TEAM#UP- Information Template for VR Tour Field Margin Demonstration Sites

Content

1.1 Site Information	
1. Country	Germany
2. Site name	Strenzfeld Campus Field Margin Trials
3. General site description	Permanent field margin close to Strenzfeld Campus of Anhalt University of Applied Sciences between farm track and arable fields.
4. Site location (GPS coordinates)	51.819335, 11.705393
5. Site area (ha)	1.2 km x 5 m
6. Type of formal protection (if any) and name (if different from above)	Landscape element (field margin >2m wide)
7. Ecosystem type(s) present	Fringe communities
8. Ecosystem services provided by the restored habitat	• Pollination • Pest control • Photosynthesis • Habitat • Water retention • Carbon storage
9. Geomorphic landscape features to note	Landscape Unit Magdeburger Börde
10. Water features, if present e.g., rivers, oxbows, streams, lakes, ponds, springs	None
11. Soil type (s)	Chernozem
12. Rare, threatened or endangered (Red List) plant or wildlife species	Some rare or endangered oligolectic wild bees, e.g., *Andrena hattorfiana*

13. Site owner(s) and/or manager(s)	Anhalt University of Applied Sciences
14. Potential or actual stakeholder groups	Department of Nature Conservation and Landscape Planning, Department of Agriculture
15. Relevant social or local community information	None
1.2 Site Diagnosis prior to restoration	
16. Geomorphic / landscape features e.g., post-mining, agriculture, infrastructure	Agriculture
17. Hydrology e.g., lack of connectivity, dams, eroding channels, nutrient runoff	Not applicable
18. Soil e.g., stability, pollutants, erosion	Not applicable
19. Is vegetation composition sufficient for ecosystem type(s)? e.g., primarily native species, diverse vegetation	No, very small, species-poor grass margin with thick litter layer due to continuous mulching
20. Is vegetation cover sufficient for ecosystem type(s)? e.g., are there problems with vegetation establishment or persistence?	No
21. Is vegetation structure adequately heterogeneous for this ecosystem type?	No
22. Problematic (e.g., invasive, expansive) species present (plant and wildlife), identity (list all) and approximate total % cover on site, if needed.	None
23. Important ecological disturbances / management missing or inappropriate e.g., grazing/herbivory, flood pulses, fire	Grass margins are maintained by mulching (mowing without biomass removal) 1-3 times per year.
24. Keystone species missing (plant and/or wildlife)	Yes
25. Wildlife conservation actions taking place or needed (list species, if any)	Not applicable
26. Food web and/or trophic level problems	Not applicable
27. Is the site's habitat connected to surroundings and/or are wildlife corridors present?	Not applicable
1.3 Ecological Restoration of the Site	
28. Describe the ecological restoration measures that have already taken place and a	• Disturbance of the grass sward (tilling): block trial (0/1/3x → block trials, end of August to begin of

general timeline of these actions.	October 2010), demonstration trial (2x, begin of April to mid-April 2011) • Sowing of 49 native wild plants (44 forbs, 5 grasses) by hand, sowing density 2g/m² (block trial: 7th October 2010, demonstration trial: 10th April 2011) • Rolling after sowing (day of sowing) • First-year management involved mulching begin of June 2011 (summer drought leads to very low biomass production) to avoid seed set of spontaneously emerging non-target plants. A second cut with biomass removal was done in late summer. • Normal management included stepwise mowing once a year with biomass removal – details see 42.
29. Approximate surface area (%) of site already restored (if any)?	See 5.
30. Please generally describe the outcomes of any previous ecological restoration measures that might have taken place on this site.	Not applicable
31. What are the current ecological restoration goals and objectives for this site?	• Establishment of species- and flower-rich field margins • Nectar and pollen supply over the whole vegetation season • Feeding, breeding, overwintering habitats for beneficial insects (pollinators, pest antagonists) • Feeding habitats for farmland birds (insects, seeds)
32. Stakeholder engagement (please describe)	Demonstration site for teaching and public relation activities (field trips, workshops)
33. Is passive ecological restoration possible after removal or reduction of cause(s) of degradation? e.g., will ecosystem(s) recover on their own (plant and/or wildlife communities) without intervention?	No, general lack of target species in the surrounding landscape.
34. Need for problematic species control? If so, method(s) of control? e.g., mechanical, chemical, …	None
35. Are species reintroductions needed? List relevant plant and/or wildlife species.	Yes, species list see start of VR tour
36. Appropriate methods of ecological restoration for this ecosystem type? Describe in detail, if possible. This should be comprehensive and based on the site diagnosis above (i.e., what is degraded or missing and needs to be restored).	See 28.
37. Barriers to accomplishing ecological restoration measures	None

38. Timeline of planned ecological restoration measure(s)	See 28.
39. Monitoring protocol(s) generally described Including how to monitor relevant, measurable indicators, such as those of the Nature Restoration Regulation.	After restoration, vegetation relevés with estimation of percentage cover of all species were carried out almost every year on 8 m^2-permanent plots in all variants and replicates.
40. Will management of restored ecosystem(s) be adapted based on long-term monitoring? If not, please explain why.	This was not necessary till now because the management fits perfectly to the restored field margins.
41. Scaling-up: how can these ecological restoration measures assist migration of key species (plant and/or wildlife) and restore connectivity of habitats?	Field margins are important corridors for wildlife movement.
42. Is there a long-term management plan for ecological restoration at this site?	Since 2012, the restored field margins are managed once a year with stepwise mowing (block trial in June or September, demonstration trial in May, June or September) with biomass removal. This will be continued.
43. Ecosystem services improved after ecological restoration	See 8.
44. Economic benefit(s) to performing these ecological restoration measures VR sites could include a section on how a person could supplement or ensure a main source of income through ER practice(s).	Indirect economic benefits by: • improvement of pest control to adjacent fields, • improvement of pollination, • improvement of soil biome, • better water infiltration, • higher carbon sequestration
45. Lessons learned from this site or other sites with similar ecosystem type(s)	Field margin diversification with a high-diversity seed mixture of native wild seed is possible on productive soil (under semi-arid conditions) when a continuous management regime can be ensured.
46. Restoration success	15 years after implementation, with continuous management (stepwise mowing once a year) 47 out of the sown 49 species are still present on the trials.
1.4 Available Resources	
47. Website link(s) to other, similar sites?	https://ser-rrc.org/restoration-database/project-map/
48. Website links to ecological restoration information relevant for this site?	English: https://www.offenlandinfo.de/en/themes/field-margins-and-perennial-wildflower-strips German: https://www.offenlandinfo.de/themen/saeume-feldraine-und-bluehstreifen
49. Relevant scientific papers	Kirmer, A., Rydgen, K., Tischew, S. (2018) Smart management is key for successful diversification of field margins in highly productive farmland. Agriculture, Ecosystems & Environment 251: 88–98. https://doi.org/10.1016/j.agee.2017.09.028
50. Site contact information	Anita Kirmer: anita.kirmer@hs-anhalt.de

Structure of VR tour field margin restoration

- **Start**
    - About this tour
    - Two types of field margin trials (restoration & management, climate)
    - Restoration success after 15 years
    - Start your virtual tour

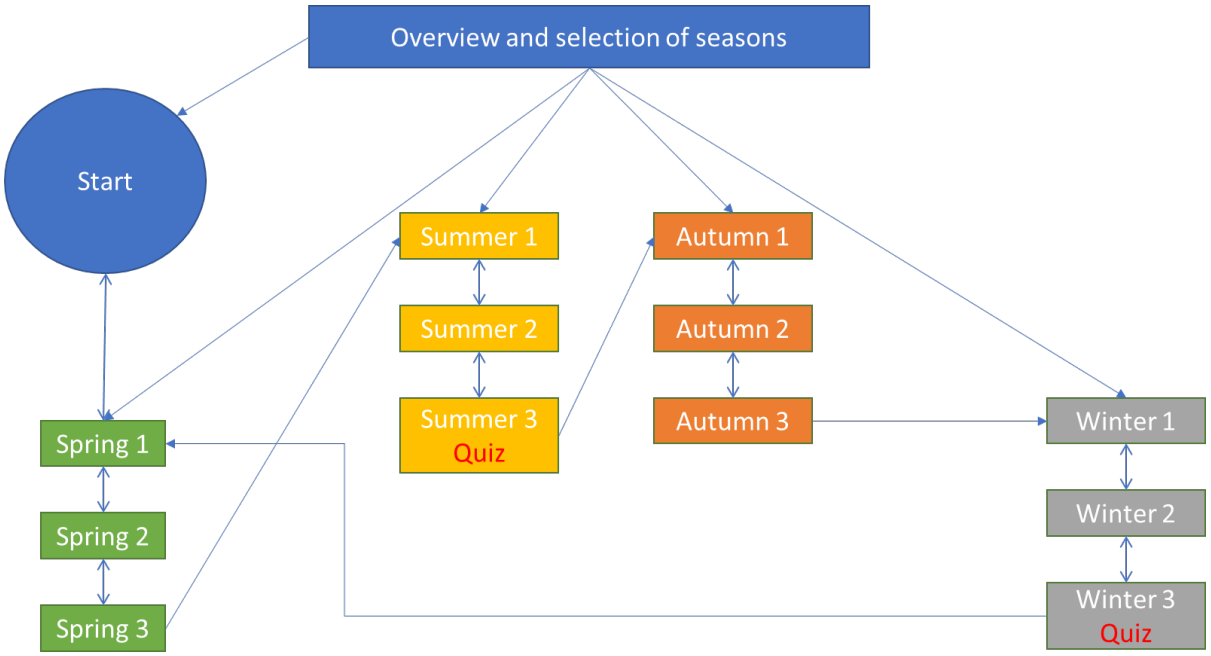
- **Scene 1-3 – SPRING**
    - **Spring 1**
        - What is a field margin?
        - Look at the flowers in early May → information about meadow sage (*Salvia pratensis*)
        - Look at the flowers in later May → information about field scabiosa (*Knautia arvensis*)
    - **Spring 2**
        - Facts about a field margin in spring
    - **Spring 3**
        - Long-term benefits of proper maintenance
        - Mowing in May → colourful flowering begin of August
        - What happenend?
            - Key maintenance practices
            - Maintenance
            - Mown material

- **Scene 4-6 – SUMMER**
    - **Summer 1**
        - How to restore a field margin in central Germany
        - Effects of mowing in June → Regrowth after mowing mid-June → flowering aspect begin of August
        - Take a closer look
            - About the flowers
            - Do you know stiff hedgenettle (*Stachys recta*)?
            - Take a look at the colourful crown vetch (*Coronilla varia*) → More information about the colourful crown vetch (*Coronilla varia*)
    - **Summer 2**
        - Facts about a field margin in summer
        - Colour explosion in July → this part was mown mid-May
    - **Summer 3**
        - Let's check your knowledge (quiz)

- **Scene 7-9 – AUTUMN**
    - **Autumn 1**
        - Facts about a field margin in autumn
    - **Autumn 2**
        - Example for poorly maintained field margins

        - Expert advice and local support in Germany
    - **Autumn 3**
        - Effects of mowing in September
        - Funding options

- **Scene 10-12 – WINTER**
    - **Winter 1**
        - Step into the freezy field margin → the importance of seed heads during winter time
    - **Winter 2**
        - Facts about a field margin in winter
    - **Winter 3**
        - It's time for a quiz



The overview can be assessed from all scenes (it's in the sky).