,* (N4, F8, R6, L7)

The well-known, biggest population of Marsh Stitchwort (1000s of plants, occupying a 70m x 20m area) was noted in 2010 in meadow 46X in swamp vegetation dominated by rather sparse and short Reed Sweet-grass, *Glyceria maxima*. The other dominants in the meadow are all coarse sedges (Slender Tufted-sedge, *Carex acuta,* Lesser Pond-sedge, *C. acutiformis,* Greater Pond-sedge, *C. riparia*, with very few broad-leaved herbs like Meadowsweet and Marsh Marigold, *Caltha palustris*. The Marsh Stitchwort is in an otherwise species-poor area as regards broad-leaved herbs, possibly due to the long period of inundation with river flood-water which this meadow experiences every winter/spring. Here it is virtually in monoculture under the *Glyceria maxima*. It may be significant that the Reed Sweet-grass is noticeably short, sparse and yellowed (perhaps caused by low nitrogen or phosphate levels) and the leaves are often afflicted by a fungal rust infection. Presumably the Marsh Stitchwort is well adapted to survive the prolonged inundation and maybe has a selective advantage here over competing broad-leaved herbs. This is a species that thrives in high nitrogen (Ellenberg Values N7, F10, R7, L7). Bare mud is always visible between the plants when the flood water goes down. The bare mud between the Reed Sweet-grass may be important for Marsh Stitchwort seedling establishment.

In this meadow the Marsh Stitchwort is absent from the dense areas of coarse sedges. It is concentrated to the south of the raised cycle path (constructed in 1990) across the meadow where the flood water is deepest and in the area where a palaeochannel of the Cherwell exists. The meadow section to the North of the cycle path is noticeably poor in Marsh Stitchwort (only a few plants) and has much less Reed Sweet-grass with a dominant, widespread, monoculture of dense Greater Pond-sedge with very dense thatch of dead leaves between the plants. Most of this Northern part is drier than the Southern section. This whole meadow was seen to be reasonably well grazed during my survey in 1978, but has virtually no grazing now. Cows are turned out into the whole area in late summer-autumn, but there is little evidence of grazing in 46X (seems to be avoided) over the past two years, although some trampling occurs.

Possible threats to this important Marsh Stitchwort population include a small (as yet) population of Orange Balsam, established in the North-east corner of the North meadow section. Great Willow-herb, *Epilobium hirsutum*, stands are advancing in the Northern section as well, in the drier areas. Expansion and dominance of coarse sedges is another problem. Lack of effective grazing or cutting is considered to contribute to the expansion of the coarse sedges and willow-herb. A further threat was the presence of a few plants of Himalayan Balsam, *Impatiens glandulifera*, in a ditch to the East of meadow 46X in 2008 and 2009. These last have been removed as soon as seen by the local New Marston Wildlife Group members.

Small amounts of Marsh Stitchwort were additionally recorded in 2010 in meadows 46Z and 48E. In these summer-grazed meadows, the plants often survive away from grazing pressure and flower successfully, in tussocks of Hard Rush, *Juncus inflexus*, or at the edges of sedge tussocks. In meadow 46Z, the grazing by stock seems to have been very light and considerable areas are becoming dominated by Reed Canary-grass and coarse sedges, which both exclude Marsh Stitchwort.

Marsh Speedwell, *Veronica scutellata,* (N3, F9, R5, L8)

Small quantities were found in 2010 in meadow 46Z and the Wolfson Meadow 57, restricted to the palaeochannels that run across both of these meadows. However, there is a large population of Marsh Speedwell in meadow 48E, which has a depression in the centre forming a large temporary pond for most of the year. This meadow is summer-grazed and the wet depression gets heavily trampled and churned up by stock. The Marsh Speedwell is occupying the outer marginal trampled/poached zone, well away from the bare mud in the most disturbed centre of the depression. Its associates here are: Creeping Bent, *Agrostis stolonifera*, Strawberry Clover, *Trifolium fragiferum*, Water-pepper, *Persicaria hydropiper*, Redshank, *Persicaria maculosa*, Silverweed, *Potentilla anserina*, Water Mint, *Mentha aquatica*, and Marsh Cudweed, *Gnaphalium uliginosum.* Despite grazing, a large part of this meadow, away from the central depression, is becoming dominated by coarse sedges.

The Rare Plants in the non-SSSI meadows North of the Victoria Arms (Almond's Farm & Burnt Mill fields LWS)

Flat-sedge, *Blysmus compressus,* (N3, F8, R8, L8)

This was last assessed in May 2009 when there was a good population, with an excess of 2252 flower spikes counted in Almonds Farm meadow on the gentle slope just north of the Victoria Arms pub in a calcareous flush/spring area. It continued to do well in 2010. A population was historically recorded in what may be this position in Druce's Flora of Oxfordshire, 1886 ('Cherwell side near Marston, 1885'). The field is grazed by horses and the wet slope, with *Blysmus*, is quite heavily poached. The flushing with calcareous water, grazing and poaching are probably all essential to the survival of this species here. Currently there is only one other Oxfordshire VC 23 population of this species.

Bladder-sedge, *Carex vesicaria,* (N4, F10, R5, L8)

A tussock of this species was found in 2009 in a ditch near the hedge bounding the Burnt Mill meadow to the North East. In 2010, additional tussocks were found in the field to the North of this, occupying only 1m x 1m in a dense, overgrown, area adjacent to the ditch/palaeochannel to the East edge of the site. This was assumed at the time to be part of Burnt Mill fields, but it has been recently discovered that this is private land beyond the extent of the LWS. Neither small population is doing well due to strong competition from other sedges and shading. In the field north of the LWS, stock (mostly sheep in 2010) are prevented from grazing near the ditch by fencing. This is detrimental to the small populations of Bladder-sedge adjacent to the ditch because of lack of germination sites in the rank, un-grazed, vegetation.

Slender Spike-rush, *Eleocharis uniglumis,* (N4, F9, R7, L8)

This is difficult to find and identify if not in flower. A small amount was found in flower in 2010 in Almonds Farm meadow on the wet slope in the southernmost calcareous flush area.

Bifid Hemp-nettle, *Galeopsis bifida,* (N6, F5, R6, L7)

A good population (51 plants) was found in the field to the North of Burnt Mill Fields LWS along the ditch (actually a palaeochannel of the Cherwell) to East in 2010. This was assumed at the time to be part of Burnt Mill fields, but it has been recently discovered that this is private land beyond the extent of the LWS. Despite the good numbers in 2010, the vegetation is too tall and dense for much successful germination in the future. Most of the population is behind a fence and isolated from grazing by sheep, therefore the vegetation is becoming too rank around the plants

Water-violet, *Hottonia palustris,* (N5, F11, R7, L7)

In 2010 only 16 tiny vegetative rosettes of this were found on bare mud in shade in the silted-up ditch/paleochannel on the east side of Burnt Mill Field. This site is heavily shaded by old, collapsing, Crack Willow pollards. This is a very poor population, just hanging on and very likely to be lost soon if no remedial management to the Willow trees and the ditch is carried out.

Bristle Club-rush, *Isolepis setacea,* (N3, F9, R5, L7)

A few small rosettes of this plant were found in the grazed and poached flush area in 2010 on the gentle slope just north of the Victoria Arms pub in Almonds Farm meadow. This species will be dependent on the water supply, grazing and poaching to create the short turf and bare soil it needs.

Tubular Water Dropwort, *Oenanthe fistulosa,* (N6, F7, R7, L7)

A large population of this species was noted in 2010 in the general sward of Burnt Mill Meadow, which has a low floristic diversity assemblage reflecting a lot of water-logging in the winter and spring of each year. It is dominated by dense Creeping Bent, *Agrostis stolonifera*, Common Spike-rush, *Eleocharis palustris*, and sedges such as Slender Tufted-sedge, *C. acuta*, and occasional Sneezewort, *Achillea ptarmica*. The water-logging is probably beneficial to the Tubular Water-dropwort population.

Greater Water-parsnip, *Sium latifolium,* (N7, F10, R7, L7)

This population has been regularly monitored by the Rare Plants Group. Counts in 2010 revealed 22 tall plants (20 in flower) in one patch by the silted ditch (paleochannel) to the east of Burnt Mill Meadow. The total area of the patch is not more than 4m in diameter. The plants are surrounded by dense, tall, coarse sedge growth and shaded by collapsing old Crack Willow pollards. Seedling establishment was very poor, although a few small ones were noted. Willow pollarding and adjacent ditch cleaning would give possibilities for increase in this important, but precariously small and isolated, population. There is currently only one other Oxfordshire VC 22 population of this species known.

Strawberry Clover, *Trifolium fragiferum,* (N6, F7, R7, L8, S2)

Quite a large population of this species was found in 2010 in Almonds Farm meadow, mainly on the gentle slope with the two wet /calcareous flushes. Here it will be dependent on the calcareous water supply and continued summer grazing.

Management Issues for Rare Plants in Marston Meadows

SSSI areas

Lack of cutting/grazing – expansion of Orange balsam, *Impatiens capensis,* and coarse, tall, sedges

Marsh Stitchwort in SSSI meadow 46X may be at risk from expansion of dense sedge (mostly Greater Pond-sedge, *C. riparia*) and expansion of Orange Balsam. This last is an annual well adapted to competing in the waterlogged conditions in which Marsh Stitchwort thrives. Its Ellenberg Values are N6, F9, R7, L7. Orange Balsam is increasing in SSSI meadows 50A, 50B and 49 along ditch lines and out into meadow vegetation. Here it possibly could affect Snake's-head Fritillary and general MG4 vegetation. Stock do eat the Orange Balsam a little and if hay cuts are not too late, it might be kept in check. It will, however, dominate the ditch flora if not controlled. Any further ditch clearing to restore drainage to the meadows over the next few years will give it even more sites to expand into, or result in new populations from buried seed. The New Marston Wildlife Group has arranged an experimental Orange Balsam-pulling event in some of the meadows in May 2011. Control of Greater Pond-sedge and other coarse sedges is not so easily tackled by volunteers and targeted mechanical topping with material removed or weed-wiping seem the most promising options.

Increased Public Pressure – sward compression and nutrient enrichment

A greater amount of dog-walking, jogging and picnicking in recent years all result in flattening of the sward and detrimental changes from hay meadow species towards a more trampling-resistant set of common species such as Perennial Rye-grass, *Lolium perenne*, and White Clover, *Trifolium repens*. Walkers are not keeping to the public rights of way and informal footpaths have been created through the middle of good MG4 swards in meadows. Here, trampling and dog faecal enrichment is changing the species composition in these areas (no data available yet, mere observations). Eventually these damaging footpaths will become 'official' – e.g. the one down the centre of MG4 sward in meadow 51 (there is no need for this footway - people could easily walk on the parallel official footpath to Rainbow Bridge only 20 or so metres away).

Increased public pressure – burn sites

Barbecue or picnic fire sites are most common alongside the river near the public footpath. Burn damage from the public fires, which kills off all soil flora and fauna, is amplified by agreed burns by the Environment Agency (EA) to clear away debris from Willows that have collapsed across the Cherwell and have been pulled out on the meadows side. Such EA willow wood burns encourage the public to think picnic fires

are allowed and people have been observed making barbeque fires on an original EA burn site in meadow 50A. Burnt ground changes fungal communities in addition to killing meadow plants and enriching the soil. Enriched ground species like nettles, *Urtica dioica* have been observed proliferating on such burn sites. If may be a long time before regeneration to meadow flora begins. The EA could be asked not to burn on meadow turf.

Lack of information to the public – illegal activities in an SSSI

There are no notices at the entrances to this whole meadow area telling people they are entering an SSSI, that certain activities are illegal and that they should keep to the footpaths. Barbed wire put up to contain grazing stock by Mr Blackburn, the tenant farmer, has sometimes been cut so that people can continue their assumed right of access to areas where there is no official footpath. Good aftermath grazing is essential for the survival of many rare plants in these areas so stock containment must happen. Digging-up of obvious orchids when in flower has occurred (reported by locals to NMWG). Early Marsh and Southern Marsh orchids occur occasionally in very small numbers (up to four recorded in any one year) in these meadows and there is not much prospect of their populations increasing with this activity happening. Clear footpath indication way-markers plus information boards at all access points to the SSSI area could help to educate the public and thus improve the treatment of the meadow areas whilst allowing their use for recreation.

Non-SSSI areas (LWS site

Burnt Mill Fields

In the ditch (palaeochannel) on the eastern edge of Burnt Mill Fields, or on its margins, occur four rare plants: Greater Water-parsnip, *Sium latifolium*, Water-violet, *Hottonia palustris*, Bladder-sedge, *Carex vesicaria*, and Bifid Hemp-nettle, *Galeopsis bifida*. These are threatened by silting, lack of grazing/cutting and shading.

Silting

This ditch (palaeochannel) is almost completely silted up, carrying a small amount of water in the winter only – mainly when the whole of Burnt Mill Field is under flood water from the adjacent Cherwell River. The lack of water in the silted ditch (combined with shading) will result in the loss of Water-Violet within a few years, as this is already reduced to a few non-flowering shoots only. It is worth noting that this is probably the ditch that historically had the uncommon aquatic liverwort *Riccia fluitans* before it became choked with mud in 1980 (last record for *R. fluitans* here is 1974 – quoted at 'Marston Ferry', which is the Victoria Arms Pub site nearby, in Killick et al (1998). This ditch is a good candidate for the past site of the historic records for the rare Tassel Stonewort, *Tolypella intricata*, noted as 'Marston' (5 records from 1884-1911, TVERC database). This ditch was obviously still open water up to the mid1970s and the Stonewort is known to be able to recur after years of absence, thus restoring at least part of this ditch to un-shaded, water-filled, conditions (perhaps as a linear pond) could have great benefits, as part of the seed and oospore bank is retained. Note that de-silting, if done, should be carried out in such a way that it allows seeds/animal assemblages to re-colonise and arisings should not be placed in areas susceptible to phosphate enrichment.

Shading

This ditch (paleochannel) is heavily shaded in part by huge, collapsing, overgrown Crack Willow ex-pollards. This is detrimental to the populations of Greater Water-parsnip and Water-violet. Re-pollarding the Willows in a section would be of great benefit to both rare species, as it would let in a great deal more light to allow better growth, flowering and seedling survival.

Rank vegetation/ lack of grazing – lack of germination sites

In one area, in the field just North of Burnt Mill Field, stock (mostly observed to be sheep) are prevented from aftermath grazing near the ditch by fencing. This is detrimental to the small populations of Bladder-sedge and Bifid Hemp-nettle adjacent to the ditch because of lack of germination sites in the rank, un-grazed, vegetation.

Almond's Farm

On the gentle slope with the spring/flush areas in the Almond's Farm part of the LWS there are four rare plants: Flat sedge, *Blysmus compressus*, Slender Spike-rush, *Eleocharis uniglumis,* Bristle Club Rush, *Isolepis setacea*, and Strawberry Clover, *Trifolium fragiferum.* All are dependent on the special hydrological conditions that occur and the current moderate grazing.

Requirement for grazing & poaching

The rare plants on this gentle slope with spring/flush areas are heavily dependent on continued stock grazing and poaching of the wet bank in that field. A watching brief needs to be kept in case of changes of ownership, and thus management, in the future – a change from grazing would be detrimental to all species, as they require quite short vegetation with bare areas. It is worth mentioning that the poached bare mud areas here support small populations of a terrestrial *Riccia* liverwort species cf. *R subbifurca*. All species of *Riccia* are uncommon in Oxfordshire.

Water supply to the springs/flushes

The water emerging from flush/springs here is calcareous with small amount of tufa formation visible. As continued water flow and water quality is necessary for the health of the populations of rare plants on the gentle slope, any development in the catchment areas of these springs that creates a greater area of hard impermeable surface and thus reduces infiltration into the soil (and thus volume of water supply to the aquifer and springs) would be very detrimental. Any activity that might cause pollution/nutrient enrichment of water in the aquifer would also adversely affect the water quality of the spring/flush areas.

Conclusions

This study has confirmed the continued occurrence of the Rare Plants that were previously known from Marston Meadows and has extended their known distributions. Further plant species currently rare in Oxfordshire have been discovered and the current total list of 14 plants on the Draft Rare Plants Register raises the conservation importance of this whole area. Plant species have been lost

since the time of botanical records by Druce and currently there are several that are in the precarious position of being represented by one or two very small populations. For their survival it is critical that isolation and fragmentation of populations do not continue. Threats to the continued survival of the rare plants have been identified and suggestions are made for management changes that would be of benefit to them.

Acknowledgements

I am grateful to landowners, tenant farmers and NE for permission to access the sites. TVERC and NE supplied copies of unpublished previous survey records. Alun Jones gave me a great deal of his time in discussion of historical information and in viewing his copies of old maps of the area.

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The new UK BAP list is at http://www.ukbap.org.uk/newprioritylist.aspx

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Appendix 1

Figure 2. Map based on one originally supplied by Natural England showing limits of the New Marston Meadows SSSI and their meadow numbers (SSSI inside red line) with the positions of Almonds Farm and Burnt Mill Fields LWS.

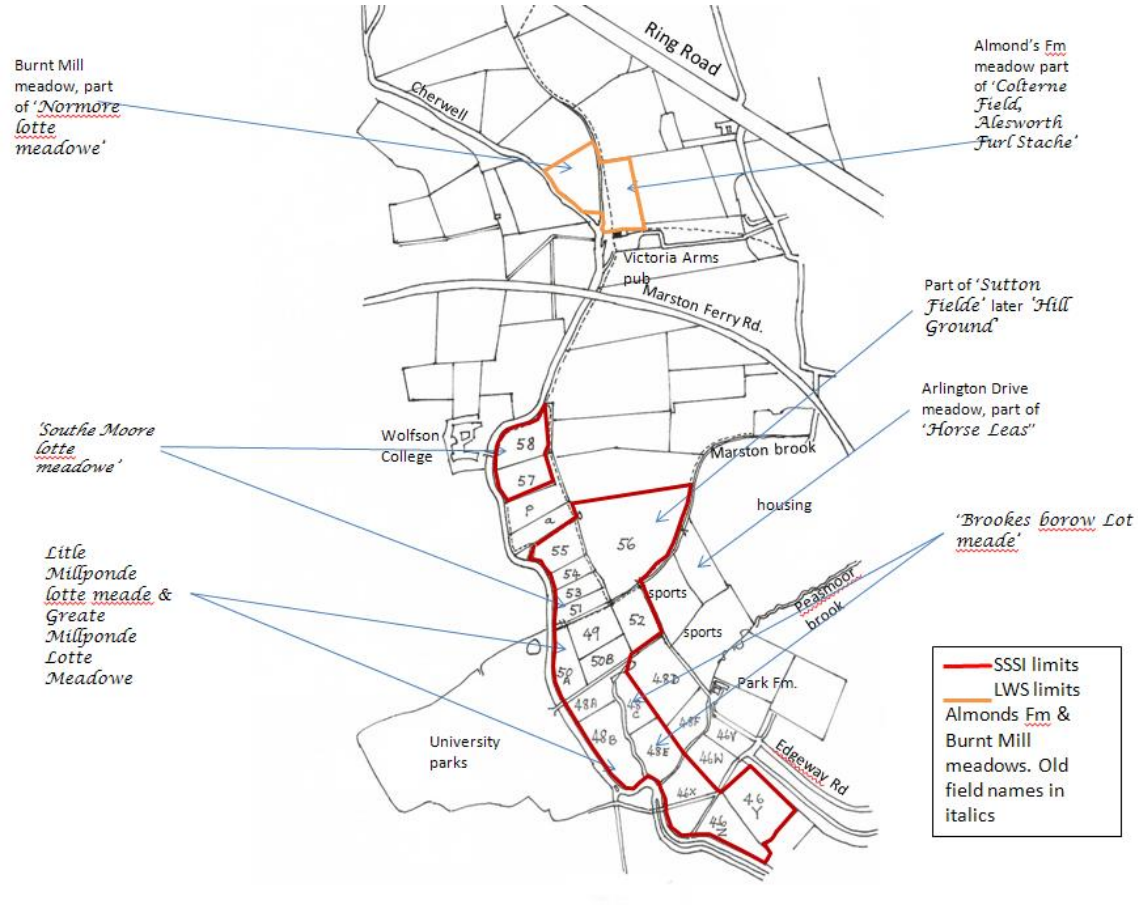
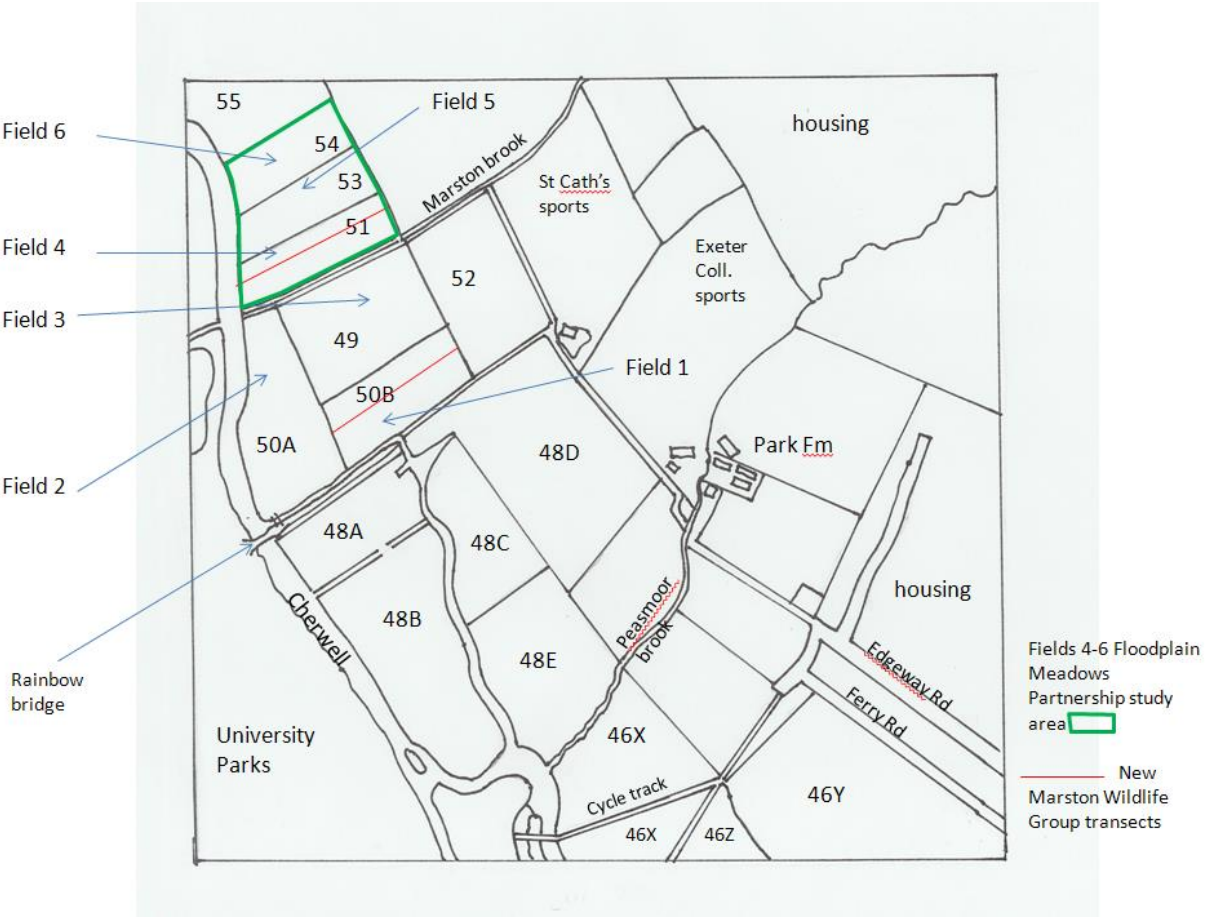


Figure 2. Map based on one supplied by the Floodplain Meadows Partnership showing the meadows they are studying with their numbering system (1-6) and the Natural England numbering system for the SSSI meadows, plus the New Marston Wildlife Group study transect positions.



APPENDIX 2

Table 1. Rare Plant species occurrence in Marston Meadows, from the Rare Plants Register for Oxfordshire (*in. litt.*) Part 1

Latin name	Common name	NE Meadow Number or Name	Colony Health 2009-2011	Comment
Carex vesicaria	Bladder Sedge	46X south section	poor, paleochannel area	waterlogged, dom. by swamp species, mostly no grazing or cutting
Chenopodium ficifolium	Fig-leaved Goosefoot	50A	poor	germ on mud removed from nearby ditch and spread in meadow
Chenopodium ficifolium	Fig-leaved Goosefoot	50B	poor	germinated on mud removed from nearby ditch and spread in meadow
Chenopodium ficifolium	Fig-leaved Goosefoot	51	?poor	burnt area at west adjacent to Cherwell, tree removal activity
Dactylorhiza incarnata	Early Marsh Orchid	56	very small	on ridge near path, south side
Eleocharis uniglumis	Slender Spike-rush	48D	poor	heavily grazed field, could easily be more common
Eleocharis uniglumis	Slender Spike-rush	46Z	small	used to be grazed more, grazing now v light, veg becoming rank
Eleocharis uniglumis	Slender Spike-rush	48E	good	variable grazing pressure, central temporary pond area
Eleocharis uniglumis	Slender Spike-rush	50B	small	in lower area, possible paleochannel?
Eleocharis uniglumis	Slender Spike-rush	51	small	in lower area, possible paleochannel?
Eleocharis uniglumis	Slender Spike-rush	55	small	in lower area, possible paleochannel?
Fritillaria meleagris	Snake's-head Fritillary	50A	poor	10 flowers in 2010, 15 flowers in 2011
Fritillaria meleagris	Snake's-head Fritillary	55	poor	3 flowers in 2010, none seen 2011
Fritillaria meleagris	Snake's-head Fritillary	49	poor	3 flowers in 2010, 5 flowers in 2011
Galeopsis bifida	Bifid Hemp-nettle	50B	poor	1 on mud removed from nearby ditch, spread in meadow
Juncus compressus	Round-fruited Rush	46Z	poor	becoming dominated by coarse sedge and *Phalaris* in parts
Juncus compressus	Round-fruited Rush	46Y	poor	few found in 2002, but none re-found in 2010
Oenanthe fistulosa	Tubular Water-dropwort	54	good	only in wetter west half of field
Oenanthe fistulosa	Tubular Water-dropwort	50B	good	only in wetter west half of field
Oenanthe fistulosa	Tubular Water-dropwort	46X north section	small	waterlogged, dom. by swamp species, mostly ungrazed and uncut
Oenanthe fistulosa	Tubular Water-dropwort	46X south section	small	waterlogged, dom. by swamp species, mostly ungrazed and uncut

Oenanthe fistulosa	Tubular Water-dropwort	48E	good	variable grazing pressure, central temporary pond area
Oenanthe fistulosa	Tubular Water-dropwort	53	small	only in wetter west half of field
Oenanthe fistulosa	Tubular Water-dropwort	57 (Wolfson South)	fair	only in palaeochannel, lower nutrient area
Oenanthe fistulosa	Tubular Water-dropwort	46Z	good	used to be grazed more, grazing now v light, veg becoming rank
Persicaria laxiflora	Tasteless water-pepper	50A	good, ? transient	under grey poplars and on mud from ditch spread in meadow
Stellaria palustris	Marsh Stitchwort	46X north section	small	waterlogged, dominated by swamp species, mostly ungrazed and uncut
Stellaria palustris	Marsh Stitchwort	46X south section	very good, extensive	waterlogged, dominated by swamp species, mostly ungrazed and uncut
Stellaria palustris	Marsh Stitchwort	46Z	good	lightly grazed, plants on edges of sedge and rush tussocks
Stellaria palustris	Marsh Stitchwort	48E	good	variable grazing pressure, in protection of rush tussocks
Trifolium fragiferum	Marsh Stitchwort	48E	good	variable grazing pressure, in protection of rush tussocks
Trifolium fragiferum	Marsh Stitchwort	46Z	small	used to be grazed more, grazing now very light, veg becoming rank
Trifolium fragiferum	Marsh Stitchwort	48D	Poor	heavily grazed field, could easily be more common
Veronica scutellata	Marsh Speedwell	48E	good	variable grazing pressure, central temporary pond area
Veronica scutellata	Marsh Speedwell	46Z	small	used to be grazed more, grazing now very light, vegetation becoming rank
Veronica scutellata	Marsh Speedwell	57 (Wolfson South)	small, poor	only in palaeochannel, lower nutrient area
Blysmus compressus	Flat-sedge	Almonds Farm Meadow	good	dependent on the flush and pony grazing and poaching
Eleocharis uniglumis	Slender Spike-rush	Almonds Farm Meadow, S flush	poor	dependent on the flush and pony grazing and poaching
Isolepis setacea	Bristle Club-rush	Almonds Farm Meadow S flush	poor	in very small area
Oenanthe fistulosa	Tubular Water-dropwort	Almonds Farm Meadow	small	at very bottom of slope to W
Triglochin palustre	Marsh Arrow-grass	Almonds Farm Meadow S & N flushes	good, but small total area	dependent on the flush and pony grazing and poaching
Carex vesicaria	Bladder Sedge	Burnt Mill Meadow, ditch to E	small	edge of ditch to E
Carex vesicaria	Bladder Sedge	Burnt Mill Meadow, ditch to N	small	edge of ditch to N
Galeopsis bifida	Bifid Hemp-nettle	Field N of Burnt Mill	good	in ungrazed rank vegetation behind fence and shaded by trees

		Meadow, ditch to E		
Hottonia palustris	Water-violet	Burnt Mill Meadow, ditch to E	very poor – last remnants!	ditch silted up and heavily shaded by willows and tall sedges
Oenanthe fistulosa	Tubular Water-dropwort	Burnt Mill Meadow	good	scattered over whole meadow area
Sium latifolium	Greater Water-parsnip	Burnt Mill Meadow, ditch to E	very small	shaded by collapsing willows and tall sedges

Part 2

Latin name	Common name	Ownership	Status	Current management
Carex vesicaria	Bladder Sedge	private	SSSI	no grazing or cutting in 2010
Chenopodium ficifolium	Fig-leaved Goosefoot	private	SSSI	hay meadow, aftermath grazed
Chenopodium ficifolium	Fig-leaved Goosefoot	private	SSSI	hay meadow, aftermath grazed
Chenopodium ficifolium	Fig-leaved Goosefoot	private	SSSI	hay meadow, aftermath grazing
Dactylorhiza incarnata	Early Marsh Orchid	private	SSSI	hay meadow, horse grazed in autumn
Eleocharis uniglumis	Slender Spike-rush	private		grazing by cows and horses
Eleocharis uniglumis	Slender Spike-rush	private	SSSI	grazing by cows and horses (but mostly lapsed)
Eleocharis uniglumis	Slender Spike-rush	private	SSSI	grazing by cows and horses
Eleocharis uniglumis	Slender Spike-rush	private	SSSI	hay meadow, aftermath grazed
Eleocharis uniglumis	Slender Spike-rush	private	SSSI	hay meadow, aftermath grazed
Eleocharis uniglumis	Slender Spike-rush	private	SSSI	hay meadow, aftermath grazed
Fritillaria meleagris	Snake's-head Fritillary	private	SSSI	hay meadow, aftermath grazed
Fritillaria meleagris	Snake's-head Fritillary	private	SSSI	hay meadow, aftermath grazed
Fritillaria meleagris	Snake's-head Fritillary	private	SSSI	hay meadow, aftermath grazed
Galeopsis bifida	Bifid Hemp-nettle	private	SSSI	hay meadow, aftermath grazed
Juncus compressus	Round-fruited Rush	private	SSSI	light grazing in summer, goose grazing on river margin
Juncus compressus	Round-fruited Rush	private	SSSI	hay meadow, insufficient cutting and grazing in recent years

Oenanthe fistulosa	Tubular Water-dropwort	private	SSSI	hay meadow, aftermath grazed in autumn
Oenanthe fistulosa	Tubular Water-dropwort	private	SSSI	hay meadow, aftermath grazed in autumn
Oenanthe fistulosa	Tubular Water-dropwort	private	SSSI	very light grazing, topped in 2009 but hay left on to rot
Oenanthe fistulosa	Tubular Water-dropwort	private	SSSI	very light grazing, topped in 2009 but hay left on to rot
Oenanthe fistulosa	Tubular Water-dropwort	private	SSSI	grazing by cows and horses
Oenanthe fistulosa	Tubular Water-dropwort	private	SSSI	hay meadow, aftermath grazed in autumn
Oenanthe fistulosa	Tubular Water-dropwort	private	SSSI	hay meadow, aftermath grazed in autumn
Oenanthe fistulosa	Tubular Water-dropwort	private	SSSI	grazing by cows and horses (but mostly lapsed)
Persicaria laxiflora	Tasteless water-pepper	private	SSSI	hay meadow, aftermath grazed
Stellaria palustris	Marsh Stitchwort	private	SSSI	very light grazing, topped in 2009 but hay left on, not cut 2011
Stellaria palustris	Marsh Stitchwort	private	SSSI	very light grazing, topped in 2009 but hay left on, not cut 2011
Stellaria palustris	Marsh Stitchwort	private	SSSI	grazing by cows and horses (but mostly lapsed)
Stellaria palustris	Marsh Stitchwort	private	SSSI	grazing by cows and horses
Trifolium fragiferum	Marsh Stitchwort	private	SSSI	grazing by cows and horses
Trifolium fragiferum	Marsh Stitchwort	private	SSSI	grazing by cows and horses (but mostly lapsed)
Trifolium fragiferum	Marsh Stitchwort	private		grazing by cows and horses
Veronica scutellata	Marsh Speedwell	private	SSSI	grazing by cows and horses
Veronica scutellata	Marsh Speedwell	private	SSSI	grazing by cows and horses (but mostly lapsed)
Veronica scutellata	Marsh Speedwell	private	SSSI	hay meadow, aftermath grazed in autumn
Blysmus compressus	Flat-sedge	Oxford City Council	LWS	grazed by horses all year round, some topping in May
Eleocharis uniglumis	Slender Spike-rush	Oxford City Council	LWS	grazed by horses all year round, some topping in May
Isolepis setacea	Bristle Club-rush	Oxford City Council	LWS	grazed by horses all year round, some topping in May
Oenanthe fistulosa	Tubular Water-dropwort	Oxford City Council	LWS	grazed by horses all year round, some topping in May
Triglochin palustre	Marsh Arrow-grass	Oxford City Council	LWS	grazed by horses all year round, some topping in May
Carex vesicaria	Bladder Sedge	private	LWS	cut for hay and aftermath grazed
Carex vesicaria	Bladder Sedge	private	LWS	cut for hay and aftermath grazed

Galeopsis bifida	Bifid Hemp-nettle	private		none here, main field cut for hay then sheep grazed
Hottonia palustris	Water-violet	Oxford City Council	LWS	none, needs urgent work to survive
Oenanthe fistulosa	Tubular Water-dropwort	Oxford City Council	LWS	cut for hay, aftermath grazed by sheep
Sium latifolium	Greater Water-parsnip	Oxford City Council	LWS	none here, main field cut for hay then sheep grazed