Interreg CENTRAL EUROPE
Centralparks
European Union
European Regional Development Fund

D.T2.1.3
GRASSLAND STATE EVALUATION PROTOCOL

Final Version

12 2020

Monitoring description of the grassland state evaluation protocol

Content

The evaluated habitat types and the aim of the survey

The methodology will be based on the idea of the methodology introduced within O.T2.1 „Assuring quality in grassland management with a goal-oriented database" (https://www.interreg-central.eu/Content.Node/Centralparks/Centralparks-CE1359-O.T2.1-Joint-strategic-document-on-ra-5.pdf) together with the base of the forest state evaluation protocol (SH4/13 project - http://karpatierdeink.hu/eng/1-feladatcsomag). During the preparation the Natura 2000 monitoring protocol for dry grasslands used as a background documentation as well.

There are numerous, very diverse (even within one habitat) grasslands within the administration area of the Danube-Ipoly National Park Directorate. That means a dozen of more than 100 ha areas of grassland in the total administration area of the national park.

These grasslands are mostly affected by turning into shrubs to a greater or lesser extend or are the areas of previous shrub removal.

The monitored variables for these areas are:

A. successional changes and natural dynamic processes-based succession

B. monitoring of the answers and effects on management. In some places that means nature conservation management, grazing or mowing/heavy duty stulking, stulk crushing and shrub cutting/removal as a part of management, invasive alien species elimination (stulking/ use of chemical) too.

The main questions of the manager/DINPD:

- Does management ensure the viability, regeneration, and possible extension of the habitats/communities and species of nature conservation interest (protected, Natura 2000, etc.)?
- Does the state of the surveyed habitats/population stagnate (if the treatment was sufficient and there is sustaining management) or is it improving sufficiently in response to the actual, already started, current management? And if not, what shall we change within the management (its methodology, mosaic, intensity, etc.)?

The methodology should be based:

I. Determination of the current state (field visit)
II. Elaboration: survey the history of the area/management
III. Defining and analyzing sample areas
IV. Analysis of the variables within the surveyed habitat/population.
V. Examination of the grass structure (facultative)

I. Level: Determination of the current state (field visit)

Normally a systematic site visit series (might be complemented with the prediction of the population's dimension of the protected and Nature 2000 species). This level could be implemented based on the "experienced opinion", does not require a detailed analysis and data collection.

This solution is not (1.) or very limitedly (2.) standardizable, but it is not time-consuming and is cost-effective. Its main advantage is that the method is adaptable to the exact area and situation and it gives immediate and concrete feedback for the area manager. (In this case, the focus is not on the scientific perfection of the monitoring, but on the practice-oriented character, where the expert level meets the everyday challenges of the grassland management level.)

(1.) Non-standardization has some disadvantages. It is Non-objective and needs the same surveyor in a long term.

(2.) Standardization possibilities:

- sampling point checking once or more time annually, monitoring for years
- taking notes on the subjective impression of the surveyor
- determined track lines
- consultation on land use management
- photo documentation
- list of queries on each habitat type (optional)

II. Level: Preparation

Consultation with the landowner about land use and any other relevant information is a must. Communication with park rangers is crucial. In general park rangers have deep knowledge about the sites. To set out sampling points park rangers' involvement is very important. If there are some records or reports on the treatment, that is very useful.

III. Level: Sampling points

The area of sampling points has the same size. Every point is circle-shaped, the radius is 11,25 m and the total area is 400 m2. Midpoint has to be marked and recorded with GPS coordinates. Several survey points are optional. It depends on the goal and resources. The first survey preferred to be done by an expert but, after all, university students also could make it.

Tasks:

- Sampling point description, important variables are: vegetation, land use, weather, natural or human-made disturbance, or any other important detail.
- Photo documentation from the midpoint, photos have to represent the vegetation and its surroundings.
- Estimation of dominant species (%) if possible all detected species have to be recorded.
- All protected and Natura 2000 species have to be recorded (number of blossoming individuals) as well as game damage.
- If the point is reforesting by bush species, the bush cover has to be recorded. If saplings are represented the height of all individuals (under 3 m), they have to be recorded each year. If the number of individuals is more than 10, height measurement has to be done on 10 randomly selected specimens.
- Preparation of mini vegetation maps.
- If any kind of disturbance covers more than 10 m^2, it has to be marked on the minimap

Time of survey

- For dry or semi-dry grasslands: May or June. If samplings will be repeated in the following years, the period has to be the same.

IV. Level: Measurement of Variables in vegetation

This phase has to be done by experts or park rangers.

In the pilot site, 6 circle-shaped sampling points have to be set up. The diameter of each circle is 80 cm (alternative hoops can be used.)

The 6 sampling units have to be perpetuated in the following way:

The circles have to be localized within the 22.5 m diameter circle in 1 marked caliber on the division of the circle, and the other 5 circles have to be pointed 4 m far from each other's center point.

Within the 80 cm diameter circles the following vegetation variables have to be recorded:

- A number of all species and their scientific names (this could be limited to the 1-2 or 3-4 dominant species, preparation of species groups, etc.)
- Total vegetation cover (%) (could be more than 100%)
- Each species cover (%): if there is a shrub layer then the B-level cover has to be determined separately
- Number and cover of flowering individuals
- Bare ground cover (%)
- Stone cover (%)
- Any kind of dung cover
- Leaf litter cover: on a five grade scale (not presented, presented in a very small amount, small amount, large amount, very large amount)
- Height of vegetation: across the division of the 80 cm diameter circle, in 5 repetitions, measured in cm. In the case of multi-layered grassland, it has to be determined in every layer (for short and long grass kinds).
- If the vegetation is covered in tussock then individual tussocks have to be determined, noted, and described. If the vegetation is partly covered by tussocks, the % of the tussock's cover has to be determined.
- Photo documentation of the circles (as much coverage of the photo as possible, photos should be taken from above, in parallel with the surface).

Facultative task – more precise prediction of the leaf litter cover:

Requires more time and effort. In some cases, it must be implemented, because in some treatments and changes the leaf litter cover is indicated by its cover. It is important to implement monitoring on the effects of grazing plus mowing/stalking and the changes in those grasslands.

The leaf litter has to be determined in the neighbor area by a minimum of 3 pieces (optimally 6) with 80 cm diameter circles. 3 m from the circle samplings (to not change the sampling plots) – the 22,5 m diameter sites, perpendicular to the sampling plots,

within the circles the total amount of leaf litter has to be separated and measured on the field.

The measuring sites could be changed.

There is a possibility of even more precise prediction:

Before collecting the leaf litter, the vegetation cover has to be cut, with 3 cm stubble high, and collected. After that, the leaf litter has to be collected. Both samples have to be dried out and measured under laboratory conditions.

Time of survey

- For dry or semi-dry grasslands: May or June. If samplings will be repeated in the following years the period has to be the same.

V. Level: Facultative task: an examination of the grass structure

Perpetuation of:

1. Three pieces 2x2m coenological (plant community) quadrat;
2. Transect along with the 2 parallel sides of minimum 1 (ideally all three) quadrat, which is 4 m long, consisting 5x5 cm micro-quadrats. During the survey of the micro-quadrats, the start and end of the clones should be fixed (it has high importance during the monitoring of the grassland-structure treatments);

based on the expert's opinion, on a selected diameter of 22,5 m representative sampling area patch and a representative part of the examined grassland (if somehow not possible: on the direct physical neighbor area with the same treatment)

The recording of grass structure is similar to the Natura 2000 intensive grassland monitoring datasheet's description.

The designation of sampling areas and the indoctrination require special expertise, after this phase the expertise of the surveyor is irrelevant. The analysis and evaluation have to be done by a professional. Based on this evaluation method any moderate degradation can be determined since the methodology is sensitive to the interactions between the species and the structural changes of the grass vegetation.

Time of survey

- For dry grasslands: May or June. If samplings will be repeated in the following years the period has to be the same. (There shall be less than a week shift between the sampling of the 2 phases.)

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