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STUDY ON THE CONSERVATION STATUS OF THE SPECIES OF COMMUNITY INTEREST IN THE “HÂRTIBACIU-TÂRNAVA MARE-OLT” NATURA 2000 SITE

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Abstract: The study comprises the results of research on the identification and analysis of the conservation status of six plant species included in the Habitats Directive, Annexes II b and IV b, Bern Convention – App I and the National Red List. The study area is the “HÂRTIBACIU-TÂRNAVA MARE-OLT” Natura 2000 site, which is a site of Community interest within the Natura 2000 network.

The study was performed based on the assessment of the conservation status of species of Community interest, from the point of view of the species population, habitat and perspectives.

It was found that the general conservation status of the six species of Community interest in the site is unfavourable, requiring the application of management measures in order to ensure the restoration of the species populations and to preserve the integrity of the habitats where it occurs.

Keywords: priority species, conservation status, Natura 2000 site.

Introduction

The “HÂRTIBACIU-TÂRNAVA MARE-OLT” Natura 2000 site is a site of Community interest in the Natura 2000 network.

The study comprises the results of research on the identification and analysis of the conservation status of six plant species included in the EU Habitats Directive, Annexes II b and IV b, Bern Convention – App I and the National Red List.

The “HÂRTIBACIU-TÂRNAVA MARE-OLT” Natura 2000 site is situated in the centre of Romania, in the southern part of Transylvania. The territory studied has a surface area of 97,000 ha, being one of the largest sites of the continental region of Romania.

The flora and vegetation of the Târnava Plateau are characterized by a great diversity of plant taxa, as a result of the location of the region, and especially, of the diversity of land forms (hills, floodplains), and of the various aspects and inclinations of the slopes. In addition, soil heterogeneity and traditional anthropo-zoogenic activity also play a role.

We should mention that the flora of this region represents about 25.62% of the Romanian flora (3500 species according to *Flora R.P.R.-R.S.R.*) [22]. Thus, 0.04% of the country's surface area gathers more than a quarter of the number of species known in the Romanian flora, which

allows us to conclude that the Sighișoara-Târnava Mare site is a region of high floristic diversity [18].

Due to the beauty of the landscape, including nature, the traditional villages and the fortified Saxon churches, this area has become a tourist attraction in all seasons, being nationally and internationally recognized as a region rich in waters and forests, with a valuable cynegetic fauna.

Today, considering the increasing anthropogenic influence, we understand why this flora and its habitat types must be preserved.

Materials and Methods

The study was performed based on the assessment of the conservation status of species of Community interest, from the point of view of the species population, habitat and perspective.

The conservation status of a species is considered favorable if:

- the population dynamics data indicate that the species is maintained in the long term as a viable element of its natural habitats;
- the natural distribution area of the species is not reduced and there are no premises for a reduction in the predictable future;
- the species occupies and will very likely occupy a sufficiently extensive habitat to maintain its population in the long term.

A *favourable conservation status* is the situation in which a species thrives (with respect to the area and size of the population as well as to the quality of the population, including the reproduction capacity, age structure, mortality), and is also likely to thrive in the future, without significant changes in the existing policies and management. The fact that a species is not threatened (e.g. there is no direct risk for it to become extinct) does not mean that it has a favourable conservation status.

The unfavourable conservation status is divided into two classes:

- "*unfavourable-inadequate*" for situations in which a change of policies or management is required to bring the species into a favourable conservation state, but there is no risk of extinction in the predictable future (e.g. 50–100 years);
- "*unfavourable-bad*" for situations in which the species is at a risk of extinction in the predictable future (e.g. 50–100 years).

To evaluate the population size, the following parameters were used: large population size (100–1000 individuals/m²), medium population size (10–100 individuals/m²), small population size (2–10 individuals/m²), very small population size (1–2 individuals/m²).

Results and Discussions

Following the field studies, six taxa were identified according to Table 1.

Table 1: List of species of Community interest included in the study

No.	CODE	Taxon	Family
1.	4068	<i>Adenophora liliifolia</i>	Campanulaceae
2.	1617	<i>Angelica palustris</i>	Apiaceae
3.	4068	<i>Crambe tataria</i>	Brassicaceae
4.	1902	<i>Cypripedium calceolus</i>	Orchidaceae
5.	4067	<i>Echium maculatum</i>	Boraginaceae
6.	4097	<i>Iris aphylla subsp.hungarica</i>	Iridaceae

The endangered taxa and their description

Species: *Adenophora liliifolia* (L.) A. DC. (Fig. 1)

Natura 2000 code: 4068

OUG Annexes 57/2007: 3, 4A

Sozological category: VU

Fam. CAMPANULACEAE

Geographical distribution: Eurasia cont.

Frequency in Romania: sporadic; it is found in forests, forest edges, scrub, wet pastures and hay-meadows, sometimes in dry steppe grasslands, from the oak belt up to the beech belt.

Distribution in ROSCI0227: Apold, Roadeș, Bunești on the northern side of the hillock at the crossing of the commune road to Roadeș and DN 1/ E 60.

Population size: medium

Current conservation status: good

Habitats in which the species is present:

6210* - Semi-natural dry grasslands and scrubland facies on calcareous substrates

Brachypodio pinnati-Festucetum rupicolae Ghișa 1962

Polygalo majoris-Brachypodietum pinnati Wagner 1941

6510 – Lowland hay-meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*).



Fig. 1: *Adenophora liliifolia*, Apold (photo: S. Oroian)

Species: *Angelica palustris* (Besser) Hoffm. (Fig. 2)

Natura 2000 code: 1617

OUG Annexes 57/2007: 3, 4A

Sozological category: VU

Fam. APIACEAE

Geographical distribution: Euro-Siberian, considered to be a glacial relict by us, although this is biogeographically questionable.

Frequency in Romania: extremely rare, continuously decreasing. Marsh grasslands, peat bogs.

Distribution in ROSCI0227: It was reported in the Coveş Valley (Rora). A population was also identified at the border of the Natura 2000 site, on the administrative territory of the town of Agnita-Ruja.

Population size: medium

Current conservation status: good.



Fig. 2: *Angelica palustris*, Ruja (photos: S. Oroian & M. Sămărghițan)

Species: *Crambe tataria* Sebeok (Fig. 3)

Natura 2000 code: 4068

OUG Annexes 57/2007: 3, 4A

Sozological category: VU

Fam. BRASSICACEAE

Crambe tataria is sporadically distributed on sunny, dry, clay or sandy slopes, in the forest-steppe zone and in the sessile oak belt. It is a mesoxerophilic-xerophilic steppe species.

Geographical distribution: Pontic-Pannonic.

Frequency in Romania: rare and continuously decreasing.

Distribution in ROSCI0227: Bunești, Saschiz, Albești.

Population size: medium: Saschiz - 100 individuals; Albești - 1 individual, poorly represented in the habitat.

Current conservation status: good, the presence of the species confirms the fact that it can be saved from extinction (in the future) if the proposed management measures are applied.

The habitat in which the species is present:

6210* - Semi-natural dry grasslands and scrubland facies on calcareous substrates.

Species: *Cypripedium calceolus* L.

Natura 2000 code: 1902

OUG Annexes 57/2007: 4 A

Sozological category: VU

Fam. ORCHIDACEAE

Cypripedium calceolus is a perennial species that flowers May-June; it is sporadically distributed in the forest-steppe zone up to the upper woodland belt, in grasslands, grassy slopes and scrub.

Geographical distribution: Western Eurasian.

Frequency in Romania: rare, continuously decreasing.

Distribution in ROSCI0227: In the Romanian Flora, vol. XII, p. 652-655, it was reported at Biertan; other bibliographic sources report it in the Daneş forest, but here it was no longer found.



Fig. 3: *Crambe tataria*, Buneşti-Viscri (photo: S. Oroian)

Species: *Echium maculatum* L. (Fig. 4)

Natura 2000 code: 4067

OUG Annexes 57/2007: 3, 4A

Sozological category: VU

Fam. BORAGINACEAE

Echium rossicum is a xerophilic-mesoxerophilic steppic grassland perennial species.

Geographical distribution: Pontic-Pannonic.

Frequency in Romania: sporadic in xerophilic grasslands in all areas.

Distribution in ROSCI0227: Apold, Biertan, Laslea, Sighişoara, Saschiz; Viscri, Roadeş [20].

Population size: the presence of large- or medium-sized populations of the species is a sure indicator of their good conservation status.

Current conservation status: satisfactory.

Habitats in which the species is present:

6240* - Sub-Pannonic steppic grasslands

The species is found in well conserved xerophilic-mesoxerophilic steppic grasslands (*Festucion valesiacae*, *Stipion lessingianae*); it is not resistant to over-grazing.

Species *Iris aphylla* L.

Natura 2000 code: 4097

OUG Annexes 57/2007: 3, 4A

Sozological category: VU

Fam. IRIDACEAE

Iris aphylla is a species found in the forest-steppe zone up to the sessile oak belt, in dry grasslands, sandy-rocky places; it is a xeromesophilic, oligotrophic species.

Geographical distribution: Eurasia cont.

Frequency in Romania: sporadic.

Distribution in ROSCI0227: Bunești, Daneș.

Population size: medium; the presence of large- or medium-sized populations of the species is a sure indicator of their good conservation status.

Current conservation status: good.

Habitats in which the species is present:

6210 - Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important sites for orchids).



Fig. 4: *Echium maculatum*, Saschiz (photo: S. Oroian)

The potential *threats/risk factors* estimated following the field studies, which involve both the species habitat and the population size dynamics (Table 2), are particularly caused by anthropogenic factors: extension of scrub, ruderalization of vegetation, penetration of invasive species. To these, activities related to land use are added: the abandonment of use (absence of mowing in particular), as well as intensive sheep and goat grazing (Fig. 5) are anthropogenic factors that can lead to the deterioration and replacement of the habitat, which affects the long-term perpetuation of the species individuals.

Also, water supply and soil humidity are extremely important for some species. *Angelica palustris* is a species that requires high amounts of ground water, even water pooling. If these abiotic conditions are influenced by various anthropogenic activities, the decrease of soil humidity levels leads to changes in the floristic structure of the phytocoenoses of the habitat in which the species individuals vegetate and to a decrease of the population size.

The short-term impact of risk factors in the absence of management interventions consists of a population size reduction, a decrease in the species distribution area in the site, a diminution of the individuals' vitality, and changes in the structure and composition of the plant associations in which the species were described.

Table 2: Evaluation matrix of the species conservation status from the point of view of the species population and the species habitat

Species	Conservation status	
	from the point of view of the species population	from the point of view of the species habitat
<i>Adenophora liliifolia</i>	U-B	U-B
<i>Angelica palustris</i>	U-B	U-B
<i>Crambe tataria</i>	U-B	F
<i>Cypripedium calceolus</i>	N	N
<i>Echium maculatum</i>	U-B	U-B
<i>Iris aphylla</i>	U-B	U-B

Legend: F: The quality of the species habitat in the protected natural area is adequate for the long-term survival of the species

U-B: Great diminution equivalent to a 5% population loss in the last 5 years/The quality of the species habitat in the site is not adequate for the long-term survival of the species

N: unknown

Proposed management measures

- prohibition of harvest of the flowers or fruits, as well as to collect, cut, unroot or destroy these plants intentionally, at any of the biological cycle stages;
- maintenance of grassland ecosystems by grazing and mowing (preventing the establishment of trees and shrubs);
- prohibition to convert grasslands specific for these species to other types of ecosystems (including forests);
- prohibition of overgrazing (Fig. 5a) and maintenance of traditional grazing (with the animal types, stocking rates and grazing duration used over the past decades);
- prohibition to use chemical fertilizers and controlled use of organic fertilizers;
- avoidance of technological measures for the use of organic fertilizers;
- avoidance of outdoor animal confinement areas, which cause the replacement of grassland communities with other types of plant communities;
- prohibition to drain the marshes;
- strict grazing prohibition in marshes and around them;
- prohibition to burn vegetation (Fig. 5b);
- regulation/strict control of tourist activities (picnic fires, creation of new paths).
- study of the biology of endangered species at European and national level (pollination, dissemination and particularly germination and the juvenile phases);
- education and continuous increase of awareness about the need to protect species.

Conclusions

The conservation status of the six identified priority species was evaluated, but noting the following: the species *Cypripedium calceolus* was not identified in the grasslands of the Natura 2000 site; this has been reported in the Daneş forest, but forests were not within the scope of the present study. The species *Angelica palustris*, reported in the wet areas of Apold-Şaeş by Emil Pop, was not found, but was identified at the border of the Natura 2000 site, in Ruja-Agnita.

The general conservation status of the six species of Community interest in the Natura 2000 site is unfavourable, requiring the application of management measures to ensure the restoration of these species' populations and the preservation of the integrity of the habitats in which they occur.

The most important risk factors/threats are: *overgrazing, the abandonment of agricultural lands and the penetration of invasive species.*

Adequate management measures are required for the restoration, maintenance or improvement of a favourable conservation status of species and habitats of Community/national interest in the studied territory.



Fig. 5a: Grazing in the "Breite Ancient Oak Trees" Nature Reserve, Sighișoara (photo: S. Oroian)



Fig. 5b: Burned oak tree in the "Breite Ancient Oak Trees" Nature Reserve, Sighișoara (photo: S. Oroian)

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**STUDIU PRIVIND STAREA DE CONSERVARE A SPECIILOR PRIORITARE DIN SITUL NATURA
2000 “HÂRTIBACIU-TÂRNAVA MARE-OLT”**

(Rezumat)

Studiul cuprinde rezultatele cercetărilor concretizate în identificarea și analiza stării de conservare a **6** specii de plante incluse în Directiva Habitate Anexele II b și IV b, Convenția de la Berna – App I și Lista Roșie națională.

Zona de studiu este reprezentată de Situl Natura 2000 **Zona “HÂRTIBACIU-TÂRNAVA MARE-OLT”** care figurează ca sit de importanță comunitară din rețeaua Natura 2000.

Studiul s-a realizat pe baza evaluării stării de conservare a speciilor de importanță comunitară, din punct de vedere al populației speciei, habitatului și perspectivelor speciei.

S-a constatat că starea de conservare a celor șase specii de interes comunitar este nefavorabilă-inadecvată, necesitând luarea unor măsuri de management pentru a asigura refacerea populațiilor speciilor și pentru a conserva integritatea habitatelor în care acestea vegetează.

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