Cowslip Meadow SSSI
Luton

Notification under section 28 of the Wildlife and Countryside Act 1981

Supporting Information

Issued by Natural England's West Anglia Area Team on 13 October 2020

Contact points and further information

This supplement is issued on request by Natural England's West Anglia AreaTeam and is intended to be read in conjunction with the notification document for owners, occupiers and other notified parties.

The address for correspondence is:

During the current coronavirus situation, Natural England staff are working remotely and a limited number of our offices are open. Please send any correspondence relating to this notification by email or contact us by phone using the information below. Alternatively, you can send a response online using the Citizenspace link below.

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The date of notification of Cowslip Meadow SSSI is: **13 October 2020**

Contents

Summary

Cowslip Meadow SSSI is notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended).

The site is considered to be of special interest for its:

- species-rich lowland meadow of the nationally rare National Vegetation Classification (NVC) type MG5 crested dog's-tail *Cynosurus cristatus* – common knapweed *Centaurea nigra* grassland; and
- population of the Nationally Rare plant, great pignut *Bunium bulbocastanum*.

1. Information used to support the selection of Cowslip Meadow SSSI

Feature	Data source	Author	Date	Content
General	Revised Guidelines for the Selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selection. JNCC, Peterborough. Published online: http://jncc.defra.gov.uk/pdf/SSSI_GuidelinesPart1_PUBLICATION_Dec2013v2.pdf	Bainbridge, I., Brown, A., Burnett, N., Corbett, P., Cork, C., Ferris, R., Howe, M., Maddock, A. & Pritchard, S. (eds)	2013	National selection guidelines for biological SSSIs
Species-rich lowland meadow	The changing extent and conservation interest of lowland grasslands in England and Wales: a review of grassland surveys 1930-1984. *Biological Conservation* 40, 281-300. https://www.sciencedirect.com/science/article/pii/0006320787901212	Fuller, R.M.	1987	Information on the national status of grassland habitats
	British Plant Communities. Volume 3: Grasslands and montane communities. Published by Cambridge University Press	Rodwell, J.S. (ed)	1992	National Vegetation Classification (NVC) for grasslands
	NVC survey. Cowslip Meadow. Unpublished report	Irving, P.	1998	Survey of grassland vegetation
	Review of coverage of the National Vegetation Classification. JNCC Report No. 302. JNCC, Peterborough. Published online: http://jncc.defra.gov.uk/page-2312	Rodwell, J.S., Dring, J.S., Averis, J.C., Proctor, M.C.F., Malloch, A.J.C., Schaminée, J.N.J. & Dargie, T.C.D.	2000	Review of NVC coverage
	Monitoring the condition of lowland grassland SSSIs. English Nature Research Report 315. Published online: http://publications.naturalengland.org.uk/publication/64033	Robertson, H.J., & Jefferson, R.G.	2000	National extent of MG5 grassland
	The condition of lowland BAP priority grasslands: results from a sample survey of non-statutory stands in England. English Nature Research Report 636. Published online: http://publications.naturalengland.org.uk/publication/106007	Hewins, E.J., Pinches, C., Arnold, J., Lush, M., Roberston, H., & Escott, S.	2005	Information on the national status of grassland habitats
	State of the Natural Environment 2008. Natural England, Peterborough. Published online: http://publications.naturalengland.org.uk/publication/31043	Natural England	2008	Review of the state of England's natural environment

Feature	Data source	Author	Date	Content
	Restoring species-rich grassland: principles and techniques. In: Peel *et al.* eds. Restoring diverse grasslands: What can be achieved where, and what will it do for us? *Aspects of Applied Biology* **115**: 11-21.	Pywell, R.F., Woodcock, B., Tallowin, J.R.B., Mortimer, S.R. & Bullock, J.M.	2012	Restoration of species-rich grasslands
	Phase II National Vegetation Classification (NVC) Survey of Cowslip Meadow and Assessment of its Potential as a Site of Special Scientific Interest	Downton, L.	2012	Survey of grassland vegetation
	Fate of semi-natural grasslands in England between 1960 and 2013: A test of national conservation policy. *Global Ecology and Conservation* **4**: 516-525. https://www.sciencedirect.com/science/article/pii/S2351989415300184	Ridding, L.E., Redhead, J.W & Pywell, R.F.	2015	National study on loss rates of semi-natural grasslands within and outside protected sites
	Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 3 Lowland Grasslands. JNCC, Peterborough. Published online: http://data.jncc.gov.uk/data/cf50f420-1b38-4253-89f8-1cb7ba010f27/SSSI-Guidelines-3-LowlandGrasslands-2019.pdf	Jefferson, R.G., Smith, S.L.N. & MacKintosh, E.J.	2019	Guidelines for selecting lowland grasslands for SSSI notification
	Cowslip Meadow, Luton. NVC survey 2019. Natural England survey (in prep.)	Prendergast, A.	2019	Survey of grassland vegetation
	Specialist support for notification of Cowslip Meadow as a SSSI	Pinches, C.E	2020	Support from Natural England's senior grassland specialist
Great pignut	Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 11. Vascular plants (flowering plants, ferns and their allies). Nature Conservancy Council, Peterborough. http://archive.jncc.gov.uk/pdf/SSSIs_Chapter11.pdf	Nature Conservancy Council	1989	National selection guidelines for SSSIs for vascular plants
	A field census of great pignut (*Bunium bulbocastanum*) on selected Luton County Wildlife Sites, and the Galley and Warden Hills SSSI. Copy held by the Bedfordshire and Luton Biodiversity Recording and Monitoring Centre (BRMC): report reference B319	Proud A.	2000	Field census of great pignut on selected Luton County Wildlife Sites, and Galley and Warden Hills SSSI

Feature	Data source	Author	Date	Content
	Arable Plants – a field guide	Wilson, P. & King, M.	2003	Distribution and threats to great pignut
	England Rare and Scarce taxa. Botanical Society of Britain and Ireland.	Stroh, P.A.	2013	Status of *Bunium bulbocastanum*
	Great pignut 2017-18 report for Luton Borough Council	Downton, L., & Dickinson, L.	2018	Great pignut 2017-18 report
	Online Atlas of the British and Irish Flora: https://www.brc.ac.uk/Plantatlas/plant/bunium-bulbocastanum Accessed January 2020	Botanical Society of the Britain and Ireland (BSBI)	2020	National distribution of *Bunium bulbocastanum*
	Specialist support for notification of Cowslip Meadow and comparison of populations of *Bunium bulbocastanum* across its English (and therefore GB) range	Taylor, I.	2020	Support for notifying the site from Natural England's senior vascular plant specialist

2. Explanation of how Cowslip Meadow meets the SSSI selection guidelines

This section explains how the information listed in Section 1 has informed the decision to notify the SSSI, according to the *Guidelines for the selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selection* (Bainbridge *et al.,* 2013), and *Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 3 Lowland Grasslands* (Jefferson *et al.,* 2019) and *Chapter 11 Vascular plants* (Nature Conservancy Council 1989), hereafter referred to as 'the Guidelines'.

2.1 Species-rich lowland meadow

Cowslip Meadow SSSI is of special interest for its species-rich meadow (see photographs 2-7 in section 6 and also the National Vegetation Classification (NVC) map in section 7) characterised by the nationally rare NVC type MG5 crested dog's-tail *Cynosurus cristatus* – common knapweed *Centaurea nigra* grassland. This species-rich neutral grassland vegetation community forms part of the 'lowland meadows' priority habitat, which is included on the list of habitats and species which are of principal importance for the conservation of biodiversity in England, as required under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Historically the area of semi-natural grassland in the UK (including MG5) has undergone a severe decline as a consequence of post-war agricultural intensification. It is estimated that by 1984 in lowland England and Wales, semi-natural grassland had declined by 97% over the previous 50 years (Fuller 1987). More recently a 47% loss has been reported between 1960 and 2013 on sites known to have supported species-rich grassland but SSSIs were found to have retained more grassland (91%), compared with non-protected sites (27%), thus highlighting their effectiveness as a means of protecting semi-natural grasslands (Ridding, Redhead & Pywell, 2015).

Such widespread loss has led to extensive fragmentation, with remaining grasslands often isolated within the landscape. In addition to loss of habitat, the quality of unimproved grasslands has also declined. An assessment of the condition of semi-natural grasslands on non-statutory sites in England in 2002/2003 found that only 16% of lowland hay meadows were considered to be in good condition, with many lacking positive indicators in sufficient number and frequency due to neglect or agricultural intensification (Hewins *et al*., 2005). In England the remaining extent of MG5 grassland is estimated to be less than 6,000 ha (Robertson & Jefferson, 2000).

The Guidelines (Part 2, Chapter 3, section 4.10, p.7) state:

> *"For those grassland communities that are now rare (less than 10,000 ha in Great Britain or less than 10,000 ha in the British lowlands, as shown in section A of Annex 1) the presumption is that all examples which are at least 0.5 ha should be selected for notification, singly or in combination*."

MG5 grassland is listed in Section A of Annex 1 of the Guidelines and is shown as a community that is rare; accordingly all examples of at least 0.5 ha should be selected.

Cowslip Meadow SSSI covers an area of 6.36 ha and was found to support 1.53 ha of MG5 grassland when surveyed in 2012 (Downton, 2012). However, in 2019 the areas previously attributed to MG5 were found to have shifted to NVC types MG1e false oat-grass *Arrhenatherum elatius* grassland, common knapweed *Centaurea nigra* sub-community and MG1a red fescue *Festuca rubra* sub-community, depending on their location within the site. This is likely to be because the site has suffered from a sub-optimal management regime in recent years. Consistent late cuts (October/November) have resulted in a shift towards a sward that favours coarser grass species at the expense of floristic diversity. In addition, a small area (0.1 ha) towards the north-west of the site was ascribed in 2019 to NVC type CG3 upright brome *Bromus erectus* grassland, a community not identified by the 2012 survey and indicating a localised calcareous influence. Unsurprisingly, given its affinity to base rich conditions, the majority of the great pignut *Bunium bulbocastanum* population is associated with this area (see section 2.2, below).

MG1e is a community of high botanical value as defined in Section A of Annex 1 of the Guidelines, but the Guidelines (Part 2, Chapter 3, section 4.12, p.8) go on to state that:

> "It is important to recognise that, in the longer term, the objective for some stands of…MG1e might be to manage them towards…neutral grassland (eg MG5)…by, in particular, introduction of grazing or hay meadow management."

This is the case at Cowslip Meadow SSSI where the MG1e grassland is judged to be recently derived from MG5 grassland as a consequence of insufficient management. The objective is to restore these areas to MG5.

MG1a is a community of lower botanical value as defined in Section B of Annex 1 of the Guidelines but the Guidelines (Part 2, Chapter 3, section 5.2, p.10) go on to state that:

> "In the case of a candidate SSSI grassland site where recent survey has recorded a community listed in section B of Annex 1…but a survey within the last ten years demonstrated the former presence there of a notifiable grassland type, then inclusion of this area within a proposed site may be considered. This would be confined to situations where the grassland of the types listed in section B of Annex 1 is adjacent to types of high botanical interest (section A of Annex 1)…"

Stands of MG1a recorded at Cowslip Meadows in 2019 were formerly identified as MG5 in 2012 and remain adjacent to communities of high botanical interest, including MG1e.

Based on the current (2019) species composition, recovery of the stands of MG1e and MG1a to MG5 in favourable condition can be achieved under a more suitable management regime. This would consist of a two cut regime with the first taking place no later than mid July and a second cut being taken in October. This would open up the sward, reduce accumulated thatch and reduce the dominance of the ranker grasses and coarser forbs. As such, the site is considered to support an example of MG5 grassland, currently in unfavourable condition (see Section 3, below), but which will be restored to a favourable state with appropriate management.

2.2 Great pignut *Bunium bulbocastanum*

Great pignut *Bunium bulbocastanum* is an umbelliferous plant of limey soils that occurs at only a few sites in Great Britain. It is Nationally Rare (Stroh 2013) and listed as a Red Data Book (RDB) species in table 24 (Chapter 11) of the Guidelines. Great pignut has declined in Great Britain and across much of its European range as a result of agricultural intensification (Wilson & King 2003). In Great Britain, the species is found only in England where it is mainly confined to the chalk hills between Tring and Cambridge.

In 2017 the great pignut population in Cowslip Meadows was surveyed by the local Wildlife Trust. At this time 249 flowering plants were counted together with an estimated 4,917 non-flowering plants. A comparison of other sites supporting significant populations of this species (see Table 1 below) shows that Cowslip Meadow supports the fourth largest great pignut population in England.

The Guidelines (Part 2, Chapter 11, section 3.2) state that:

> *"All RDB species' localities should be regarded as candidate sites. One RDB species qualifies a site for selection if it has:*
> *[…]*
> *3.2.3 a good population of the species in an AOS supporting a substantial proportion of localities for the species.*
> *[…]*
> *Judgement of a "good population" should be made in discussion with the…rare plant specialist, who holds precise data on both distribution and population sizes of RDB species."*

The AOS (Area of Search) for Cowslip Meadow is 'The Chilterns' National Character Area (NCA)[1], which includes the great majority of the localities supporting great pignut in Great Britain. Table 1 (below) shows that Cowslip Meadow SSSI supports the fourth largest population of great pignut in both the AOS and in Great Britain. The great pignut population at Cowslip Meadow is therefore eligible for selection as a good population of the species in an AOS supporting a substantial proportion of localities for the species.

The north-west of the site supports the majority of the great pignut *Bunium bulbocastanum* population. The grassland management in this area will need to take account of the habitat requirements for great pignut as this species thrives in slightly taller swards. Parts of the site that are of particular importance for great pignut should be identified and have cutting timed for later in the season to allow it to flower and set seed.

2.3 Site boundary determination

Cowslip Meadow SSSI comprises a mosaic of unimproved neutral grassland habitats, a small area of grassland showing more of a calcareous influence particularly important for the great pignut population, with smaller areas of fen, swamp, scrub woodland and open water. To the north and west the site is bounded by housing, to the east by the A6 road, and to the south by school grounds (see photograph 1 in section 6).

The Guidelines (Part 2, Chapter 3, Section 5.1, page 10) state:

> "*SSSI boundaries should be drawn to encompass the special features of the site and all land necessary to ensure the protection and sustainability of those features. […] Consideration should be given to the inclusion of whole management units, entire ecological units and land required for supporting processes, such as hydrology. Thus, for example, this may require the inclusion within a site boundary of areas of land supporting grassland communities of lower botanical interest (section B of Annex 1), or non-grassland vegetation."*

The communities of lower botanical interest (such as MG1 grassland) and non-grassland vegetation on the site are an integral part of the ecological and management units within which they form a mosaic with the MG5 grassland. For this reason they are included within the SSSI boundary.

[1] National Character Areas (NCAs) divide England into 159 natural areas, each defined by a unique combination of landscape, biodiversity, geodiversity and economic and cultural activity. NCAs are now used as 'areas of search' for the purposes of SSSI selection (where appropriate) in England. For more information on NCAs, see https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making

Table 1 Largest great pignut *Bunium bulbocastanum* populations in Great Britain

Rank	Site name	Area of Search	Latest count	Sustainable population?	Recorder	Year
1	Dallow Downs and Winsdon Hill SSSI	Chilterns	86,513 (including 67,933 flowering)	Yes	Beds, Cambs & Northants (BCN) Wildlife Trust	2017
2	Galley and Warden Hills SSSI	Chilterns	62,975 (including 46,233 flowering)	Yes	BCN Wildlife Trust	2017
3	Ivinghoe Hills complex	Chilterns	"Multiple colonies: one (centred on SP958158) may have as many as 10,000 plants. The others are all <1000, often 10's - 100's"	Yes	A. McVeigh (pers. comm. via P. Stroh (BSBI))	2019
4	Cowslip Meadow SSSI	Chilterns	5,116 (including 249 flowering)	Yes	BCN Wildlife Trust	2017
5	Leagrave Common County Wildlife Site (CWS)	Chilterns	4,457 (including 471 flowering)	Yes	BCN Wildlife Trust	2017
6	Bradger's Hill CWS	Chilterns	3,055 (including 285 flowering)	Yes	BCN Wildlife Trust	2017
7	Totternhoe Green Lane	Chilterns	"The only other population where numbers may reach the high 100s, low 1000s is at Totternhoe, where it is liberally scattered along a green lane"	Yes	P. Stroh (BSBI) pers. comm.	2019
8	Cherry Hinton Pit SSSI and Limekiln Close and West Pit LNR	East Anglian Chalk	100s (BCN report of 2017 gives a count of 36 for 2014 and 63 for 2017)	Yes	CUBG, City of Cambridge and Flora of Cambs (A. Leslie)	2019
9	Hertfordshire sites	Chilterns	"owing to the small size of almost all its populations in the county, the species is extremely vulnerable" (BCN Report 2017 gives a count of 0 from 2014 onwards)	Unknown	Flora of Hertfordshire (T. James)	2009

3. Assessment of the current condition of Cowslip Meadow SSSI

Site unit numbers*	Interest features	Reported condition**	Date of last assessment
1	Species-rich lowland meadow grassland; great pignut	Unfavourable – declining	16 July 2019

*** Site units** are divisions used by Natural England for administrative purposes only.

**** Reported condition**
SSSIs are notified because of special biological or geological features. When these features are being managed so that their special nature conservation interest is being maintained they are said to be in favourable condition. This is a United Kingdom standard and the terminology and definitions are more fully described in 'A Statement on Common Standards Monitoring (CSM)', produced by the Joint Nature Conservation Committee in 1998.

4. Selection of 'operations requiring Natural England's consent'

Natural England selects operations from a master list when determining the list of operations requiring consent for individual SSSIs. The selection is based on the likelihood that the operations may cause damage to the special features that are the reasons for notification of the SSSI. As well as selecting operations from the master list, the precise wording of each operation may be tailored to suit the particular circumstances at the site.

It is not possible to predict every possible eventuality that may arise on a site but the aim is to identify all operations where it is reasonably foreseeable that, if carried out at certain times or in a particular manner somewhere within the SSSI, are likely to damage the special interest features. The table below records at least one reason justifying the inclusion of each operation in the list for Cowslip Meadow SSSI. It is not intended to be exhaustive and in most cases there will be other ways in which the specified operation is likely to cause damage.

Standard reference number	Type of operation	At least one reason for listing
1.	Cultivation, including ploughing, rotovating, harrowing and re-seeding.	Grassland and great pignut could be destroyed.
2.	Grazing and alterations to the grazing regime (including type of stock, intensity or seasonal pattern of grazing).	Grassland and great pignut sensitive to over or under grazing, which could lead to changes in community composition.
3.	Stock feeding and alterations to stock feeding practice.	Could lead to localised nutrient enrichment or poaching which would damage grassland and great pignut.
4.	Mowing or cutting vegetation and alterations to the mowing or cutting regime (such as from haymaking to silage).	Grassland and great pignut sensitive to cutting or mowing, which could lead to changes in community composition if carried out inappropriately.
5.	Application of manure, slurry, silage liquor, fertilisers and lime.	Grassland and great pignut sensitive to nutrient enrichment, which could lead to dominance by competitive species.
6.	Application of pesticides, including herbicides (weedkillers) whether terrestrial or aquatic, and veterinary products.	Grassland and associated flora/fauna all sensitive to these, both through direct loss and change to community composition.
7.	Dumping, spreading or discharging of any materials.	Risk of obscuring/smothering grassland and great pignut.
8.	Burning.	Grassland and great pignut sensitive to burning, both through direct loss and changes in community composition.
9.	Release into the site of any wild, feral, captive-bred or domestic animal, plant, seed or micro-organism (including genetically modified organisms).	Could lead to unforeseen interactions with indigenous species and changes in community composition.
10.	Killing, injuring, taking or removal of any wild animal (including dead animals or parts thereof), or their eggs and nests, including pest control, and disturbing them in their places of shelter.	Could lead to unforeseen changes in community composition, for instance if key herbivores, pollinators or predators affected. Direct damage to sward could result from some methods.
11.	Destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen, fungus, leaf-mould or turf.	Damage to grassland habitats and constituent species, including great pignut.

Standard reference number	Type of operation	At least one reason for listing
12.	Tree and woodland management and alterations to tree and woodland management (including planting, felling, pruning and tree surgery, thinning, coppicing, changes in species composition and removal of fallen timber).	Risk of incidental damage to grassland and great pignut, direct loss and changes in community composition due to shading.
13a.	Draining (including the use of mole, tile, tunnel or other artificial drains).	Risk of incidental damage and direct loss to grassland and great pignut.
13b.	Modification to the structure of water courses (streams, springs, drains and ditches), including their banks and beds, as by re-alignment, re-grading, damming or dredging.	Risk of incidental damage and direct loss to grassland and great pignut.
13c.	Management of aquatic and bank vegetation for drainage purposes.	Risk of incidental damage and direct loss to grassland and great pignut.
14.	Alterations to water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes). Also the modification of current drainage operations.	Grassland sward sensitive to changes in hydrology. Direct damage to grassland and great pignut in the immediate vicinity.
15.	Infilling or digging of ditches, dykes, drains, ponds, pools, marshes or pits.	Direct damage to grassland and great pignut.
20.	Extraction of minerals, including hard rock, sand and gravel, topsoil and sub-soil.	Direct loss of grassland and great pignut.
21.	Destruction, construction, removal, re-routing or re-grading of roads, tracks, walls, fences, hard-stands, banks, ditches or other earthworks, including soil and soft rock exposures, or the laying, maintenance or removal of pipelines and cables, above or below ground.	Direct loss of or incidental damage to grassland and great pignut.
22.	Storage of materials.	Risk of obscuring/smothering grassland and great pignut.
23.	Erection of permanent or temporary structures or the undertaking of engineering works, including drilling.	Direct loss of grassland and great pignut.
26.	Use of vehicles or craft.	Risk of damage to grassland and great pignut, for instance from soil compaction or wheel-rutting.
27.	Recreational or other activities likely to damage or disturb the features of special interest or their habitats.	Risk of damage to grassland and great pignut, for instance due to excessive trampling.
28a.	Game and waterfowl management and hunting practices and alterations to game and waterfowl management and hunting practice.	Inappropriate location and types could damage grassland and great pignut, for instance due to nutrient enrichment around feeders.

5. Site unit map

The map on the following page shows the provisional boundaries of the site units, which are divisions used by Natural England for administrative purposes only.

Insert Site Unit Map

6 Photographs

Photograph 1

Cowslip Meadow SSSI boundary shown in red

Scale (at A3): 1:1,608
Map produced by Denise Rose,
Landscape, Biodiversity & Designation Team
Date flown: 07/06/2016.

Photograph 2: Species-rich area in north-west of site, July 2019

Photograph 3: Same view as photograph 2, August 2014

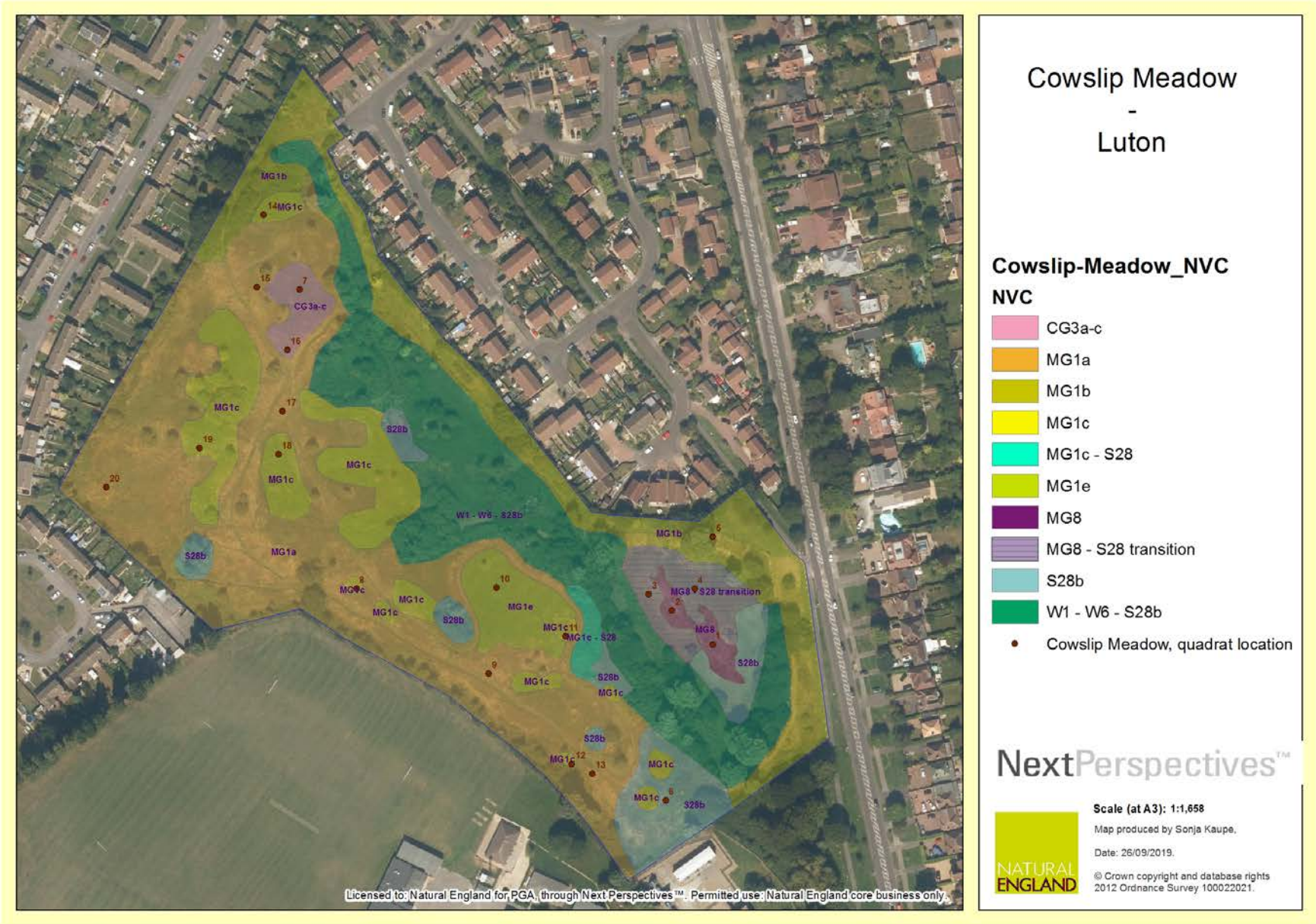
Photograph 4: View south into swampy depression, July 2019

Photograph 5: Same view as photograph 4, August 2014

Photograph 6: Central section of the site dominated by meadowsweet, July 2019

Photograph 7: Species-rich area in north-west of site, July 2019 (close up of sward in photograph 2)

7 NVC Map


Cowslip Meadow
-
Luton
Cowslip-Meadow_NVC
NVC
CG3a-c
MG1a
MG1b
MG1c
MG1c - S28
MG1e
MG8
MG8 - S28 transition
S28b
W1 - W6 - S28b
Cowslip Meadow, quadrat location
NextPerspectives™
Scale (at A3): 1:1,658
Map produced by Sonja Kaupe.
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