Species-rich grassland: species and habitat resource pack
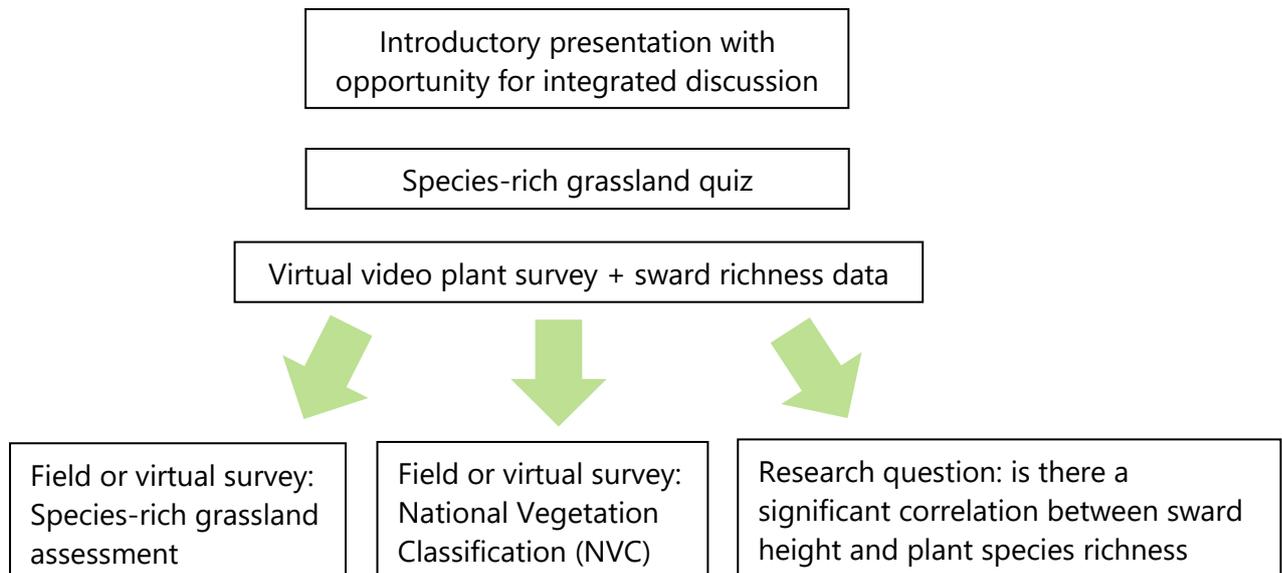
Lecturer notes

Aims of species-rich grassland education resources:
- To raise awareness of species-rich grassland among future land managers.
- To engage future land managers in species-rich grassland conservation and management.
- To develop practical field skills in grassland species identification, survey and analysis.

Level and indicative subjects:

Adaptable for Further and Higher Education.

Agriculture; environment; ecology; biology; conservation; geography; countryside.

Species and habitat pack structure:

Introductory presentation with opportunity for integrated discussion

Species-rich grassland quiz

Virtual video plant survey + sward richness data

Field or virtual survey: Species-rich grassland assessment

Field or virtual survey: National Vegetation Classification (NVC)

Research question: is there a significant correlation between sward height and plant species richness

Do I need access to a species-rich grassland site?

Not necessarily. A virtual field survey video is available. Alternatively, you could adapt to any site you have access to, such as a site that is not species rich to assess how it could be restored.

How much time is needed?

As much or as little as suits your course. A few slides or species case studies could be integrated into a lecture, up to a full day workshop activity.

When should these activities be done?

Field activities are best between May-August, or the virtual field survey can be used in any season.

Who provides the risk assessment?
This is the responsibility of the staff leading the activity. As the risk assessment is specific to your institution, site and students, it is not provided as part of the pack.

Suggested session plan:

Activity	Lecturer	Student
Introductory presentation **Quiz (**answers below)	Presents the topics with discussion and Q&A encouraged throughout. Quiz can be used to assess prior knowledge, or to generate discussion.	Contributes to discussion, takes notes. Answer questions and discuss answers.
How can the presentation and quiz be adapted? • Use MAGIC maps to identify grassland sites local to you and adapt species and examples to suit your geographical area and abiotic condition. • Ask students to produce a glossary of grassland definitions before the presentation e.g. semi-natural, semi-improved, species-rich, unimproved, upland, lowland. • Ask students to investigate the many different ways grassland is classified – this is complex, involves academic reading sources, and will provide scope for discussion. • Make a quiz in an electronic format e.g. Socrative, Kahoot. Or use it as an assessment tool.		
Field practical survey or virtual survey **Species-rich grassland assessment** **NVC** **Sward data**	Choose and adapt either the species-rich grassland assessment or NVC. Risk assess. Explain the fieldwork/ virtual protocol. Ask students to form groups to plan the fieldwork/ virtual activity. Monitor and advise during activity.	Work in groups of 3-5 to plan, design, and carry out field survey. Use resources to identify species. Record species data either on paper or electronically. Optionally record further variables e.g. sward height.
How can the field activity be adapted? • The species-rich grassland assessment is a relatively simple activity, although students need to identify any negative indicators such as white clover, creeping buttercup or pernicious weeds. • National Vegetation Classification is a more complex survey technique, requiring identification skills for all species present. Ideal if you already teach NVC and need an applied activity. • Students may use a range of identification resources such as botanical key, field guide, or app. • Add variables for correlation with species richness e.g. sward height, soil pH. • Focus on calcareous grassland indicator species.		

Using the survey data	Use for teaching theory, methods or statistics, or for assessment.	Report back on findings to demonstrate understanding and skills gained.

How can use of survey data be adapted?
- Activities such as a verbal summary or presentation, up to a research project.
- Use the virtual or real field survey to assess professional habitat classification report writing.
- Use data in conjunction with secondary datasets, such as butterfly larval food plants.
- Sward data is available for students to correlate with species richness in a scientific report.
- Collect monitoring data over seasons/ years with different groups to genuinely inform site management or to develop higher level research projects or dissertations.

Quiz answers/ points for discussion:

Q1. What are the names of these two butterfly species?

- a) **Meadow Brown and Ringlet (*Maniola jurtina* and *Aphantopus hyperantus)***
- b) Brown Hairstreak and Large Heath (*Thecla betulae* and *Coenonympha tullia)*
- c) Brown Argus and Gatekeeper (*Aricia agestis* and *Pyronia tithonus)*

Q2. Do you recognise any of the plant species in the background? Wild marjoram (*Origanum vulgare*) and Ladies Bedstraw (*Galium verum*)

Q3. Can you identify these two species? White clover (*Trifolium repens*) Red clover (*Trifolium pratense*)

Q4. Which one of these species does not count towards the 30% wildflower cover required in the species-rich grassland classification? White clover.

Q5. This is the Marbled White butterfly (*Melanargia galathea).*

What are the habitat preferences of this butterfly?

- a) **The adult butterfly prefers purple flowers such as wild marjoram and knapweed.**
- b) **It prefers unimproved calcareous grassland.**
- c) **The main food plant of its caterpillar is Red Fescue grass (*Festuca rubra*).**

All true!

Q6. A3 B1 C2

Q7. What is the name of this plant? They all are! Many common names, as well as the botanical name.

Q8. Why are Latin botanical names important? Due to confusion caused by numerous common names. Latin is a 'dead' language and the meanings remain the same. It can also be descriptive of the species. It is international and politically unbiased.

Q9. Match the butterfly/ moth to its larval food plant   A4   B1   C3   D2

Q10. What kind of faeces can you see in the background? Horse

Q11. What might this mean for the management of the species-rich grassland site? This site is conservation grazed by ponies to keep the sward height fairly low to encourage plant diversity. Option to discuss other species used for conservation grazing and advantages and disadvantages of these.

Q12. Can you identify the species? Burnet moth and its caterpillar + Bird's-foot trefoil

Q13. What is the connection between these three images? Bird's-foot trefoil is the larval food plant of the Burnet moth.

Q14. What plant species is this?

   a) Early purple orchid (*Orchis mascula*)
   b) Bee orchid (*Ophrys apifera*)
   c) **Pyramidal orchid (*Anacamptis pyramidalis*)**

Q15. This species is known as 'the meadow maker'.

It is semi-parasitic, feeding off the nutrients in the roots of surrounding grasses.

A good indicator of high quality grassland.

What is the name of this species?

   a) Primrose (*Primula vulgaris*)
   b) Meadow buttercup (*Ranunculus acris*)
   c) **Yellow rattle (*Rhinanthus minor*)**

Opportunity to research further in terms of its role in restoration.