European Community Directive
on the Conservation of Natural Habitats
and of Wild Fauna and Flora
(92/43/EEC)

Supporting documentation for the Third Report by the United Kingdom under Article 17
on the implementation of the Directive
from January 2007 to December 2012
Conservation status assessment for

Habitat:

H6510 - Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

**IMPORTANT NOTE – PLEASE READ**

- The country-level reporting information contained in this document is a contribution to the Article 17 UK report for the habitat/species concerned.
- It has been provided by **Natural Resources Wales** and refers only to the state of the habitat/species in **Wales** - it does not constitute an assessment for the whole of the UK.
- The Article 17 UK Approach document provides details on how this information has been used and, combined with information supplied by other Statutory Nature Conservation Bodies
- The format of the document is closely aligned to that set out by the European Commission for Member State reporting – as a result, some of the fields are not applicable at a country-level and have deliberately been left blank – in addition, the content of most fields is constrained by the EC reporting categories.

As of 1 April 2013, the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales became Natural Resources Wales/Cyfoeth Naturiol Cymru
Reporting format on the 'main results of the surveillance under Article 11’ for Annex I Habitats Types

0.2 Habitat code
H6510

1.1 Maps

1.1.1 Distribution map

1.1.2 Method used - map

<table>
<thead>
<tr>
<th>Complete survey/Complete survey or a statistically robust estimate</th>
</tr>
</thead>
</table>
| The distribution (and extent) of H6510 has been calculated from revisits to sites originally surveyed as part of the Lowland Grassland Survey of Wales 1987-2004 (LGSW; Stevens et al., 2010). The LGSW was a targeted NVC (Rodwell (ed.), 1992) survey focussing on grasslands of high conservation interest in the Welsh lowlands. All LGSW occurrences of NVC MG4 were included in the definition of H6510. This source was the basis for the Welsh distribution data in the previous (2007) reporting round. Mapped LGSW records for MG4 have been incorporated into a polygon-based GIS inventory for the habitat (Stevens & Smith, 2012).

The LGSW drew information from the Habitat Survey of Wales (Blackstock et al., 2010), a comprehensive field-by-field survey. The former included any known examples of MG4 which, within a single site, formed at least 0.5 ha,
Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)

<table>
<thead>
<tr>
<th>Issue</th>
<th>WALES</th>
</tr>
</thead>
</table>

Together with smaller stands where they occurred in association with other grasslands of high conservation value.

Although the data together are considered to give comprehensive coverage of the region, there are some potential deficiencies (although it is not known if these would affect 10km square distribution), for example:

1. Small isolated stands of the habitat (under 0.5 ha) may not have been specifically targeted for NVC survey.
2. Some examples of H6510 may have been overlooked during Phase 1 survey, for example meadows surveyed after the hay had been cut.

H6510 is known from just seven survey sites in Wales. These were originally surveyed by the LGSW in the period 1989 to 1999, but all apart from one very small (0.1 ha) example were revisited during the 2009 to 2012 period. These revisits confirmed the continued presence of the habitat in every one of the 10 km squares in which it was previously known. There is therefore a high level of confidence that the distribution map is an accurate representation of actual current distribution, notwithstanding the possible presence of overlooked examples of the habitat.

### 1.1.3 Year or period

2009-2012

Although the baseline survey for each site with H6510 is from before 2007, as noted in 1.1.2, the current distribution has been calculated from site revisits between 2009 and 2012.

### 1.1.4 Additional distribution map

False

### 1.1.5 Range map

Please refer to the UK report for this habitat.

### 2.1 Biogeographical region or marine regions

ATL

### 2.2 Published sources


BRIG. 2007. A preliminary Assessment of the implications of climate change for the implementation of UK BAP targets. Report to UK Biodiversity.
### 2.3 Range

<table>
<thead>
<tr>
<th><strong>2.3.1 Surface area Range</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.3.2 Method used Range</strong></td>
<td><strong>Complete survey/Complete survey or a statistically robust estimate</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Refer to audit commentary under 1.1.2.</strong></td>
</tr>
<tr>
<td><strong>2.3.3 Short-term trend Period</strong></td>
<td><strong>No change to the habitat’s distribution has been noted since the initial site surveys for the LGSW (between 1987 and 1999).</strong></td>
</tr>
<tr>
<td><strong>2.3.4 Short-term trend Trend direction</strong></td>
<td><strong>See 2.3.3.</strong></td>
</tr>
<tr>
<td>2.3.5 Short-term trend Magnitude</td>
<td>a) Minimum</td>
</tr>
<tr>
<td>See 2.3.3.</td>
<td></td>
</tr>
<tr>
<td>b) Maximum</td>
<td></td>
</tr>
<tr>
<td>2.3.6 Long-term trend Period</td>
<td></td>
</tr>
<tr>
<td>See 2.3.3.</td>
<td></td>
</tr>
<tr>
<td>2.3.7 Long-term trend Trend direction</td>
<td></td>
</tr>
<tr>
<td>See 2.3.3.</td>
<td></td>
</tr>
<tr>
<td>2.3.8 Long-term trend Magnitude Optional</td>
<td>a) Minimum</td>
</tr>
<tr>
<td>See 2.3.3.</td>
<td></td>
</tr>
<tr>
<td>b) Maximum</td>
<td></td>
</tr>
<tr>
<td>2.3.9 Favourable reference range</td>
<td>a) Value in km²</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Operator</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>c) FRR is unknown</td>
<td>False</td>
</tr>
<tr>
<td>d) Method used to set FRR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3.10 Reason for change</td>
<td>a) Genuine change?</td>
</tr>
<tr>
<td>Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to:</td>
<td></td>
</tr>
<tr>
<td>See 2.3.3.</td>
<td></td>
</tr>
<tr>
<td>b) Improved knowledge/more</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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### 2.4 Area covered by habitat

<table>
<thead>
<tr>
<th>2.4.1 Surface area</th>
<th>Value in km²</th>
<th>0.1072</th>
</tr>
</thead>
</table>

The current total area is considered to be an accurate reflection of the habitat's presence in the region. The area is based on high quality data from NVC surveys and coverage is comprehensive, although, as described in 1.1.2, some areas of the habitat may have been overlooked or were too small for inclusion in detailed surveys. Although no new sites for the habitat have been detected since 2007 and no sites lost, the total extent has increased due to an actual increase in community area at two sites due to improved habitat management. MG4 is a grassland community of quite specific environmental conditions, and relatively small changes in, for example, hydrology and management can alter vegetation patterning and community spatial distribution within sites.

<table>
<thead>
<tr>
<th>2.4.2 Year or period</th>
<th>2004-2012</th>
</tr>
</thead>
</table>

The data used to produce the total area figure are from NVC vegetation maps from the period 2004 to 2012, apart from one site with a tiny area (0.1 ha; less than 1% of the total extent) surveyed in 1995.

<table>
<thead>
<tr>
<th>2.4.3 Method used Area covered by habitat</th>
<th>Complete survey/Complete survey or a statistically robust estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>See 1.1.2.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.4.4 Short-term trend Period</th>
<th>2001-2012</th>
</tr>
</thead>
</table>

Revisits to survey sites in the 2001 to 2012 period (six out of seven sites) have revealed an overall increase in extent of H6510 over the period. This comes from increase in area at two (adjacent) sites; at one other site, the area of the community has apparently undergone flux over the period (decreasing initially before increasing again to approximately its 2001 level).

<table>
<thead>
<tr>
<th>2.4.5 Short-term trend Trend direction</th>
<th>increase</th>
</tr>
</thead>
</table>

See 2.4.4.

<table>
<thead>
<tr>
<th>2.4.6 Short-term trend Magnitude a) Minimum</th>
<th>23</th>
</tr>
</thead>
</table>
A notable decline in area was recorded at one H6510 site in the longer time period. Although this site has partially recovered since, overall this has meant a small decrease in total extent of the habitat over the 1989-2012 period.

A slight decrease at less than 1% per year has been recorded for the long term period, due to loss of habitat at one site (see 2.4.8), although some recovery at this site has now been observed. It is also worth noting that no new areas of the habitat have been found in Wales in recent years.

Revisits to sites over the 1989 to 2012 period: six out of seven sites have had one or more visit in this period since the baseline survey (only one very small site – 0.1 ha – not revisited).
Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) WALES

<table>
<thead>
<tr>
<th>d) Method used to set FRA value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The past distribution of this habitat in Wales (prior to detailed survey work in the 1987-2004 period) is unknown. However, small fragments of grassland resembling the habitat have been recorded more widely than the current distribution and suitable hydrological and edaphic conditions probably occur on lowland floodplains through much of the region, particularly in the eastern districts, but also at least locally in the west. Typical plant species of the habitat (such as Sanguisorba officinalis and Thalictrum flavum) have wider current or past distributions on floodplain land in Wales, also perhaps suggesting a much wider H6510 distribution and extent previously.</td>
</tr>
</tbody>
</table>

Remnant examples of the habitat are now highly fragmented in Wales, but it is not clear what area, configuration and connectivity the habitat needs to be considered favourable.

<table>
<thead>
<tr>
<th>2.4.13 Reason for change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the difference between the reported value in 2.4.1 and the previous reporting round mainly due to:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>a) Genuine change?</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) Improved knowledge/more accurate data?</td>
<td>False</td>
</tr>
<tr>
<td>The difference in surface area between the 2007 and 2013 reporting rounds is mainly due to an actual increase in habitat area at three sites, the result of more sensitive management at these sites.</td>
<td></td>
</tr>
<tr>
<td>c) Use of different method (e.g. &quot;Range tool&quot;)</td>
<td>False</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.5 Main pressures</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Pressure</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>H = high importance</td>
</tr>
</tbody>
</table>

| A03: mowing / cutting of grassland | H |
| A04: grazing | H |
| H04: Air pollution, air-borne pollutants | H |
| J02: human induced changes in hydraulic conditions | H |
| J03: Other ecosystem modifications | H |
| A08: Fertilisation | M |
| I02: problematic native species | L |
| M01: Changes in abiotic conditions | L |
| M02: Changes in biotic conditions | L |
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A04 – grazing (HIGH). In CCW’s ‘Actions Database’ (see 2.5.1), grazing is highlighted as an issue in 43% of management units on sites with the habitat as a key feature; Grazing type/timing and overgrazing are implicated.

J02 – human induced changes in hydraulic conditions (HIGH). Drainage issues were highlighted for 29% of units. Two of the key (largest) sites for the habitat in Wales have wetted up somewhat in recent years, which could lead to a reduction in the H6510 habitat. There is currently a shortage of understanding regarding the hydrology of individual sites.

A03 – mowing/cutting of grassland (HIGH). Insufficient cutting was highlighted for 29% of units. Two of the key sites are affected.

H04 - air pollution, air-borne pollutants (HIGH). On a GIS system, the area of the habitat was overlayed onto Nitrogen exceedance data at 5 km resolution (2009 data): exceedance of the Critical Load (at 20kg N/ha/yr) was then calculated as being across 60% of the habitat.

J03 - other ecosystem modifications (HIGH). This refers to habitat fragmentation. This habitat is highly fragmented, mainly by improved grassland. The potential for genetic exchange would seem to be very low.

A08 – fertilisation (MEDIUM). Fertiliser was highlighted as an issue for 14% units. This is the suspected cause of the loss of habitat at one site in the long-term period.

I02 – problematic native species (LOW). Although not highlighted in the ‘Actions Database’, spread of Filipendula ulmaria and Carex acutiformis is a local issue, largely related to insufficient cutting and drainage issues.

M01 - changes in abiotic conditions (LOW). Climate change.
M02 - changes in biotic conditions (LOW). Climate change.

2.5.1 Method used – pressures based exclusively or to a larger extent on real data from sites/occurrences or other data sources

Data held in CCW’s Special Sites ‘Actions Database’, which provides information on ‘issues’ affecting habitats and species within the protected sites series in Wales, were used to provide a basis for quantifying pressures/threats relating to the habitat within protected sites. Data are provided at a ‘feature’ level; examples of H6510 habitat correspond with the ‘neutral grassland’ SSSI feature type. A list of the issues affecting all of the management units containing H6510 in Wales was obtained and counts made of how frequently each issue was highlighted. Issues were considered for their relevance to the habitat (see Guest (2012a) for more details). The ‘special sites’ (SSSI) account for 100% of the H6510 resource in Wales by area.

Air pollution (N deposition) is assessed separately using a defined approach (Guest, 2012 (b)). Assessment of climate change effects (M01 & M02) used the Biodiversity Reporting and Information Group assessment for the habitat (BRIG, 2007).

2.6. Main threats

<table>
<thead>
<tr>
<th>a) Threats</th>
<th>b) Ranking</th>
<th>c) Pollution qualifier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H = high importance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M = medium importance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L = low importance</td>
<td></td>
</tr>
</tbody>
</table>

H = high importance
M = medium importance
L = low importance
Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)

WALES

Threats were assessed as for pressures (see 2.5.1), and each issue judged as to whether it appears likely to still be relevant in the near future and at what level. Recent and intended changes to H6510 site management regimes were taken into account and the level of some threats downgraded accordingly.

**2.6.1 Method used – threats**

<table>
<thead>
<tr>
<th>Threat Category</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>H04: Air pollution, air-borne pollutants</td>
<td>H</td>
</tr>
<tr>
<td>J02: Human induced changes in hydraulic conditions</td>
<td>H</td>
</tr>
<tr>
<td>J03: Other ecosystem modifications</td>
<td>H</td>
</tr>
<tr>
<td>A03: Mowing / cutting of grassland</td>
<td>M</td>
</tr>
<tr>
<td>A04: Grazing</td>
<td>M</td>
</tr>
<tr>
<td>M01: Changes in abiotic conditions</td>
<td>M</td>
</tr>
<tr>
<td>A08: Fertilisation</td>
<td>L</td>
</tr>
<tr>
<td>I02: Problematic native species</td>
<td>L</td>
</tr>
<tr>
<td>M02: Changes in biotic conditions</td>
<td>L</td>
</tr>
</tbody>
</table>

J02 – human induced changes in hydraulic conditions (HIGH). Drainage issues remain critical to H6510 site integrity and there remains a shortage of understanding regarding individual site hydrology. H04 - air pollution, air-borne pollutants (HIGH). On a GIS system, the area of the habitat was overlayed onto Nitrogen exceedance data at 5 km resolution (2020 data): exceedance of the Critical Load (at 20kg N/ha/yr) was then calculated as being across 58% of the habitat. J03 - other ecosystem modifications (HIGH). The habitat seems certain to remain highly fragmented, and the potential for genetic exchange therefore very low. A04 – grazing (MEDIUM). Current grazing issues on sites are largely being dealt with, although there are ongoing difficulties maintaining appropriate grazing. A03 – mowing/cutting of grassland (MEDIUM). Current issues are now largely being dealt with, but general difficulties maintaining appropriate cutting regimes remain. M01 - changes in abiotic conditions (MEDIUM). Climate change. Threat level increased from pressure level as this habitat is particularly at risk from changes in water levels and especially summer flooding events, which may be in a period of greater frequency in northern Europe (Sutton & Dong, 2012). The threat level here is a best guess and it is conceivable this could become a high risk in the future. A08 – fertilisation (LOW). Current issues are apparently largely dealt with and it is thought that SSSI protection should prevent overuse of fertilisers, although this issue remains a possible threat in view of the potential for permanent loss of the habitat. I02 – problematic native species (LOW). Becoming less of an issue, although Carex acutiformis still present locally. M02 - changes in biotic conditions (LOW). Climate change.
Air pollution (N deposition) is assessed separately using a defined approach (Guest, 2012 (b)). Assessment of climate change effects (M01 & M02) used the Biodiversity Reporting and Information Group assessment for the habitat (BRIG, 2007) along with an assessment of recent trends.

### 2.7 Complementary information

#### 2.7.1 Typical species
(as used in the assessment of Structure and function)

#### 2.7.2 Typical species – method used

#### 2.7.3 Justification of % thresholds for trends

#### 2.7.4 Structure and functions
- Methods used

| Estimate based on partial data with some extrapolation and/or modelling |
| Assessment of structure and function within designated sites (SAC and SSSI) is mainly based on the results of Common Standards Monitoring (CSM; JNCC, 2004; CCW, 2005) visits. |
| Three of the six SSSI supporting the habitat in Wales have been monitored, two in the 2007-12 period and one in the 2001-6 period. The H6510 habitat at each site was considered as unfavourable, although that at one site was only marginally so, and that at another was considered ‘recovering’. Unfavourable condition was due to paucity of positive indicator species and presence of negative indicators. However, five of the six SSSI are currently considered to be under suitable management and are probably now either in favourable condition or are recovering (inferred from recent site surveillance visits, which mostly post-date the CSM visits). |

#### 2.7.5 Other relevant information

| H6510 is highly restricted in Wales and existing examples highly fragmented. The habitat would almost certainly have been much more widespread in the region, particularly in the eastern districts (Stevens et al., 2010). The whole known Welsh resource is on (and in all cases is regarded as a feature on) SSSI and this has successfully prevented short-term loss of the habitat (and even facilitated some recent increase in extent). However, the future prospects for the habitat seem poor without concerted efforts to restore areas of the habitat outside the SSSI network, particularly to bolster existing sites. |
| Two thirds of the mapped area of the habitat is under SSSI Land Agency Agreement, but none is (as of March 2011) under agri- |
environment schemes, so a third of the habitat does not receive specifically targeted management. Data from CCW’s Actions Database indicate that ‘appropriate conservation management’ is in place on 57% of SSSI management units containing the habitat, although this percentage may now be greater (as discussed in 2.7.4).

The current distribution and extent of the habitat in Wales appear to be fairly stable. All sites are on SSSI and suitable management has been introduced or maintained at most sites. The chances of further increase in extent on SSSI are limited by site boundaries and the need for expansion outwith the statutory site network has yet to be fully realised. The potential effects of climate change may be more significant than has been previously realised in view of the susceptibility of the habitat to relatively small changes in hydrological conditions (see 2.6). It may be possible, however, to buffer the affects of nitrogen deposition through limiting manure applications to vulnerable sites. Fragmentation of the habitat, and the effect of that on genetic mixing, is hard to quantify, but may be very significant in the long term.

2.8 Conclusions (assessment of conservation status at end of reporting period)

Please refer to the United Kingdom assessment for this habitat.

3. Natura 2000 coverage & conservation measures - Annex I habitat types

3.1 Area covered by habitat

<table>
<thead>
<tr>
<th>3.1.1 Surface area</th>
<th>a) Minimum</th>
<th>0</th>
</tr>
</thead>
</table>

Complete survey/Complete survey or a statistically robust estimate
### 3.1.3 Trend of surface area within the network

<table>
<thead>
<tr>
<th></th>
<th>stable</th>
</tr>
</thead>
</table>

### 3.2 Conservation measures

Conservation measures taken (i.e. already being implemented) within the reporting period and provided information about their importance, location and evaluation.

<table>
<thead>
<tr>
<th>Measure</th>
<th>3.2.1</th>
<th>3.2.2</th>
<th>3.2.3</th>
<th>3.2.4</th>
<th>3.2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measure</td>
<td>Type</td>
<td>Ranking</td>
<td>Location</td>
<td>Broad evaluation of the measure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a) Legal/statutory</td>
<td>b) Administrative</td>
<td>c) Contractual</td>
<td>d) Recurrent</td>
</tr>
<tr>
<td>1.2: Measures needed, but not implemented</td>
<td>Y</td>
<td>H</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>1.3: No measure known/impossible to carry out specific measures</td>
<td>Y</td>
<td>M</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>2.1: Maintaining grasslands and other open habitats</td>
<td>Y</td>
<td>H</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4.2: Restoring/imp roving the hydrological regime</td>
<td>Y</td>
<td>H</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>6.3: Legal protection of habitats and species</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>H</td>
<td>Y</td>
</tr>
</tbody>
</table>

In Wales, there is no H6510 on SAC, but 100% is a SSSI feature; 66% of the total is under SSSI.
Land Agency Agreement, but none is covered by agri-environment scheme agreement (see 2.7.5). There is potential to expand the resource outwith the SSSI network and the habitat is specifically highlighted in Glastir agri-environment prescriptions, but there is currently a lack of focussed restoration work.

Notes specific to conservation measures:
1.2 A third of the habitat does not receive specifically targeted management (see above). Minimal work has been undertaken to expand the resource outwith statutory sites, and much more work is required.
1.3 Habitat changes due to climate change.
2.1 Specific management measures required and maintained: traditional hay meadow management with appropriate aftermath grazing.
4.2 Managing water levels on sites: Manipulation of drainage to allow flood water to enter and leave at one site.
6.3 This is an ongoing requirement and is very probably the underlying reason the habitat has increased in area in recent years (see 2.4.4).