CONSERVATION VALUE AND DEGREE OF THREAT OF NATURAL HABITATS – AN ATTEMPT FOR EVALUATION MATRIX

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ABSTRACT
The main problem of developing an evaluation matrix is the transformation of “quality” parameters into “quantity” parameters. Based on our previous experience an attempt for elaboration of evaluation matrix for natural habitats was made. A four level scale of 25, 50, 75 to 100 relative units gives the possibility to measure the conservation value and degree of threat. Several types of parameters were used for evaluation: spatial, temporal and functional. The occurrence of species with conservation value in the habitats and species’ presence in national and international legislation was taken into account. The most significant condition for the effective use of the matrix is the sufficient knowledge about the habitats and threats selected for evaluation. Corresponding with the IUCN categories, four degrees of the Index of Threat were accepted: CRh – Critically Endangered; ENh – Endangered; VUh – Vulnerable; NTh – Near Threatened, where the letter “h” indicates “habitat”. Four degrees of the Index of Conservation Value were accepted: HSh – Highly Significant; CSh – Conservation Significant; LSh – Least Significant; NSh – Non Significant.

Keywords: conservation value, degree of threat, evaluation, matrix, natural habitats

Introduction
In Bulgarian botanical practice some matrices for the evaluation of similar problems exist and have been used by scientists and decision makers in Bulgaria. These are, e.g. Matrix for the evaluation of the threats at the species level (2, 3); Evaluation of the botanical significance of a given territory (6); Evaluation of the condition of the tourist tracks in National Parks (4); Evaluation of the tourist impact on protected areas (5). The wider acceptance of the evaluation schemes mentioned above gave us the idea to suggest a matrix for the evaluation the conservation significance and degree of threat of natural habitats in Bulgaria. To authors’ knowledge such method has not been described up to now. It is, however, highly necessary in the context of active nature conservation at the habitat and species level. The matrix is constructed on the basis of Bulgarian habitats but it is made as general as possible so it may be applied for universal evaluation of habitats with minor modifications.

Materials and methods
An attempt to develop a general system for evaluation of the conservation value and degree of threat of the habitats was given. This limits the subjective factor in the course of the evaluation. Forming a set of parameters and fixed range of values for condition of habitats we approach the realistic measurement of the conservation status and degree of the threat of natural habitats. Because of the “quantitative” nature of most parameters a scalar approach and ranging was accepted. The range of 25, 50, 75 and 100 units were taken. The proportions in the evaluation of the relict and endemic species are based on the total number of species in the flora. The matrix works in proportional relation – i.e. to a larger conservation value corresponds a higher unit of significance. The four levels of Degree of Conservation Value of the habitat (DCVh) and Degree of Threat of the habitat (DTh) correspond with the four major degrees of the IUCN categories used for evaluation at the species level. The estimate of conservation value is correlated with the degree of threat and the factors that define it. The more important the habitat is the more threatened it is and more protection is needed. The values of the “better” habitats are higher. The values of the more threatened habitats are higher too. To distinguish between IUCN (1) abbreviations we add letter “h” which denote “habitat”. The matrix consists of a number of
important parameters that are grouped as follows: 1) Spatial [area, geographic position, endemic situation, position and frequency of habitats in the florogeographic (FGR) and biogeographic (BGR) region]; 2) Temporal (relict and recent species and coenoses); 3) Functional (species composition, type of use, genetic relations, isolation, etc.); 4) Legal (presence in the national and international legislative acts). Each group and subgroup parameters are described by four units – 25, 50, 70 and 100.

1. Evaluation matrix of DCVh and DTh. 1. Spatial parameters.

Finally, an Index of Conservation Value of the Habitat (ICVh) and an Index of Threat of the habitat (ITH) is calculated as a mean of the values of all parameters. The degrees of the ICVh are Highly Significant (HSh), Significant (Sh); Low Significant (LSh); Non Significant (NSh). The degrees of ITH are Critically Endangered (CRh), Endangered (ENh), Vulnerable (VUh), and Near Threatened (NTh).

2. Temporal parameters.

3. Functional parameters

4. Presence of plants and fungi with conservation value in national and international legislative acts.

Comments

The matrix described below (Annex) gives more than 10
000 possible combinations of values of different parameters. One of the most important characters of the evaluation is that the evaluations for “Degree of conservation value” and “Degree of threat of habitat” are reciprocal. Both DCVh and DTh are evaluated with the same values for the following parameters: Spatial, Temporal at the species and coenotic level, Functional (dynamics of the species composition – anthropogenic changes, collecting of resources for industrial purpose, stability of the habitat), and presence of conservation important species and habitats in the national and international legislation. In the other remaining set of parameters the evaluations are inversely. This “contradiction” is determined by the nature of the parameters selected. In this case it is possible in the end the habitat to be evaluated as conservation less insignificant but highly threatened. Such habitat will have a higher final value and the evaluation will make it equal with the habitat importance. Because of the ultimate goal for the protection of habitats, the already mentioned “contradiction” is acceptable. The suggested matrix for evaluation needs serious knowledge, amount of information and data. In the case of some “insufficiency “more important role is given to the experience of experts. Probably, six degree scale will give more exact values but it may prove unnecessary complicated. We prefer four degree scale corresponding with main IUCN categories of threat. That gives possibility for pragmatic organization of the potential protection.

**Conclusion**

The mean of the values of all parameters form the Index of Conservation Value of the habitat (ICVh) and the Index of Threat of the habitat (ITh):

<table>
<thead>
<tr>
<th>“Index of conservation value” (ICVh)</th>
<th>“Index of threat” (ITh)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Significant (HSb)</td>
<td>Critically Endangered (CRh)</td>
<td>76 - 100</td>
</tr>
<tr>
<td>Significant (Sb)</td>
<td>Endangered (ENb)</td>
<td>51 - 75</td>
</tr>
<tr>
<td>Least Significant (LSb)</td>
<td>Vulnerable (VUb)</td>
<td>26 - 50</td>
</tr>
<tr>
<td>Non Significant (NSb)</td>
<td>Near Threatened (NTh)</td>
<td>0 - 25</td>
</tr>
</tbody>
</table>

In case when the species is mentioned in the national and international documents its value has to be calculated twice

**REFERENCES**