Public green spaces - management for economy, climate and nature's recovery

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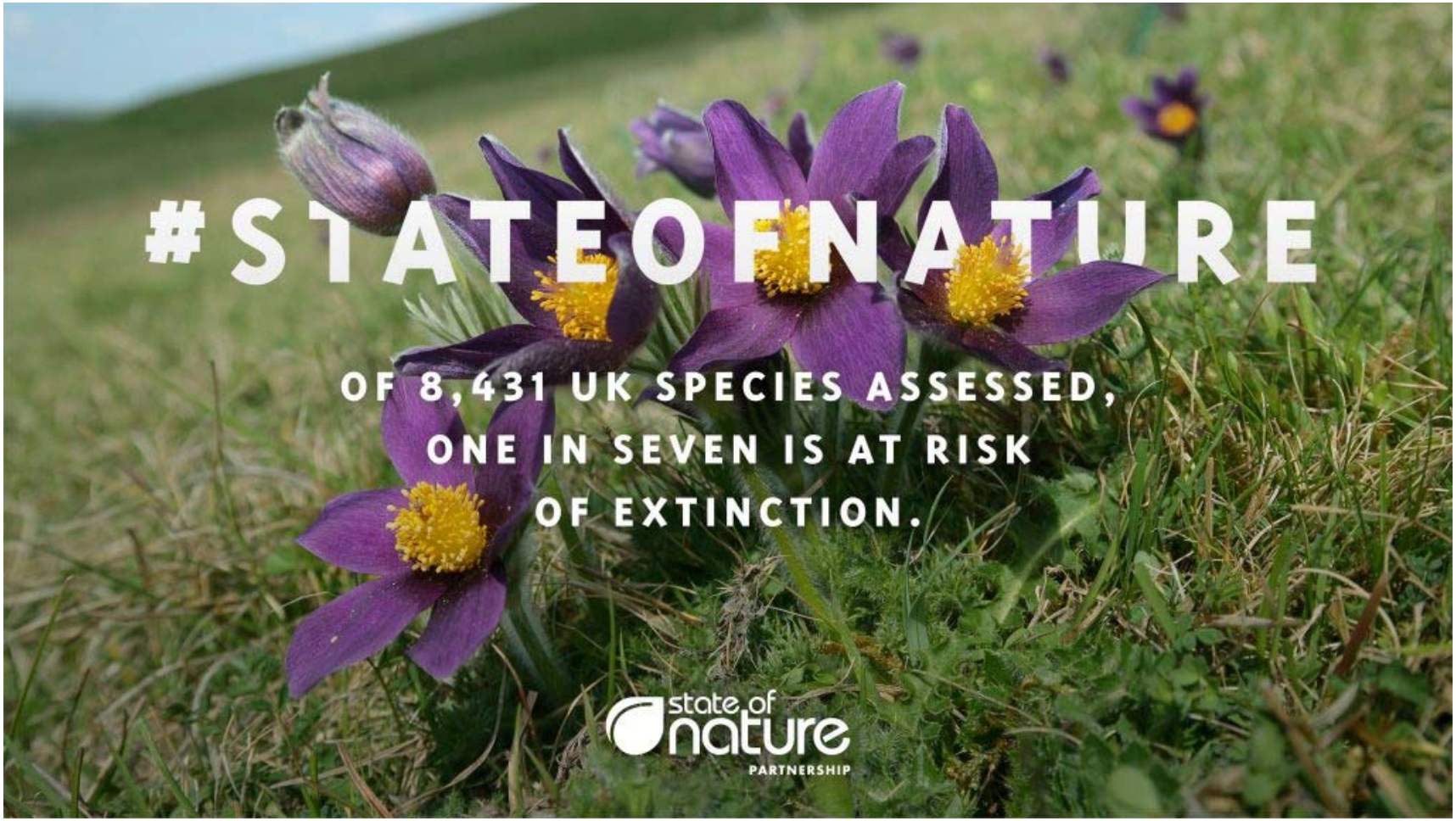
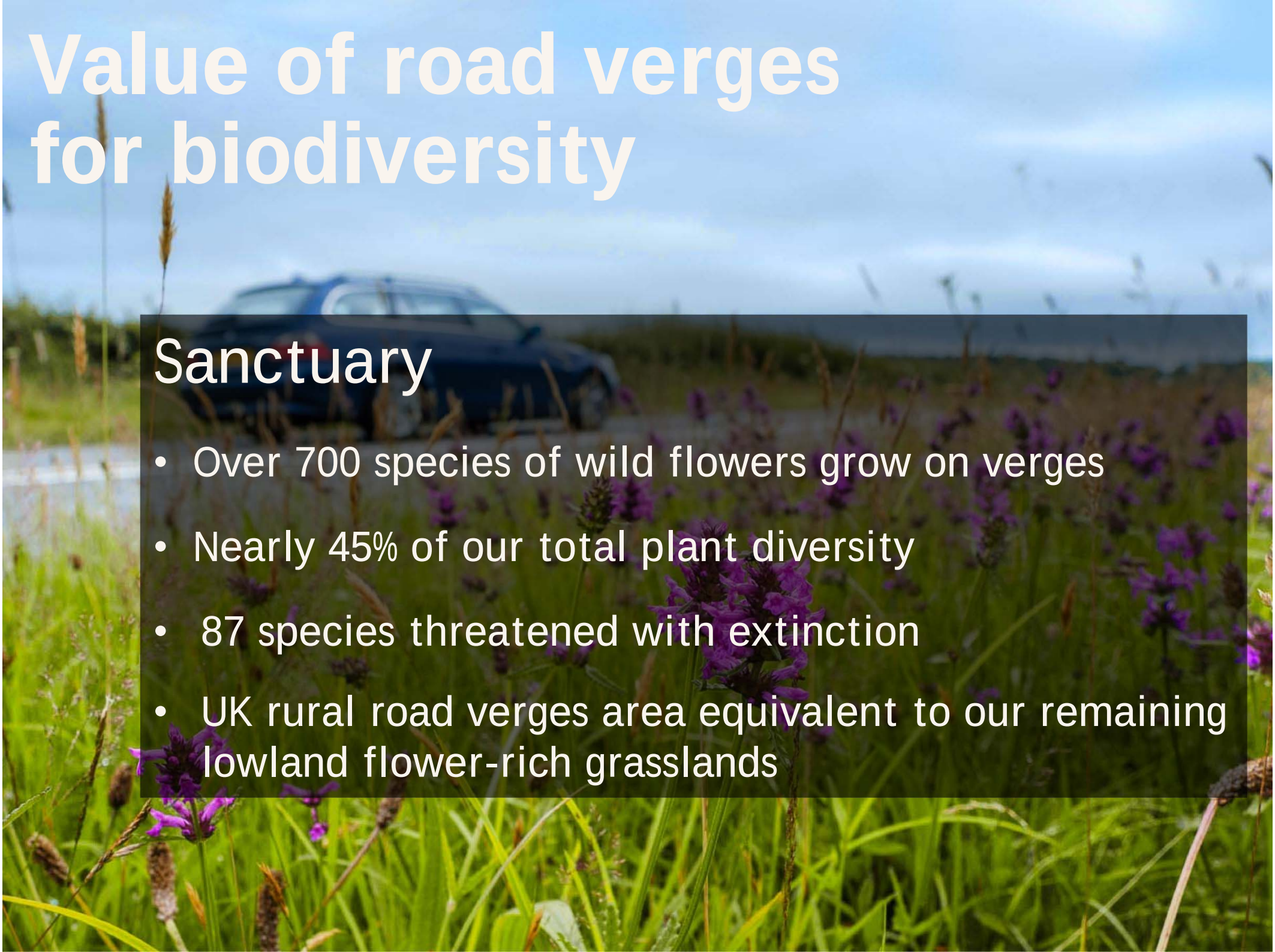


- **58% of species are in decline**
- **1 in 7 UK species at risk of extinction**
- **97% wildflower meadows lost since 1930s**

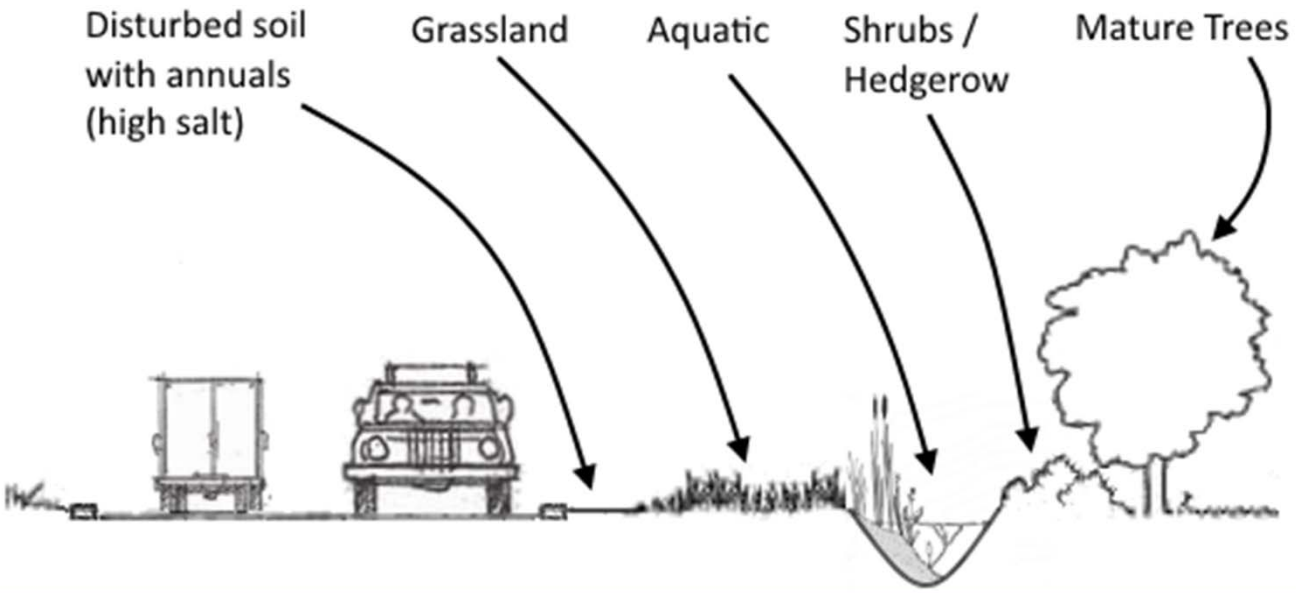
Value of road verges for biodiversity



Sanctuary

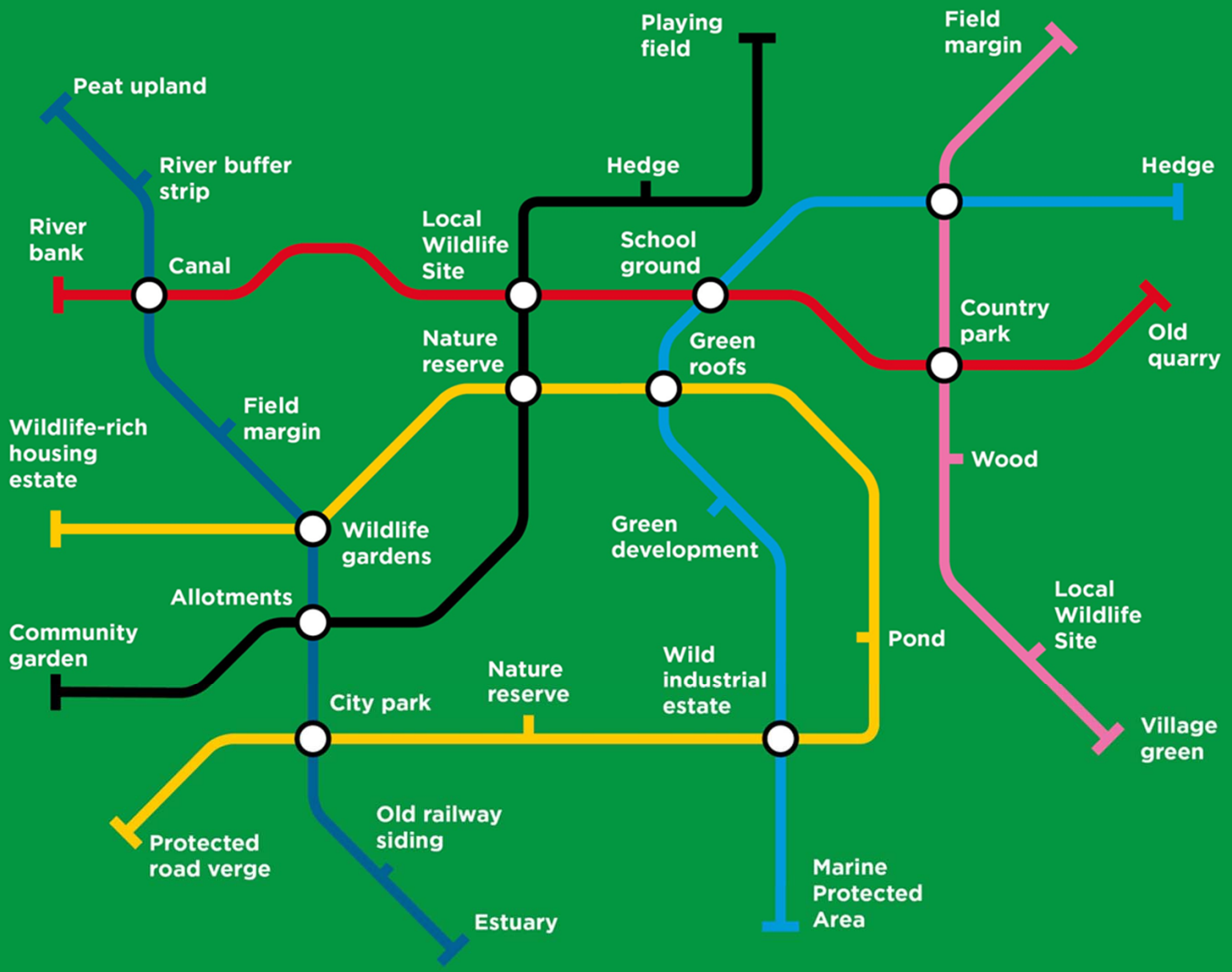
- Over 700 species of wild flowers grow on verges
- Nearly 45% of our total plant diversity
- 87 species threatened with extinction
- UK rural road verges area equivalent to our remaining lowland flower-rich grasslands

Road verge habitats



Verge habitat	Number of species	% of all species
Grassy verges	579	36.3
Disturbed verges	86	5.4
Wooded verges	187	11.7
Salted verges	17	1.1
Total verge species	**724**	**45.4**
Ditches	51	3.6
Hedgerows	290	18.2
Total roadside species	**809**	**50.7**

Connectivity + Public green spaces



Hedgerow Management

- Ideally trim every 3 years mid-Jan to end Feb
- Always avoid March-Aug inclusive (bird nesting)

Cutting frequency ↓
every year → **every 3 years**
Flower abundance **x 2.1**
Mass of **berries x 3.4**

Staley et al. (2012)

Moth abundance and diversity ↑ with ↓ in cutting frequency and **cutting in winter rather than autumn**

Facey et al. (2014)

Most hedgerow berries, on non-cut hedges, had been **foraged by mid-January**

Croxton, P.J. & Sparks, T.H. (2004).

WOODLAND TRUST


Grassland would have been maintained
by wild herbivores in a natural landscape

Principal pressures on public grassland

Cuts too frequent or too infrequent

Too many cuts: diversity lost

No cuts: tussocks → scrub → trees

- >2 cuts per year / no cuts

Smothering mulch

Only vigorous minority of species survive

- No collection of cuttings

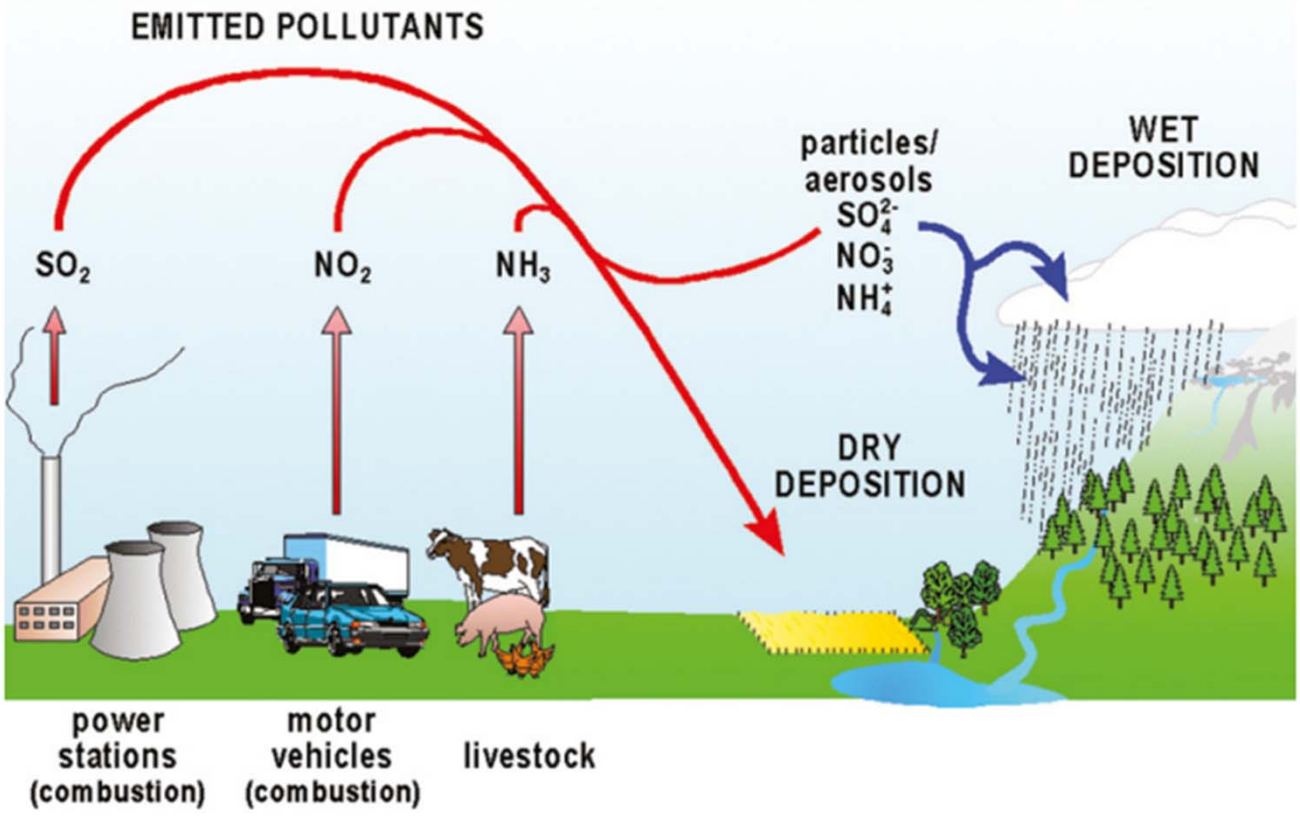
Accumulating fertility

Tall growth of nettles, hogweed, thistles

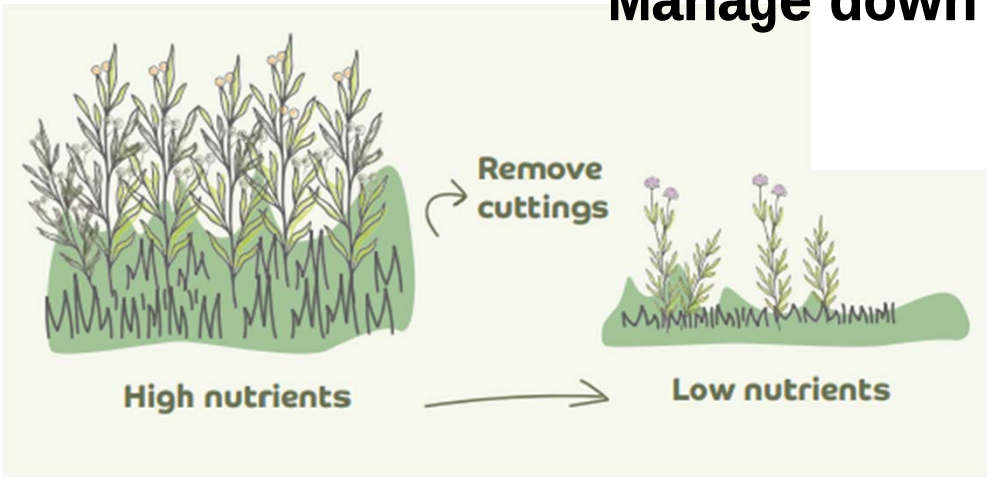
- Mulching cuts, indirect chemical inputs from agriculture and vehicle emissions

CS2000 (Lowland England, Scotland and Wales)

Investing in lower maintenance



Manage down the maintenance



Depletion of nutrients through biomass removal

Quicker results (2-3 years) on lighter soils

Dorset Council

Cuttings disposal in situ into hedgerow bases where species-poor

- Cut and collect scheme reduced cutting frequency by 30%
- Five-year management savings of £36,000 and £11,000/yr staff savings
- Covering cost of new cut-and-collect machinery

Machinery for managing roadside verges and wildflower grasslands - https://www.youtube.com/watch?v=8IKDgkSdL5A

Design Manual for Roads and Bridges (DMRB) updated

roadverges.plantlife.org.uk

Managing grassland road verges: a best practice guide

- sets out different management approach
- improve biodiversity value of verges and **reduce long-term management costs**

Timing of management is key

Wildlife-friendly verges doesn't mean no cutting at all *and* maintaining safe roads is crucial

Management option		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
One cut									full cut				
Two cuts	Summer and autumn cutting								partial cut		full cut		
	Late winter and autumn cutting		full cut							full cut			
	Dry verges (short vegetation)	regular cuts								regular cuts			
	Species-rich verges with mown edge		1m strip							full cut			

A *two-cut* management approach is ideal

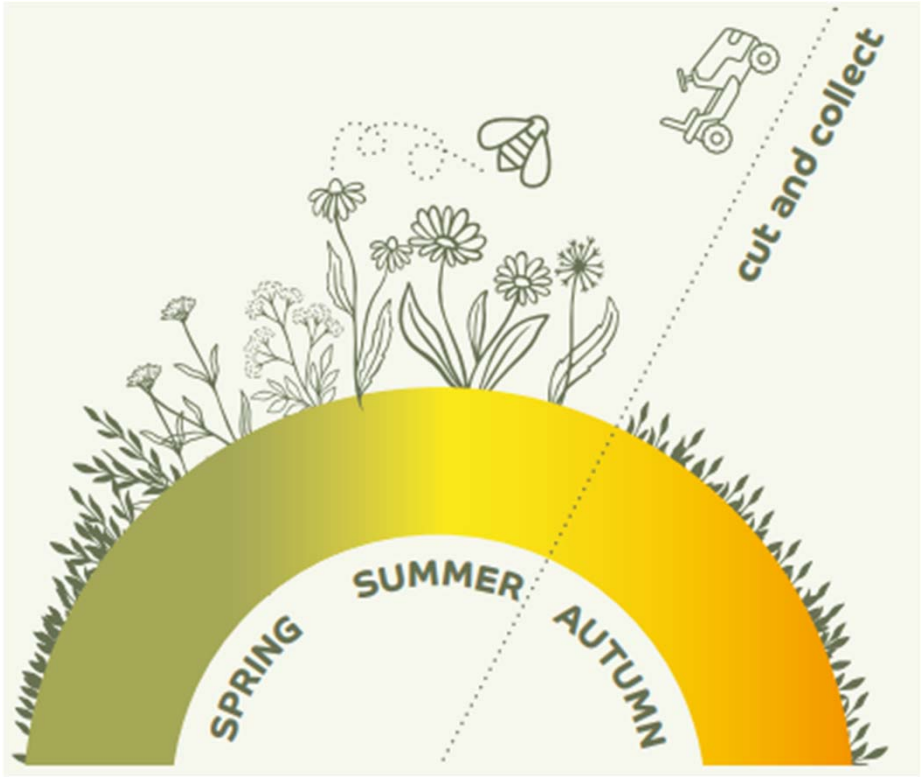
- suppresses coarse grasses and taller herbs

If only *one cut* possible:

- cut once between Aug and Sep

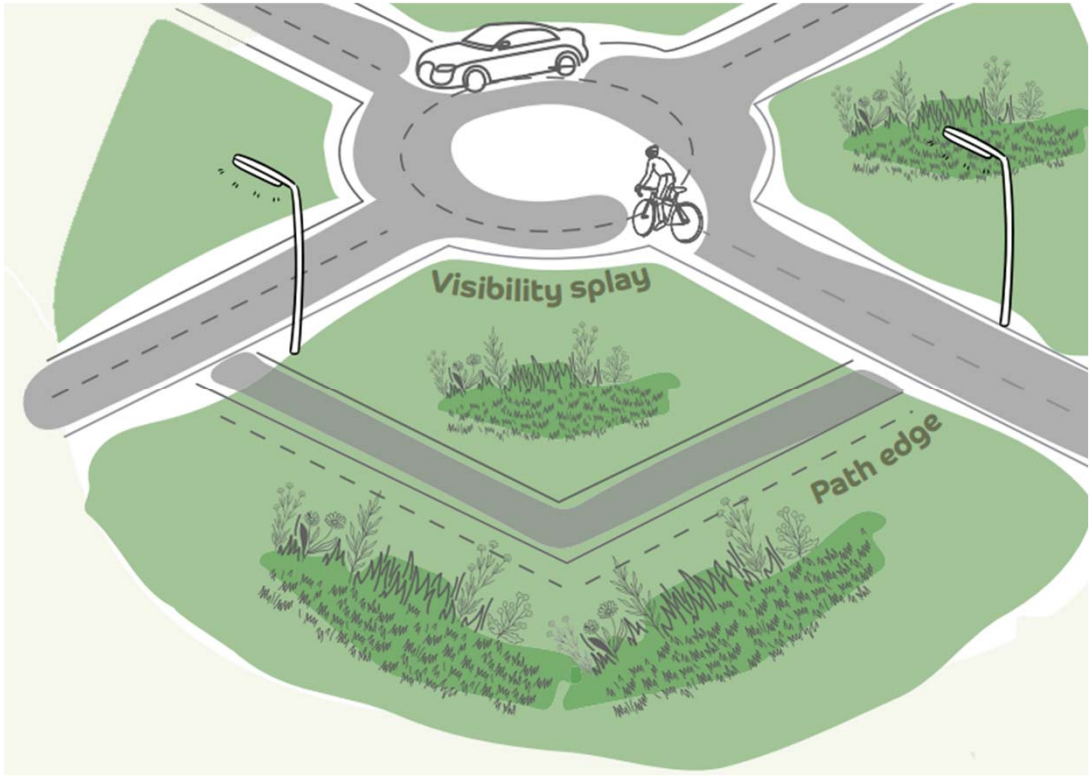
Remove cuttings where possible

GRID GWYRDD GWENT
GWENT GREEN GRID



nature isn't neat
Code of Action
Handbook

For other public green spaces too



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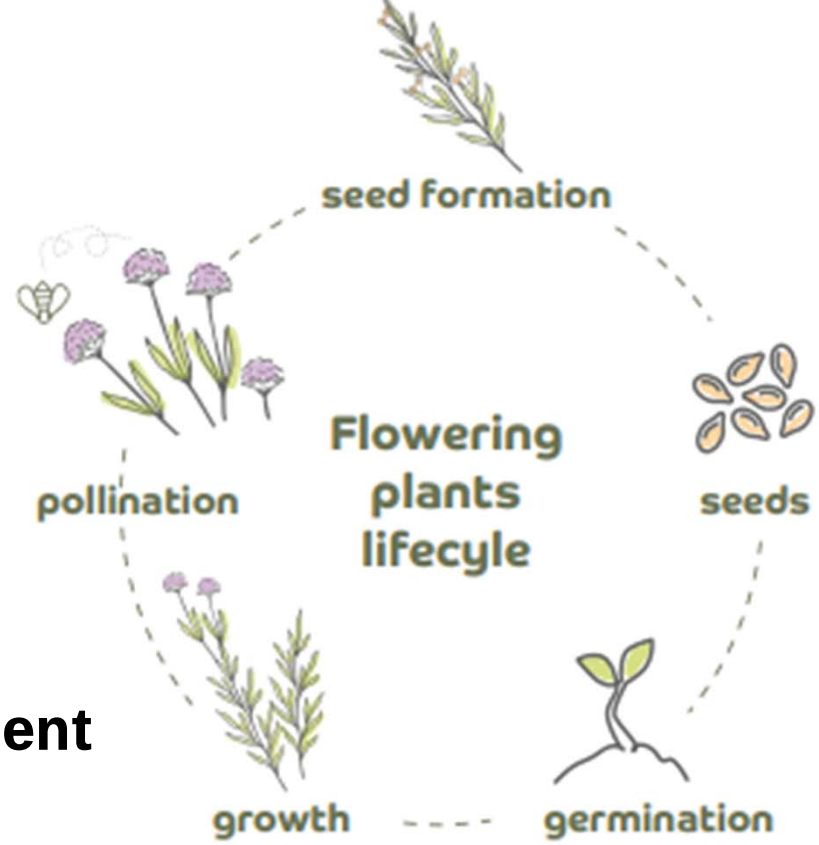
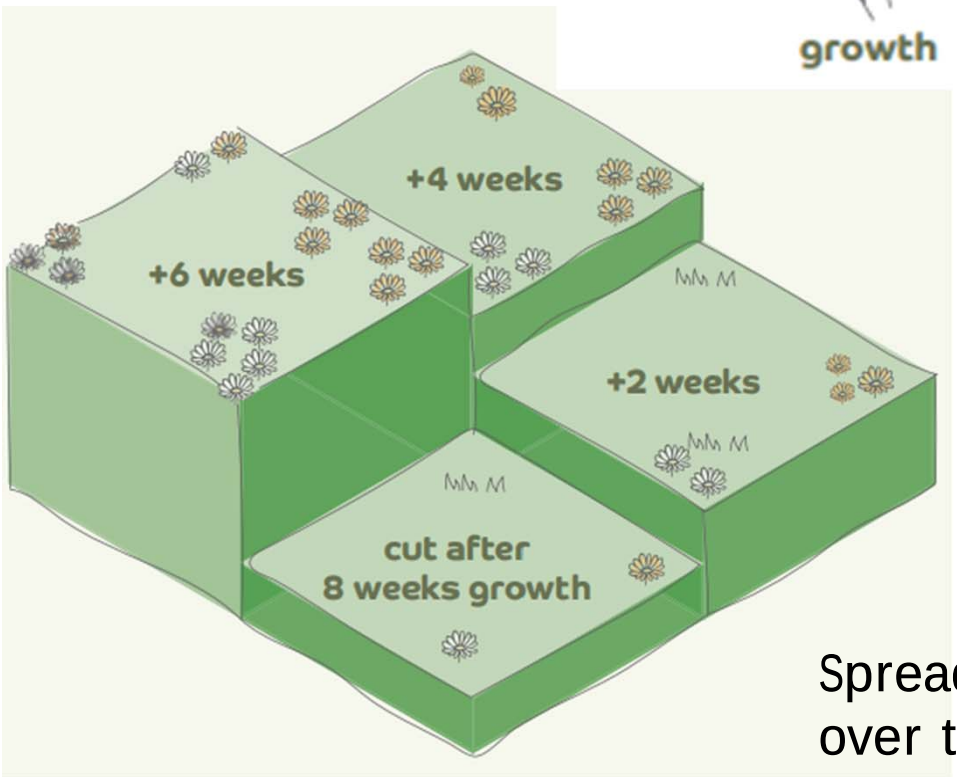
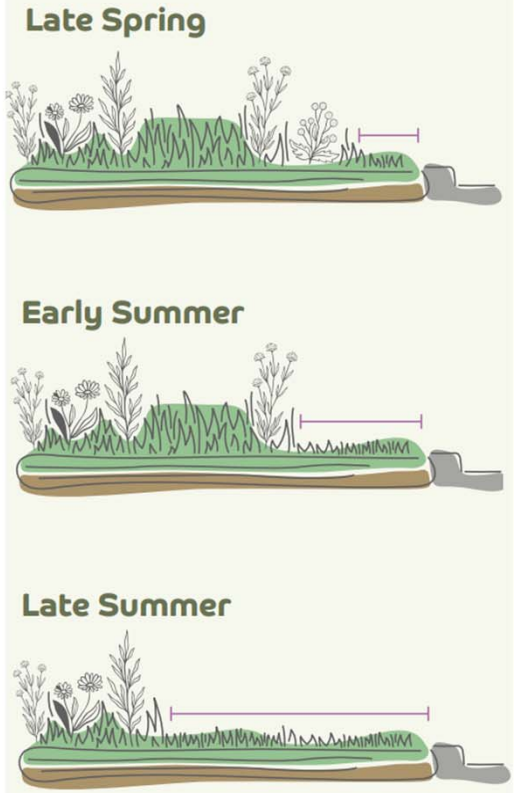


Rotational management



Spreading the effort over the year

Incremental management



Flowering Lawn
(mow every 6-8 weeks)

Tall herbs
(mow every 2 years
along back verge)

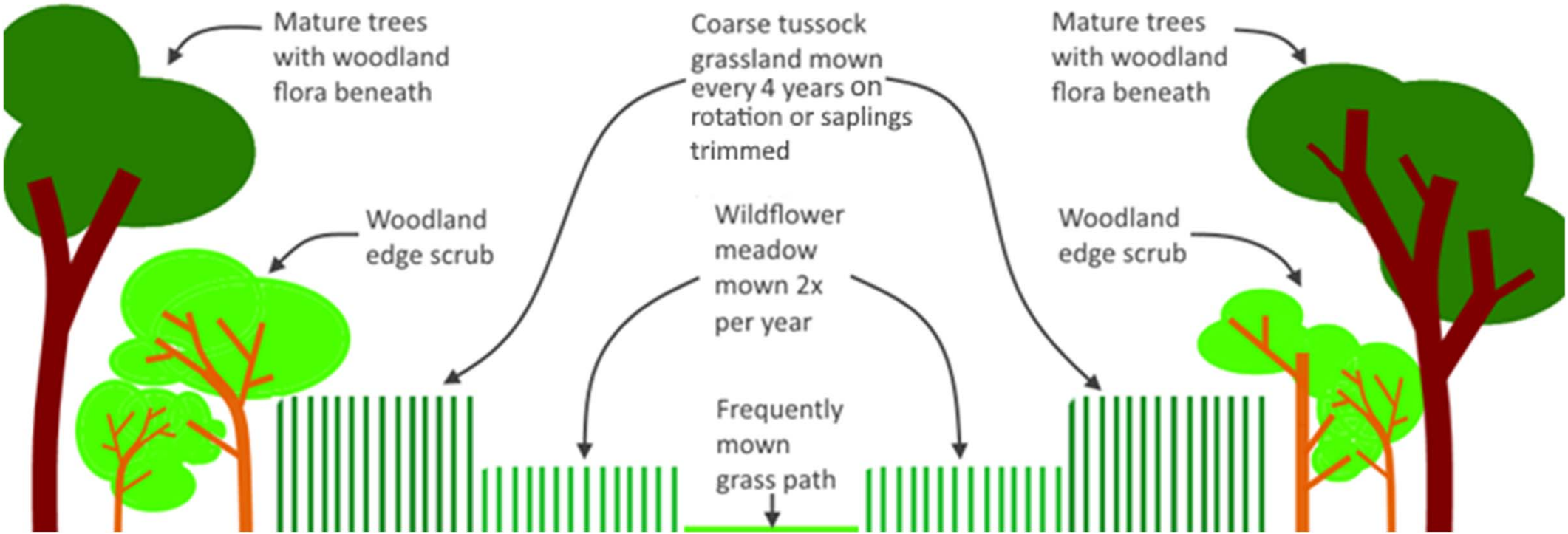
Wildflower-rich meadow
(Cut and clear twice per year
avoiding April-Aug incl.)

Rough grassland
(minimal management every few years
for encroaching scrub on rotation)

Scrub mosaic (Thin and coppice
every 10-15 years on rotation)

Stepped intervention model

- Adapt to available resources / usage scenarios



How to make a meadow with native wild flowers

Even if you only have a small area, you can enjoy a meadow full of native wild flowers. Your local wildlife will thank you for it. All you have to do is mow differently...

Choose an open, sunny area for your meadow, with no nettles or brambles. Then take a closer look in spring and summer – what's already growing there?

A good meadow can be home to more than 100 different grasses and flowers.

If your area is bare ground or has fewer than five wild flowers

CREATE a meadow

If your area has more than five different wild flowers already

ENHANCE a meadow

Making Meadows

Starting principles

meadows.plantlife.org.uk

Know your soil

Site history

Ecological survey

Invasive species management

Meadow management

Cut 2-3 times per year depending on fertility and collect the cuttings.

Tall-growing, high abundance of grasses, presence of nettle, thistle, dock, cleavers

Cut (and collect!):
1. Late May (**restorative cut**)
2. August (**hay cut**)
3. October (**aftermath cut**)

Low-growing, more wildflowers, finer grasses

Cut (and collect!):
1. Late July to September (**hay cut**)
2. Oct/Nov or March (**aftermath cut**)

Note: Restorative cutting incompatible with yellow rattle

Making Meadows
Sourcing seed

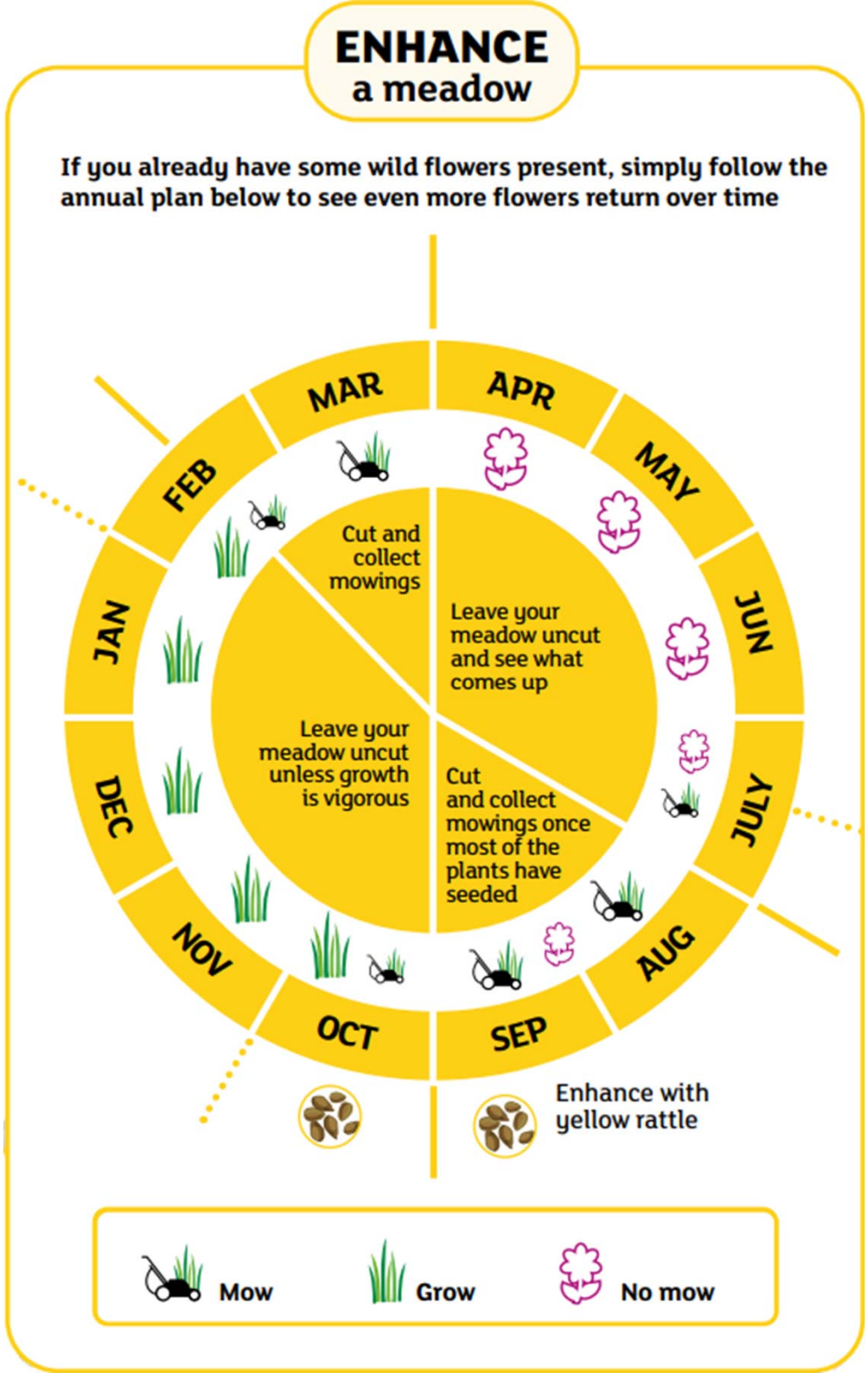
- Provenance is important
- Ecological function, character
- Safeguard against invasive species
- Source locally or from reputable supplier
- Meadow mixes – UK sourced
  - non-competitive grasses
  - wildflower species to suit soil

Seed collecting

Green hay

www.plantlife.org.uk/uk/our-work/campaigning-change/keeping-wild-wildflower


Two phases of establishment
1. Establishment year (frequently mown)
2. Ongoing meadow management from year 2



Augmentation:

- Scarify to 50% bare and over-sow
- Patch clearance and sowing
- Plug plants into cleared patches
- Addition of yellow rattle if species already present

meadows.plantlife.org.uk

Village verge restoration

Lincolnshire Wildlife Trust

Redefining the perennial herbaceous border and the British lawn!

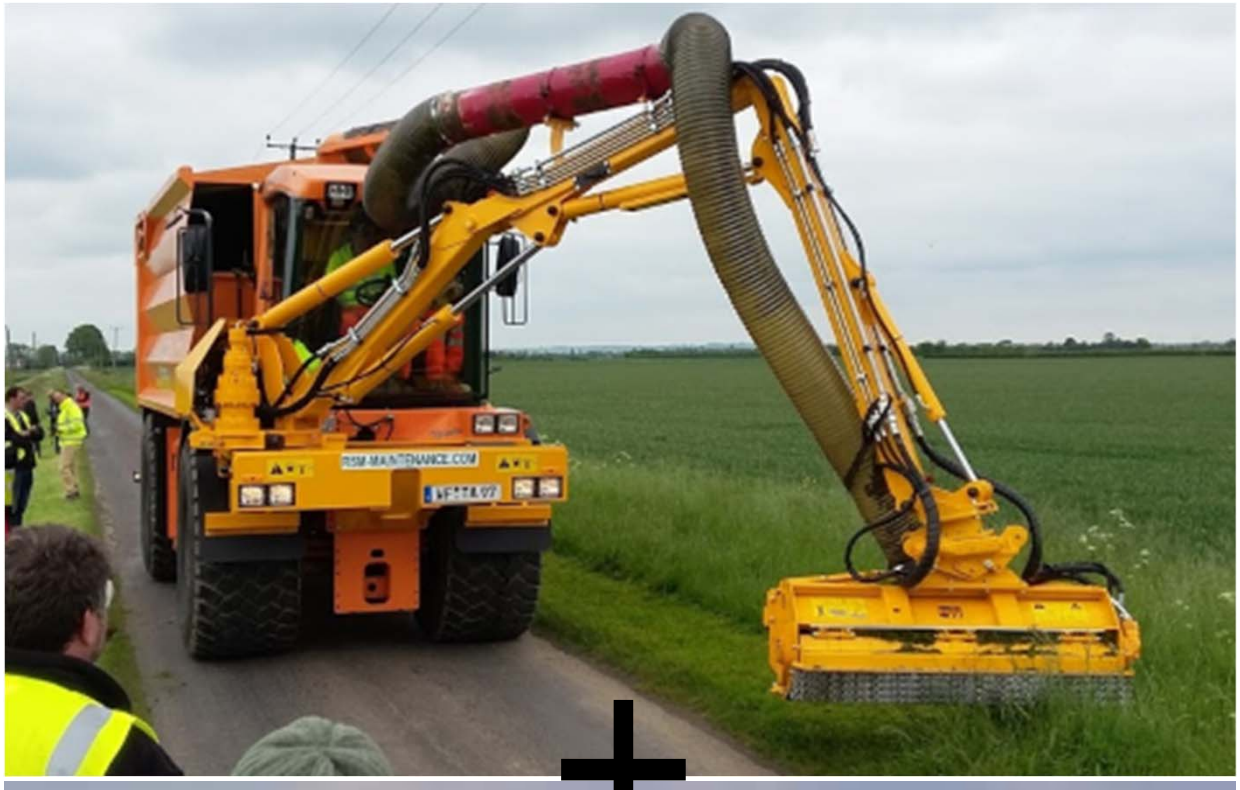
- Climate change resilience
- Carbon footprint
- Economy
- Ecological function

No need to:

feed / weed / water / replant


BUT hay-making is expensive, labour-intensive, time-consuming and weather-dependent

Potential solution: Biomass harvesting with anaerobic digestion of cuttings



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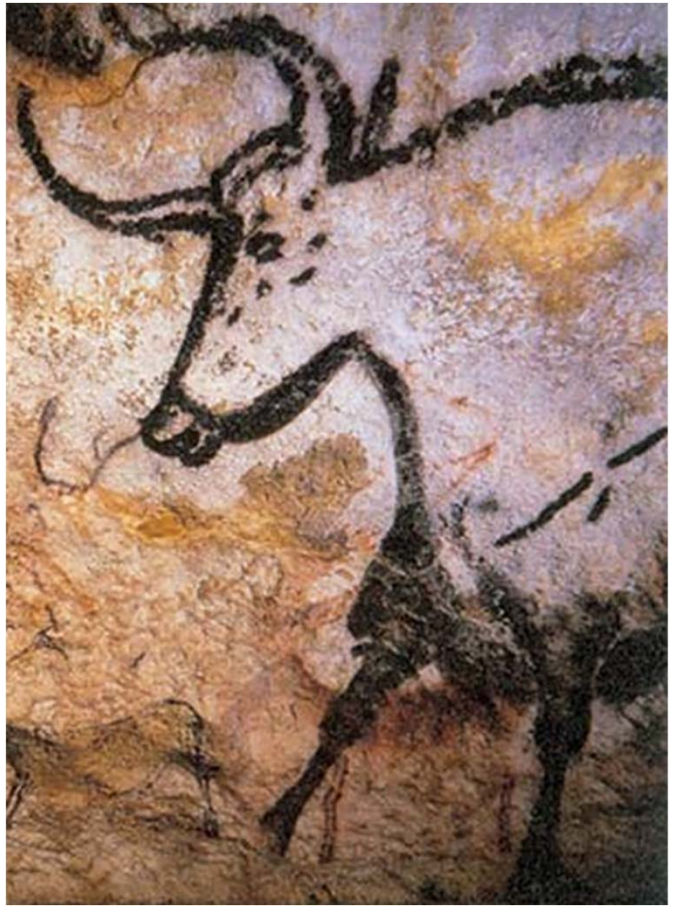
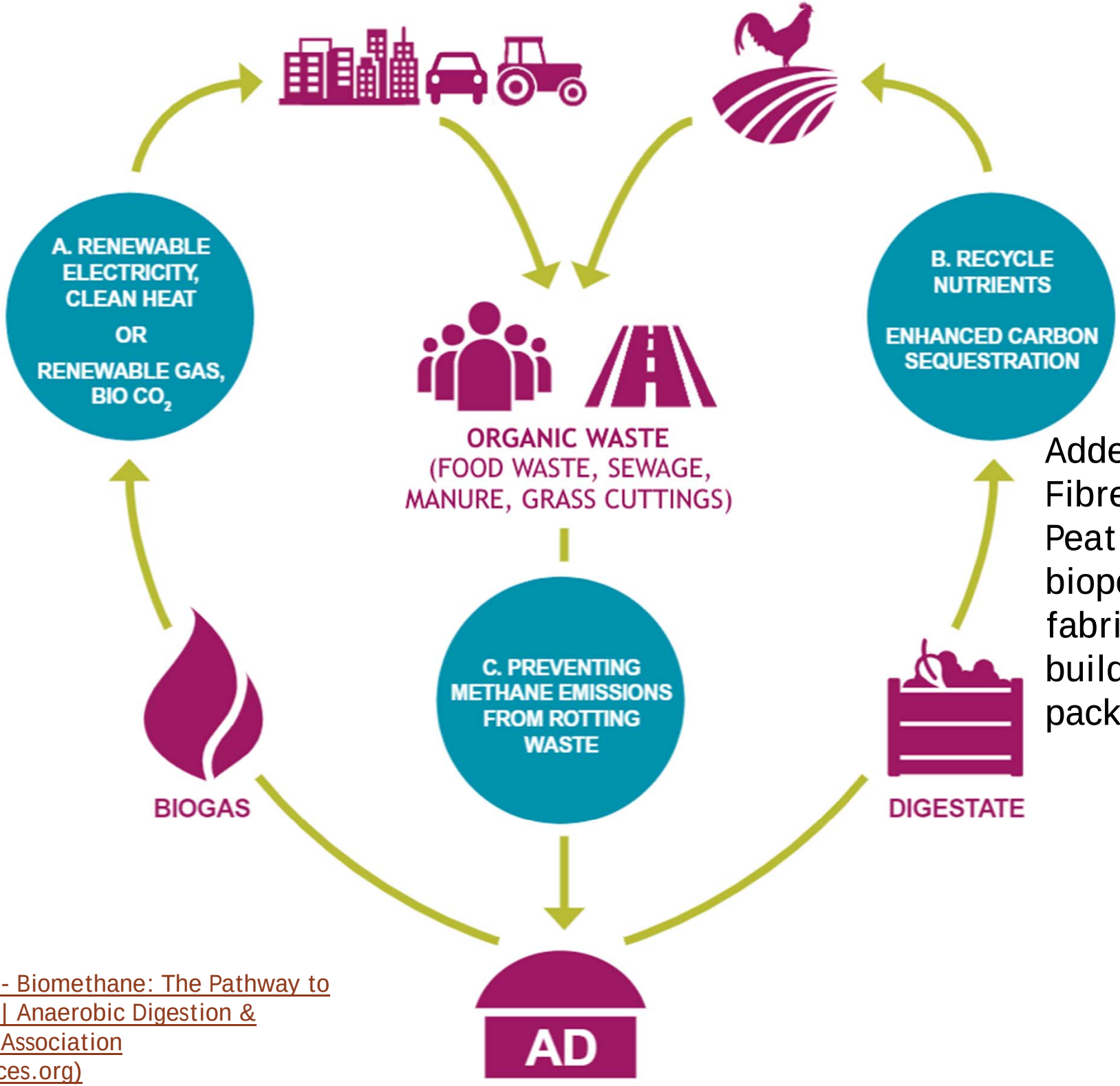




Added value:
Fibres =
Peat substitute
biopolymers
fabrics
building
packaging

ADBA Report - Biomethane: The Pathway to 2030 | ADBA | Anaerobic Digestion & Bioresources Association (adbioresources.org)

Linear mosaic cutting

Edge: Cut and collect in May and August

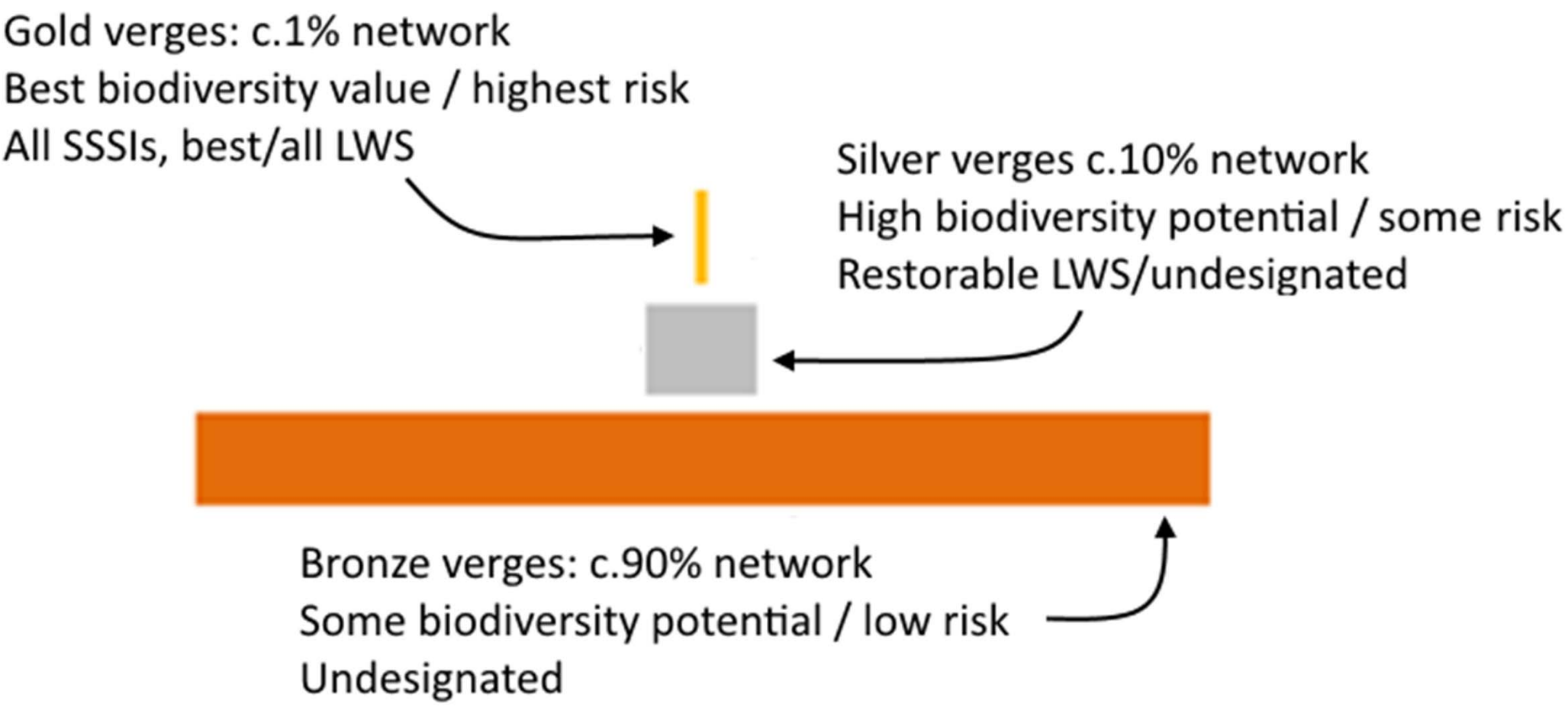
Centre: Cut and collect in August only (also in May if productive)

Back: Cut with/without collection only once (Aug-Oct) every 2-3 years (alternate sides where possible). Carry flail for less disturbance.

Mowing with sanctuary strips

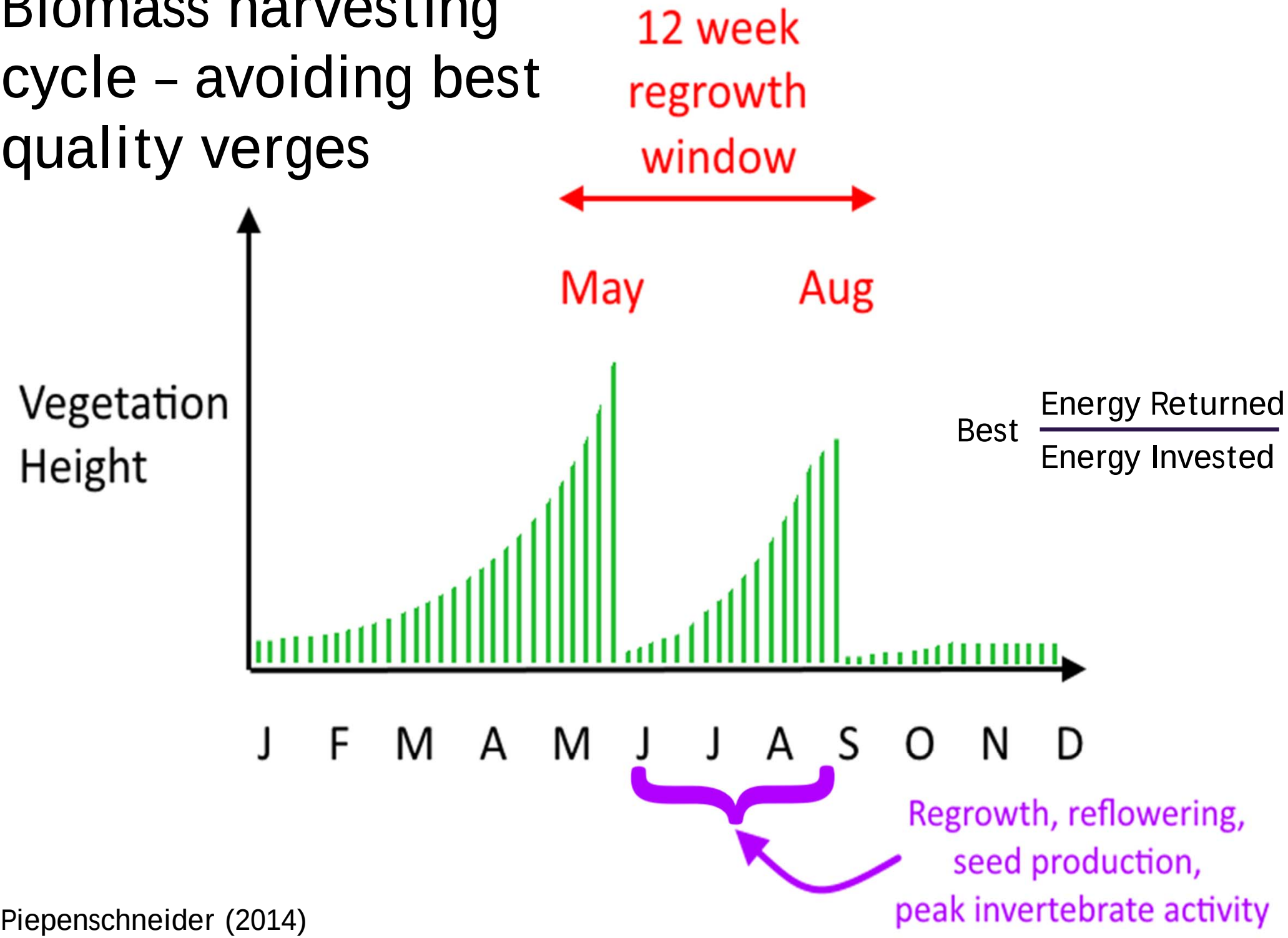
Verge ‘Quality Pyramid’

Working with your Local Nature Partnership , Wildlife Trust
Biodiversity Opportunity Maps, Local Nature Recovery Strategies



Summary of results - Life on the Verge 2009-16, Lincolnshire Wildlife Trust

Biomass harvesting cycle – avoiding best quality verges



Piepenschneider (2014)

Cut and collection harvester systems

Cut and collection harvester systems

- Mastenbroek Herder
- LCC, Leeds Univ., London Business School, Peakhill Assoc.
- PAHs / PTEs / C:N / pH / solubility all favourable
- Energy generation approx. 2-3x energy cost of harvest
- Operating cost offset by value of grass for AD

Cut and collection harvester systems

FARMERS WEEKLY

- T6 Methane Power (in production since 2019)
- Particulates reduced by 99%
- 80% reduction in CO^2 emissions
- 30% saving on running costs

Could the mower ‘feed itself’?

NEW HOLLAND AGRICULTURE

A whole ‘Cornwall’s-worth’ of land hidden in plain sight

UK Road verges:
>400,000km length
260,000ha in UK (1.2%)
(Phillips et al. 2021)
- approximately the size of **Dorset**

UK green space (public):
43,550 sites
85,847ha
- nearly the size of **Rutland**

Totaling the size of **Cornwall**

Estimating UK's road verge and green space biomass resource

260,000ha road verge (excluding SRN)

+

85,847 ha of publicly accessible green space in England, Scotland & Wales (4.9% of urban areas) across 76/884 sites[1]

=

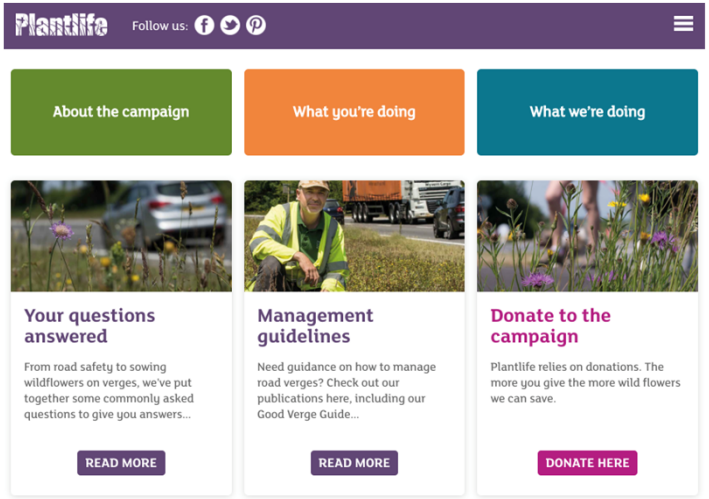
electricity for over 285,000 homes
equivalent to 175 onshore wind turbines

(assuming 2 harvests per year of herbaceous biomass from only 50% of the area)

1. ONS UK Natural Capital – Urban accounts (2019) https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapital/urbanaccounts#extent-of-green-and-blue-spaces-in-urban-areas-in-great-britain
2. Conservative biomass estimates from road verge trials in Montgomeryshire 2005. (https://www.montwt.co.uk/sites/default/files/2021-01/living_highways_report_2006.pdf)
3. Methane yield from grass silage = 310 per m^3 CH4 /t of DM (McEniry 2013, Grass for biogas production: The impact of silage fermentation characteristics on methane yield in two contrasting biomethane potential test system)
4. 1m^3 of CH4 = 6kWhrs (https://energypedia.info/wiki/Electricity_Generation_from_Biogas)
5. According to the Department for Business, Energy & Industrial Strategy (BEIS), the average household uses 3,731 kWh per year (https://www.gov.uk/government/statistics/energy-consumption-in-the-uk)
6. An average onshore wind turbine with a capacity of 2.5–3 MW can produce more than 6 million kWh in a year – enough to supply 1,500 average EU households with electricity. https://www.ewea.org/wind-energy-basics/faq/

Raising the bar together

- *creating the space:*
  - to share learning
  - to showcase progress
- *working with:*
  - councillors, highways teams, waste teams, service providers
- *providing:*
  - guidelines and tailored advice
  - scrutiny reports/ business cases/ workshops / strategies
  - publicity - sharing good news

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