Grassland Communities – why, what and where?

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Grassland Communities – why, what & where?

1. Nature conservation reasons (Europe-wide)

- Huge losses– 97% since 1930s, <1% of UK land cover now, but continuing losses – in Peak District, 50% loss between mid 1980s & 1990s, 10.4 old meadow indicators down to 1.7 over 10 years in sample, field scabious, great burnet & rough hawkbit lost from 70% of 1980s sites

- ~1,400 spp of pollinators/other dependent insects

- Bird's-foot trefoil, field scabious & devil's bit scabious are food plant for 160, 26 & 25 inverts respectively

- Major effect on UK birds, small mammals, fungi, soil animals etc

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2. Ecosystem Services:

- **Carbon** (mostly in soils) store/sequestration increased by:
  - ❖More legumes & slow-growing plants – decay slower
  - ❖Wider range of plants, red clover a key spp, deeper roots
  - ❖More mosses – slow rate of C respiration & high C:N ratio
  - ❖Fungal not bacterial based soil system (no N fertilisers + spp-rich)
  - ❖Saprophytic fungi especially important
  - ❖low intensity grazing (to maximise litter return to soil)
- Can sequester c.30-44gC/m^2/yr 0-30cm depth
- Arable emits c14.29MtCO^2e/yr
- 60% of soil C >30cm deep, & sensitive to management

Key sources – NERR043, RIN043, NERR026, Deyn et al. 2011, Defra BD5003

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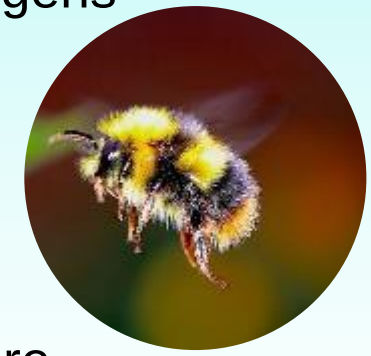
3. Other ecosystem services

- Health and Wellbeing – flowers important elements plus other species – singing birds, bees, butterflies, etc
- Flood control – increased roughness, increased OM in soils, removed drainage for wet grasslands, ponds and marshes within grasslands all help reduce runoff & flood peaks
- Water quality – reduced agri-chemicals from catchment, low input, low output reduces dung reaching drainage (reduces pathogens eg E.coli, cryptosporidium risks)



- Pollination – particularly for nearby crops/gardens
- Food – honey
- Archaeology- setting for features
- Cultural heritage – celebrate folk lore, customs, literature, are historic habitats
- Greater resilience to climate change with variable rooting and functional characters
- Many have clear financial benefits

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4. Unappreciated value for stock

- Diverse forage gives choice – animals select to counteract effects of plant chemicals, maximising health and wellbeing, including shrubs & trees. Stock prefer herbs
- Herbs higher crude protein, energy value, minerals & trace elements than grasses, eg ribwort plantain protein levels highest in July/August, & high in Ca, S, K, Zn
- Hospital fields for sick animals – natural/self medication
- Higher beneficial polyunsaturated than saturated & mono-unsaturated fats in herb-rich fed beef '*You are what you eat has been eating*'

5. Success in grassland creation & restoration

- High value grasslands quick & relatively easy to create/restore
- Can have affinities with high value types within 5-10 years
- Will attract more invertebrates & other animals in first year
- Are beautiful to look at – colourful, changeable
- Can inspire and give enjoyment quickly
- Can be done at any scale – micro to landscape
- Rewarding for us all

Stansted Airport created grassland

Merseyside, Landlife seed field

Lathkill Dale restored hay field

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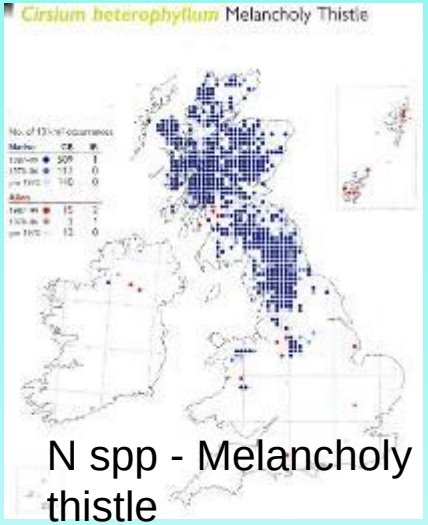
Grassland Communities – why, **what** & where?

- Communities to reflect soil, climate, aspect, hydrology, geographical location (N, S, W, E, urban etc)
- Need full range of grassland types using locally native spp
- Future predicted with climate change



N spp - Melancholy thistle

2019 spring – large bare areas

Mini-meadow pre 2018 on limestone chippings

Melancholy thistle reduced in 2018 drought, Northern spp

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Grassland Communities – why, what & where?

- Need to fit into Lawton's principles – bigger, better, more & joined up, accommodate dispersal distances
- 25year Environment Plan in England – 500,000ha wildlife-rich habitat
- >3m ha spp-rich grassland lost, most left = small, fragmented
- need opportunity mapping including ecosystem services
- More ambition needed?



Conclusions

- **Why**
  - To compensate for all the values of what we have lost
- **What & where**
  - Joined up thinking vital for integrated network of spp-rich sites across admin/organisation's boundaries
  - Large scale & interlinked to support resilient & sustainable metapopulations
  - Varied according to local environment, but climate change resilient
  - Incorporate ecosystem services
  - We need to be very ambitious

All photos are of restored/created wildflower grasslands