METHODOLOGY FOR HABITAT TYPES AND EVALUATION OF CONSERVATION DEGREE

1. Selection and characteristics of the sampling plots

In order to study the vegetation ecology and to distinguish the different vegetation types, phytosociological samples (relevés) conduct using the Braun-Blanquet method (Braun-Blanquet 1951, 1964).

Vegetation sampling perform at locations with distinct physiognomic characteristics. Sampling localities select based on the following criteria: a) to be large enough to include all the species that are part of the specific vegetation unit, and b) to be homogenous, both floristically and ecologically. Relevé positions mapped on the WGS84 projection system based on their G.P.S. (Global Positional System) co-ordinates.

The plot size of every relevé is according to European standards (Chytrý & Otýpková 2003):

- 200 m^2 for forest communities
- 16 m^2 for grasslands and rock communities
- 4 m^2 for aquatic plant communities

In each relevé the following data are recorded in a specially designed form:

- General data: Number of relevé, date of assessment, locality and plot size, elevation, water depth, relief, exposition, inclination, cover of vegetation for each layer (tree, shrub, herb), height of each layer, geological substratum and soil type.
- Data for the evaluation of conservation degree: structure and functions, positive impacts, pressures and threats, and restoration possibility.
- Data for the species: Every taxon that participated in the vegetation community was recorded and its cover-abundance was evaluated according to the modified Braun-Blanquet nine-part scale (Dengler *et al.* 2008) where: r (1) = 1 individual with 0-5% cover, + (2) = 2-5 individuals with 0-5% cover, 1 (3) = 6-50 individuals with 0-5% cover, 2m (4) = more than 50 individuals with 0-5% cover, 2a (5) = any amount of individuals with 5-12.5% cover, 2b (6) = any amount of individuals with 15-25% cover, 3 (7) = any amount of individuals with 26-50% cover, 4 (8) = any amount of individuals with 50-75% cover, 5 (9) = any amount of individuals with 75-100% cover.

2. Data analyses

After the collection of the field data and the identification of plant samples, the data are compiled in Microsoft Excel 2010 or in some other data base, and then are arithmetically analyzed (e.g. Two-Way Indicator Specification Analysis, cluster analysis). From these analysis are exported the plant communities.

2.1. Syntaxonomy

Plant communities were classified according to the Braun-Blanquet method (1951, 1964) into: class (suffix: -etea), order (suffix: -etalia), union (suffix: -ion) and sub-union (suffix: -etum). Wherever it is not possible to classify the vegetation unit to an association it was ranked as a community in the next highest syntaxon that could be distinguished.

The nomenclature of the vegetation units are determined, where possible, according to the codes of Barkman et al. (1976, 1986) and Weber et al. (2000). Where there is no possibility of denomination, due to lack of a definitive conclusion on the systematic classification of a vegetation unit, the nomenclature provided by other researcher is used.

2.2. Define of habitat types

Habitat types were classified according to the available codes derived from "The Interpretation Manual of European Union Habitats". When it was not possible to include the vegetation units in any of the proposed Annex I habitat types, EUNIS coding usually is adopted.

2.3. Evaluation of habitat types conservation degree

The conservation degree per relevé and grid cell (10 x 10 km)[1] is estimated using three categories of criteria:

- Conservation degree of structure: The current state of habitat type structures and functions, including the completeness of typical species.
- Conservation degree of functions: An assessment of the prospects for maintaining the structures and functions of the habitat type.
- Restoration possibility: The possibility of the restoration of structures and functions and typical species of the habitat type, from a scientific and technocratic point of view.

The conservation degree is calculated by combining the methodology proposed by Evans & Arvela (2011) and that followed for completing the SDF (European Commission 2011), based on the following eight criteria in particular:

Criterion 1. Conservation degree of typical species
Criterion 2. Conservation degree of specific structure and functions
Criterion 3. Future trend of structure and functions
Criterion 4. Future status of structure and functions
Criterion 5. Area cover by the habitat type compared to reference value
Criterion 6. Future trend of area cover by the habitat type
Criterion 7. Future trend of area cover by the habitat type compared to reference value
Criterion 8. Restoration possibility

For each of these criterion the degree of conservation (based on field protocols, see header data in Annex I) is calculated to be:

A: Excellent conservation degree (A)
B: Good conservation degree (B)
C: Moderate or limited conservation degree, (C) = all other combinations.

Based on the combination of the above criteria, three main groups of criteria result:

1. (Group A) 'Existing conservation degree of structures and functions' (Final evaluation of structures and functions), resulting from the combination of criteria 1, 2 and 5:

Excellent Conservation Degree (A): when both the Typical Types parameter and the Structure and Functions parameter are at Extremely Good Conservation degree
Good Conservation Degree (B): when at least one of the two parameters (Typical species or Structure and Functions) are of Good Conservation Degree and no parameter are at Moderate Conservation Level,
Moderate or Limited Conservation Degree (C): when at least one of the two parameters (Typical species or Structure and Functions) are at Moderate Conservation Level, or
Unknown Conservation Degree (X): when one of the two parameters (Typical Species or Structure and Functions) are of Good Conservation Degree and the other is at an unknown Preservation Degree, or both are at an unknown Conservation Degree.

2. (Group B) 'Prospects for maintaining structures-functions and extent' (Final evaluation of structure and functions perspectives), resulting from the combination

[1] For the purpuse of the conservation degree assessment for the habitat types as well as for the species of European concern a grid of 10 X 10 Km has been created.

of the existing conservation degree calculated above, and criteria 3 and 4 as well as criteria 5, 6 and 7:

Area cover (Criterion 5, 6, 7)	Future trend (Criterion 3)	Future status (Criterion 4)	Conservation prospects
A	A	A	**A**
A	B	A	**A**
A	B	B	**B**
A	B	X	**B**
A	C	B	**C**
A	C	C	**C**
A	C	X	**C**
A	X	A	**A**
A	X	B	**B**
A	X	C	**C**
A	X	X	**X**
B	A	A	**A**
B	A	B	**B**
B	A	X	**B**
B	B	B	**B**
B	B	C	**C**
B	B	X	**B**
B	C	B	**B**
B	C	C	**C**
B	C	X	**C**
B	X	B	**B**
B	X	C	**C**
B	X	X	**X**
C	A	A	**A**
C	A	B	**B**
C	A	C	**C**
C	A	X	**C**
C	B	B	**B**
C	B	C	**C**
C	B	X	**C**
C	C	C	**C**
C	C	X	**C**
C	X	A	**B**
C	X	B	**B**
C	X	C	**C**
C	X	X	**X**
X	A	A	**A**
X	A	B	**B**
X	A	C	**C**
X	A	X	**X**
X	B	A	**B**
X	B	B	**B**
X	B	C	**C**
X	B	X	**X**
X	C	A	**B**
X	C	B	**B**
X	C	C	**C**
X	C	X	**X**
X	X	A	**X**
X	X	B	**X**
X	X	C	**X**
X	X	X	**X**

The above results give the following combination:

Excellent (A)
Good (B)
Moderate or limited (C)
Unknown (X)

3. (Group C) Possibility for rehabilitation, which was estimated per sampling plot by the person conducting the sampling (criterion 8).

The final calculation of the conservation degree per relevé is shown as follows:

Final degree of structure-function conservation (Group A)	Conservation prospects (Group B)	Restoration possibility (Group C)	Conservation degree
A	A	Easy	**A**
A	A	Possible with an average effort	**A**
A	A	Difficult or impossible	**A**
A	A	Unable to assess	**A**
A	B	Easy	**A**
A	B	Possible with an average effort	**A**
A	B	Difficult or impossible	**A**
A	B	Unable to assess	**A**
A	C	Easy	**A**
A	C	Possible with an average effort	**A**
A	C	Difficult or impossible	**A**
A	C	Unable to assess	**A**
A	X	Easy	**A**
A	X	Possible with an average effort	**A**
A	X	Difficult or impossible	**A**
A	X	Unable to assess	**A**
B	A	Easy	**A**
B	A	Possible with an average effort	**A**
B	A	Difficult or impossible	**A**
B	A	Unable to assess	**A**
B	B	Easy	**B**
B	B	Possible with an average effort	**B**
B	B	Difficult or impossible	**B**
B	B	Unable to assess	**B**
B	C	Easy	**B**
B	C	Possible with an average effort	**B**
B	C	Difficult or impossible	**C**
B	C	Unable to assess	**C**
B	X	Easy	**X**
B	X	Possible with an average effort	**X**
B	X	Difficult or impossible	**X**
B	X	Unable to assess	**X**
C	A	Easy	**B**
C	A	Possible with an average effort	**B**
C	A	Difficult or impossible	**C**
C	A	Unable to assess	**X**
C	B	Easy	**B**
C	B	Possible with an average effort	**C**
C	B	Difficult or impossible	**C**
C	B	Unable to assess	**C**
C	C	Easy	**C**
C	C	Possible with an average effort	**C**
C	C	Difficult or impossible	**C**
C	C	Unable to assess	**C**
C	X	Easy	**X**
C	X	Possible with an average effort	**X**
C	X	Difficult or impossible	**C**
C	X	Unable to assess	**X**
X	A	Easy	**B**
X	A	Possible with an average effort	**B**
X	A	Difficult or impossible	**X**
X	A	Unable to assess	**X**
X	B	Easy	**B**
X	B	Possible with an average effort	**X**
X	B	Difficult or impossible	**X**
X	B	Unable to assess	**X**
X	C	Easy	**X**
X	C	Possible with an average effort	**X**
X	C	Difficult or impossible	**X**
X	C	Unable to assess	**X**

Final degree of structure-function conservation (Group A)	Conservation prospects (Group B)	Restoration possibility (Group C)	Conservation degree
X	X	Easy	**X**
X	X	Possible with an average effort	**X**
X	X	Difficult or impossible	**X**
X	X	Unable to assess	**X**

Based on the conservation degree of the sampling plots falling in each cell, the conservation degree of the habitat type for each cell (as well as for the whole research area) is calculated as follows:

Conservation degree = A (excellent conservation)	Conservation degree = B (good conservation)	Conservation degree = C (moderate or limited conservation)
If a percentage greater than, or equal to, 75% of the sampling plot (SP) within a cell has an excellent conservation status	If the percentage of the SP in a cell having an excellent degree of conservation is less than 75% and the percentage of SP having a moderate conservation degree is less than 25%	If a percentage greater than, or equal to, 25% of the SP within a cell has moderate degree of conservation

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