

Eyes on the prize: will our grassland restoration targets deliver the desired environmental benefits?

**Clare Pinches, Senior Specialist Grasslands
Natural England**

- Where do we get our targets for grassland restoration from?*
- How do we identify locations with the most potential for grassland restoration and expansion?
- How can we increase the likelihood of success? (Steve P to cover evidence to delivery tomorrow)
- How do we know when we're achieving our targets? When is good, good enough?
- Should the grassland outcomes we're seeking be less prescriptive, e.g. grounded in functional ecology? Seeking more structural diversity/ecotones?
- Should other factors, public access and enjoyment opportunity be considered?

Where do we get our targets for grassland restoration and expansion?



Outcome 1B. More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in the overall extent of priority habitats by at least 200,000 ha

Aims:

- to reverse species declines (Outcome 3) by increasing total area of PH;
- to ensure the right type of habitat is delivered in appropriate places (type, extent and pattern of PH are all important in restoring biodiversity and delivering other ecosystem services);
- to reduce level of fragmentation.

Progress to date - 60,377 ha (Nov 2015)



Where do we get our targets for grassland restoration and expansion? (cont.)



Outcome 1 B encompasses:

- No net loss (no loss for irreplaceable habitats)

AND

Increase in extent through:

- Restoration – management of degraded habitat which no longer meets the definition of priority habitat (MG6, MG9, MG10 etc for grassland)
- Expansion (re-creation) – establishment of priority habitat where it is not present and where no significant relicts of the habitat currently exist (MG7 – grassland leys and arable)



Breaking down the 200,000 ha target – how much of each PH habitat?



Four principles were used to underpin framework for provisional breakdown:

- 1) Aim to create sufficient habitat to reverse species declines (if we know how much habitat a particular species or species groups need)
- 2) Give high priority to replacing habitats lost most recently (particularly degraded habitats)
- 3) Lower priority should be given to increasing the area of habitats for which large un-fragmented areas remain (Outcome 1A improving condition priority)
- 4) Recognise ecological and practical constraints to expansion and restoration

How much of each Priority grassland type?



Priority habitat	Indicative increase	Increase category	% increase from baseline extent
Lowland calcareous grassland	10,000	B - habitats which have experienced a severe recent decline in extent (<75% in the past 50 years) and for which significant opportunities exist to restore and expand	15-25%
Lowland dry acid grassland	8,000		
Lowland meadows	7,000		
Purple moor grass and rush pasture	5,000		
Upland hay meadows	300		
Coastal and floodplain grazing marsh	15,000	D - habitats for which the priority is to improve condition rather than increase extent - because either extensive tracts of the habitat remain or because there are few opportunities for expansion due to physical or ecological constraints	0-5%
Upland calcareous grassland	750		
Calaminarian grassland	0	E - Irreplaceable habitat	0%

- Increases should be delivered in ways consistent with enhancing ecological networks in line with local landscape delivery visions and aligned with Countryside Stewardship priorities

How do we identify locations with the most potential for restoration and expansion?



Various approaches (generic)

- **Network Models e.g. Condatis, Least-cost Ecological Network Model**
- **Local Ecological Networks - NPPF**
- **Local landscape scale projects – e.g. NIA**
- **Local opportunity maps**
- **Wetland Vision maps**

- **T & F group 2 developed breakdown of national targets by National Character Areas (NCAs) for consideration/discussion based on National Significance of each NCA for each habitat, size of the NCA and fragmentation index. This provided reasonable match with target NCAs but imperfect match with NIAs Nature Improvement Areas.**

NE's Maximising Land use Change Project



Aims to identify priority locations for creation and restoration of non-woodland habitats which deliver for biodiversity and WFD (align these to Forestry Commission's Woodland for Water Maps) using

1. Habitat potential maps (supplementing existing 1D approach identifying suitable soils and topography)

2. Habitat creation maps based on fragmentation data (Climate Change Vulnerability Mapping Represents the areas of habitat that are most fragmented and also close to each other (best opportunity to enhance the network)

3. Habitat restoration data - using existing data to identify potential sites with degraded habitat (Biodiversity 2020 1B) based on existing non-priority habitat from the PHI, Land use categories from Landcover 2007 and existing knowledge of known locations

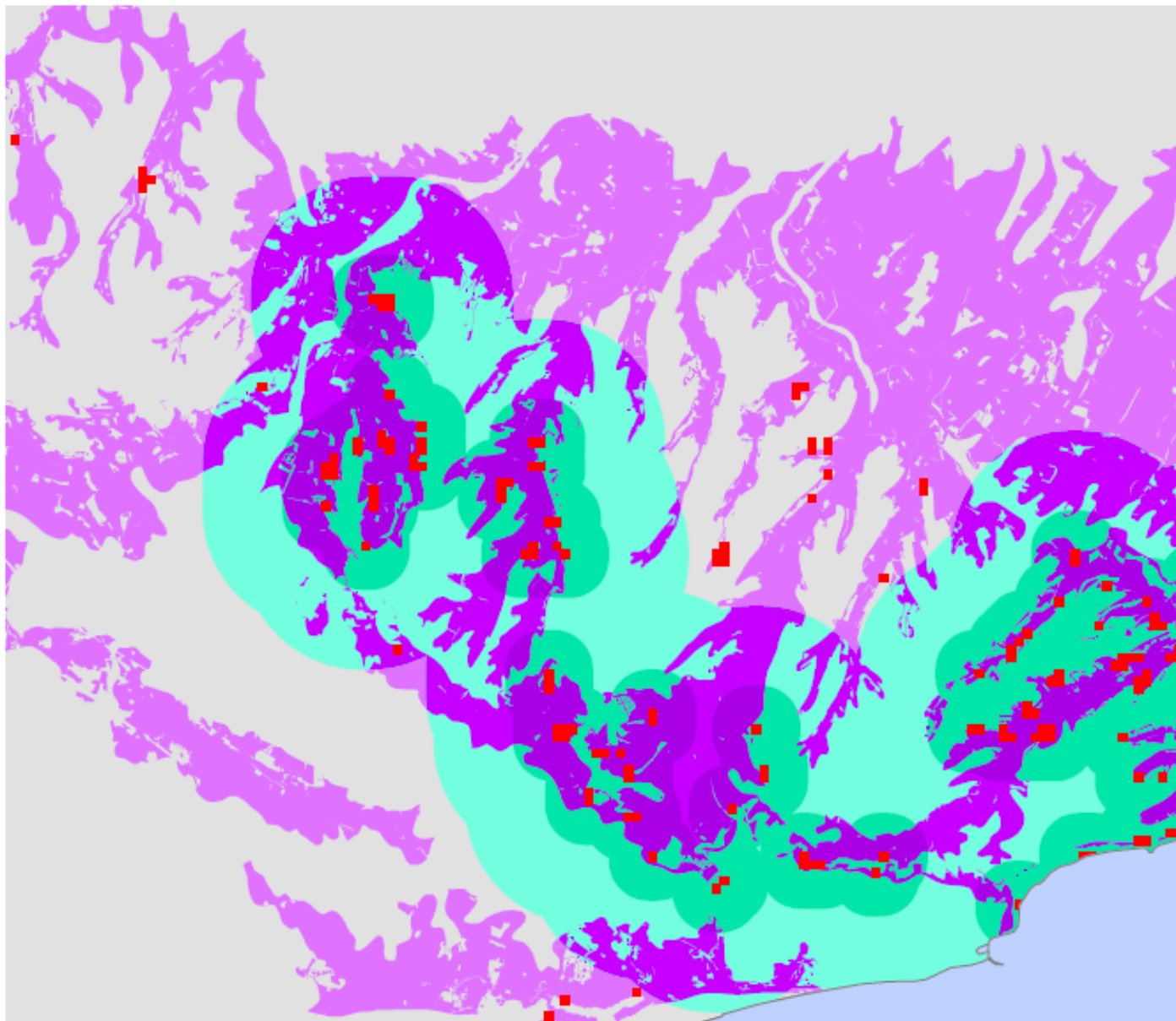


Maximising land use change project



- **Currently consulting on and testing maps to see how they can help to target habitat creation and restoration e.g. within in Focus Areas or to improve ecological networks**
- **Recognition that for any parcel of land there could be a variety of end points in terms of priority habitat**
- **Inclusion of data on SACs identified under IPENS project and data on important S41 species with each NCA helps to refine the palette and inform selection of target habitat type.**

Habitat Creation – Lowland Calcareous Grassland



Lowland Chalk
Grassland
1 & 2km 'habitat
creation areas'
withiin Calcareous
Grassland Potential
Areas

North Kent area

Legend

- LCG_High Frag/High Prox
- LCG1k within CGpotential
- LCG2k within CGpotential
- LCG1km_Creation_Areas
- LCG2km_Creation_Areas
- Chalk Grassland Potential

0 0.5 1 2 Miles
|-----|-----|-----|-----|

How can we increase the likelihood of success?



- **Realising potential and determining site suitability**
- **Target to low soil phosphorus sites ADAS index 0 or (or very stressed sites)**
- **Implement sufficiently interventionist management (e.g. introduction of green hay, wildflower seed, significant changes to grazing management)**
- **Secure and sustain the commitment and enthusiasm of the agreement holder**



How do we know when we're achieving our targets? When is good, good enough?

Key 2a: Key to identify semi-improved (Go2) and species-rich grasslands

Do **at least two** of the following apply?¹

- Cover of rye-grasses and white clover is less than 10%.
- The sward is species-rich (more than 15 vascular plant species/m², including grasses).
- There is high cover of wildflowers² and sedges (more than 30%), excluding white clover, creeping buttercup and injurious weeds³.

YES →

The field holds **species-rich grassland** and is likely to be either existing priority habitat, or restorable to priority habitat.

Refer to **key 2b** below to identify the priority habitat.

A wide range of grass species may be present, including blue moor-grass, crested hair-grass, heath-grass, meadow oat-grass, sheep's fescue, tor-grass, upright brome, quaking grass and yellow oat-grass in addition to the more commonly occurring grasses typical of semi-improved grassland (see below).

NO

Do **at least two** of the following apply?

- Cover of rye-grasses and white clover is less than 30%.
- The sward is moderately species-rich (9–15 species/m², including grasses).
- The cover of wildflowers¹ and sedges, excluding white clover, creeping buttercup and injurious weeds, is 10% or more.

YES →

The field holds **semi-improved grassland (G02)**.

- More species-rich examples (refer to **Key 2b** below) may be a feature targeted in some regional theme statements.
- If there is rough or rushy grassland within an SDA, check existing or potential value as a habitat for breeding waders.
- There may also be potential for restoration to a grassland priority habitat (refer to **Key 2c**).

Typical grass species are cock's-foot, common bent, crested dog's-tail, false oat-grass, meadow fescue, meadow foxtail, red fescue, sweet vernal grass, Timothy and tufted hair-grass.

NO

Do **at least two** of the following apply?

- Cover of rye-grasses and white clover is more than 30%.
- The sward is species-poor (up to 8 species/m², including grasses).
- There is low cover of wildflowers¹ and sedges (less than 10%), excluding white clover, creeping buttercup and injurious weeds.

YES →

The field holds species-poor **Improved grassland (G01)**

- There may be potential for restoration to a priority grassland habitat (see **Key 2c**).

Typical grass species are cock's-foot, Italian rye-grass, perennial rye-grass, rough-stalked meadow-grass, Timothy and Yorkshire-fog.

NO

The field may be a non-grassland habitat, e.g. lowland heath or fen.

¹ Whilst these criteria generally hold true for most species-rich grassland, some lowland acid grasslands may be naturally species-poor and/ or be dominated by grasses and lower plants. Some purple moor-grass and rush pasture swards may not meet these criteria especially where grazing is intermittent or has been abandoned. If on soils where these habitats might occur, check whether indicator species are present and frequency thresholds for features G05 or G07 are met.

² The term 'wildflowers' is used here to mean broadleaved herbs, sedges and rushes. Plants may not all be in flower at the time of the survey.

³ Injurious weeds are creeping and spear thistles, broad-leaved and curled dock and common ragwort.

Key 2b Key to identify grassland priority habitat and grassland restorable to priority grassland status

From **key 2a** species-rich grassland

The field holds **species-rich grassland**. Refer to the tables on the following pages to help identify the possible priority habitat grassland type, eg upland hay meadow.

For the identified priority habitat type, are the required number of wildflower indicators present at or above the threshold frequency (see Tables 2–8)?

NO

YES

Are four indicator species from a priority habitat feature list present, but below the threshold frequency (see Table 2-8), or are three indicator species at least occasional?

The field holds **good-quality species-rich grassland**, which should be recorded in the eBEHTA Environmental Feature Data Sheet as a **grassland priority habitat feature**. (It is eligible for GS6.)

YES

From **key 2a** Semi-improved grassland

The field holds **good quality semi-improved or degraded grassland of high species-richness** which should be recorded in the notes column of the eBEHTA Environmental Feature Data Sheet as **G02* restorable to the appropriate grassland priority habitat feature**. You should also capture no and frequency of priority grassland indicators present in this column. This grassland has high potential for restoration and should ideally be brought into GS7. **Key 2c** may help you make this judgement.

NO

The field holds **semi-improved grassland of moderate species-richness**¹

Are five semi-improved grassland wildflower indicators (see Table 1 below) and/ or priority grassland indicator species (where the grassland priority habitat feature definitions, as set out in boxes above, are not met) at least occasional in the sward?

- In some circumstances, semi-improved grassland can be restored to a target habitat. Please refer to **Key 2c** to help determine if this may be relevant to the area of grassland.
- In some areas of the country, the maintenance of semi-improved grassland may be a target. See the relevant targeting or theme statement for further details.

NO

YES

The field holds species-poor **semi-improved grassland**.

The field holds good-quality **semi-improved grassland** of moderate species-richness.

¹ In wet grassland with a bulky sward, which includes a number of wildflowers and occasional to frequent rushes and sedges, and where cover of rye-grasses and white clover cover is less than 10%, check for the number and frequency of indicator species of purple moor-grass and rush pasture and lowland meadow and pasture and record as such if the criterion is met. Similarly, in short swards on sandy soils check the number and frequency of indicator species of lowland dry acid grassland. In such swards, there may be fewer than 15 species per square metre and less than 30%

Could we take a different approach?



Should the grassland outcomes we're seeking be less prescriptive?

- Good argument for having more flexible end point based on functional ecology
- Is it flower rich, structurally interesting and providing good invertebrate habitat?
- Are there a sufficient number and frequency of plant species indicative of low nutrient/high stress situations?



Not seeking fit to a priority grassland type, even less an NVC type – but still a need for grassland to attain a certain quality level based on plant species present?

Should the grassland outcomes we're seeking be less prescriptive? (cont)



For certain very low P sites (former quarries, gravel workings, some arable?) strong argument to allow natural regeneration (no seed introduction)

BUT on most ex-arable land, or on existing grassland sites where competition effect from weeds, crop volunteers or existing vegetation is high – the short term of AE agreements dictates that we often have to secure rapid restoration through significant management intervention.

Seed introduced will influence resultant grassland type.



Could we take a different approach?



“Keeping the wild in wildflower” debate - Plantlife

“ In our rush to save wildlife, we are forgetting that our wild flora is an integral part of that wildlife....To relegate wild flowers entirely to a 'nectar' or 'seed' mix is to miss the point that they are as much a part of our local natural and cultural heritage as butterflies, birds and bees. For example, there is a world of difference between enjoying otters in your local wildlife park to coming upon them in the wild; and so it is between enjoying, say, bluebells planted prettily in someone's garden to standing in a spring woodland shimmering with wild bluebells.” Dr Deborah Long

Could we take a different approach?



- Concern that standard generic meadow mix risks homogenising our countryside – reliance on usual suspects.
- Most of our old meadows are much richer and more varied in character – the unique mixtures of flowers helping to define our sense of place.
- Advocates a natural or assisted re-colonisation approach (i.e. encouraging spread of wildflowers via livestock movement, using natural seeding techniques and local seed as much as we can.

Issues

Evidence suggests many sites need a jump start – can we afford to wait? Is this the best use of AES funds?

Is there sufficient local seed to service demand?

Given historic scale of seed introduction, particularly since 1960s are we botanists being too precious about naturalness?

Should other factors, public access and enjoyment opportunity be considered?



How do we know when we're achieving our targets? When is good, good enough?



Grassland Table 2 G04 – Lowland calcareous grassland – priority habitat

Soils and topography	Wildflower indicator species	Species abundance threshold	Typical grasses (do not count as indicator species)
<p>Calcareous soils over chalk and limestone in the lowlands and enclosed upland fringe, generally below 300 m.</p> <p>See note to G08 – Upland calcareous grassland – priority habitat.</p>	betony beautiful St John's-wort bird's-foot-trefoil biting stonecrop bloody crane's-bill carline thistle clustered bellflower common agrimony common rock-rose cowslip dropworts devil's-bit scabious eyebright fairy flax field scabious gentians greater knapweed hairy violet harebell hawkweed oxtongue hoary plantain hoary rock-rose horseshoe vetch kidney vetch lady's bedstraw marjoram milkworts mouse-ear hawkweed orchids ox-eye daisy purple milk-vetch restharrow rough/lesser hawkbit sainfoin salad burnet saw-wort small blue-green sedges small scabious squinancywort stemless thistle thyme-leaved sandwort wild basil	At least two frequent and three occasional in the sward. If either three indicator species are occasional or four are present (but not limited to field corners or edges), then record this as G04 in condition B. Record as failing condition 5 in the notes column.	blue moor-grass cock's-foot common bent crested hair-grass hairy oat-grass meadow oat-grass quaking-grass sheep's fescue tor-grass upright brome yellow oat-grass