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Urban Grassland Conservation

Steve Bolton
Nature Conservation Consultant
BSc MSc



Workshop Agenda

10:00 - 12:00

Presentation & Discussion: *Grassland conservation & ecology, meadow creation, management and monitoring*

12:00 - 12:30

Lunch Break

12:30 - 15:30

Sunny Hill Park - guided walk to look at meadows and grassland and practice monitoring survey

Urban grasslands

Amenity & flowering lawn



Wildflower meadows



Road verges



Wild/neglected greenspaces



Threats and challenges

- Habitat loss
- Use of chemicals
- Development
- Intensive mowing regimes
- Pollution
- Soil compaction
- Invasive species
- Habitat fragmentation

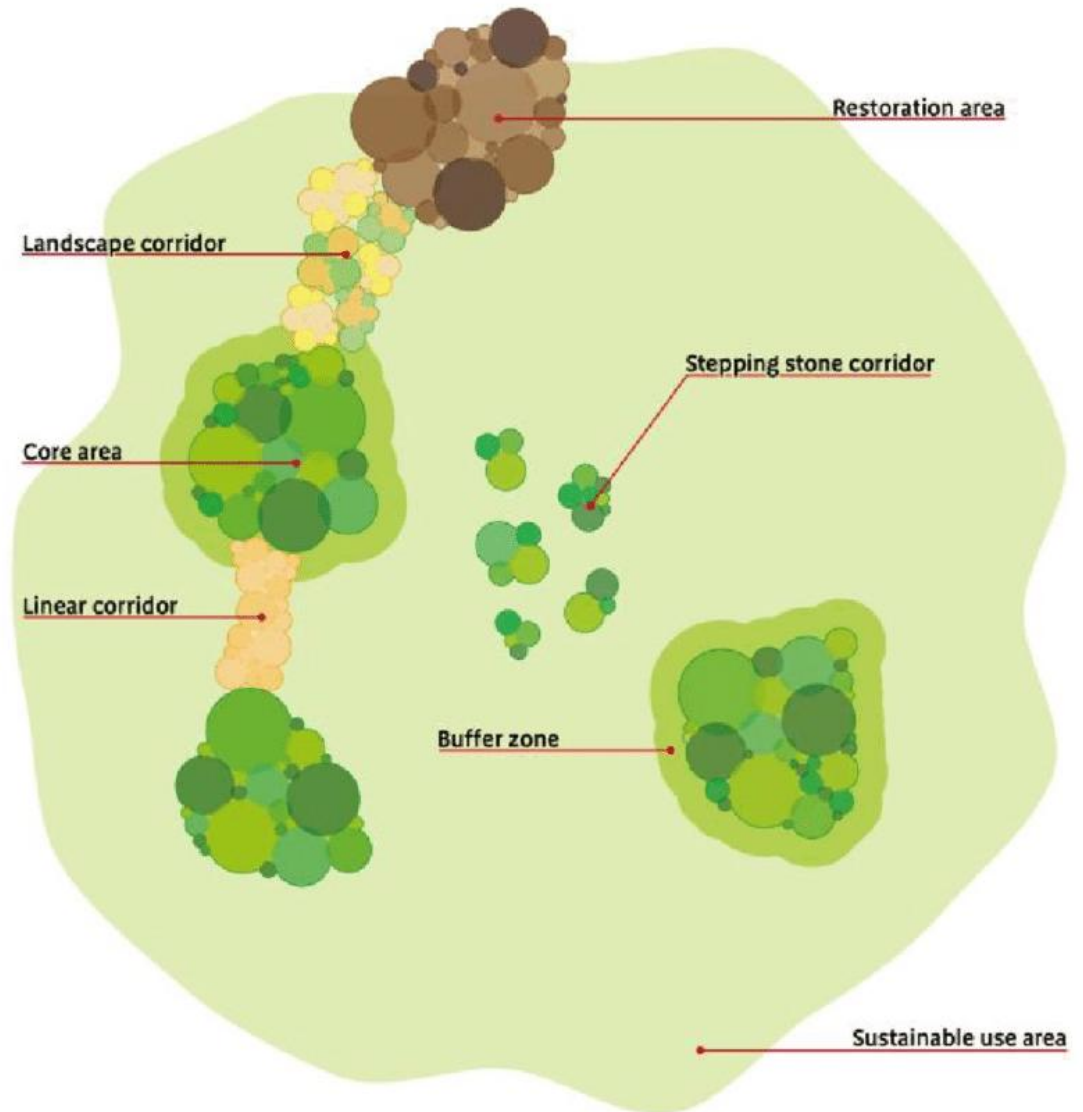


Grassland conservation

Wildlife needs bigger, better, more and joined up places
‘More space for nature to thrive’

Making space for nature: A review of England’s Wildlife Sites and Ecological Network

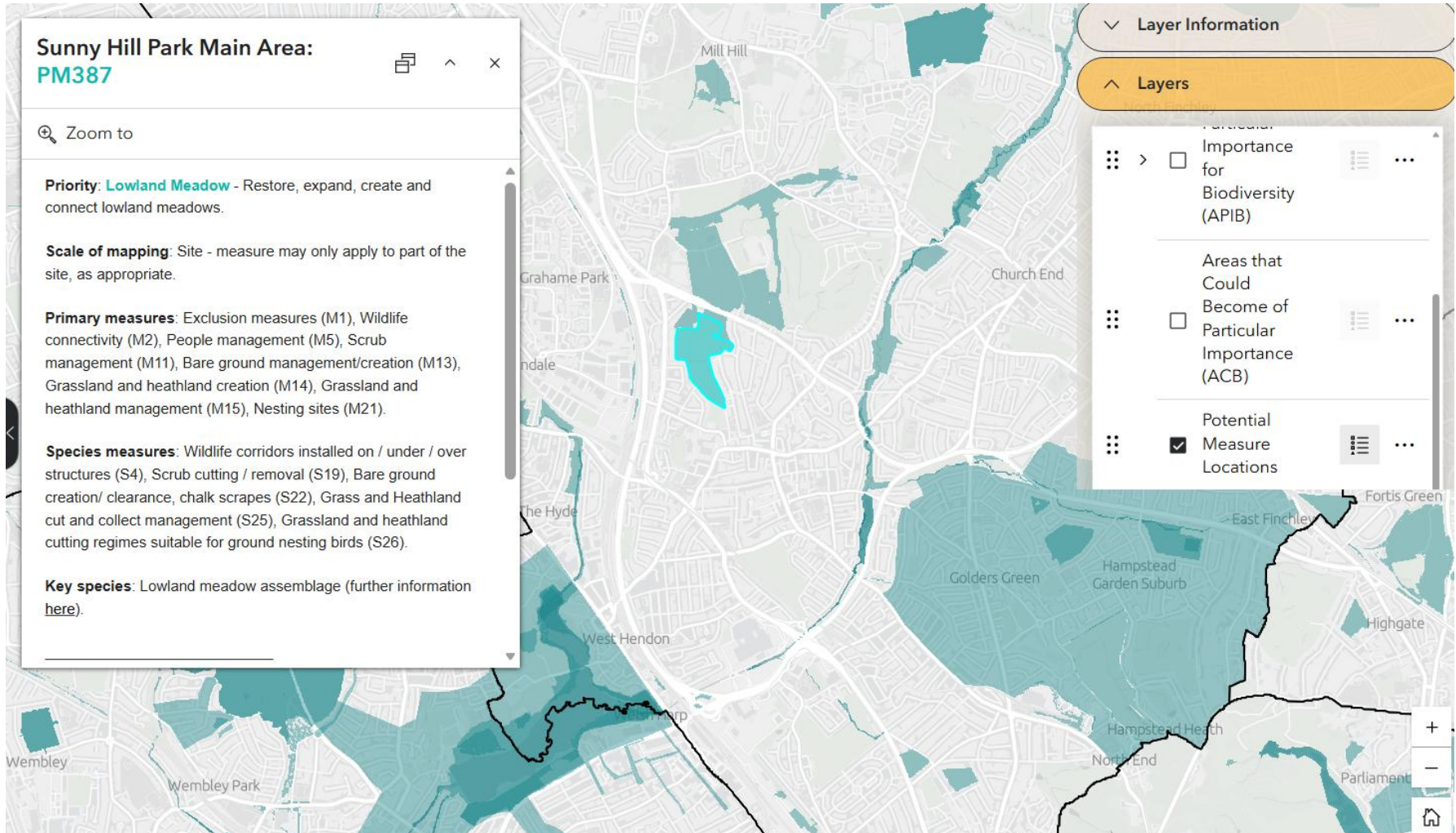
Professor Sir John Lawton CBE FRS
2010



Grassland conservation

London Local Nature Recovery Strategy

Sunny Hill Park – potential meadow restoration



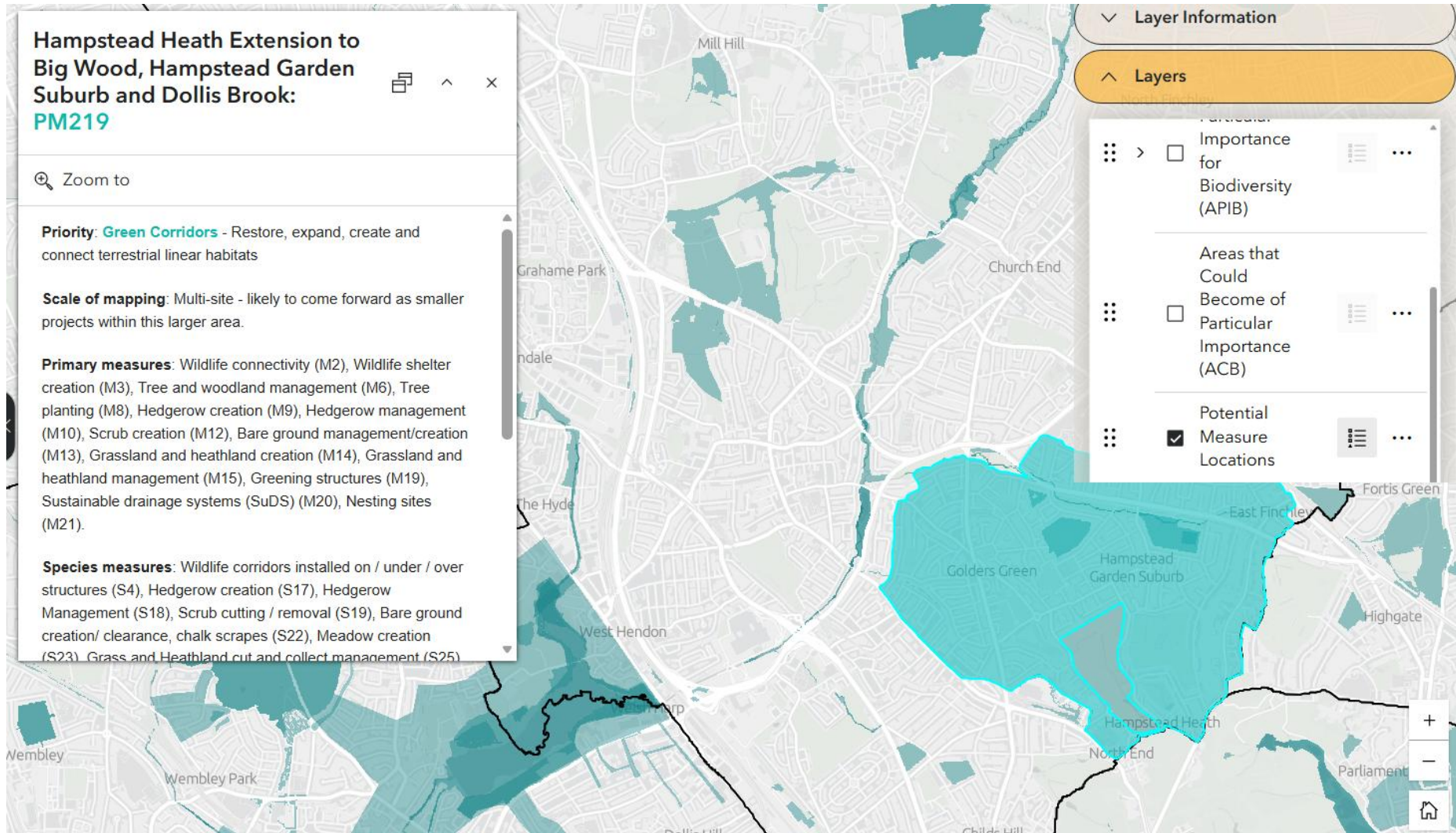
Grassland conservation

LNRS – lowland meadow assemblage

Common name	Taxon	Key species measure	Primary habitat
Common toad	Amphibian	S4 - Wildlife corridors installed on / under / over structures	Standing water
Skylark	Birds	S26 - Grassland and heathland cutting regimes suitable for ground nesting birds	Grassland (other)
Devil's-bit scabiosa	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Dyer's greenwood	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Elecampane	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Fen bedstraw	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Greater burnet-saxifrage	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Imperforate St John's-wort	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Spiny restharrow	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Strawberry clover	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Yellow vetchling	Flowering plants	S25 - Grass and heathland cut and collect management	Lowland meadows
Shrill carder bee	Invertebrates - Bees	S19 - Scrub cutting / removal	Chalk grassland
Andrena pilipes agg.	Invertebrates - Bees	S22 - Bare ground creation/ clearance, chalk scrapes	Grassland (other)
Large garden (ruderal) bumblebee	Invertebrates - Bees	S19 - Scrub cutting / removal	Grassland (other)
Moss carder-bee	Invertebrates - Bees	S19 - Scrub cutting / removal	Grassland (other)
Red-girdled mining bee	Invertebrates - Bees	S22 - Bare ground creation/ clearance, chalk scrapes	Grassland (other)
Red-shanked carder-bee	Invertebrates - Bees	S19 - Scrub cutting / removal	Grassland (other)
Red-tailed (hill) cuckoo bee	Invertebrates - Bees	S19 - Scrub cutting / removal	Grassland (other)
Wall brown	Invertebrates - Butterflies	S25 - Grass and heathland cut and collect management	Grassland (other)
Essex skipper	Invertebrates - Butterflies	S25 - Grass and heathland cut and collect management	Tall grassland
Large skipper	Invertebrates - Butterflies	S25 - Grass and heathland cut and collect management	Tall grassland
Small skipper	Invertebrates - Butterflies	S25 - Grass and heathland cut and collect management	Tall grassland
Small heath	Invertebrates - Butterflies	S25 - Grass and heathland cut and collect management	Grassland (other)
Harvest mouse	Mammals - Terrestrial	S25 - Grass and heathland cut and collect management	Tall grassland

Grassland conservation

LNRS – green corridors



The value of meadows

- Over 700 species of wild plants grow in grassy meadows supporting 1,400 species of invertebrates
- A typical meadow can have 570 flowers per square metre in early summer
- Flower-rich grasslands can store 500% more carbon than pure grass
- Looking at a flower like an Oxeye Daisy for just 6 seconds has been shown to lower your blood pressure

What is a meadow?

'With a mixture of soft grasses and wild flowers reaching above your knees, a traditional meadow is a field or grassy area allowed to grow unhindered until it's cut for hay in late summer.'

- By cutting and mowing at the right time, we can create meadows in our gardens, parks, community spaces and along road verges.
- Any grassy habitat can become a meadow - we just have to let the flowers bloom and set seed, so allowing them to increase year-on-year

Habitat & Species Loss

Since the 1930s, we've lost 97% of our wildflower meadows.

41% of the earth's remaining insects are threatened with extinction.

UK butterflies fell by 46% between 1976 and 2017

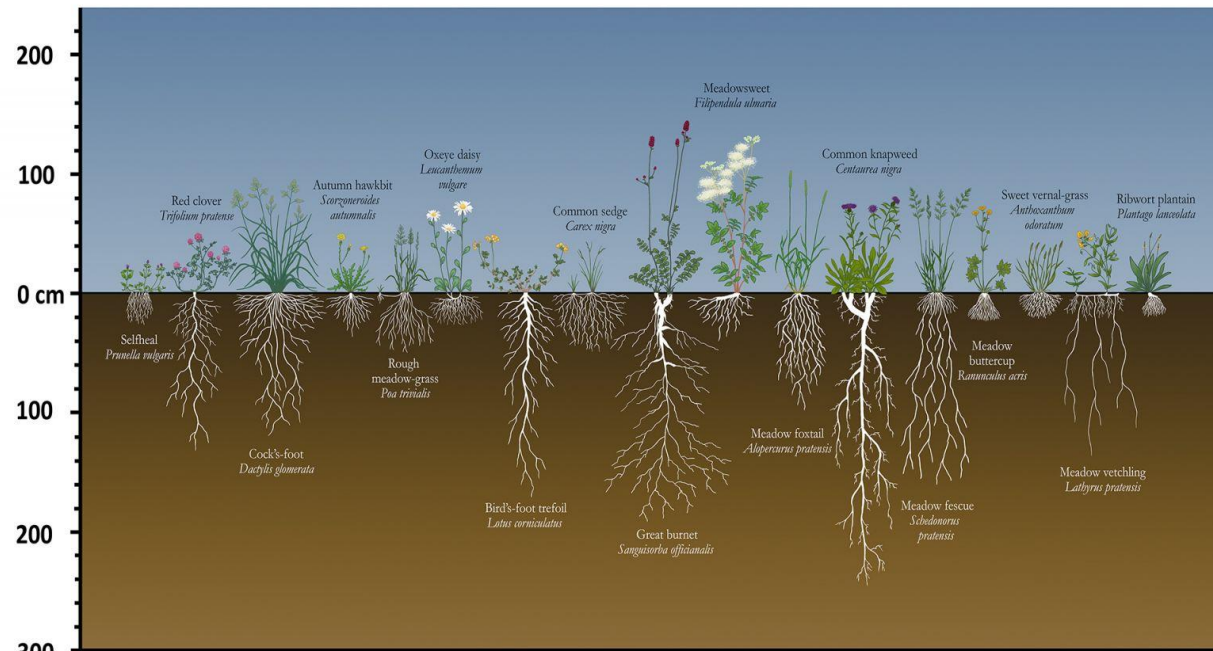
*Insects carry out vital roles –
Pollination, seed dispersal, nutrient
cycling & food for other wildlife*



Photos – Susan Simmonds.
Information Source - Insect Declines & Why They
Matter, (2019) Dave Goulson

Biodiversity Loss & Climate Change

From Shoots to Roots: revealing the above and below ground structure of meadow plants



Natural habitats with multiple species, undisturbed soils and complex root systems **store carbon.**

Consider the opposite of this – monocultures (single species of crops), disturbed soils and manicured lawns!)– Little biodiversity and carbon loss!



www.floodplainmeadows.org.uk www.open.ac.uk/ees
Artwork by Vicky Bowskill with botanical expertise from Dr Irina Tatarenko
© Open University

Grassland ecology

Pea Family: (*Fabaceae*)

Common Bird's
Foot Trefoil



Gorse



Red Clover



Sainfoin



Grassland ecology

Bedstraw Family: (*Rubiaceae*)

Squinancywort



Woodruff



Lady's Bedstraw



Cleavers



Grassland ecology

Daisy Family: (*Asteraceae* a.k.a. *Compositae*)

Daisy



Spear Thistle



Common
Knapweed



Yarrow



Grassland ecology

Dead-nettle Family: (Lamiaceae)

Marjoram



Wild Thyme



White Dead-nettle



Yellow Archangel



Grassland ecology

Carrot Family: (*Umbelliferae*)

Wild Carrot



Wild Parsnip



Cow Parsley



Grassland ecology

To complete their life cycle, butterflies need:

- **Caterpillar foodplants:** species specific, prefer native plants
- **Adult butterfly food resources:** flowers for nectar or aphid honeydew
- **Shelter:** territories, warm conditions, egg and caterpillar development (e.g. tall grass ,shrubs)
- **Over-wintering refuge areas:** For hibernating eggs, caterpillars, chrysalises or adults (e.g. dense vegetation, grass tussocks)

Butterfly Caterpillar food-plants - meadows

- **Common & Sheep's Sorrel**
(Small Copper)



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- **Bird's-foot Trefoil** (Common
Blue and Burnet Moths)



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- **Coarse grasses** e.g. Cock's Foot
(Skippers, Ringlet)



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- **Fine grasses** e.g. Bents, Fescues
(Meadow Brown, Gatekeeper,
Small Heath, Marbled White)



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- **Geranium spp** (Brown Argus)



Grassland ecology

- Our best grasslands for wildflowers, bees and butterflies develop on the poorest soils
- Lots of plants are able to compete for what nutrients are available
- Coarse grasses can't dominate



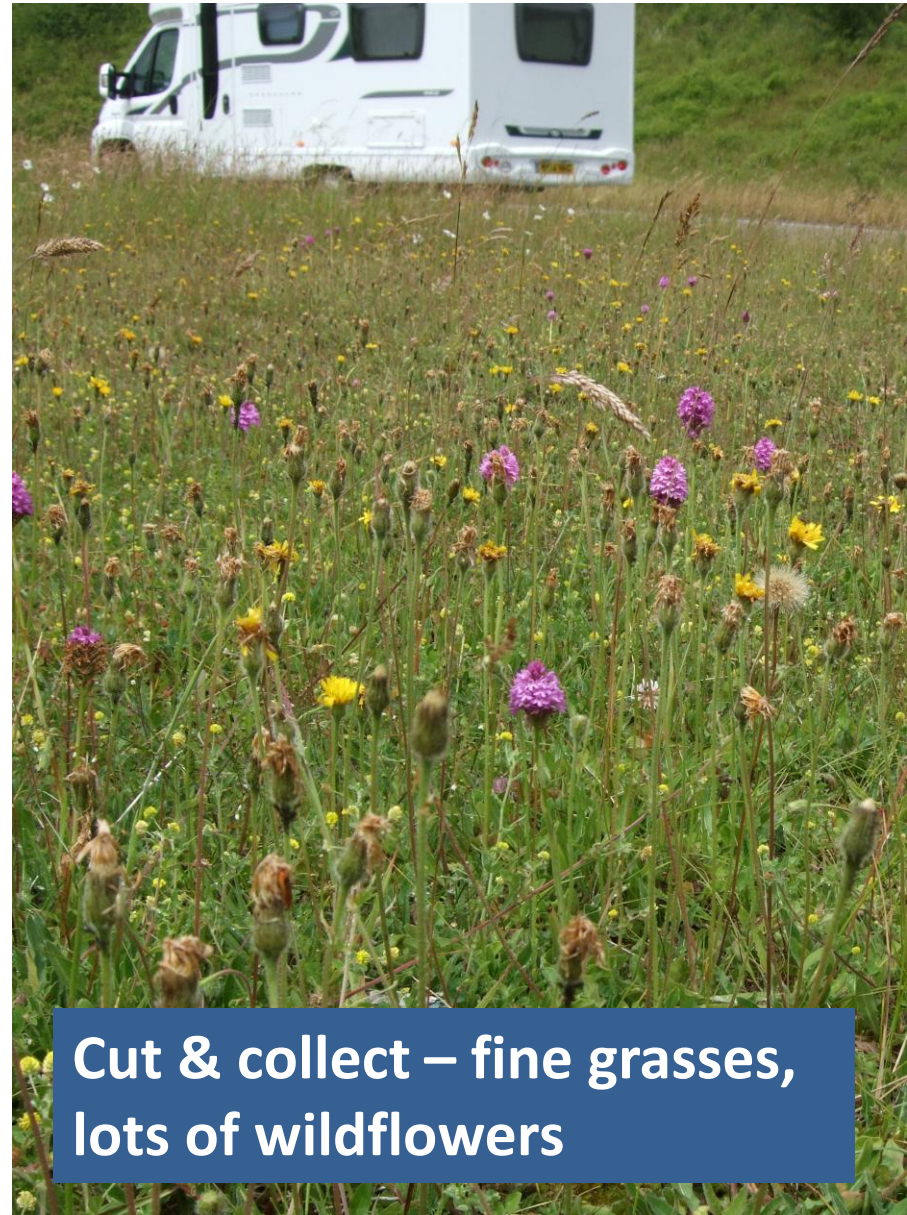
What does soil fertility do to grassland?



Grassland management - 2 systems



Mow & leave arisings – lots of coarse grasses, few wildflowers



Cut & collect – fine grasses, lots of wildflowers

Barnet grassland management

- 20 'No Mow May' sites since 2020
- Amenity grassland cutting frequency reduced from 16 to 8 times from 2025
- 22 sites cut and collected in March and/or September with some refuge areas uncut
- 9 Parks and 6 road verges with 'environmental cut'
- 4 meadow seeding sites
- Tiny Meadow in Hampstead Garden Suburb

West Hendon in house 'environmental cut'



Cut and collecting methods



Assessing soil fertility in urban grasslands



Assessing soil fertility in urban grasslands

Higher fertility

- coarse broad leaved grasses
- few herbs
- thick, no gaps
- cut and leave...



Assessing soil fertility in urban grasslands

Higher fertility



3 OPTIONS

- 1. Repeat cut and collect**
- 2. Turf/topsoil removal**
- 3. Import low nutrients soils**

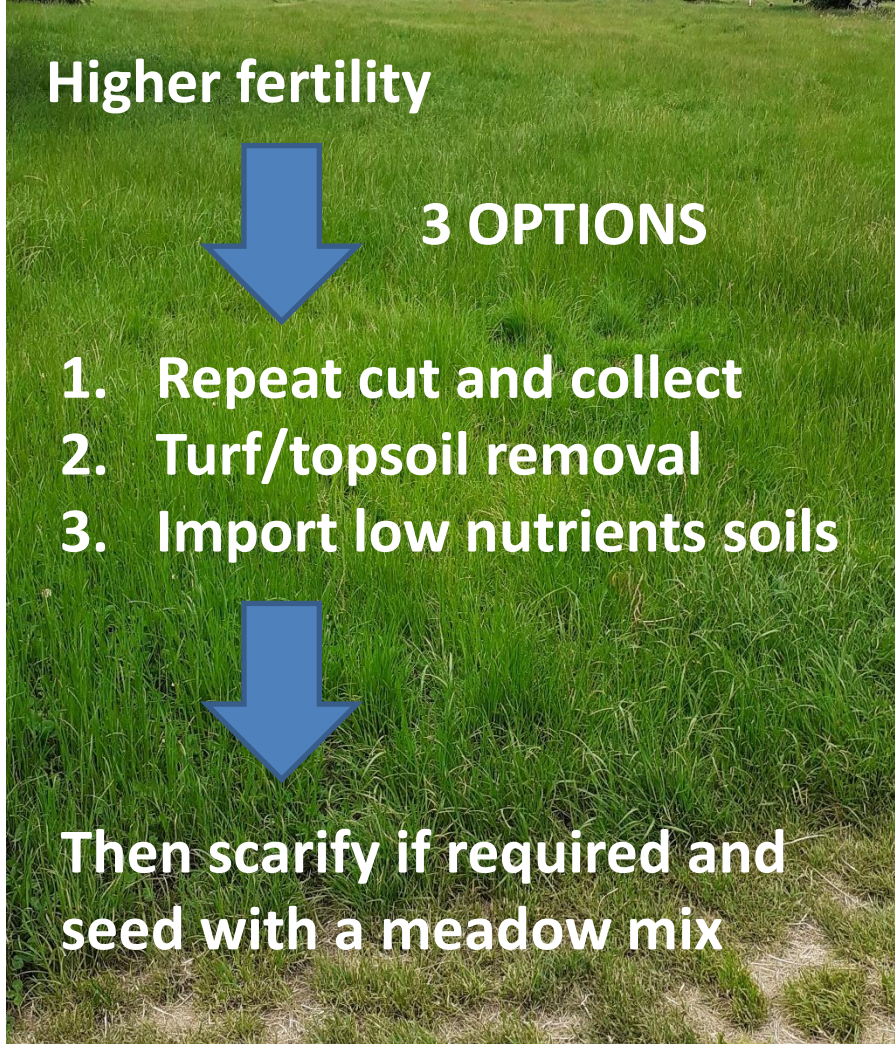


**Then scarify if required and
seed with a meadow mix**

Lower fertility



**scarify and seed
maintain by cut and collect**



Repeat cut and collect method

- Reduce fertility for best results in grass dominated areas
 - Lots of plants can compete for the limited nutrients
 - Infrequent mowing: reduced maintenance and cost
- Repeat cut-and-collect mowing method
 - Let grass grow to 12"+, cut and remove arisings
 - Repeat in approx. April, July and September
 - The nutrients in the leaves are removed
 - Less to cut each time
- Following Sept. cut scarify and seed using a native perennial wildflower meadow mix or green hay
 - Rake, harrow or rotovate to remove thatch and prepare seedbed
 - Sow seeds thinly and lightly rake over
 - Can include annuals for colour and nurse crop
 - 'Yellow rattle' can help but needs to be done in autumn
 - Ideally cut and collect a few times until end of March
 - Late summer cut and collect and another 6-8 weeks later

Pollinator seed mix - Example

20% Native Wildflower Species	
Common Name	Latin name
Cornflower	<i>Centaurea cyanus</i>
Corn Marigold	<i>Glebionis segetum</i>
Corn Poppy	<i>Papaver rhoeas</i>
Field forget-me-not	<i>Myosotis Arvensis</i>
Bird's-foot trefoil	<i>Lotus corniculatus</i>
Teasel	<i>Dipsacus fullonum</i>
Viper's Bugloss	<i>Echium vulgare</i>
Wild mignonette	<i>Reseda lutea</i>
Common Knapweed	<i>Centaurea nigra</i>
Lady's Bedstraw	<i>Galium verum</i>
Field Scabious	<i>Knautia arvensis</i>
Wild Marjoram	<i>Origanum vulgare</i>
Wild red clover	<i>Trifolium pratense</i>
Selfheal	<i>Prunella vulgaris</i>
Red Champion	<i>Silene dioica</i>
Ragged Robin	<i>Silene flos-cuculi</i>
White Champion	<i>Silene latifolia</i>
Hedge Woundwort	<i>Stachys sylvatica</i>
Tufted Vetch	<i>Vicia cracca</i>
Bush Vetch	<i>Vicia sepium</i>
Common Sorrel	<i>Rumex acetosa</i>
Yellow Rattle	<i>Rhinanthus Minor</i>
80% Native fine grasses	
Common Bent	<i>Agrostis capillaris</i>
Crested Dogstail	<i>Cynosurus cristatus</i>
Red Fescue	<i>Festuca rubra</i>
Smooth-stalked Meadow-grass	<i>Poa pratensis</i>

Key Points

- Soil Type & Drainage
- Local Provenance Seed
- Perennials versus Annuals

Meadow establishment - Plantlife

Timetable of meadow flowers

Years after seeding	Plants to begin flowering
1-2	Yellow rattle, eyebright, buttercups, white clover, lesser trefoil, selfheal, common mouse-ear, yarrow, ribwort plantain.
3-4	Oxeye daisy, cat's-ear, hawkbits, common knapweed, red clover, common bird's-foot-trefoil, common sorrel, field scabious, wild carrot, Devil's-bit scabious, Lady's-bedstraw, betony, cowslip, great burnet, ragged-Robin.
5-7	Tufted vetch, meadow vetchling, common spotted orchids, marsh orchids, bee orchid, pyramidal orchid, pepper saxifrage, meadow saxifrage.
7-10	Burnt orchid, green-winged orchid, greater butterfly orchid, dyer's-greenweed, snake's-head fritillary.

<https://www.plantlife.org.uk/wp-content/uploads/2024/02/The-Good-meadow-guide-Plantlife.pdf>



Once regularly mown amenity grass, cut-and-collect started 2017, seeded in autumn 2017, now wildflower meadow in 2019

Fine grasses indicate low fertility - cut and collect in autumn 2022 followed by harrowing (scarification) and seeding



Restoration at Coppetts Wood

- Restored from amenity use
- Funded secured with Friends group
- Harrowing and seeding
- Cut and collect management
- Interpretation
- Monitoring?



Welcome to Coppetts Wood Meadow

Welcome to the Meadow

Wildflower meadows are a key component of English ecosystems, and support biodiversity through habitat provision, pollinator food resources, increasing genetic diversity and improving soil health.

Protecting and restoring wildlife meadows and habitats is therefore crucial for maintaining the health and stability of natural environments.

This wildlife meadow is an important habitat corridor, creating a link between Coppetts Wood Local Nature Reserve and Gleadfields Local Nature Reserve. This green link allows birds, mammals, amphibians, reptiles, and insects to migrate back and forth to both reserves including local gardens and allotments.

Wildflower meadows, when managed correctly, support a diverse mix of wildflowers and grasses such as Common Knopweed (*Centaurea nigra*), Ox-Eye Daisy (*Leucanthemum vulgare*) and Meadow Crane's-bill (*Geranium pratense*).

The flowers act as a food source and provide plants for insects to lay eggs on. This increases the insect abundance and diversity. Many bird and bat species will feed on the insects present in wildflower meadows.

We hope you enjoy this meadow area, but please do not pick the wildflowers, as the insects need them for food.



Caring for people, our places and the planet

You are welcome to enjoy this area, but please do not pick or damage any flowers.
Please email park@barnet.gov.uk to find out about joining the Coppetts Wood Conservationists, who lead on projects such as this to make the nature reserve a better place for people and wildlife. Alternatively refer to the Coppetts Wood Conservationists notice board.



Scarify and seed – low soil fertility?

2024 Tiny Meadow at Henley's
Corner, Hampstead Green
Suburb

Funded by Earthwatch

Scarified by contractor

Seeded by volunteers



Rotovation - Hackney



Topsoil stripping method, Clapham Common



Seeded spring 2022



July 2022

Topsoil stripping and seeding



July 2023

Meadow creation example with mini digger



Mini- meadow creation by community group



Wildflower turf



Use of low fertility soils



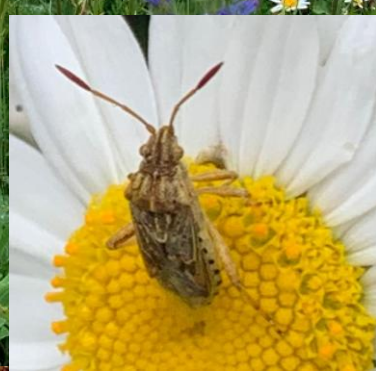
This is a slow growing wildflower meadow

The soil is low nutrient which wild flowers love and this helps to prevent other species taking over

In time it will look beautiful and be a great food source for insects











Maintaining Meadows

Dependant on site conditions, for established species rich sites:

- Cut and collect August/September once most plants have seeded. Ideally another cut 6 weeks later.

AUTUMN IS ONE OF MAIN PERIODS OF WILDFLOWER GERMINATION

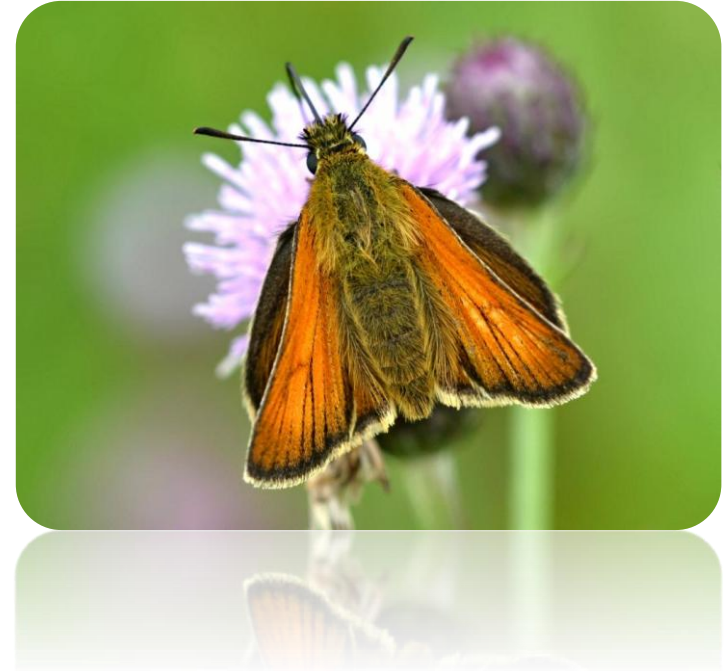
- Avoid cutting grassland too short, as many species require longer vegetation.
- Remove clippings to reduce soil fertility.
- If possible leave mowings to dry and turn to release seed before collecting.

For restoration sites with higher fertility/ grass growth

- Cut and collect late July/August. Then another cut 6-8 weeks later.
- 3rd cut and collect in March.
- Frequency can be reduced.

Maintaining Meadows

- For larger more established sites always leave some part of the site uncut each year as refuge areas
- For example, the caterpillar of the Small Skipper butterfly spends the winter in a dead leaf sheath of the grass Yorkshire-fog.
- Manage scrub in autumn/winter to prevent encroachment

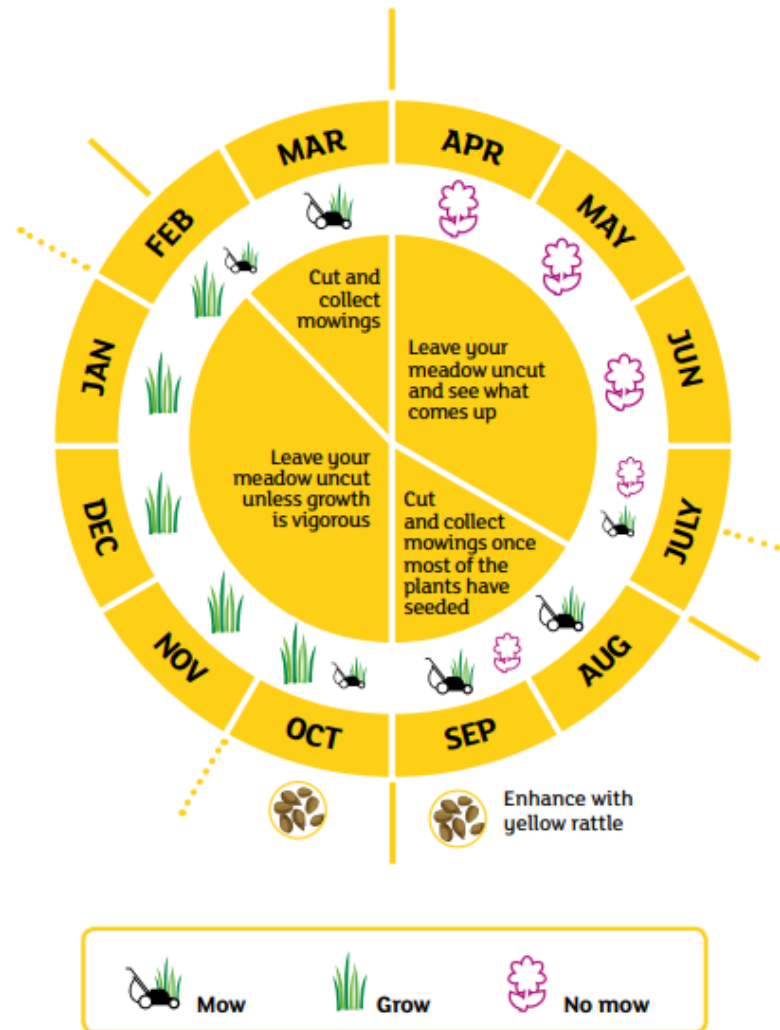


Maintaining Meadows

Plantlife - Management Chart

<https://www.plantlife.org.uk/wp-content/uploads/2024/02/The-Good-meadow-guide-Plantlife.pdf>

Small-scale wild flower meadow care (garden setting)



Grassland monitoring

Rapid Grassland Assessment

- Simple and effective
- Identification of a few 'indicator species' (positive and negative)
- Measurement of physical attributes, eg sward height, % scrub, % cover of wildflowers
- Needs to be tailored to the individual site
- Great for monitoring change

Share guidance and templates via email

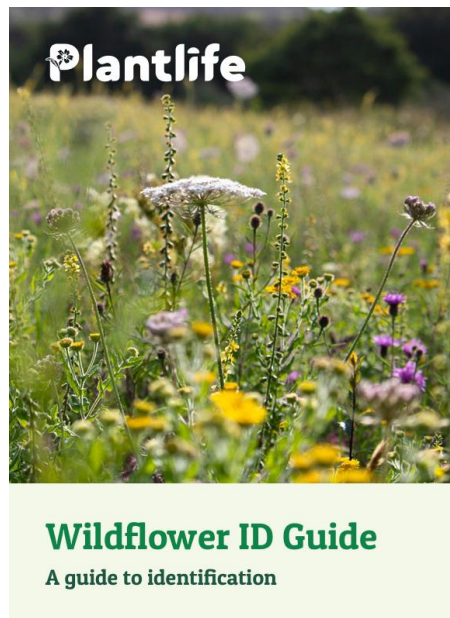
Plantlife guidance

<https://pembrokeshiremeadows.co.uk/wp-content/uploads/2023/01/How-to-design-undertake-and-analyse-rapid-assessment-En-1.pdf>

Grassland monitoring

Rapid Grassland Assessment

[Plantlife](#)
[Wildflower](#)
[ID guide](#)



[Grassland plants 1 guide – Field Studies Council](#)



Grassland monitoring

Rapid Grassland Assessment

Before the survey

- Determine the extent of the survey
- Identify positive and negative indicator species
- Identify physical features eg sward height, % cover wildflowers, % scrub
- Set targets

Plantlife guidance

Lowland meadow species		Comment
Common bird's-foot trefoil	<i>Lotus corniculatus</i>	Common in most lowland meadows
Common / black knapweed	<i>Centaurea nigra</i>	Common in most lowland meadows
Meadow vetchling	<i>Lathyrus pratensis</i>	Common in most lowland meadows
Lady's bedstraw	<i>Galium verum</i>	Common in more calcareous lowland meadows, and base-rich flushes and rock outcrops
Meadow buttercup	<i>Ranunculus acris</i>	Common in most damper lowland meadows
Bulbous buttercup	<i>Ranunculus bulbosus</i>	Common in most drier lowland meadows
Betony	<i>Betonica officinalis</i>	Common in more acid lowland meadows
Devil's-bit scabious	<i>Succisa pratensis</i>	Common in more acid lowland meadows
Field scabious	<i>Knautia arvensis</i>	Common in most lowland meadows
Hawkbits	<i>Leontodon sp.</i>	Common in most lowland meadows. Not separated out to ease identification, but could be separated into autumn hawkbit <i>Leontodon autumnalis</i> and rough hawkbit <i>Leontodon hispidus</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>	Common in most lowland meadows
Salad burnet	<i>Poterium sanguisorba</i>	Common in more calcareous lowland meadows and base-rich flushes and rock outcrops
Self-heal	<i>Prunella vulgaris</i>	Common in most lowland meadows
Yellow rattle	<i>Rhinanthus minor</i>	Common in most lowland meadows
Tufted vetch	<i>Vicia cracca</i>	Common in most lowland meadows
Crested dog's-tail	<i>Cynosurus cristatus</i>	Common in most lowland meadows
Sweet vernal grass	<i>Anthoxanthum odoratum</i>	Common in most lowland meadows
Quaking-grass	<i>Briza media</i>	Common in more calcareous lowland meadows and base-rich flushes and rock outcrops
Yellow oat-grass	<i>Trisetum flavescens</i>	Common in more calcareous lowland meadows and base-rich flushes and rock outcrops

Grassland monitoring

Rapid Grassland Assessment

Grassland is species-rich if it has:

- More than 15 plant species per square metre
- More than 30% cover of wildflowers and sedges (excluding white clover, creeping buttercup and injurious weeds such as creeping thistle, common ragwort or spear thistle)
- Less than 10% cover of white clover and perennial rye grass

Plantlife guidance

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Grassland monitoring

Rapid Grassland Assessment

- In peak flowering season walk a W pattern across area
- Stop at regular intervals and survey a 1m x 1m quadrat
- Fill in the [form](#) at each stop
 - Indicator species presence
 - Physical attributes
- Enter count onto excel spreadsheet
- Use same method each time



Grassland monitoring

RGA data analysis

- Results measure grassland condition.
- Newly seeded meadows take a number of years to establish.
- Indicate if condition is improving or declining when comparing year on year data.
- The trend can be helpful to see if site management is having a positive effect.
- Management can be adjusted accordingly.



Take-home messages

- Low nutrient soils support greater biodiversity.
- We can achieve lowered fertility by design and management - cut-and-collect is practicable.
- Meadow creation is one of the most cost-effective and fastest ways to increase biodiversity and store carbon.
- Planting and seeding at any scale can help support biodiversity
- Improving habitats in parks and greenspaces will help connect existing habitats and create a better environment.
- Monitoring is important to inform management.



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Questions?