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**Studii și cercetări de științele naturii
și muzeologie**



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FOREWORD

This volume represents an enhancement in value of researches conducted on Dobrogea natural heritage by experts in the Danube Delta Ecotourism Museum Centre – ICEM Tulcea in order to carry out its investigation, conservation and protection.

The research was conducted within two subject matters: *Assessment of the natural heritage of Tulcea County* (coordinator PhD. Eng. Cristina Dinu) where the administrative-territorial units of Tulcea County were studied, and *Environmental research of the protected natural areas of Dobrogea Plateau* (coordinator PhD. Eng. Mihai Petrescu), which dealt with the nature reserves and national parks in the counties of Tulcea and Constanța, legally established and proposed.

The research of Dobrogea natural heritage consisted of making an inventory of the main taxonomic groups (higher plants, birds, mammals) and habitats of conservation interest, preliminary assessment of their conservation status, and presentation of matters related to landscape and biotope elements (geological substrata, types of soil) of the areas studied. Lists of species and habitats and their occurrence data within protected natural areas studied, were also updated.

Given the large area of study and logistical possibilities, species, habitats, landscapes, geological and pedological aspects could not be exhaustively inventoried; further research shall detail the data presented in this paper. Therefore, this research was deemed as a contribution to the knowledge of the natural heritage of Dobrogea and not as a complete assessment thereof.

This volume presents the results of the research conducted in 2011-2013, on the natural heritage of 25 communes / towns, 34 legally established and proposals of nature reserves, 19 from Tulcea County, respectively 15 from Constanța County.

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CHAPTER I

Contributions to the knowledge of the natural heritage of some territorial-administrative units in Tulcea County

Keywords: *Balkan, coenotaxa, Dobrogea, flora, geology, habitat, landscape, Natura 2000, plant community, protected area, site, soil, soil science species, Steppic, supra-Mediterranean, sustainable development, threatened, Pontic, Ponto-Sarmatic, Tulcea, vegetation.*

From the ecological point of view Tulcea County represents the most important region of Romania, as here the largest surface of protected areas/ Natura 2000 sites occur at the national level. It also represents the most important natural area in the European Union for the conservation of most species and habitats of community interest from the Steppic and Pontic bioregions. The sustainable development of this area involves first of all the *in situ* conservation, both inside and outside the protected areas, of the protected species and habitats, mainly those of community interest, for which the local and central administration have numerous responsibilities, at national and European levels.

In this context, even though numerous studies were conducted in Tulcea County, they were mainly focused on the Danube Delta area, for the remaining area the existing data being less detailed and/ or updated. For this particular reason the *Gavrilă Simion* Eco-Museum Research Institute in Tulcea initiated an overall and updated assessment of the natural heritage of this region for each of the administrative territories (towns, communes), presented within the first chapter of this paper. Besides the scientific importance of this research, which can be used as a basis for the clarification, particularization and updating of the data regarding the presence occurrence, conservation status of some protected species and habitats, another goal is facilitating national and European funds at the level of each administrative unit of the county. This could be achieved using the results of the research partially presented in this paper, for the: management on a scientific basis of the natural heritage within the areas under the jurisdiction of the local authorities, both inside and outside protected areas; the drafting of the chapters regarding the natural heritage of each commune/ town within the financial applications; the procurement of clearings etc.

For the natural protected areas within Dobrogea Plateau inventoried within the assessments conducted on the administrative territories of the communes/ towns of Tulcea County, in chapter I only the data resulting during this research progress, in a single year, are presented, along with the inventories performed outside these areas in the relevant period. In chapter II, for the same reserves, other field data are presented, as a result of the investigations conducted between 2011 and 2013, in periods other than those mentioned in chapter I.

RESEARCH METHODS

The methods utilized in both chapters of this paper for the description of species, habitats/coenotaxa and of the geology and soil science aspects are concisely presented below. In this paper the names of the habitats are both in Romanian and English, while for the list of species for each habitat scientific names were used.

Flora, vegetation, habitats, landscape. The on-site research consisted in observations on itineraries and inventories generally in 100 square meters plots, according to the Braun-Blanquet method. The coenotaxa with an area below 100 square meters were considered plant community fragments, therefore they were not recorded in plots. Only in few situations, for forest habitats with high trees, of 200 square meters plots were used, in order to properly include all main key species. In the plots the species dominance is assessed according to the Braun-Blanquet scale. Within a certain plant community the dominance of the species identified outside the plots only and the sites where they are located are underlined in the text. The flora inventory is presented in the lists of species mentioned for each coenotaxon in the habitat description. For each species, between brackets, the variation limits of the dominance are mentioned, followed by the site where they were identified. For each plant community in a certain habitat first the most important species for conservation, represented by the key, respectively the threatened taxa there are presented. The remaining species, for the forests and thickets are grouped in vegetation layers that correspond to the main groups of biological forms (trees, shrubs/lianas, grasses etc.). The identification and framing of the plant species, coenotaxa and habitats are based on PHYSIS database and other papers or field guides (CIOCÂRLAN, 1994; CIOCÂRLAN, 2000; CIOCÂRLAN, 2009; DEVILLIERS, DEVILLIERS-TERSCHUREN, LINDEN, 1996; DIHORU, DONIȚĂ, 1970; HOREANU, 1976A; HOREANU, 1976B; IVAN, 1979; OLTEAN *et alii*, 1994; POPESCU-ZELETIN *et alii*, 1971; PRODAN, 1934; SANDA, 1998; SANDA, 2002; SANDA, ARCUȘ, 1999; SANDA, VICOL, ȘTEFĂNUȚ, 2008; SĂVULESCU *et alii* 1976; SÂRBU *et alii*, 2007).

The scientific names of the threatened taxa was maintained as it is listed in the national red list (OLTEAN *et alii*, 1994) in order to avoid any confusion, even though the denomination of all the other species corresponds mainly to other more recent references (CIOCÂRLAN, 2009). The framing of the taxa was made according to the conservation importance. Thus taxa were framed to the subspecies level only where it was necessary to distinguish between infrataxa with or without conservation importance (ex. *Corydalis solida* subsp. *slivenensis* versus *Corydalis solida* subsp. *solida*), only in the case of the threatened taxa. The threatened species where the subspecies is not mentioned were mentioned in this form in order to correspond with the scientific denomination listed in the national red list (OLTEAN *et alii*, 1994). For the key species the subspecies was mentioned only where the plant community denomination specifies the respective subspecies scientific name, in order to justify the proper framing of the studied phytocoenoses; like *Sedo hillebrandtii* - *Polytrichetum piliferi*, in which case it was

necessary to separate *Sedum urvillei* subsp. *hillebrandtii* from *Sedum urvillei* subsp. *urvillei*. The other taxa, with no particular conservation value, were framed only to the species level, being mentioned in their sensu lato form, except the exceptional situations in which it was necessary to make a distinction between a native and an alien species (ex. *Cannabis sativa* subsp. *spontanea* versus *Cannabis sativa* subsp. *sativa*), significant for the conservation status of a certain plant community. Similar situations, where some subspecies that are important for conservation are mentioned, while the other taxa are only framed at the species level can also be quoted from the references mentioned previously (SANDA, VICOL, ȘTEFĂNUȚ, 2008).

The correspondence with the community interest habitats follows the descriptions in the EUR 27 version of the *Interpretation Manual of the European Union Habitats* (EUROPEAN COMMISSION-DG ENVIRONMENT, 2007). The preliminary assessment of the importance and conservation status of threatened species or habitats/ coenotaxa, as a basis for the evaluation of the conservation priorities, was made by using a scale, as follows. For the species the first three gradations correspond to the IUCN threat categories (endangered, vulnerable, rare), to which the "critically endangered" category was added. For the next three gradations, that correspond to the "not threatened" IUCN category the following frequency categories were used: sporadic, frequent, very frequent. A correspondence was also set between these categories and the Braun-Blanquet scale for the assessment of the dominance within the plots. For the preliminary evaluation of the habitat threat categories an adapted form of the previous scale was used, based on the estimation of the percentage limits in the research route within which the habitat/ coenotaxa was noticed.

The correspondence between the dominance, habitat frequency and the threat categories for species and habitats/ coenotaxa

| Dominance indices (specii) | Threat category | Habitat frequency in the studied area (% of the route) |
|--|-----------------------|--|
| r – <5 individuals /plot, with negligible dominance | critically endangered | - |
| + – ≤ 1 % dominance | endangered | + – ≤ 1 % |
| 1 – 1-10 % dominance | vulnerable | I – 1-10 % |
| 2 – 10-25 % dominance | rare | II – 10-25 % |
| 3 – 25-50 % dominance | sporadic | III – 25-50 % |
| 4 – 50-75 % dominance | frequent | IV – 50-75 % |
| 5 – 75-100 % dominance | very frequent | V – 75-100 % |

The conservation status was preliminary assessed by threat categories. Thus, the higher threat categories correspond to a lower conservation status,

closer to an unfavourable level. Also the higher the number of threatened species, the better the conservation status can be considered.

Wherever data allowed also the conservation status of the plant communities/ habitats induced by the intensity of human activities was assessed. A simple scale which estimates a high, medium, low or null level of disturbance was used, taking into account the dominance indices and the number of ruderal and/ or non-native species identified in the plots located in plant communities, in the studied habitats. Within each plant community the presence of at least one ruderal/ non-native species with a certain dominance index corresponds to a level of disturbance, i.e.: r – very low; + – low, 1 – medium; 2-5 – high. Additionally, for oak forests that are usually represented by more or less derived phytocoenoses, if the oak species proportion is: higher or equal to 2 (20%) – low disturbance; between (or equal to) 1 (10%) and 2 (20%) – medium disturbance; no oaks – high disturbance. The highest disturbance level in the canopy or shrub/ grasses layer is considered representative for the overall plant community. Within the species list for each plant community the ruderal species are underlined, while the non-native ones are mentioned in the description of the respective coenotaxa.

Fauna. The bird and mammal species inventories were conducted on the same route in the studied areas for each field research. To perform these operations optical devices i.e. binoculars and telescopes for ornithological observations were used. For every investigated area only the species listed within the appendages of the Ordinance 57/2007 and Law 13/1993, were mentioned, without indicating those protected by other conventions ratified by Romania.

Geology, soil science. The study was achieved based on the thematic cartographic materials and satellite imagery in digital format, as well as data from field studies in different locations of Tulcea County. In order to achieve an accurate image of the geological structure and soils cover in the studied areas, all these data were correlated. The digital data came from different sources, as follows:

- Romanian Geological Map scale 1: 200000, sheets: Focșani (L-35-XXII), Brăila (L-35-XXVIII), Tulcea (L-35-XXIX), Sulina (L-35-XXX), Călărași (L-35-XXXIV), Constanța (L-35-XXXV), Mangalia (K-35-V), published by the Geological Institute of Romania and provided in digital format by geo-spatial.org (earth.unibuc.ro);
- ASTER GDEM Ver2 produced by METI and NASA in cooperation with the Japan-US ASTER Science Team and available in several tiles on the website of the latter (www.gdem.aster.ersdac.or.jp);
- Relief Map Units (*shapefiles* format) provided by geo-spatial.org (earth.unibuc.ro);
- Attribute maps (scale 1: 1000000) derived from the European Soil Database v2 (Google Earth files format) made by European Soil Data Centre (ESDAC) and provided through European Soil Portal (eussoils.jrc.ec.europa.eu);
- ESDB v2 - Raster Library 1kmx1km (*shapefiles* format) performed by

European Soil Data Centre (ESDAC) and provided through European Soil Portal (eusoils.jrc.ec.europa.eu);

- CORINE Land Cover maps (*shapefiles* format) performed by European Environment Agency at scale 1:100000 in 2006 (www.eea.europa.eu).

Firstly, data processing was achieved by their conversion from the WGS84 at Stereo 70 projection system, assembling the tiles of Romanian Geological Map, ASTER GDEM Ver2 mosaics, as well as CORINE Land Cover thematic layers. Then the data were loaded as thematic layers in Quantum GIS application and after that analysed in correlation with field studies data.

Research concerning the natural heritage of Beștepe commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT, Mariana CUZIC

ACCESS: Road DJ222C Tulcea-Beștepe

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:
Danube Delta Biosphere Reserve, Dealurile Beștepe
nature reserve

NATURA 2000 SITES: Delta Dunării (Site of Community Interest, Special
Protection Area), Beștepe-Mahmudia (Special Protection
Area)

GEOLOGY AND PEDOLOGY

Within the administrative territory of Beștepe village, there were identified the Devonian deposits of silicolite, green phyllitic clay and limestone to which are added the Middle Triassic deposits of blackish-grey limestone and micritic limestone which occur through the Quaternary loess layers. Within that area, the riverbed of Danube is dug in the bed of Holocene deposits of siltite. All those types of rocks underlying the following territorial units of soil types such as Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998) and Kastanic chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), on the continental part, as well as Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-alluvial gley soils along Sf. Gheorghe branch.

LANDSCAPE

The artificial habitats are spread on most of the commune's territory, being mainly represented by agriculture fields and less by forestry plantations – northwards of the Sf. Gheorghe branch of the Danube, respectively by stone quarries in its southern sector.

The natural habitats, represented by wetland vegetation mainly reed or reed mace beds, distributed on both sides of the Danube, as well as by riparian forests of white willow and less by elm stands. Other natural habitats, typical for the saline soils, usually occur in the transition area between the wetlands and the mainland.

The steppe grasslands are concentrated on the western part of the Beștepe hills, the highest elevation within this territory (242 m), an outstanding viewpoint over the Danube Delta and the Razim lagoon. On these hills also steppe thickets and sub-Mediterranean woods can be found, the latest especially on the northern slopes, more humid. Restricted areas of isolated steppe grasslands occur on the slopes adjacent to the Danube floodplain, like also at the southern limit of this commune's territory.

FLORA, VEGETATION, HABITATS

The high conservation value of the native vegetation is obvious, taking into account that most of the plant communities are framed into priority habitats of community importance, such as 1530* (15.A2124, 15.A21275, 15.A2143), 40C0* (31.8B721, 31.8B731), 6260* (34.A2111), 62C0* (34.92, 34.9211), 91F0* (44.4).

The major part of the plant communities is endangered, being followed by vulnerable coenotaxa, of which one is sporadic. The conservation status can be considered favourable in general, as most of the plant communities are low disturbed, closely followed by coenotaxa representative for a natural status. The maximum recorded level of disturbance corresponds to a medium level.

The mentioned locations are included in the Danube Delta Site of Community Interest, except the: steppe grasslands situated westwards Beștepe locality, adjacent to the Danube floodplain, represented by Dealul Cetățuii, the plateau where the Gaetic fortress is situated.

15. A2124 Western Pontic saltmarsh rush saline meadows

***Scorzonero parviflorae-Juncetum gerardii* (Wenzl.1933) Wendelbg. 1943**, an endangered plant community, described from the Danube floodplain – Beștepe commune (BLD), shows a low degree of disturbance, as only two ruderal species with a reduced dominance were observed.

Key species: *Juncus gerardi* (4; BLD).

Other species: *Cynodon dactylon* (1; BLD), *Plantago major* (+; BLD), *Polygonum aviculare* (+; BLD), *Potentilla reptans* (+; BLD), *Ranunculus sceleratus* (r; BLD), *Ranunculus trichophyllus* (+; BLD).

15. A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** plant community can be considered vulnerable within the Beștepe commune's territory. The six

ruderal species, even though they have a reduced dominance, represent half of the species inventory and thus indicate a medium degree of human activities influence.

Key species: *Cynodon dactylon* (2; BLD), *Trifolium fragiferum* (+; BLD).

Other species: *Bromus hordeaceus* (+; BLD), *Bromus tectorum* (+; BLD), *Hordeum murinum* (+; BLD), *Juncus gerardi* (+; BLD), *Mentha aquatica* (+; BLD), *Plantago major* (+; BLD), *Poa pratensis* (1; BLD), *Potentilla anserina* (+; BLD), *Potentilla reptans* (+; BLD), *Verbena officinalis* (+; BLD).

15. A2143 Western Ponto-Caspian saltmarsh grass swards

***Aeluropetum littoralis* (Prodan 1939) Șerbănescu 1965**, an endangered coenotaxon within the Beștepe commune area, can be considered as being at the upper limit of the low disturbance category, from the ruderal species presence (5 taxa) point of view.

Key species: *Aeluropus littoralis* (2; BLD)

Other species: *Capsella bursa-pastoris* (+; BLD), *Chenopodium glaucum* (+; BLD), *Juncus gerardi* (+; BLD), *Matricaria recutita* (+; BLD), *Mentha pulegium* (+; BLD), *Plantago major* (+; BLD), *Polygonum aviculare* (+; BLD), *Ranunculus sceleratus* (+; BLD), *Rorippa sylvestris* (1; BLD), *Sclerochloa dura* (+; BLD).

22.422 Small pond weeds communities

***Ceratophylletum demersi* (Soó 1927 n.n.) Den Hartog et Segal 1964**, a vulnerable plant community that occurs in the lakes of the Danube floodplain, close to the Gaetic fortress, near Beștepe (BLD), shelters one vulnerable threatened species, *Stratiotes aloides*, endangered at least within the analysed phytocoenosis. As no ruderal/alien taxa were recorded, it can be considered as representative for a natural status.

Key species: *Ceratophyllum demersum* (3; BLD).

Threatened species: *Stratiotes aloides* (+; BLD).

Other species: *Myriophyllum spicatum* (+-1; BLD), *Nymphaea alba* (+-1; BLD), *Ranunculus trichophyllus* (+; BLD), *Potamogeton lucens* (1; BLD).

***Ceratophylletum submersi* (Soó 1927 n.n.) Den Hartog et Segal 1964**, a vulnerable plant community within the studied area, can be considered as being close to its natural status as no alien/ ruderal species were identified.

Key species: *Ceratophyllum submersum* (3; BLD).

Other species: *Bolboschoenus maritimus* (+; BLD), *Myriophyllum spicatum* (1; BLD), *Nymphoides peltata* (+; BLD), *Phragmites australis* (+; BLD), *Potamogeton crispus* (1; BLD), *Ranunculus trichophyllus* (+; BLD).

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931**, an endangered plant community, analysed within the steppe grasslands situated westwards of Beștepe locality, adjacent to the Danube floodplain (PBVE), has a medium position from the point of view of ruderal plants invasive tendencies, the four such species having a dominance variation of +-1.

Key species: *Prunus spinosa* (5; PBVE).

Other species:

- shrubs/ lianas: *Rubus caesius* (+; PBVE), *Sambucus nigra* (+; PBVE);
- grasses/ undershrubs: *Artemisia vulgaris* (+; PBVE), *Ballota nigra* (+; PBVE), *Bromus sterilis* (+; PBVE), *Cynodon dactylon* (+; PBVE), *Galium aparine* (+; PBVE).

31.8B731 Western Pontic jasmine Christ's thorn scrub

***Asphodelino luteae-Paliuretum* Sanda et al. 1999** plant community can be considered endangered within the Dealurile Beștepe nature reserve sector framed within the Beștepe commune. There it was registered a low level of invasion of non-native (*Prunus cerasifera*), respectively ruderal species (three taxa).

Key species: *Paliurus spina-christi* (4; DBBE).

Threatened species: *Paliurus spina-christi* (4; DBBE).

Other species:

- shrubs/ lianas: *Crataegus monogyna* (+; DBBE), *Rosa canina* (+; DBBE);
- grasses/ undershrubs: *Agrimonia eupatoria* (+; DBBE), *Anthriscus caucalis* (+; DBBE), *Bromus sterilis* (+; DBBE), *Crepis sancta* (+; DBBE), *Festuca valesiaca* (+; DBBE), *Cruciata pedemontana* (+; DBBE), *Poa angustifolia* (+; DBBE), *Potentilla argentea* (+; DBBE), *Prunus cerasifera* (+; DBBE), *Trifolium campestre* (+; DBBE), *Xeranthemum anuum* (+; DBBE).

34. A2111 Western Pontic sand pioneer grass

***Brometum tectorum* Bojko 1934**, an endangered plant community from Dealul Cetățuii (DCET), indicates a very intense grazing, reflected in the variation limits of the ten ruderal species (+-3) which prevail in number and dominance. There is also to mention a low participation of non-native species, like *Ailanthus altissima* (+).

Key species: *Bromus tectorum* (3; DCET).

Other species: *Achillea setacea* (+; DCET), *Agropyron cristatum* (1; DCET), *Ailanthus altissima* (+; DCET), *Bromus hordeaceus* (+; DCET), *Carduus thoermeri* (+; DCET), *Erodium cicutarium* (+; DCET), *Eryngium campestre* (+; DCET), *Euphorbia seguieriana* (+; DCET), *Festuca valesiaca* (+; DCET), *Marrubium peregrinum* (+; DCET), *Onopordum acanthium* (+; DCET), *Plantago lanceolata* (+; DCET), *Poa bulbosa* (+; DCET), *Senecio vernalis* (+; DCET), *Thymus pannonicus* (+; DCET).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** plant community, studied within the Dealurile Beștepe nature reserve – Beștepe commune (DBBE), where it can be estimated as rare (F: II), while within the whole commune it can be framed as vulnerable. Taking into account the dominance variation (+-1) of the eight ruderal species, a medium degree of disturbance can be established.

Key species: *Festuca valesiaca* (4; DBBE).

Other species: *Achillea coarctata* (+; DBBE), *Achillea setacea* (+; DBBE), *Agropyron cristatum* (+; DBBE), *Bassia prostrata* (+; DBBE), *Bromus hordeaceus* (+; DBBE), *Capsella bursa-pastoris* (+; DBBE), *Cerastium brachypetalum* (1;

DBBE), *Convolvulus arvensis* (+; DBBE), *Erysimum diffusum* (+; DBBE), *pedemontan* (+; DBBE), *Koeleria macrantha* (+; DBBE), *Plantago lanceolata* (+; DBBE), *Poa bulbosa* (+; DBBE), *Senecio vernalis* (+; DBBE), *Teucrium chamaedrys* (+; DBBE), *Trifolium arvense* (+; DBBE).

***Stipetum capillatae* (Hueck 1931) Krausch 1961** plant community can be considered vulnerable in the Dealurile Beștepe nature reserve (DBBE), while within the whole commune it can be estimated as endangered. Despite its numerous ruderal species (eight taxa), it still can be framed into the low disturbance category, due to their reduced dominance.

Key species: *Stipa capillata* (3; DBBE).

Other species: *Bromus squarrosus* (+; DBBE), *Convolvulus cantabricus* (+; DBBE), *Crepis sancta* (+; DBBE), *Crataegus monogyna* (+; DBBE), *Digitalis lanata* (+; DBBE), *Echium italicum* (+; DBBE), *Eryngium campestre* (+; DBBE), *Erysimum diffusum* (+; DBBE), *Euphorbia seguieriana* (+; DBBE), *Festuca valesiaca* (1; DBBE), *Cruciata pedemontana* (+; DBBE), *Orlaya grandiflora* (+; DBBE), *Poa angustifolia* (+; DBBE), *Poa bulbosa* (+; DBBE), *Sanguisorba minor* (+; DBBE), *Senecio vernalis* (+; DBBE), *Teucrium chamaedrys* (+; DBBE), *Thymus pannonicus* (+; DBBE), *Tragopogon dubius* (+; DBBE).

***Agropyretum pectiniformae* (Prodan 1939) Dihoru 1970** can be considered as endangered within the Beștepe territory, where it was studied on the plateau where the Gaetic fortress is situated (BCG). There a low level of invasion of non-native plants (*Ailanthus altissima*) and ruderal species (six taxa) can be estimated.

Key species: *Agropyron cristatum* (3; BCG).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; BCG).

Other species: *Achillea setacea* (+; BCG), *Ailanthus altissima* (+; BCG), *Convolvulus arvensis* (+; BCG), *Dactylis glomerata* (+; BCG), *Erodium cicutarium* (+; BCG), *Erysimum diffusum* (+; BCG), *Euphorbia seguieriana* (+; BCG), *Festuca valesiaca* (+; BCG), *pedemontan* (+; BCG), *Koeleria macrantha* (+; BCG), *Linum austriacum* (+; BCG), *Linum tenuifolium* (+; BCG), *Marrubium peregrinum* (+; BCG), *Medicago minima* (+; BCG), *Plantago lanceolata* (+; BCG), *Poa bulbosa* (+; BCG), *Stipa capillata* (+; BCG), *Teucrium chamaedrys* (+; BCG), *Teucrium polium* (+; BCG), *Thymus pannonicus* (+; BCG).

34.9211 Western Pontic thyme steppes

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974** is typical for the rocky area within the Dealurile Beștepe nature reserve – Beștepe commune sector (DBBE), being endangered within the studied area, where two rare threatened species were observed, endangered within these phytocoenoses. There can be estimated a low level of disturbance indicated by three ruderal species.

Key species: *Polytrichum piliferum* (2; DBBE).

Threatened species: *Festuca callieri* (+; DBBE), *Silene compacta* (+; DBBE).

Other species: *Artemisia austriaca* (+; DBBE), *Asperula tenella* (+; DBBE), *Bombacilaena erecta* (+; DBBE), *Chondrilla juncea* (+; DBBE), *Digitaria sanguinalis* (+; DBBE), *Kohlruschia prolifera* (+; DBBE), *Potentilla argentea* (+;

DBBE), *Rumex acetosella* (1; DBBE), *Scleranthus perennis* (+; DBBE), *Stipa capillata* (+; DBBE).

44.4 Mixed oak-elm-ash forests of great rivers

Fraxino-Ulmetum Oberdorfer 53, described from the lower part of the slopes adjacent to the Danube floodplain (PBVE), is an endangered coenotaxon with a medium degree of ruderal plant invasion, represented by two species with a significant dominance (+-1).

Key species: *Ulmus procera* (5; PBVE).

Other species:

- shrubs/ lianas: *Crataegus monogyna* (+; PBVE), *Prunus spinosa* (1; PBVE).

- grasses/ undershrubs: *Agropyron cristatum* (+; PBVE), *Ballota nigra* (1; PBVE), *Cannabis sativa* subsp. *spontanea* (+; PBVE), *Cynodon dactylon* (+; PBVE), *Dactylis glomerata* (+; PBVE), *Origanum vulgare* (+; PBVE).

53.1111 Freshwater *Phragmites* beds

Scirpo-Phragmitetum W. Koch 1926 plant community framed in this habitat subtype is sporadic in the Beștepe commune area, being observed in the wetlands of the Danube floodplain (BLD), situated between the Beștepe locality and the Danube. As in the studied situations this community was mono-dominant, no plots were analysed.

53.1121 Dry freshwater *Phragmites* beds

Scirpo-Phragmitetum W. Koch 1926 plant community, estimated as vulnerable in the respective territory, has a typical species structure, with no alien/ ruderal taxa.

Key species: *Phragmites australis* (5; BLD).

Other species: *Atriplex hastata* (+; BLD), *Calystegia sepium* (+; BLD), *Ranunculus sceleratus* (+; BLD), *Rorippa sylvestris* (+; BLD), *Rumex palustris* (+; BLD), *Typha angustifolia* (+; BLD).

53.132 Lesser reed-mace beds

Typhetum angustifoliae Pignatti 1953 plant community is found in the Beștepe area in its typical form, as species-poor phytocoenoses, with no alien/ ruderal taxa. It can be considered endangered (F: +) within the studied territory.

Key species: *Typha angustifolia* (5; BLD).

Other species: *Bolboschoenus maritimus* (+; BLD), *Ceratophyllum demersum* (+; BLD), *Lycopus europaeus* (+; BLD), *Myriophyllum spicatum* (+; BLD), *Schoenoplectus lacustris* (+; BLD).

FAUNA

Birds. On the administrative territory of the Beștepe commune there were identified 87 species of birds that are mentioned in Appendices 3 and 4B of the Ordinance 57/2007. According to these the strictly protected bird species identified in the area, which can be found in Annex 3 (53 species) are represented by: *Gavia stellata*, *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus olor*, *Cygnus cygnus*, *Aythya nyroca*, *Tadorna tadorna*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Himantopus himantopus*, *Sterna hirundo*, *Chlidonias hybridus*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Melanocorypha calandra*, *Anthus campestris*, *Phoenicurus phoenicurus*.

The rare species, which give a high conservation value to the area include: *Botaurus stellaris*, *Ixobrychus minutus*, *Pelecanus crispus*, *Platalea leucorodia*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus macrourus*, *Circus pygargus*, *Recurvirostra avosetta*, *Himantopus himantopus*.

There were observed 34 protected species listed in the Annex 4B of the Ordinance 57/2007, representing taxa which require strict protection: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombicilla garrulus*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Prunella modularis*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. The rarest bird species therein for the area are: *Sturnus roseus*, *Motacilla cinerea*, *Locustella naevia*, *Locustella luscinioides*.

The bird species not found in the two annexes of the Ordinance 57/2007, but listed in the Annex II of Law 13/1993, are: *Podiceps grisegena*, *Podiceps nigricollis* (caspicus), *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Charadrius dubius*, *Tringa stagnatilis*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Calidris alpina*, *Calidris ferruginea*, *Calidris alba*, *Larus melanocephalus*, *Caprimulgus europaeus*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*,

Ficedula albicollis, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

The bird species nesting in the territory of the Beștepe commune include: *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Circus aeruginosus*, *Falco vespertinus*, *Porzana porzana*, *Sterna hirundo*, *Chlidonias hybridus*, *Chlidonias niger*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Dryocopus martius*, *Sylvia nisia*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*, *Podiceps grisegena*, *Podiceps nigricollis*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza schoeniclus*, *Oenanthe oenanthe*, *Alauda arvensis*, *Melanocorypha calandra*, *Turdus philomelos*, *Turdus merula*, *Miliaria calandra*.

Mammals. The total number of species found in the area Beștepe commune is of 28 species, respectively: *Erinaceus concolor*, *Talpa europaea*, *Crocidura suaveolens*, *Rhinolophus hiposideros*, *Myotis myotis*, *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Pipistrellus nathusii*, *Pipistrellus kuhlii*, *Lepus europaeus*, *Spermophilus citellus*, *Dryomys nitedula*, *Microtus agrestis*, *Mus musculus*, *Apodemus sylvaticus*, *Apodemus flavicollis*, *Rattus norvegicus*, *Spalax leucodon*, *Canis aureus*, *Vulpes vulpes*, *Meles meles*, *Mustela putorius*, *Mustela nivalis*, *Mustela erminea*, *Mustela eversmani*, *Felis silvestris*, *Sus scrofa*, *Capreolus capreolus*.

Strictly protected species of mammals found in the area, which can be found in Annex 3 of the Ordinance 57/2007 are: *Rhinolophus hiposideros*, *Myotis myotis*, *Spermophilus citellus*, *Mustela eversmani*. Mammalian species requiring strict protection, included in Appendices 4A and 4B are represented by: *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Pipistrellus nathusii*, *Pipistrellus kuhlii*, *Dryomys nitedula*, *Spermophilus citellus*, *Felis silvestris*, *Spalax leucodon*.

Research concerning the natural heritage of Carcaliu commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT, Laura DOXAN

ACCESS: Road DN22 Tulcea-Măcin, DJ222L Măcin-Carcaliu

NATURA 2000 SITES: Brațul Măcin (Site of Community Interest), Dunărea Veche-Brațul Măcin (Special Protection Area), Măcin-Niculițel (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Carcaliu village is characterized by the Silurian deposits of sandstones, limestones and marls. These occur in the western part on small areas. In the north and north-eastern part of the area, on a small surface, the Carapelit formation (Lower Carboniferous age), composed of conglomerates, sandstones, tuffs, schists and siltites occur. Also the Paleozoic outcrops of granite gneisses can be found here. These types of stones outcrop through the Quaternary loess layers which cover the central-eastern part of the area. The western part of the area is occupied by the Holocene psamo-pelitic deposits.

Based on these stones types, the various types of territorial units of soil such as Distric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998) occurs. Along the Danube River on the alluvial deposits and alluvia were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

The Carcaliu commune's territory is largely dominated by agricultural fields, both on the former floodplain and on the low plateau and hills which lie from Măcin Mountains foothills to the former wetlands adjacent to the Danube. Nearly all the natural habitats are concentrated on a very narrow stripe in the floodplain, between the dams and the Danube riverbanks. Even in this restricted area the poplar plantations occur on important surfaces, leaving a reduced space for the natural or semi-natural habitats. These latest ones are mainly represented by white willow, black poplar or white poplar. The grasslands consist mainly of *Echinochloa crus-galli* meadows, along the Danube riverbanks. On the muddy riverbanks, covered temporarily by the shallow waters of the Danube, flowering rush communities were identified.

FLORA, VEGETATION, HABITATS

Despite the reduced areas of the natural habitats, most of these are framed into community interest habitats like 92A0 (46.1621, 44.6611 and 44.6612). The

endangered plant communities prevail, only one of them being vulnerable. No threatened species were identified in the studied situations. The level of the invasive tendencies of ruderal/alien species is equally divided between low and medium, only one plant community having a high degree of disturbance.

46.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** is a vulnerable plant community within the whole studied territory, being inventoried in the Danube floodplain (CLD). There can be estimated a medium disturbance degree as, besides the only ruderal species which was identified in the plots, the two non-native species recorded have a dominance index of ± 1 .

Key species: *Salix alba* (5; CLD).

Other species:

- trees: *Fraxinus americana* (1; CLD);
- shrubs/ lianas: *Amorpha fruticosa* (+; CLD), *Rubus caesius* (+; CLD);
- grasses/ undershrubs: *Elymus repens* (\pm ; CLD), *Alisma plantago-aquatica* (\pm ; CLD), *Berula erecta* (+; CLD), *Bidens tripartita* (+; CLD).

44.6611 Western Pontic white poplar galleries

***Populetum albae* (Br.-Bl. 31 pp.) Borza 37**, an endangered plant community, studied within the Danube floodplain (CLD) is characterized by a low influence of human activities, as both non-native species (*Amorpha fruticosa*, *Fraxinus americana*), as well as the two ruderal taxa, have reduced dominance.

Key species: *Populus alba* (3; CLD).

Other species:

- trees: *Fraxinus americana* (+; CLD), *Populus nigra* (1; CLD), *Salix alba* (+; CLD);
- shrubs/ lianas: *Amorpha fruticosa* (+; CLD), *Rubus caesius* (+; CLD);
- grasses/ undershrubs: *Elymus repens* (+; CLD), *Glechoma hederacea* (+; CLD), *Mentha aquatica* (+; CLD), *Solanum nigrum* (+; CLD).

44.6612 Western Pontic white-black poplar galleries

***Populetum nigro-albae* Slavnic 1952** is an endangered plant community observed within the Danube floodplain (CLD) with a medium level of disturbance, according to the variation of the dominance indices of two ruderal species, which have a reduced dominance, to which there can be added the non-native species (*Amorpha fruticosa*, *Fraxinus americana*).

Key species: *Populus nigra* (3; CLD).

Other species:

- trees: *Fraxinus americana* (+; CLD), *Salix alba* (+; CLD);
- shrubs/ lianas: *Amorpha fruticosa* (+; CLD);
- grasses/ undershrubs: *Bidens tripartita* (+; CLD), *Calystegia sepium* (\pm ; CLD), *Convolvulus arvensis* (\pm ; CLD), *Glechoma hederacea* (\pm ; CLD), *Potentilla reptans* (\pm ; CLD).

Plant communities which are not framed into the Palaearctic habitats classification

***Echinochloo-Polygonetum lapathifolii* Soó et Csűrös 1974** plant community can be estimated as endangered, being observed in the Danube floodplain (CLD). It can be assessed as a highly disturbed plant community, as most of the species are ruderal, including the dominant species or non-native taxa like *Amaranthus retroflexus*.

Key species: *Echinochloa crus-galli* (5; CLD).

Other species: *Amaranthus retroflexus* (+; CLD), *Bidens tripartita* (+; CLD), *Chenopodium album* (+; CLD), *Cyperus glomeratus* (+; CLD), *Setaria pumila* (+; CLD), *Solanum nigrum* (+; CLD), *Xanthium italicum* (+; CLD).

***Butometum umbellatae* Konczak 1968**, an endangered plant community from the Danube floodplain (CLD) with a very reduced biodiversity, has a low level of ruderal species invasive tendencies.

Key species: *Butomus umbellatus* (3; CLD).

Other species: *Salix alba* (+; CLD), *Xanthium italicum* (+; CLD).

FAUNA

Birds. Within the studied avifauna of the administrative territory of the Carcaliu commune there were inventoried 72 bird species included in appendices of the Ordinance 57/2007, of which 41 species are strictly protected, being classified in Annex 3, used to establish the Natura 2000 network: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Tadorna tadorna*, *Pernis apivorus*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Sterna hirundo*, *Chlidonias hybridus*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Caprimulgus europaeus*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Emberiza hortulana*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Species which confer a high conservation value to this area include: *Tadorna tadorna*, *Pernis apivorus*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Sylvia nisoria*, *Emberiza hortulana*, *Anthus campestris*.

The other 31 species are protected, being classified in Annex 4B of the order which includes animal and plant species requiring strict protection: *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*,

Carduelis spinus, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

Among the rarest birds which are included in this appendix in this area were observed: *Actitis hypoleucos*, *Motacilla cinerea*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Regulus regulus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis flammea*.

Bird species identified in the studied area which are not found in the two annexes of the Ordinance 57/2007, but listed in Annex II of Law 13/ 1993, are: *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Apus melba*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Aquatic ecosystems close to cliffs, the steppe, agricultural and rural areas, lead to an abundance of species and populations nesting in the area, among them being observed: *Ciconia ciconia*, *Aythya nyroca*, *Tadorna tadorna*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Buteo buteo*, *Caprimulgus europaeus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Emberiza citrinella*.

Research concerning the natural heritage of Cerna commune

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ACCESS: Road DN22D Tulcea-Cerna

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: Măcin Mountains National Park

NATURA 2000 SITES: Munții Măcinului (Site of Community Interest), Măcin-Niculitel (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Cerna commune is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite, to which are added tufogene greenschist which occur in the central-eastern part. The Silurian deposits of sandstones, limestones and marls occupy the central part of the area, along with the Devonian deposits of the slate schists, quartzite and grey limestones. The eastern part of the area is occupied by the Carapelit formation (Lower Carboniferous age) which is composed of conglomerates, sandstones, tuffs, schists and siltites. Also here could be found outcrops of the Paleozoic granite gneisses (between pre-Silurian metamorphic deposits and Lower Carboniferous age deposits) and alkaline granite. The Upper Cretaceous limestones deposits outcrop in the southern part of area being composed of the Cenomanian deposits of organogenic limestones, sandy limestone and marl limestones, Turonian deposits of yellowish and white sandy limestone, as well as Coniacian deposits of marly limestones and white sandy limestone. These types of stones outcrop through the Quaternary loess layers which cover the entire area.

Based on these stones types, the various types of territorial units of soil such as Dystric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on limestone, Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998) occur. Along the Danube River on the alluvial deposits and alluvia there were developed Calcareous alluvial soils and Calcareous-gleyed alluvial soils.

LANDSCAPE

From the altitudinal point of view the landscape within the Cerna's territory is dominated by the southern part of the Măcin Mountains range, where the highest peak is Priopcea (410 m). This higher relief is mainly covered by more or less compact Balkan and sub-Mediterranean forests. As the altitudes gradually decrease towards the west and south the clearings of the forests become larger, especially on the rocky summits and southern slopes, while the compact forests are replaced by wooded steppe and steppe vegetation.

Towards the south and south-west the sharp and rocky peaks of the Hercynian Măcin Mountains are replaced by the rolling limestone hills of the Cretaceous Babadag Plateau, known as Muchiile Cernei. There the wooded steppe vegetation, dominated by white oak (*Quercus pubescens*), sometimes with eastern hornbeam (*Carpinus orientalis*), on the northern slopes, turns eastwards into a treeless rocky steppe on the upper part of the hills, while on the deeper soils of the foothills a loess steppe with taller grasses occur.

At its extreme southern limit the Cerna's commune territory even reaches a third major geological structure the Precambrian Casimcea Plateau, in the Aiorman Valley, where the Peceneaga-Camena geological fault is located. Not only there, but also especially in the Lake Traian's area, wetland vegetation occur, represented mainly by saline grasslands, reed beds and also some aquatic vegetation.

FLORA, VEGETATION, HABITATS

The high variation of the altitudes, soil water supply and salt concentration leads to a high habitat diversity, mostly typical for the Steppic bioregion, with a high conservation value. Thus, most of the habitats are of community interest, like 91Y0 (41.2C22), 91M0 (41.76831, 41.76834), the highest importance having the priority ones such as: 1530* (15.A211, 15.A21275), 40C0* (31.8B721, 31.8B731), 62C0* (34.92, 34.9211), 91AA* (41.73723, 41.73724). As a preliminary observation the conservation status for most of the plant communities can be considered as favourable, as most of them have a low level of ruderal plant invasion, with the exception of *Pruno spinosae-Crataegetum* (medium), *Asphodelino luteae-Paliuretum* (medium), *Botriochloetum ischaemi* (medium), *Sedo hillebrandtii-Polytrichetum piliferi* (medium) and *Artemisio austriacae-Poëtum bulbosae*, where there is an intense perturbation due to human activities.

All the locations mentioned within the Cerna's commune territory are within protected areas of national/ international importance: (LT – Lacul Traian, CP-Chervant Priopcea, MCI – Muchiile Cernei-laila; Măcin Mountains National Park: VMA – Valea lui Martin, RB – Dealul Roman Bair) or within the Natura 2000 sites Măcin Mountains (CECR – Pășunea Cerna-Carapelit, DNE – Dealul Megina) and Podișul Nord Dobrogean (PCAP – Pădurea Căprioara).

15.A211 Western Pontic saline steppes

***Artemisietum santonici* Soó 1947 corr. Guterm. et Mucina 1993** plant community can be considered vulnerable (F: I) within the Lacul Traian nature reserve (LT) and endangered at the Cerna commune's level. This low diversity association occur on low salt soils adjacent to Traian Lake and even though it is grazed, with the exception of the dominant *Artemisia santonica*, in the plots there were identified only two ruderal species, with low dominance.

Key species: *Artemisia santonica* (3; LT).

Other species: *Achillea setacea* (+; LT), *Cichorium intybus* (+; LT), *Cynodon dactylon* (1; LT), *Daucus carota* subsp. *carota* (+; LT).

15.A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** association represents a transition zone between wetland and steppe vegetation that, despite grazing, contain only two ruderal species with a low dominance. It can be estimated as vulnerable (F: I) within the Lacul Traian reserve (LT), respectively endangered (F: +) at the level of all the studied area.

Key species *Cynodon dactylon* (4; LT), *Trifolium fragiferum* (+-3; LT).

Other species: *Artemisia santonica* (+; LT), *Cichorium intybus* (+; LT), *Daucus carota* subsp. *carota* (+; LT), *Plantago major* (+; LT), *Ranunculus sceleratus* (+; LT).

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931** association is vulnerable within the Valea lui Martin (VMA) area, included in the Măcin Mountains National Park. Still within Cerna commune it could be framed into the endangered category. This coenotaxon can be considered as being affected by ruderal species presence at a medium level, taking into account the presence of five species, among which *Stellaria media* has a higher abundance-dominance index (1).

Key species *Prunus spinosa* (3; VMA).

Other species:

- shrubs/ trees/ lianas: *Fraxinus ornus* (+; VMA), *Pyrus pyraeaster* (+; VMA), *Ulmus procera* (1; VMA);

- grasses/ undershrubs: *Alliaria petiolata* (+; VMA), *Anthriscus cerefolium* (+; VMA), *Arum orientale* (+; VMA), *Coronilla varia* (+; VMA), *Gagea lutea* (+; VMA), *Galium aparine* (+; VMA), *Geranium rotundifolium* (+; VMA), *Geum urbanum* (+; VMA), *Lamium purpureum* (+; VMA), *Marrubium vulgare* (+; VMA), *Stellaria media* (1; VMA).

31.8B731 Western Pontic jasmine Christ's thorn scrub

***Asphodelino luteae-Paliuretum* Sanda et al. 1999** plant community is extremely rare and thus endangered in the studied area, including within the Chervant-Prîopcea nature reserve (CP), the only location where it was identified so far within Cerna commune. Due to grazing there was recorded a medium level of ruderal species participation that exceeds in percentage the others. Among the six such species *Stellaria media* has a higher dominance (1). Only one threatened species, the vulnerable, dominant, *Paliurus spina-christi* was identified.

Key species: *Paliurus spina-christi* (4; CP).

Threatened species: *Paliurus spina-christi* (4; CP).

Other species:

- grasses/ undershrubs: *Achillea setacea* (1; CP), *Agropyron cristatum* (+; DB), *Capsella bursa-pastoris* (+; CP), *Dichanthium ischaemum* (+; CP), *Geranium rotundifolium* (+; CP), *Galium humifusum* (+; CP), *Marrubium peregrinum* (+; CP), *Poa bulbosa* (+; CP), *Stellaria media* (1; CP).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiacae* Wagner 1941** plant community was registered within the Chervant-Prîopcea nature reserve (CP), where it can be considered rare (F: II), being also identified with an insular restricted distribution (F: +) on the hill summits within the forest of Valea lui Martin area (VMA). Even though there were recorded five ruderal species, still the influence of this factor is low, as all of them have a low dominance. It worth to mention that, from the five rare threatened species identified so far *Achillea ochroleuca* and *Dianthus nardiformis* are vulnerable at the national level, the last being of European

importance and distribution. All these species are locally endangered, at least within this plant community.

Key species: *Festuca valesiaca* (3; CP, VMA).

Threatened species: *Achillea ochroleuca* (+; VMA), *Dianthus nardiformis* (+; CP), *Gagea szovitzii* (+; CP), *Muscari neglectum* (+; VMA), *Thymus zygioides* (+; CP).

Other species: *Achillea coarctata* (+; CP), *Achillea setacea* (+; VMA), *Androsace elongata* (+; VMA), *Bassia prostrata* (+; CP), *Coronilla varia* (+; VMA), *Crataegus monogyna* (+; PC), *Cruciata pedemontana* (+; PC, VMA), *Dactylis glomerata* (+; VMA), *Dichanthium ischaemum* (1-2; CP, VMA), *Erophila verna* (+; CP), *Eryngium campestre* (+; CP), *Fragaria viridis* (+; CP), *Geranium rotundifolium* (+; VMA), *Lamium purpureum* (+; VMA), *Leontodon crispus* (+; CP), *Marrubium peregrium* (+; VMA), *Orlaya grandiflora* (+; VMA), *Potentilla argentea* (+; CP, VMA), *Ranunculus ficaria* (+; VMA), *Ranunculus illyricus* (+; CP), *Sanguisorba minor* (+; CP), *Stipa capillata* (+; CP), *Taraxacum erythrospermum* (+; CP, VMA), *Teucrium polium* (+; CP).

***Artemisia austriacae*-*Poëtum bulbosae* Pop 1970** association was studied within the grasslands included in the Lacul Traian Nature Reserve (LT) where it can be assessed as rare (F: II). This secondary plant community is a result of intense grazing which is reflected in the dominance of *Poa bulbosa*, while the other two ruderal plants have a low dominance. Only one rare threatened species was identified in this community which can be assessed as endangered at the local level.

Key species: *Poa bulbosa* (2; LT).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; LT).

Other species: *Agropyron cristatum* (1; LT), *Acinos arvensis* (+; LT), *Artemisia annua* (+; LT), *Consolida regalis* (+; LT), *Dichanthium ischaemum* (+; LT), *Euphorbia seguieriana* (1; LT), *Festuca valesiaca* (1; LT), *Linaria genistifolia* (+; LT), *Plantago lanceolata* (+; LT), *Stipa capillata* (+; LT), *Teucrium polium* (+; LT), *Thymus pannonicus* (+; LT), *Xeranthemum annuum* (+; LT).

***Botriochoetum* (*Andropogonetum*) *ischaemi* (Kist. 1937) Pop 1977** secondary association, the most widespread within the grasslands, can be considered between vulnerable within Traian Lake reserve (LT; F: I) and frequent (F: IV) in other protected areas like Muchiile Cernei-laila (MCI) and Chervant-Priopcea (CP). Intermediate values are found within Valea lui Martin (VMA; F: I) and Roman Bair (RB; F: II). It holds the third place from the richness of threatened plants point of view. Among the seven such species, mostly rare, *Crocus reticulatus* and *Dianthus nardiformis* are vulnerable, while the second is also of European importance. At the level of the analyzed plots nearly all species can be considered as locally endangered, except *Gagea szovitzii*, critically endangered. The ruderal plants (nine species) occurrence and dominance indicates a medium level of human activities influence.

Key species: *Dichanthium ischaemum* (3-5; CECR, CP, LT, MCI, RB, VMA).

Threatened species: *Centaurea napulifera* (+; VMA), *Crocus reticulatus* (+; CECR), *Corydalis solida* subsp. *slivenensis* (+; VMA), *Dianthus nardiformis* (+; CECR), *Gagea szovitzii* (2; CECR), *Koeleria lobata* (+; CP), *Thymus zygioides* (+; CP).

Other species: *Achillea nobilis* subsp. *neilreichii* (+; MCI), *Achillea setacea* (+; RB), *Acinos arvensis* (+; MCI), *Agropyron cristatum* (+; LT), *Alyssum murale* (+; CECR), *Alyssum saxatile* (+; VMA), *Artemisia austriaca* (+; MCI), *Artemisia annua* (+; LT), *Cichorium intybus* (+; CECR, CP), *Cynodon dactylon* (+; MCI), *Elymus hispidus* (+; VMA), *Erophila verna* (+; LT), *Eryngium campestre* (+; CECR, CP), *Euphorbia agraria* (+; VMA), *Euphorbia seguieriana* (+; LT), *Festuca valesiaca* (2; CECR), *Fragaria viridis* (+; CECR, RB, VMA), *Fraxinus ornus* (+; CECR, VMA), *Hypericum perforatum* (+; VMA), *Lamium purpureum* (+; VMA), *Leontodon crispus* (+; CP), *Linaria genistifolia* (+; LT), *Muscari neglectum* (+; VMA), *Orlaya grandiflora* (+; VMA), *Poa bulbosa* (+1; CECR, LT, MCI), *Potentilla argentea* (+; RB), *Ranunculus illyricus* (+; CECR, RB), *Sanguisorba minor* (+; CECR, CP), *Scilla bifolia* (+; VMA), *Sideritis montana* (+; MCI), *Taraxacum erythrospermum* (+; CP, MCI), *Teucrium chamaedrys* (+; CECR), *Teucrium polium* (+; CP, LT, MCI, RB), *Thymus pannonicus* (+; CECR, MCI), *Veronica arvensis* (+; MCI), *Viola arvensis* (+; LT).

***Stipetum capillatae* (Hueck 1931) Krausch 1961** plant community, identified on reduced areas, can be considered as vulnerable (F: I), at least in the Dealul Megina area (DME). Among the few species identified the two ruderal species allow its framing into the low intensity levels of this aspect.

Key species: *Stipa capillata* (4; DME).

Threatened species: *Achillea nobilis* subsp. *neilreichii* (+; DME).

Other species: *Agropyron cristatum* (+; DME), *Carduus thoermeri* (+; DME), *Cichorium intybus* (+; DME), *Dichanthium ischaemum* (1; DME), *Festuca valesiaca* (+; DME), *Potentilla argentea* (+; DME), *Thymus pannonicus* (+; DME).

34.9211 Western Pontic thyme steppes

***Agropyro-Thymetum zygoidi* Dihoru (1969) 1970** plant community is the most widespread in the rocky steppe areas, still being considered as rare (F: II) within the Muchiile Cernei-laila (MCI) and Chervant-Priopcea (CP) nature reserves. Within it was recorded the highest concentration of threatened plants, the eight such species being mainly rare at the national scale, except the vulnerable *Dianthus nardiformis* and *Campanula romanica*, both of European conservation value. All can be estimated as endangered within this plant community, only *Dianthus nardiformis* and *Festuca callieri* being vulnerable. A low ruderalization level can be deduced from the reduced participation of the three such species.

Key species: *Agropyron ponticum* (2; CP, MCI), *Thymus zygoides* (2; CP, MCI).

Threatened species: *Allium saxatile* (+; CP), *Campanula romanica* (+; CP), *Dianthus nardiformis* (1; CP), *Echinops ritro* subsp. *ruthenicus* (+; MCI), *Festuca callieri* (1; CP), *Iberis saxatilis* (+; CP), *Pimpinella tragium* subsp. *lithophila* (+; CP, MCI), *Potentilla bornmuelleri* (+; CP, MCI), *Sanguisorba minor* s.l. (+; CP), *Tanacetum millefolium* (+; MCI), *Thymus zygoides* (2; CP, MCI).

Other species: *Alyssum murale* (+; CP), *Asperula tenella* (+; CP), *Dichanthium ischaemum* (1; CP, MCI), *Erophila verna* (+; CP), *Euphorbia*

seguieriana (+; MCI), *Festuca valesiaca* (1; CP), *Leontodon crispus* (+; CP), *Marrubium vulgare* (+; MCI), *Poa bulbosa* (+; CP, MCI), *Sanguisorba minor* (+; CP), *Scleranthus perennis* (+; CP), *Sideritis montana* (+; CP, MCI), *Taraxacum erythrospermum* (+; CP), *Teucrium polium* (+; CP).

34.9211 Western Pontic thyme steppes

***Sedo hillebrandtii*-*Polytrichetum piliferi* Horeanu et Mihai 1974** plant community was identified as a vulnerable association (F: I) within the Cervant-Priopcea nature reserve (CP) as well as in the areas of Valea lui Martin (VMA) and Pășunea Cerna-Carapelit (CECR). The high conservation value is underlined also by the occurrence of nine rare species, among which the most important are *Campanula romanica* and *Moehringia grisebachii*, protected also at the European level as vulnerable. Within this community they can be estimated as endangered, except the vulnerable *Festuca callieri*, *Gymnospermium altaicum* subsp. *odessanum* and *Thymus zygoides*, while *Gagea szovitzii* is critically endangered. A medium level of human induced perturbation is represented by the presence of seven ruderal species of which *Poa bulbosa* has a significant dominance for this level.

Key species *Polytrichum piliferum* (2; CECR, CP), *Sedum urvillei* subsp. *hillebrandtii* (2; CP).

Threatened species: *Campanula romanica* (+; CP), *Celtis glabrata* (+; CP), *Festuca callieri* (1-2; CECR), *Gagea szovitzii* (r; CECR), *Gymnospermium altaicum* subsp. *odessanum* (+-1; VMA), *Moehringia grisebachii* (+; CP), *Potentilla bornmuelleri* (+; CECR), *Silene compacta* (+; CECR), *Thymus zygoides* (1-2; CECR).

Other species: *Acer tataricum* (+; CECR), *Alyssum murale* (+; CP), *Asperula tenella* (+; CECR), *Asplenium trichomanes* (+; CP), *Cerasus mahaleb* (+; CP), *Crepis sancta* (+; CECR), *Dichanthium ischaemum* (+; CP, CECR), *Herniaria glabra* (+; CECR), *Lamium amplexicaule* (+; CP), *Ligustrum vulgare* (+; CP), *Marrubium peregrinum* (+; CP), *Poa bulbosa* (1; CP, CECR), *Potentilla argentea* (+; CP), *Ranunculus illyricus* (+; CP, CECR), *Rumex acetosella* (+; CECR), *Stellaria media* (+; CP), *Stipa capillata* (+; CP, CECR), *Taraxacum erythrospermum* (+; CP), *Veronica hederifolia* (+; CP), *Viola arvensis* (+; CP).

41.2C22 Moldo-Muntenian sessile oak-hornbeam forests

***Tilio tomentosae*-*Carpinetum betuli* Doniță 1968** plant community was identified on restricted areas (F: I) within the Valea lui Martin (VMA) area, where it may be ranked as vulnerable (F: I). Between the two threatened species recorded, *Corydalis solida* subsp. *slivenensis* is sub-endemic and *Galanthus plicatus* is vulnerable and of European importance. Both are endangered at the community level. The invasion of ruderal plants is low, as only three such species, with a restricted dominance, were identified. These are considered ruderal plants, but also occur in undisturbed habitats. The tree layer is totally derived.

Key species: *Carpinus betulus* (1; VMA), *Tilia tomentosa* (1; VMA).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; VMA), *Galanthus plicatus* (+; VMA).

Other species:

- trees: *Acer campestre* (+; VMA), *Acer platanoides* (+; VMA), *Fraxinus excelsior* (1; VMA), *Quercus pedunculiflora* (+; VMA), *Quercus polycarpa* (+; VMA), *Sambucus nigra* (+; VMA);
- shrubs/ lianas: *Cornus mas* (+; VMA), *Hedera helix* (+; VMA);
- grasses/ undershrubs: *Anemone ranunculoides* (+; VMA), *Anthriscus cerefolium* (+; VMA), *Corydalis solida* (+; VMA), *Gagea lutea* (+; VMA), *Geum urbanum* (+; VMA), *Ranunculus ficaria* (1; VMA), *Scilla bifolia* (+; VMA), *Stellaria media* (+; VMA), *Veronica hederifolia* (+; VMA).

41.73723 Moesian *Paeonia peregrina* - white oak woods.

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** plant community is the most widespread forest association due to the lower altitude of the hills in the studied area (in comparison with the Greci commune area within Măcin Mountains), which corresponds mainly to the sub-Mediterranean forests layer. It was identified at Valea lui Martin (VMA), Pădurea Căprioara (PCAP), Pășunea Cerna-Carapelit (CECR). Beside its priority habitat character, it is also one of the richest in threatened species among the studied forest communities. The five rare threatened species inventoried in these plots include the sub-endemic *Corydalis solida* subsp. *slivenensis* and the vulnerable *Galanthus plicatus*, the latest of European importance. All of these are estimated as endangered at this community level, except the first mentioned which is vulnerable. Only two ruderal species with a reduced participation indicate a low level of perturbation.

Key species: *Carpinus orientalis* (1-5; CECR, VMA, PCAP), *Quercus pubescens* (2; CECR, VMA).

Threatened species: *Corydalis solida* subsp. *slivenensis* (1; PCAP, VMA), *Galanthus plicatus* (+; VMA), *Mercurialis ovata* (+; PCAP), *Myrrhoides nodosa* (+; VMA), *Nectaroscordum siculum* subsp. *bulgaricum* (+; VMA).

Other species:

- trees: *Fraxinus ornus* (+1; VMA);
- shrubs/ lianas: *Cornus mas* (1; PCAP, VMA), *Crataegus monogyna* (+; VMA), *Rosa canina* (+);
- grasses/ undershrubs: *Alliaria petiolata* (±; VMA), *Anthriscus cerefolium* (+; VMA), *Anthriscus nemorosa* (±; VMA), *Arum orientale* (+; VMA), *Brachypodium sylvaticum* (+; VMA), *Corydalis solida* (1; VMA), *Dactylis polygama* (+; VMA), *Filipendula vulgaris* (+; VMA), *Galium aparine* (+; PCAP, VMA), *Geum urbanum* (+; PCAP), *Geranium robertianum* (±; PCAP), *Geranium lucidum* (±; CECR), *Geranium rotundifolium* (±; CECR), *Glechoma hirsuta* (±; PCAP), *Lamium purpureum* (+; CECR, PCAP, VMA), *Poa nemoralis* (±; VMA), *Polygonatum latifolium* (+; PCAP), *Stellaria media* (+; CECR, PCAP), *Veronica hederifolia* (+; VMA), *Viola odorata* (±; CECR, PCAP), *Viola suavis* (+; CECR).

41.73724 Moesian *Galium dasypodium*-white oak woods

***Galio dasypodi-Quercetum pubescentis* Doniță 1970** plant community, assessed as vulnerable (F: I) within the Pășunea Cerna-Carapelit (CECR), has

two threatened species in the studied plots, of which *Centaurea napulifera* is rare and *Crocus reticulatus* is vulnerable. Within this phytocoenosis these species can be considered as endangered. The low ruderal plant contribution to the species inventory is shown by two such taxa with a low dominance.

Key species *Quercus pubescens* (3; CECR).

Threatened species: *Centaurea napulifera* (+; CECR), *Crocus reticulatus* (+; CECR).

Alte specii:

- trees: *Fraxinus ornus* (2; CECR);
 - grasses/ undershrubs: *Corydalis solida* (+; CECR), *Galium aparine* (+; CECR), *Gagea lutea* (+; CECR), *Geum urbanum* (+; CECR), *Ranunculus illyricus* (+; CECR), *Muscari neglectum* (+; CECR), *Veronica hederifolia* (+; CECR), *Viola odorata* (+; CECR).

41.76831 Dobrogean paeonia sessile oak forests

***Fraxino orni-Quercetum dalechampii* Doniță 1970** is a rare (F: II) plant community identified in Valea lui Martin (VMA). There five rare threatened species at the national level were observed, increasing thus the conservation value of this phytocoenosis. Of these *Corydalis solida* subsp. *slivenensis* is sub-endemic, while *Galanthus plicatus* is mentioned in the European Red List.

Key species: *Fraxinus ornus* (1-2; VMA), *Quercus dalechampii* (1-2; VMA).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; VMA), *Galanthus plicatus* (+; VMA), *Gymnospermium altaicum* subsp. *odessanum* (±; VMA), *Mercurialis ovata* (±; VMA), *Nectaroscordum siculum* subsp. *bulgaricum* (±; VMA).

Alte specii:

- trees: *Acer campestre* (+; VMA), *Carpinus orientalis* (1-2; VMA), *Cerasus mahaleb* (+; VMA), *Quercus polycarpa* (1; VMA), *Tilia tomentosa* (+; VMA);
 - shrubs/ lianas: *Cornus mas* (+; VMA), *Ligustrum vulgare* (+; VMA);
 - grasses/ undershrubs: *Alliaria petiolata* (+; VMA), *Anthriscus cerefolium* (1; VMA), *Anemone ranunculoides* (±; VMA), *Arum orientale* (±; VMA), *Corydalis solida* (±; VMA), *Dactylis polygama* (±; VMA), *Gagea lutea* (+; VMA), *Geum urbanum* (+; VMA), *Glechoma hirsuta* (+; VMA), *Lamium purpureum* (±; VMA), *Poa bulbosa* (+; VMA), *Poa nemoralis* (±; VMA), *Ranunculus ficaria* (+; VMA), *Scilla bifolia* (+; VMA), *Stellaria media* (+; VMA), *Veronica hederifolia* (±; VMA), *Viola odorata* (±; VMA).

41.76834 Western-Pontic sessile oak-lime-oriental hornbeam-*Galanthus* forests

***Galantho plicatae-Tilietum tomentosae* Doniță 1970** plant community can be considered as rare (F: I), at least within Valea lui Martin (VMA) area. The high conservative importance is underlined also by the four protected species inventoried so far in this type of forest, which include the sub-endemic *Corydalis solida* subsp. *slivenensis* and *Galanthus plicatus*, of European importance. There is a low percentage of ruderal species (five species).

Key species: *Galanthus plicatus* (1; VMA), *Quercus dalechampii* (1; VMA), *Tilia tomentosa* (2; VMA).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; VMA), *Galanthus plicatus* (+; VMA), *Mercurialis ovata* (+; VMA), *Nectaroscordum siculum* subsp. *bulgaricum* (+; VMA).

Alte specii:

- trees: *Acer campestre* (+; VMA), *Carpinus orientalis* (1; VMA), *Fraxinus ornus* (+; VMA), *Quercus pedunculiflora* (1; VMA);

- shrubs/ lianas: *Cornus mas* (+; VMA), *Evonymus verrucosus* (+; VMA), *Ligustrum vulgare* (+; VMA);

- grasses/ undershrubs: *Alliaria petiolata* (+; VMA), *Anthriscus cerefolium* (+; VMA), *Corydalis solida* (+; VMA), *Dactylis polygama* (+; VMA), *Galium aparine* (+; VMA), *Geum urbanum* (+; VMA), *Lamium purpureum* (+; VMA), *Poa nemoralis* (+; VMA), *Scilla bifolia* (+; VMA), *Stellaria media* (+; CT, E), *Urtica dioica* (+; VSe), *Veronica hederifolia* (+; VMA), *Viola odorata* (+; VMA).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community, framed within this habitat subtype, is represented by the reed beds which are not submerged by the waters of Traian Lake (LT), thus having a higher diversity than the 53.1111 subtype. No ruderal/alien species were observed. It can be assessed as a rare coenotaxon (F: II) within the nature reserve.

Key species *Phragmites australis* (5; LT).

Other species: *Berula erecta* (+; LT), *Calystegia sepium* (+; LT), *Mentha aquatica* (+; LT), *Ranunculus sceleratus* (+; LT), *Schoenoplectus tabernaemontani* (+; LT), *Typha angustifolia* (+; LT).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community was identified within the Traian Lake nature reserve (LT), where it is the most widespread (F: III) type of vegetation. It occurs on important areas within the respective water body, having a low diversity and no ruderal/ alien species.

Key species *Phragmites australis* (5; LT)

Other species: *Alisma plantago-aquatica* (+; LT), *Typha angustifolia* (1; LT).

Plant communities which are not framed within the Palaearctic habitat classification

***Gymnospermio altaicae-Celtetum glabratae* M. Petrescu 2004** plant community is an endangered coenotaxon (F: +) within the Chervant-Priopcea (CP) nature reserve, where the only threatened species is the dominant *Celtis glabrata*. The rare ruderal species occur in a restricted number (four taxa) with a reduced dominance, indicating thus a low influence of human activities.

Key species: *Celtis glabrata* (2; CP).

Threatened species: *Celtis glabrata* (2; CP).

Alte specii:

- trees: *Cerasus mahaleb* (1; CP), *Fraxinus ornus* (+; CP), *Quercus pubescens* (1; CP);
- shrubs/ lianas: *Ligustrum vulgare* (+; CP), *Rosa canina* (1; CP);
- grasses/ undershrubs: *Alyssum saxatile* (+; CP), *Cardus thoermeri* (+; CP), *Cystopteris fragilis* (±; CP), *Geranium rotundifolium* (+; CP), *Lamium amplexicaule* (+; CP), *Marrubium vulgare* (+; CP), *Orlaya grandiflora* (+; CP), *Sedum urvillei* subsp. *hillebrandtii* (±; CP), *Veronica hederifolia* (+; CP), *Viola odorata* (+; CP).

FAUNA

Birds. Within the Cerna commune there have been identified 89 species of birds listed in the Appendices 3 and 4B of the Ordinance 57/2007. From this total amount 60 species are strictly protected, being found in Annex 3 of the ordinance, such as: *Gavia stellata*, *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Tadorna ferruginea*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Porzana parva*, *Crex crex*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hibridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna sandvicensis*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Picus canus*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*.

It is important to underline the rarest of the species mentioned above, which give a high conservation value to this area: *Botaurus stellaris*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Platalea leucorodia*, *Anser erythropus*, *Branta ruficollis*, *Tadorna ferruginea*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus macrourus*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Recurvirostra avosetta*, *Himantopus himantopus*.

In this territory there were identified 29 species requiring strict protection, these being found in the Annex 4B of the Ordinance 57/2007: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Motacilla flava*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. The rarest bird species in the area, included in this appendix are *Carduelis flammea* and *Coccothraustes coccothraustes*.

Bird species identified in the area which are not found in the two annexes of the Ordinance 57/2007 but are mentioned in the Annex II of the Law 13/ 1993 are:

Podiceps grisegena, *Podiceps auritus*, *Podiceps nigricollis* (caspius), *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Charadrius dubius*, *Gallinago media*, *Tringa stagnatilis*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Calidris temminckii*, *Calidris alpina*, *Calidris ferruginea*, *Calidris alba*, *Larus melanocephalus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Ficedula hypoleuca*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Lake Traian, the rural and agricultural areas, are ideal places for the nesting of a large number of species and populations, such as: *Botaurus stellaris*, *Egretta alba*, *Ardea purpurea*, *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Tadorna tadorna*, *Circus aeruginosus*, *Falco vespertinus*, *Porzana porzana*, *Porzana parva*, *Crex crex*, *Sterna hirundo*, *Chlidonias hybridus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Locustella naevia*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Podiceps grisegena*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Ficedula albicollis*, *Ficedula hypoleuca*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza schoeniclus*.

Research concerning the natural heritage of Chilia commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Waterways Tulcea branch and Chilia branch

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:

Danube Delta Biosphere Reserve

NATURA 2000 SITES: Delta Dunării (Site of Community Interest, Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Chilia Veche commune is characterized by the Late Pleistocene loess deposits and Holocene deposits of siltite those

underlying of the following territorial units of soil types formation Gleyed chernozems, Gleyi-mollic solonchaks, Gleyed-typical (vermic-calcaro-calcic) kastanozems and Typical (vermic-calcaro-calcic) kastanozems on levee, as well as Calcareous-gleyed-mollic alluvial soil, Calcareous-alluvial gley soils, Calcareous-marshy alluvial gley soils, Semisubmerged-histic alluvial gley soils, Hemic-terric histosols etc.

LANDSCAPE

The natural habitats occur on large areas within the Chilia commune's territory, representing about half of this administrative unit, most of them being concentrated in the eastern sector. The rest is mainly represented by the agriculture polders which have replaced the former wetlands. Except the continental levee (Grindul Chilia), all the other natural areas are represented by wetlands, typical for the fluvial Delta, with extensive fixed or floating reed beds. The lakes and channels are dominated by aquatic vegetation, of a high amenity, especially in the blooming period, in the case of the white or yellow water-lily beds, as well as of the water-soldier or water chestnut communities. On higher riverbanks the white willow riparian forests also confer an outstanding aesthetic value to the landscape, while on the lower levees they are usually replaced by grey willow scrub.

FLORA, VEGETATION, HABITATS

The largest areas of natural vegetation are represented by reed beds, which are not community interest habitats, like also most of the aquatic vegetation types. Still, in this area there are several community interest habitats like 3150 (22.413) and 92 A0 (44.1621).

Within Chilia territory the major part of the habitats are vulnerable, followed by endangered and rare ones, only the permanently flooded reed beds being sporadic. Even though the majority of those habitats are not protected, most of them are representative for a natural status, the overall disturbance levels being framed between medium and low.

Protected or not, most of the habitats have a certain conservation importance, as they shelter generally two threatened species and less one or no such taxa.

All the analysed areas are framed within the Danube Delta Biosphere Reserve and the Danube Delta Site of Community Interest.

22.413 Water-soldier rafts

***Stratiotetum aloidis* Nowinski 1930**, a vulnerable plant community at least within the Eracle channel – Chilia commune (CHE), besides the dominant species has also another vulnerable threatened taxa, *Trapa natans*. It can be considered as typical for a natural status, taking into account the absence of ruderal/ alien species.

Key species: *Stratiotes aloides* (4-5; CHE).

Threatened species: *Stratiotes aloides* (5; CHE), *Trapa natans* (1; CHE).

Other species: *Nymphaea alba* (1; CHE), *Nuphar lutea* (+1; CHE), *Phragmites australis* (+; CHE), *Typha angustifolia* (+1; CHE).

22.4311 Water-lily beds

***Nymphaetum albae* Vollmar 1947** plant community is vulnerable within the Eracle channel – Chilia commune (CHE), where two vulnerable threatened species (*Stratiotes aloides*, *Trapa natans*) were identified in the plots of this representative coenotaxon, with no alien/ ruderal taxa. Within this vegetation type the first species can be considered endangered, while the second is vulnerable.

Key species: *Nymphaea alba* (3; CHE).

Threatened species: *Stratiotes aloides* (+; CHE), *Trapa natans* (1; CHE).

Other species: *Ceratophyllum demersum* (+; CHE), *Hydrocharis morsus-ranae* (+; CHE), *Nuphar lutea* (1; CHE), *Phragmites australis* (+; CHE), *Typha angustifolia* (+; CHE).

***Myriophyllo verticillati-Nupharetum luteae* W. Koch 1926** is a vulnerable plant community recorded along the Eracle channel – Chilia commune (CHE). Two vulnerable threatened species were registered, like *Trapa natans*, which is also vulnerable within the studied coenotaxon and the endangered *Stratiotes aloides*.

Key species: *Nuphar lutea* (3; CHE).

Threatened species: *Stratiotes aloides* (+; CHE), *Trapa natans* (1; CHE).

Other species: *Nymphaea alba* (1; CHE), *Ceratophyllum demersum* (+; CHE).

22.4312 Water chestnut carpets

***Trapetum natantis* V. Kárpáti 1963** is an endangered plant community, at least in the Eracle channel area – Chilia commune (CHE), where its conservation value is enhanced by the presence of the vulnerable threatened species *Trapa natans* and *Stratiotes aloides*, of which the first is dominant, protected by Berne Convention, while the second is endangered within this coenotaxon.

Key species: *Trapa natans* (3; CHE).

Threatened species: *Stratiotes aloides* (+; CHE), *Trapa natans* (3; CHE).

Other species: *Phragmites australis* (±; CHE), *Typha angustifolia* (1; CHE).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924** is considered a rare plant community (F: II) in the Eracle channel area (CHE). There can be estimated a medium level of non-native plant invasive tendencies (*Amorpha fruticosa*, *Prunus cerasifera*) taking into account their dominance variation limits (+1). The only ruderal taxon recorded has a reduced dominance, so it indicates a low disturbance from this point of view.

Key species: *Amorpha fruticosa* (1; CHE), *Salix alba* (4; CHE).

Other species:

- trees: *Prunus cerasifera* (+; CHE);

- shrubs: *Rubus caesius* (1; CHE);

- grasses/ undershrubs: *Arctium lappa* (+; CHE), *Bidens tripartita* (+; CHE), *Iris pseudacorus* (+; CHE), *Myosotis scorpioides* (+; CHE), *Myosoton aquaticum*

(+; CHE), *Phragmites australis* (+; CHE), *Rumex palustris* (+; CHE), *Solanum dulcamara* (+; CHE), *Symphytum officinale* (±; CHE).

44.9216 Grey willow scrub

***Calamagrosti-Salicetum cinereae* Soó et Zólyomi in Soó 1955** is estimated as an endangered plant community along the Eracle channel – Chilia commune (CHE). It is nearly mono-dominant, as there are just a few *Phragmites australis* individuals in the studied phytocoenosis.

Key species: *Salix cinerea* (5; CHE).

Other species: *Phragmites australis* (+; CHE).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926**, a sporadic plant community framed into this habitat, shelters two vulnerable threatened species, endangered within this coenotaxon which was inventoried along the Eracle channel (CHE).

Key species: *Phragmites australis* (5; CHE), *Typha angustifolia* (1; CHE).

Threatened species: *Trapa natans* (+; CHE).

Other species: *Calystegia sepium* (+; CHE), *Lythrum salicaria* (+; CHE), *Salix alba* (+; CHE).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926**, a rare (F: II) plant community framed in this habitat, can be considered as rare (F: II) within Chilia commune's territory (CHE). There only one non-native species was identified (*Amorpha fruticosa*). Its reduced dominance shows a low disturbance from this point of view.

Key species: *Phragmites australis* (5; CHE).

Other species: *Amorpha fruticosa* (+; CHE), *Bidens tripartita* (+; CHE), *Calystegia sepium* (+; CHE), *Lythrum salicaria* (+; CHE), *Myosotis scorpioides* (+; CHE), *Senecio paludosus* (+; CHE), *Salix alba* (+; CHE).

Plant communities which are not framed into the Palaearctic habitats classification

***Ceratophylletum demersi* Hild 1956** represents a vulnerable plant community identified in the Eracle channel – Chilia commune (CHE) has two vulnerable threatened taxa of which *Trapa natans* is vulnerable and *Stratiotes aloides* is endangered within the analysed situations.

Key species: *Ceratophyllum demersum* (5; CHE).

Threatened species: *Stratiotes aloides* (+; CHE), *Trapa natans* (1; CHE).

Other species: *Hydrocharis morsus-ranae* (+; CHE)

FAUNA

Birds. According to the ornithological studies performed on the territory of the Chilia commune, there have been inventoried 100 species of birds which can be found in the Annex 3 and 4B of the Ordinance 57/2007. Of these taxa, a total of 62 species are mentioned in the Annex 3 of the ordinance, being strictly protected and used within the design activities for the *Natura 2000* network, these

being represented by: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Milvus milvus*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Porzana porzana*, *Porzana parva*, *Porzana pusilla*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*.

The rarest species listed above, which give a high conservation value to this area, include: *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Egretta alba*, *Ciconia nigra*, *Aythya nyroca*, *Tadorna tadorna*, *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus macrourus*, *Circus pygargus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco cherrug*, *Falco peregrinus*, *Porzana parva*, *Crex crex*, *Recurvirostra avosetta*, *Larus minutus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*.

A total of 38 species are protected and can be found in Annex 4B of Ordinance 57/2007, representing animal and plant species which require strict protection: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombicilla garrulus*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. Some of the rarest bird species framed in this annex are: *Jynx torquilla*, *Motacilla cinerea*, *Phoenicurus ochruros*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Regulus regulus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

Bird species identified in the area but not mentioned in the two annexes of the Ordinance 57/2007, which are listed in the Annex II of Law 13/ 1993, are: *Podiceps grisegena*, *Podiceps nigricollis*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Hirundo daurica*, *Delichon urbica*, *Lanius senator*,

Troglodytes troglodytes, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Ficedula hypoleuca*, *Parus palustris*, *Parus lugubris*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

The high diversity of habitats in the area, the large areas of the floodplains, favour the nesting of a large number of species and populations of bird species within Chilia commune area, of which the certain or probable nesting is estimated for: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Botaurus stellaris*, *Egretta garzetta*, *Ardea purpurea*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus olor*, *Aythya nyroca*, *Haliaeetus albicilla*, *Circus aeruginosus*, *Falco vespertinus*, *Porzana porzana*, *Porzana parva*, *Porzana pusilla*, *Sterna hirundo*, *Chlidonias hibridus*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Podiceps grisegena*, *Podiceps nigricollis*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Oenanthe oenanthe*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza schoeniclus*.

Research concerning the natural heritage of I.C. Brătianu commune

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**PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:-
NATURA 2000 SITES:-**

GEOLOGY AND PEDOLOGY

The administrative territory of I.C. Brătianu commune is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite to

which are added tufogene greenschist, which occur in the south-eastern part. These types of deposits outcrop through the Quaternary loess layers which cover some parts of the area. The central-western part of the area is occupied by the Holocene psamo-pelitic deposits.

Based on these types of deposits, the various types of territorial units of soil such as Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on limestone, Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998) occur. Along the Danube River, on the alluvial deposits and alluvia, were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

The largest part of this commune's territory is represented by agriculture fields. Still, in its northern area grasslands prevail, which occur on the former wetlands of the Danube floodplain, drained at present, situated eastwards of the dyke adjacent to the river, westwards of this dam. The wetlands are in free flooding regime, the natural vegetation forming a narrow stripe along the Danube, being represented by wetland grasslands and restricted areas of *Tamarix ramosissima* shrubs and *Populus nigra* stands. Most of this stripe of vegetation is occupied by poplar and less by willow plantations.

FLORA, VEGETATION, HABITATS

Even though the number of habitats is restricted, they still have a conservation value, all of the plant communities identified so far being framed into habitats of community interest, like 92A0 (44.6612), 92D0 (44.814112), some of them being priority habitats: 1530* (15.A21275), 62C0* (34.A2111, 34.92).

Nearly each of the plant communities fits into one of the threat categories, from endangered to sporadic. Only the vulnerable category includes two coenotaxa. Most of the plant communities show signs of a high disturbance, the other extreme value of this factor being low. All the mentioned locations are situated outside protected areas.

15. A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** plant community, a vulnerable coenotaxon (F: I) within this commune, has a medium level of disturbance due to grazing, indicated by the number of ruderal species (10 taxa), that exceeds the other taxa. Their dominance variation is also significant in this sense (+-1). It was studied within the grasslands northwards of I.C. Brătianu (BPN).

Key species: *Cynodon dactylon* (1; BPN), *Trifolium fragiferum* (1; BPN).

Other species: *Bromus hordeaceus* (1; BPN), *Capsella bursa-pastoris* (+; BPN), *Centaurea calcitrapa* (+; BPN), *Cichorium intybus* (+; BPN), *Descurainia sophia* (+; BPN), *Elymus repens* (1; BPN), *Galium humifusum* (+; BPN), *Hordeum*

murinum (+; BPN), *Juncus gerardi* (+; BPN), *Lolium perenne* (1; BPN), *Medicago lupulina* (+; BPN), *Puccinellia limosa* (+; BPN), *Ranunculus repens* (+; BPN), *Rorippa sylvestris* (+; BPN), *Solanum nigrum* (+; BPN), *Verbena officinalis* (+; BPN), *Xanthium spinosum* (+; BPN).

34. A2111 Western Pontic sand pioneer grass swards

***Brometum tectorum* Bojko 1934** is the most widespread plant community within the grasslands northwards of I.C. Brătianu (BPN), where it can be considered sporadic (F: IV), while at the whole commune's territory level it is rare (F: II). The invasive trend of the ruderal plants have a high level, shown by their dominance (+-3), as well as by the fact that these four species represent half of this coenotaxon inventory.

Key species: *Bromus tectorum* (3; BPN).

Other species: *Arenaria serpyllifolia* (+; BPN), *Artemisia austriaca* (+; BPN), *Bromus hordeaceus* (1; BPN), *Cynodon dactylon* (+; BPN), *Erodium cicutarium* (+; BPN), *Galium humifusum* (1; BPN), *Medicago minima* (+; BPN).

44.814112 Danube small reed fresh water *Tamarix* stands

***Calamagrostio-Tamaricetum ramosissimae* Simon et Dihoru (1962)** plant community, identified within the Danube floodplain section framed between the dyke and the riverbanks, northwards of I.C. Brătianu (BNLD). It can be considered endangered within the studied territory (F: +). The high level of disturbance is obvious, as the ruderal species (9 taxa) prevail within its inventory, having also a significant dominance (+-1). There are also two non-native species (*Amorpha fruticosa*, *Ailanthus altissima*), but with a reduced dominance.

Key species: *Tamarix ramosissima* (4; BNLD).

Other species:

- shrubs/ lianas: *Ailanthus altissima* (+; BNLD), *Amorpha fruticosa* (+; BNLD);
 - grasses/ undershrubs: *Aristolochia clematitis* (+; BNLD), *Bromus tectorum* (1; BNLD), *Capsella bursa-pastoris* (+; BNLD), *Chenopodium album* (+; BNLD), *Descurainia sophia* (+; BNLD), *Geranium pusillum* (+; BNLD), *Hordeum murinum* (+; BNLD), *Senecio vernalis* (+; BNLD), *Xanthium italicum* (+; BNLD).

34.92 Ponto-Sarmatic steppes

***Artemisio austriacae-Poëtum bulbosae* Pop 1970** plant community, rare (F: II) within the grasslands northwards of I.C. Brătianu commune (BPN), has a high level of ruderal plants invasive trend, as most of the species belong to this category, also having significant dominance indices (+-2). A low disturbance from the non-native species point of view is shown by the only such taxon, *Xanthium spinosum*.

Key species: *Artemisia austriaca* (2; BPN), *Poa bulbosa* (1; BPN).

Other species: *Achillea setacea* (+; BPN), *Bromus tectorum* (+; BPN), *Bromus hordeaceus* (1; BPN), *Capsella bursa-pastoris* (+; BPN), *Carduus thoermeri* (+; BPN), *Descurainia sophia* (+; BPN), *Erodium cicutarium* (+; BPN), *Galium humifusum* (+; BPN), *Hordeum murinum* (+; BPN), *Polygonum aviculare*

(+; BPN), *Sclerochloa dura* (+; BPN), *Urtica dioica* (+; BPN), *Xanthium spinosum* (+; BPN).

44.6612 Western Pontic white-black poplar galleries

***Populetum nigro-albae* Slavnic 1952** is a vulnerable coenotaxon (F: I), being observed in the free flooding regime area of the Danube floodplain, westwards of the dyke which protects I.C. Brătianu commune. A low disturbance, still to its upper limit, can be assessed from the presence of six ruderal taxa with a low dominance. There is also visible a low presence of alien species, like *Fraxinus americana* and *Amorpha fruticosa*.

Key species: *Populus nigra* (4; BSLD).

Other species:

- trees: *Fraxinus americana* (+; BSLD);
- shrubs/ lianas: *Amorpha fruticosa* (+; BSLD);
- grasses/ undershrubs: *Arctium lappa* (+; BSLD), *Artemisia absinthium* (+; BSLD), *Cannabis sativa* subsp. *spontanea* (+; BSLD), *Chenopodium album* (+; BSLD), *Elymus repens* (+; BSLD), *Lysimachia nummularia* (+; BSLD), *Lythrum salicaria* (+; BSLD), *Poa trivialis* (1; BSLD), *Polygonum aviculare* (+; BSLD), *Rorippa sylvestris* (+; BSLD), *Rumex palustris* (+; BSLD).

FAUNA

Birds. The studied avifauna of the administrative territory of the I.C. Brătianu commune was inventoried, here being observed 70 bird species included in the Appendices 3 and 4B of the Ordinance 57/2007. Of this amount 38 species are strictly protected, being classified in the Annex 3 of this ordinance: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Pernis apivorus*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Burhinus oedicnemus*, *Sterna hirundo*, *Chlidonias hybridus*, *Asio flammeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Caprimulgus europaeus*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*. Among these, several species enhance the conservation value of this area, like: *Pernis apivorus*, *Circaetus gallicus*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Burhinus oedicnemus*, *Sylvia nisoria*, *Emberiza hortulana*, *Anthus campestris*.

The other 32 species are protected, being classified in the Annex 4B of this ordinance, representing animal and plant species which require strict protection: *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa*

striata, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. Some of the rarest birds in this area that are included in this appendix are represented by: *Actitis hypoleucos*, *Jynx torquilla*, *Motacilla cinerea*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Phylloscopus trochilus*, *Regulus regulus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis flammea*.

Bird species identified in the area which are not found in the two annexes of the Ordinance 57/2007 but can be found in Annex II of Law 13/ 1993 are: *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Apus melba*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

The species with breeding populations in the area include: *Ciconia ciconia*, *Aythya nyroca*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Buteo buteo*, *Caprimulgus europaeus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

Research concerning the natural heritage of Dăeni commune

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PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: -

NATURA 2000 SITES: Brațul Măcin, Podișul Nord Dobrogen (Sites of Community Interest), Dunărea Veche – Brațul Măcin (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Dăeni commune is characterized by the Upper Proterozoic metamorphic deposits of green schist or greenish phyllite these

outcropping through the Quaternary loess layers which cover central-southern part of the area. The western part of the area is occupied by the Holocene psamo-pelitic deposits.

Based on these stone types, the various types of territorial units of soil such as Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998) occur. Along the Danube River on the alluvial deposits and alluvia were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

Within the Dăeni commune's territory the natural habitats can be estimated as covering less than one quarter of the total area, being mainly concentrated along the Danube floodplain, where they are mainly represented by riparian willow forests on the Danube riverbanks and islands.

The steppe grasslands occur on the loess steep slopes adjacent to the Danube floodplain, but also along the few valleys with permanent or temporary rivulets from the Dobrogea Plateau, where, in more humid conditions, due to the ground water, restricted mesophile grasslands are found. The rest of this commune's territory is mainly represented by large agriculture fields.

FLORA, VEGETATION, HABITATS

Most of the plant communities are framed into habitats of community interest like 92A0 (44.1621) and 62C0* (34.92, 34.9211).

The human activities pressure on these restricted natural habitats is obvious for most of them, which have a high (two plant communities) or medium (one coenotaxon) level of disturbance. Still two plant communities show a low intensity of human impact.

Most of the plant communities have between one and two threatened species, mainly endangered, only one being critically endangered and/ or endangered, within different plant communities.

All the locations mentioned below are framed into the Brațul Măcin (Sites of Community Interest) and/or Dunărea Veche-Brațul Măcin (Special Protection Area).

34.92 Ponto-Sarmatic steppes

***Cynodonti-Poëtum angustifoliae* Rapaics ex Soó 1957** is a vulnerable coenotaxon within the slopes adjacent to the Danube floodplain (DN). The only ruderal species, *Bromus hordeaceus*, shows a low process of invasion of these kinds of taxa.

Key species: *Cynodon dactylon* (1; DN), *Poa angustifolia* (4; DN).

Other species: *Agropyron cristatum* (+; DN), *Bromus hordeaceus* (+; DN), *Dichanthium ischaemum* (1; DN), *Euphorbia seguieriana* (+; DN), *Festuca valesiaca* (+; DN), *Galium humifusum* (+; DN), *Medicago lupulina* (+; DN), *Medicago minima* (+; DN), *Salvia nemorosa* (+; DN), *Thymus pannonicus* (+; DN).

***Medicagini minimae-Festucetum valesiaca* Wagner 1941**, an endangered plant community occurs northwards of Dăeni, on the slopes adjacent to the Danube floodplain (DN), where *Ornithogalum amphibolum*, a rare and vulnerable species of European importance was identified, this being endangered within the respective coenotaxa. A low disturbance is indicated by the four ruderal species with reduced dominance.

Key species: *Festuca valesiaca* (2; DN), *Medicago minima* (1; DN).

Threatened species: *Ornithogalum amphibolum* (+; DN).

Other species: *Agropyron cristatum* (1; DN), *Bassia prostrata* (+; DN), *Bromus squarrosus* (+; DN), *Bromus tectorum* (+; DN), *Euphorbia seguieriana* (+; DN), *Gypsophila pallasii* (+; DN), *Poa bulbosa* (+; DN), *Senecio vernalis* (+; DN), *Xeranthemum annuum* (+; DN).

***Artemisia austriaca-Poëtum bulbosae* Pop 1970** is a vulnerable (F: I) coenotaxon that was inventoried within Valea Siliștei (DVSI). Despite the intense grazing, one vulnerable threatened species *Ornithogalum amphibolum*, of European importance, was identified, with a much reduced dominance (r), thus being framed into the “critically endangered” category. A high disturbance is indicated by the dominance variation (+2) of the five ruderal species.

Key species: *Artemisia austriaca* (1; DVSI), *Poa bulbosa* (2; DVSI).

Threatened species: *Ornithogalum amphibolum* (r; DVSI).

Other species: *Anthemis austriaca* (+; DVSI), *Arenaria serpyllifolia* (+; DVSI), *Bromus tectorum* (1; DVSI), *Cardus thoermeri* (+; DVSI), *Euphorbia seguieriana* (+; DVSI), *Galium humifusum* (+; DVSI), *Hordeum murinum* (+; DVSI), *Medicago minima* (+; DVSI), *Senecio vernalis* (+; DVSI), *Viola kitaibeliana* (+; DVSI).

***Agropyron cristati-Kochietum prostratae* Zólyomi 1958** plant community can be considered vulnerable (F: I). It was recorded from the slopes of the loess plateau adjacent to the Danube floodplain, northwards of Dăeni (DN). From the two rare threatened species identified there *Ornithogalum amphibolum* is also vulnerable and of European importance. A medium degree of disturbance is indicated by three ruderal species and their dominance variation (+1).

Key species: *Agropyron cristatum* (1; DN), *Bassia prostrata* (2; DN).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; DN), *Ornithogalum amphibolum* (+; DN).

Other species: *Bromus tectorum* (+; DN), *Bombycilaena erecta* (+; DN), *Euphorbia seguieriana* (1; DN), *Gypsophila pallasii* (+; DN), *Haplophyllum suaveolens* (+; DN), *Medicago minima* (+; DN), *Poa bulbosa* (1; DN), *Senecio vernalis* (+; DN), *Salvia nemorosa* (±; DN), *Stipa capillata* (±; DN).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924** plant community, estimated as vulnerable (F: I), was inventoried within the Danube floodplain at Ostrovul Dăeni (OD). There were

recorded two non-native species (*Fraxinus americana*, *Morus alba*) whose dominance (+-1) indicates a medium disturbance from this point of view. There can be deduced a medium disturbance due to ruderal species as three such taxa with reduced dominance were observed, which are equal in number with the native species, typical for a natural status.

Key species: *Salix alba* (5; OD)

Other species:

- trees: *Fraxinus americana* (1; OD), *Morus alba* (+; OD);
- grasses/ undershrubs: *Alisma plantago-aquatica* (+; OD), *Bidens tripartita* (+; OD), *Plantago major* (+; OD), *Polygonum aviculare* (+; OD), *Potentilla reptans* (+; OD).

Plant communities which are not framed within the Palaearctic habitats classification

***Poëtum pratensis* Răvăruț, Căzăceanu et Turenschi 1956** can be considered an endangered plant community (F: +) within the Dăeni commune, where it was observed along the Siliștea Valley (Valea Siliștea – DVSI), southwards of Dăeni. The very intense disturbance due to overgrazing is shown by the fact that, except *Galium humifusum*, all the species are ruderal, including the dominant *Poa pratensis*.

Key species: *Poa pratensis* (5; DVSI).

Other species: *Artemisia austriaca* (+; DVSI), *Bromus hordeaceus* (+; DVSI), *Bromus tectorum* (+; DVSI), *Capsella bursa-pastoris* (+; DVSI), *Descurania sophia* (+; DVSI), *Eryngium campestre* (+; DVSI), *Galium humifusum* (+; DVSI), *Geranium rotundifolium* (+; DVSI), *Hordeum murinum* (+; DVSI), *Lamium amplexicaule* (+; DVSI), *Poa bulbosa* (+; DVSI), *Stellaria media* (+; DVSI).

FAUNA

Birds. Within the studies upon the avifauna of the administrative territory of the Dăeni commune there were inventoried 71 bird species included in appendices 3 and 4B of the Ordinance 57/2007. From these taxa 41 species are strictly protected, being classified in the Annex 3 of the ordinance, these being: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Tadorna tadorna*, *Pernis apivorus*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Sterna hirundo*, *Chlidonias hybridus*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Caprimulgus europaeus*, *Melanocorypha calandra*, *Lulula arborea*, *Oenanthe isabellina*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*. Among these species of high conservation value include: *Gavia stellata*, *Tadorna tadorna*, *Pernis apivorus*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Burhinus oedicephalus*, *Oenanthe isabellina*, *Oenanthe pleschanka*, *Sylvia nisoria*, *Emberiza hortulana*, *Anthus campestris*.

The other 30 species require strict protection, being classified in the Annex 4B of the ordinance, like: *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. The rarest birds in this area included in this Appendix are represented by: *Actitis hypoleucos*, *Jynx torquilla*, *Motacilla cinerea*, *Prunella modularis*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Phylloscopus trochilus*, *Regulus regulus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis flammea*.

Bird species identified in the area which are not found in the two annexes of the Ordinance 57/2007 but are mentioned in the Annex II of Law 13/ 1993, are: *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Apus melba*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

The location of the Dăeni commune that includes the Dunărea Veche branch with its islands, the aquatic habitats, the steppe grasslands and agricultural/ rural areas, lead to an abundance of species and populations nesting in the area, represented by: *Ixobrychus minutus*, *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Tadorna tadorna*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Melanocorypha calandra*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Buteo buteo*, *Caprimulgus europaeus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

Research concerning the natural heritage of Greci commune

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ACCESS: Road DN22 Tulcea-Măcin, DJ222K

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: Măcin Mountains National Park

NATURA 2000 SITES: Munții Măcinului (Site of Community Interest), Măcin-Niculitel (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Greci commune is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite to which are added tufogene greenschist which occur in the south-western part on small areas. The eastern part of this territory is occupied by the Carapelit formation (Lower Carboniferous age) which is composed of conglomerates, sandstones, tuffs, schists and siltites. Also here were found the Paleozoic outcrops of granite gneisses (between pre-Silurian metamorphic deposits and Lower Carboniferous age deposits). These types of stones outcrop through the Quaternary loess layers which cover the entire area.

Based on these stones types, the various types of territorial units of soil such as Distric litosols (Dystic Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998) occurs. Along the Danube River on the alluvial deposits and alluvia were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

Even though the territory of Greci commune is dominated by arable fields, concentrated in its central part, the native vegetation still covers an important area, mainly in the peripheral zones of the studied region. Here occur the highest altitudes within the Dobrogea Plateau that allow the existence of several vegetation layers, developed between the Danube level up to the highest peak of Măcin Mountains, Greci (467 m).

Thus, eastwards from the Danube riverbanks, where the native riparian forests are nearly completely replaced by forestry plantations, the low altitudes are characterized by fragments of steppe grasslands and halophile vegetation. The last occurs around the Slatina Lake, with brackish waters, mainly dominated by reed beds, creating a landscape contrast with the dry Culmea Pricopanului mountain range, with a Paleozoic schists substratum.

The loess steppe grasslands, dominated mainly by *Dichanthium ischaemum*, *Festuca valesiaca*, *Stipa capillata*, *Poa bulbosa*, occur especially on

flat relief, or in the lower parts of the slopes within Culmea Pricopanului, Greci depression, Sivrica-Piatra Greci and also on the foothills of Culmea Măcinului, the main range of Măcin Mountains.

The rocky steppe that has as main key species *Thymus zygioides*, *Festuca callieri*, *Sedum urvillei* subsp. *hillebrandtii* covers most of the rocky substrata, being mainly found in the upper parts of the hills, ridges and peaks. In the flowering period it confers an even more attractive aspect to the spectacular massive granite or schist megalithic formations. This type of steppe, more than the loess steppe, occur as well within the forest massifs, where it has an insular aspect, most of the scenic lookout points being situated in these areas.

The wooded steppe formed mainly of *Quercus pedunculiflora* and *Quercus pubescens* creates a transition zone towards the compact forests, being distributed mostly within the Greci depression and southwards of the commune, on southern foothills or around the rocky steppe „islands” within the forest massifs, on the main range of the mountains.

At medium altitudes occur the sub-Mediterranean forest of *Quercus pubescens* and *Carpinus orientalis*, low and compact. The highest altitudes or valleys, with more or less deep soils, are typical biotopes for the Balkan forest, with key species like *Quercus dalechampii*, *Quercus petraea*, *Tilia tomentosa*, *Carpinus betulus* etc.

Despite their low altitudes, the steep rocky slopes, the deep valleys, bare or forested, as well as the rivulets, that sometimes form small waterfalls, create mountain scenery, unexpected for the flat or rolling hills landscapes of other areas within the Dobrogea Plateau.

FLORA, VEGETATION, HABITATS

The native vegetation of the Greci commune area has a high conservation value, as most of the habitats inventoried are of community interest, like 91Y0 (41.2C22), 91M0 (41.76831, 41.76833), 92A0 (44.1621), most of these being priority such habitats like: 1530* (15.A2135), 62C0* (34.92, 34.9211), 91AA* (41.73723, 41.73724). This high conservation importance is also underlined by the presence within most of these vegetation types of at least one threatened species, the maximum number being of eight such taxa. The vulnerable plant communities prevail, followed by rare and less by endangered coenotaxa. As a preliminary assessment it can be considered that the conservation level is favourable for most of the studied plant communities, at least in the analysed plots, as the number and dominance of the ruderal plants is low. The only exceptions are the *Artemisia austriacae*-*Poëtum bulbosae* secondary plant community, with a high presence and dominance of ruderal species, due to overgrazing, respectively the *Paeonio peregrinae*-*Carpinetum orientalis* association, and *Tilio tomentosae*-*Carpinetum betuli* with medium levels of disturbance. All the locations described below are framed within the Munții Măcinului *Natura 2000* site.

15.A2135 Western Pontic *Hordeum hystrix* swards

***Hordeetum hystricis* (Soó 1933) Wendelberger 1943**, plant community was identified in the vicinity of Slatina Lake (LSL) where ruderal species occur in a low percentage, being represented by only one species, underlined below. In the area of Slatina Lake it can be considered a vulnerable coenotaxon (F: I), while at the level of the Greci commune territory it has an endangered character (F: +).

Key species: *Hordeum geniculatum* (3; LSL).

Other species: *Achillea setacea* (+; LSL), *Agropyron elongatum* (+; LSL), *Bolboschoenus maritimus* (1; LSL), *Bromus squarrosus* (+; LSL), *Cruciata pedemontana* (+; LSL), *Juncus gerardi* (+; LSL), *Phragmites australis* subsp. *australis* var. *humilis* (1; LSL), *Plantago lanceolata* (+; LSL), *Potentilla argentea* (+; LSL), *Puccinellia convoluta* (+; LSL), *Scorzonera laciniata* (+; LSL).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** plant community was inventoried within Dealul Piatra Greci-Sivrica (DPGS; F: III) and Roman Bair (RB; F: I), within the whole studied territory being estimated as rare (F: II). Its conservation value is underlined by the five threatened taxa, mostly rare at the national level, with the exception of *Dianthus nardiformis*, which is also a vulnerable European species, listed in the European Red List (United Nations, 1991). The ruderal species have a low contribution to the phytocoenoses inventory, being represented by six taxa with a reduced dominance.

Key species: *Festuca valesiaca* (3-4; DPGS, RB), *Medicago minima* (+; RB).

Threatened species: *Achillea leptophylla* (+; DPGS), *Dianthus nardiformis* (+; DPGS), *Gagea szovitzii* (+; RB), *Potentilla bornmuelleri* (+; DPGS), *Thymus zygioides* (+; DPGS).

Other species: *Achillea setacea* (+; DPGS), *Artemisia austriaca* (+; DPGS), *Cichorium intybus* (+; DPGS), *Cruciata pedemontana* (+; RB), *Dichanthium ischaemum* (+-2; DPGS), *Eryngium campestre* (+; DPGS), *Filipendula vulgaris* (+; RB), *Fragaria viridis* (+; RB), *Herniaria glabra* (+; DPGS), *Lamium purpureum* (+; RB), *Orlaya grandiflora* (+; RB), *Phleum phleoides* (+; DPGS), *Plantago lanceolata* (+; DPGS), *Poa bulbosa* (+; DPGS), *Potentilla argentea* (+; DPGS, RB), *Pyrus pyraister* (+; PB), *Ranunculus illyricus* (+; RB), *Sedum urvillei* subsp. *hillebrandtii* (+; DPGS), *Rumex acetosella* (+; DPGS), *Scleranthus perennis* (+; DPGS), *Stipa capillata* (1; DPGS), *Taraxacum erythrospermum* (+; RB), *Teucrium chamaedrys* (+; DPGS), *Teucrium polium* (+; DPGS).

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community was registered within the Măcin Mountains National Park, where it can be estimated as vulnerable (F: I) in the Culmea Pricopanului (CPG) and Culmea Măcinului (CMG) sectors that belong to Greci commune. In the Valea Ghiului (VGL) area it can be considered endangered (F: +). At the level of whole commune of Greci it can be estimated as vulnerable (F: I). It worth to mention the presence of five threatened species among which *Crocus reticulatus* and *Paeonia peregrina* are vulnerable, *Salvia aethiopis* is endangered, *Galanthus elwesii* is rare. Within these phytocoenoses all these species can be considered endangered, *Sternbergia colchiciflora* identified within Dealul Moroianu (DMO),

except the critically endangered *Salvia aethiopis*. There can be observed a low dominance and percentage of ruderal species (five taxa).

Key species: *Dichanthium ischaemum* (3-4; VGL, CPG).

Threatened species: *Crocus reticulatus* (\pm ; VGL), *Galanthus elwesii* (+; VGL), *Paeonia peregrina* (\pm ; VGL), *Salvia aethiopis* (r; CPG), *Sternbergia colchiciflora* (r- \pm ; DMO).

Other species: *Achillea coarctata* (+), *Alyssum murale* (+; VGL), *Anthemis austriaca* (+; CPG), *Cichorium intybus* (+; VGL), *Cruciata pedemontana* (+; CPG), *Dactylis glomerata* (+; VGL), *Echium vulgare* (+; CPG), *Eryngium campestre* (+; CPG), *Erysimum diffusum* (\pm ; CPG), *Festuca valesiaca* (1; CPG), *Kohlruschia prolifera* (+; CPG), *Linaria genistifolia* (+; CPG), *Sedum urvillei* subsp. *hillebrandtii* (+; CPG), *Teucrium polium* (+; CPG), *Thymus pannonicus* (\pm ; VLG), *Tragopogon dubius* (+; CPG).

Artemisia austriacae-Poëtum bulbosae Pop 1970 association was studied within the Greci pasture (Pășunea Greci-PGRE) where it holds most of the area (F: IV), being still estimated as rare (F: II) at the commune's level. The intense grazing is reflected in the dominance of ruderal species, underlined in the text, which exceed the other taxa both in number (11 taxa), as well as in dominance variation limits (+2).

Key species: *Artemisia austriaca* (1; PGRE), *Poa bulbosa* (2; PGRE).

Other species: *Achillea setacea* (+; PGRE), *Anthemis austriaca* (+; PGRE), *Arenaria serpyllifolia* (1; PGRE), *Capsella bursa-pastoris* (+; PGRE), *Carduus thoermeri* (+; PGRE), *Carpinus orientalis* (+; PGRE), *Convolvulus arvensis* (+; PGRE), *Crataegus monogyna* (+; PGRE), *Cynodon dactylon* (+; PGRE), *Erodium cicutarium* (+; PGRE), *Eryngium campestre* (+; PGRE), *Hordeum murinum* (+; PGRE), *Medicago minima* (+; PGRE), *Plantago lanceolata* (+; PGRE), *Orlaya grandiflora* (+; PGRE), *Senecio vernalis* (+; PGRE).

Stipetum capillatae (Hueck 1931) Krausch 1961 coenotaxa was recorded within the Priopcea – Sivrica Pasture (PPSI) where it can be considered rare (F: II), respectively endangered (F: +) within the Greci commune area. The low dominance of the five ruderal taxa indicates a reduced impact of the human activities.

Key species: *Stipa capillata* (5; PPSI).

Other species: *Cichorium intybus* (+; PPSI), *Erophila verna* (+; PPSI), *Eryngium campestre* (+; PPSI), *Euphorbia agraria* (+; PPSI), *Festuca valesiaca* (+; PPSI), *Cruciata pedemontana* (\pm ; PPSI), *Lamium purpureum* (+; PPSI), *Poa angustifolia* (+; PPSI), *Potentilla argentea* (+; PPSI), *Taraxacum erythrospermum* (+; PPSI), *Teucrium chamaedrys* (+; PPSI), *Teucrium polium* (+; PPSI), *Thymus pannonicus* (+; PPSI).

34.9211 Western Pontic thyme steppes

Agropyro-Thymetum zygoidi Dihoru (1969) 1970 plant community was studied in the Dealul Piatra Greci – Sivrica Hill (DPGS) area, where it can be estimated as vulnerable (F:I), like within the whole commune area. Among the three rare threatened species recorded *Dianthus nardiformis* is also vulnerable

and of European importance. The low impact of grazing is reflected in the reduced participation of the four ruderal species.

Key species: *Thymus zygioides* (2; DPG).

Threatened species: *Achillea leptophylla* (+; DPGS), *Allium saxatile* (+; DPGS), *Dianthus nardiformis* (1; DPGS).

Other species: *Anthemis austriaca* (+; DPGS), *Arenaria serpyllifolia* (+; DPGS), *Bombycilaena erecta* (+; DPGS), *Bromus tectorum* (+; DPGS), *Cleistogenes bulgarica* (+; DPGS), *Cichorium intybus* (+; DPGS), *Dichanthium ischaemum* (+; DPGS), *Eryngium campestre* (+; DPGS), *Herniaria glabra* (+; DPGS), *Leontodon crispus* (+; DPGS), *Kohlrauschia prolifera* (+; DPGS), *Phleum phleoides* (+; DPGS), *Scleranthus perennis* (+; DPGS), *Sedum urvillei* subsp. *hillebrandtii* (+; DPGS), *Stipa capillata* (+; DPGS), *Teucrium polium* (+; DPGS).

***Festucetum callierii* Șerbănescu 1965 apud Dihoru (1969) 1970** plant community, registered as vulnerable (F: I) on Moroianu Hill (Dealul Moroianu – DMO) and as sporadic within Culmea Pricopanului (CPC; F: III), can be estimated as vulnerable within the Greci commune's territory. Within this phytocoenosis there were identified five threatened species, mainly rare, except *Dianthus nardiformis* and *Lactuca viminea* that are also vulnerable, the first being of European importance. This can be also explained by the reduced influence of grazing, the only ruderal species being *Echium vulgare* and *Poa bulbosa*, with a low dominance.

Key species: *Festuca callieri* (2; DMO).

Threatened species: *Dianthus nardiformis* (±; CPG), *Festuca callieri* (2; DMO), *Lactuca viminea* (±; CPG), *Sempervivum ruthenicum* (±; DMO), *Silene compacta* (+; DMO), *Sternbergia colchiciflora* (r-±; DMO), *Thymus zygioides* (1; DMO).

Other species: *Agropyron ponticum* (+; DMO), *Allium rotundum* (±; DMO), *Alyssum murale* (+; DMO), *Chrysopogon gryllus* (+; DMO), *Convolvulus cantabricus* (1; DMO), *Echium vulgare* (+; DMO), *Erysimum diffusum* (+; CPG), *Linaria genistifolia* (+; DMO), *Poa bulbosa* (+; DMO), *Sedum urvillei* subsp. *hillebrandtii* (+; DMO), *Stipa capillata* (+; DMO), *Taeniatherum caput-medusae* (±-2; DMO), *Teucrium polium* (+; DMO), *Verbascum banaticum* (+; DMO).

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974** plant community was inventoried within Dealul Moroianu (DMO), Pășunea Greci (PGRE) and Culmea Pricopanului (CPG), where it can be considered as vulnerable (F: I), like on the whole commune area. The only exception is represented by the first location, where the association can be estimated as rare (F: II). This plant community has the highest value for conservation among the studied ones, as it shelters eight threatened species, mainly rare. Among these, *Campanula romanica* is endemic, having European importance. Only one ruderal species was noticed, its reduced dominance indicating a low human intervention.

Key species: *Polytrichum piliferum* (1; DMO), *Sedum urvillei* subsp. *hillebrandtii* (1; DMO).

Threatened species: *Allium saxatile* (+; DMO), *Campanula romanica* (+; DMO), *Cheilanthes marantae* (+; DMO), *Dianthus nardiformis* (±; PGRE, CPG),

Festuca callieri (+-1; DMO, PGRE, CPG), *Moehringia grisebachii* (\pm ; DMO, PGRE), *Silene compacta* (+; DMO), *Thymus zygioides* (+; DMO).

Other species: *Alyssum saxatile* (+; DMO), *Chrysopogon gryllus* (+; DMO), *Echium vulgare* (\pm ; CPG), *Fraxinus ornus* (+; DMO), *Linaria genistifolia* (+; DMO), *Quercus pubescens* (+; DMO), *Rumex acetosella* (+; DMO), *Scleranthus perennis* (+; DMO), *Teucrium polium* (\pm ; CPG), *Vulpia myuros* (+; DMO).

41.2C22 Moldo-Muntenian sessile oak-hornbeam forests

***Tilio tomentosae-Carpinetum betuli* Doniță 1968** represents a vulnerable plant community within the Greci commune, where it was studied within the Valea Căutici area (GVC). There, it occurs as a medium disturbed coenotaxon, due to its partially derived canopy.

Key species: *Carpinus betulus* (1; GVC), *Quercus dalechampii* (1; GVC), *Tilia tomentosa* (2; GVC).

Other species:

- trees: *Acer campestre* (+; GVC);
- shrubs/ lianas: *Crataegus monogyna* (+; GVC), *Evonymus verrucosus* (+; GVC), *Sambucus nigra* (+; GVC);
- grasses/ undershrubs: *Anemone ranunculoides* (+; GVC), *Anthriscus cerefolium* (+; GVC), *Arum orientale* (+; GVC), *Corydalis solida* (+; GVC), *Gagea lutea* (+; GVC), *Ranunculus ficaria* (1; GVC), *Scilla bifolia* (+; GVC), *Viola odorata* (+; GVC).

41.73723 Moesian *Paeonia peregrina* - white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** coenotaxa was recorded in the areas of Dealul Cetatea Veche (DCV) and Roman Bair (RB), as a rare (F: II) respectively vulnerable (F: I) community. It had, in the studied plot, two rare threatened species, *Celtis glabrata* and the sub-endemic *Corydalis solida* subsp. *slivenensis*. In the studied situation the phytocoenosis has a medium level of ruderal plant occurrence, as from the five such species *Stellaria media* has a dominance of 1.

Key species: *Carpinus orientalis* (3; DCV, RB), *Quercus pubescens* (2; DCV, RB).

Threatened species: *Celtis glabrata* (+; DCV), *Corydalis solida* subsp. *slivenensis* (+; RB).

Other species:

- trees: *Cerasus mahaleb* (1; DCV);
- shrubs/ lianas: *Cornus mas* (+; RB), *Crataegus monogyna* (\pm ; RB), *Rosa canina* (+; DCV, RB);
- grasses/ undershrubs: *Alliaria petiolata* (+; RB), *Anthriscus cerefolium* (+; RB), *Bromus sterilis* (+; DCV), *Corydalis solida* (+; RB), *Galium aparine* (+; DCV), *Geum urbanum* (+; RB), *Poa nemoralis* (+; DCV), *Stellaria media* (1; DCV), *Thlaspi perfoliatum* (+; DCV), *Veronica hederifolia* (+; RB), *Viola suavis* (+; RB).

41.73724 Moesian *Galium dasypodium*-white oak woods

***Galio dasypodi-Quercetum pubescentis* Doniță 1970** plant community,

considered vulnerable within the Greci area, has one rare threatened taxon within the analysed situations from Valea Căutici (GVC). It is a low disturbed vegetation type, taking into account the variation of the dominance indices of the two ruderal species.

Key species: *Quercus pubescens* (3; GVC).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; GVC).

Other species:

- trees: *Fraxinus ornus* (2; GVC);

- shrubs/ lianas: *Crataegus monogyna* (+; GVC), *Evonymus verrucosus* (+; GVC), *Ligustrum vulgare* (+; GVC);

- grasses/ undershrubs: *Alliaria petiolata* (+; GVC), *Filipendula vulgaris* (+; GVC), *Fragaria viridis* (+; GVC), *Gagea lutea* (+; GVC), *Galium aparine* (+; GVC), *Geum urbanum* (+; GVC), *Tanacetum corymbosum* (+; GVC), *Viola odorata* (+; GVC).

41.76831 Dobrogean paeonia sessile oak forests

***Fraxino orni-Quercetum dalechampii* Doniță 1970** plant community was inventoried on Dealul Cetatea Veche (DCV; F: III), as a phytocoenosis with old growth oaks, within Roman Bair (RB; F: I) and Valea Ghiului (VGL; F: I). Within the Greci commune it can be considered rare (F: II). Among the four threatened rare species, there should be underlined mainly *Celtis glabrata* and *Galanthus elwesii*, a species rarely found within Greci commune, where *Galanthus plicatus* is much more frequent. Five ruderal species, with low dominance, were recorded within the plots.

Key species: *Fraxinus ornus* (1; DCV, RB), *Quercus dalechampii* (2; RB, DCV).

Threatened species: *Celtis glabrata* (1; DCV), *Galanthus elwesii* (\pm 1; VGL), *Mercurialis ovata* (+; RV, VGL), *Nectaroscordum siculum* subsp. *bulgaricum* (\pm ; RB).

Other species:

- trees: *Acer campestre* (+; RGB), *Carpinus orientalis* (+; DCV, RB), *Cerasus mahaleb* (+; DCV), *Quercus polycarpa* (1), *Tilia tomentosa* (+; DCV);

- shrubs/ lianas: *Cornus mas* (\pm ; RB), *Crataegus monogyna* (+; RB);

- grasses/ undershrubs: *Alliaria petiolata* (+; DCV), *Allium rotundum* (+; DCV), *Anthriscus cerefolium* (+; DCV, RB), *Arum orientale* (\pm ; RB), *Corydalis solida* (+; RB), *Dactylis polygama* (+; RB, DCV), *Digitalis lanata* (+; DCV), *Galium aparine* (+; DCV, RB), *Geum urbanum* (+; RB), *Lamium purpureum* (+; RB), *Poa bulbosa* (+; DCV), *Poa nemoralis* (+; RB, DCV), *Stellaria media* (+; RB), *Veronica hederifolia* (+; RB), *Viola odorata* (+; RB).

41.76833 Dobrogean *Quercus pedunculiflora*-lime-oriental hornbeam forests

***Quercus pedunculiflorae-Tilietum tomentosae* Doniță 1970**, a vulnerable coenotaxon has one rare threatened taxa within the studied plots from Valea Căutici (GVC), where the only ruderal species, *Urtica dioica*, indicates a low disturbance.

Key species: *Quercus pedunculiflora* (2; GVC), *Tilia tomentosa* (2; GVC).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; GVC).

Other species:

- trees: *Acer campestre* (2; GVC), *Fraxinus excelsior* (1; GVC);
- shrubs/ lianas: *Crataegus monogyna* (+; GVC), *Sambucus nigra* (+; GVC);
- grasses/ undershrubs: *Anemone ranunculoides* (+; GVC), *Arum orientale* (+; GVC), *Corydalis solida* (+; GVC), *Geum urbanum* (+; GVC), *Gagea lutea* (+; GVC), *Ranunculus ficaria* (1; GVC), *Scilla bifolia* (+; GVC), *Urtica dioica* (+; GVC), *Viola odorata* (+; GVC).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** plant community, endangered within the commune territory, where it occurs in the Danube Floodplain (GLD), shows a low level of human activities influence, as it has only one non-native species, with a reduced dominance (*Amorpha fruticosa*).

Key species: *Amorpha fruticosa* (+; GLD), *Salix alba* (+; GLD).

Other species: *Butomus umbellatus* (+; GLD), *Lycopus europaeus* (+; GLD), *Mentha aquatica* (+; GLD), *Rorippa sylvestris* (+; GLD).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** association, estimated as vulnerable (F: I) within Greci commune, forms the reed beds which cover most of the Slatina Lake (LSL) shores, associated with the permanently flooded reed beds, monodominant, represented by the 53.1111 habitat. Within the species poor inventory of this association there were not recorded so far threatened or ruderal species.

Key species: *Phragmites australis* (5; LSL).

Other species: *Bolboschoenus maritimus* (+; LSL), *Lycopus europaeus* (+; LSL), *Mentha aquatica* (+; LSL).

Plant communities which are not framed within the Palaearctic habitat classification

***Gymnospermium altaicae-Celtetum glabratae* M. Petrescu 2004** plant community was studied within the area of Dealul Cetate Veche (DVC), where it was estimated as endangered (F: +), so far. In the plots there was identified, beside the dominant *Celtis glabrata*, another rare threatened species, *Lactuca viminea*, which is also considered vulnerable. The four ruderal species, underlined below, with a low dominance, indicate a reduced level of human impact.

Key species: *Celtis glabrata* (4; DCV).

Threatened species: *Celtis glabrata* (4; DCV), *Lactuca viminea* (+; DCV).

Other species:

- trees: *Carpinus orientalis* (+; DCV), *Cerasus mahaleb* (1; DCV), *Fraxinus ornus* (+; DCV);
- shrubs/ lianas: *Crataegus monogyna* (+; DCV);
- grasses/ undershrubs: *Alliaria petiolata* (1; DCV), *Alyssum murale* (+; DCV), *Alyssum saxatile* (+; DCV), *Ballota nigra* (+; DCV), *Bromus sterilis* (+; DCV), *Galium aparine* (+; DCV), *Sedum urvillei* subsp. *hillebrandtii* (+; DCV), *Stellaria media* (+; DCV).

FAUNA

Birds. On the administrative territory of the Greci commune the 63 species of birds which were identified so far are found within the Appendices 3 and 4B of the Ordinance 57/2007 (annexes are used to design the *Natura 2000* network). The strictly protected bird species identified in the area, which can be found in Annex 3 (31 species) are: *Ciconia nigra*, *Ciconia ciconia*, *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Burhinus oediconemus*, *Asio flammeus*, *Caprimulgus europaeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Melanocorypha calandra*, *Lulula arborea*, *Oenanthe isabellina*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Of the species listed above, the rarest for this area are: *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco peregrinus*, *Burhinus oediconemus*, *Asio flammeus*, *Oenanthe isabellina*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*.

There were a total of 32 protected species which can be found in Annex 4B of the Ordinance 57/2007, representing animal and plant species which require strict protection, as follows: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombicilla garrulus*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Regulus ignicapillus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Corvus corax*, *Passer hispaniolensis*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. Some of the rarest birds within this annex for this area are represented by: *Jynx torquilla*, *Motacilla cinerea*, *Bombicilla garrulus*, *Prunella modularis*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Regulus regulus*, *Regulus ignicapillus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis spinus*, *Carduelis flammea*.

Identified bird species not found in the two annexes of the Ordinance 57/2007 but listed in Annex II of Law 13/ 1993, which ratifies the Berne Convention, are: *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Apus melba*, *Dendrocopos major*, *Picoides tridactylus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Ficedula hypoleuca*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

Among the bird species which nest in the Greci there can be quoted: *Burhinus oediconemus*, *Asio flammeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*,

Motacilla alba, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Muscicappa striata*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Sylvia curruca*, *Sylvia borin*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Emberiza citrinella*.

Research concerning the natural heritage of Grindu commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT, Mariana CUZIC

ACCESS: Road E87 Tulcea-Galați, DN22E, DJ222M Garvăn-Grindu

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: Danube
Delta Biosphere Reserve

NATURA 2000 SITES: Delta Dunării (Site of Community Interest, Special
Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Grindu commune is characterized by the Late Pleistocene loess deposits on the south-eastern part and Holocene psamo-pelitic deposits underlying the following territorial units of soil types formation: Gleyed chernozems, Gleyed kastanozems, Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-gleyed-mollic alluvial soil, Calcareous-alluvial gley soils, Calcareous-marshy alluvial gley soils etc.

LANDSCAPE

Within the commune largely prevail the artificial habitats, mainly represented by agricultural fields and less by forestry plantations, the latest mainly along the Danube.

The natural/ semi-natural or ruderal taxa occur on very restricted areas, especially along the Danube, between the riverbanks and the dikes of the polder that surrounds Grindu commune. They consist of mesophile grasslands with isolated patches of riparian forests. Most of the ruderal vegetation types occur in the Grindu polder along dikes and drainage canals.

FLORA, VEGETATION, HABITATS

Within this territory there were identified so far two community interest habitats 1530* (15.A21275) and 92A0 (44.1621). The other plant communities are not framed within any protected habitats. All the studied locations are situated within Delta Dunării SPA. As a result of their overall reduced area most of the plant communities can be estimated as endangered, the rest being vulnerable. No

threatened taxa were observed, the intense human pressure on natural/ semi-natural/ ruderal coenotaxa is visible, as the highly disturbed plant communities prevail, followed by medium and low levels of human activities influence.

15. A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958**, can be considered as a vulnerable and low disturbed coenotaxon, mainly due to grazing, which favour the occurrence of three ruderal and one non-native species (*Ambrosia artemisiifolia*). It was observed in the Danube floodplain, between the riverbanks and the dam parallel to the Danube (GL).

Key species: *Cynodon dactylon* (4; GL).

Other species: *Achillea setacea* (+; GL), *Ambrosia artemisiifolia* (+; GL), *Althaea officinalis* (+; GL), *Cannabis sativa* subsp. *spontanea* (+; GL), *Linaria vulgaris* (+; GL), *Mentha pulegium* (1; GL), *Pulicaria dysenterica* (+; GL), *Xanthium italicum* (+; GL), *Xanthium spinosum* (+; GL).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** is an endangered plant community which was observed in the Danube floodplain (GL) as isolated willow stands. A medium level of disturbance, as a result of grazing, can be deduced from the presence of five ruderal taxa which represent half of the inventory.

Key species: *Populus alba* (+; GL), *Salix alba* (5; GL).

Other species: *Elymus repens* (+; GL), *Cannabis sativa* subsp. *spontanea* (+; GL), *Cynodon dactylon* (+; GL), *Mentha aquatica* (+; GL), *Setaria viridis* (+; GL), *Xanthium italicum* (+; GL).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926**, an endangered plant community within the studied area was identified along the drainage canals within the polder which surrounds the commune (GE). Within this low diversity coenotaxa half of the inventory is represented by ruderal and non-native species (*Ambrosia artemisiifolia*). This can be interpreted as a medium degree of disturbance.

Key species: *Phragmites australis* (5; GE).

Other species: *Ambrosia artemisiifolia* (+; GE), *Calystegia sepium* (+; GE), *Cannabis sativa* subsp. *spontanea* (+; GE), *Rubus caesius* (+; GE).

Plant communities which are not framed within the Palaearctic habitat classification

***Sclerochloo-Polygonetum avicularis* (Gams 1927) Soó 1940** a vulnerable plant community identified within the polder which includes the Grindu commune (GE), indicates a highly disturbed status, taking into account the dominance of the ruderal taxa (+-3), which prevail in the inventory, together with alien taxa like *Ambrosia artemisiifolia* and *Datura stramonium*.

Key species: *Polygonum aviculare* (3; GE).

Other species: *Ambrosia artemisiifolia* (+; GE), *Artemisia absinthium* (+; GE), *Chenopodium album* (+; GE), *Datura stramonium* (+; GE), *Phragmites*

australis (1; GE), *Rorippa sylvestris* (+; GE), *Taraxacum officinale* (+; GE), *Xanthium italicum* (+; GE).

***Agropyretum repens* Felföldy 1942**, an endangered coenotaxa within the commune, can be considered as having a high level of disturbance indicated by the dominance of the ruderal taxa (+-3) which overpass the other species number, together with one non-native taxa.

Key species: *Elymus repens* (3; GE).

Other species: *Achillea setacea* (+; GL), *Artemisia absinthium* (1; GE), *Cannabis sativa* subsp. *spontanea* (+; GL), *Chenopodium album* (+; GE), *Glycyrrhiza echinata* (+; GE), *Morus alba* (+; GE), *Phragmites australis* (1; GE).

***Potentillo argenteae-Artemisietum absinthii* Falinski 1965**, an endangered plant community, was identified within the polder around Grindu commune (GE). A high degree of ruderal species invasive tendencies can be observed, the two such species having a significant dominance variation (1-3). To these there can be added the presence of the non-native *Ambrosia artemisiifolia* (+; GE).

Key species: *Artemisia absinthium* (3; GE).

Other species: *Achillea setacea* (+; GL), *Elymus repens* (1; GE), *Ambrosia artemisiifolia* (+; GE), *Glycyrrhiza echinata* (+; GE), *Linaria genistifolia* (+; GE), *Phragmites australis* (1; GE).

FAUNA

Birds. As a result of the ornithological studies conducted on the territory of the Grindu commune there have been inventoried 100 species of birds which can be found in the Ordinance 57/2007. Of this, a total of 62 species are listed in the Annex 3, such as: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Milvus milvus*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Porzana porzana*, *Porzana parva*, *Porzana pusilla*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*.

Among the rarest species listed above, which give a high conservation value to this area, there can be quoted: *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Egretta alba*, *Ciconia nigra*, *Aythya nyroca*, *Tadorna tadorna*, *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus macrourus*, *Circus pygargus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion*

haliaetus, *Falco cherrug*, *Falco peregrinus*, *Porzana parva*, *Crex crex*, *Recurvirostra avosetta*, *Larus minutus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*.

A total of 38 species are protected and can be found in the Annex 4B of the Ordinance 57/2007, as follows: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombycilla garrulus*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

Some of the rarest bird species listed in this annex are: *Jynx torquilla*, *Motacilla cinerea*, *Phoenicurus ochruros*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Regulus regulus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

Bird species identified in the area which are not listed in the two annexes of the Ordinance 57/2007 but included in Annex II of Law 13/ 1993 are represented by: *Podiceps grisegena*, *Podiceps nigricollis*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Dendrocygna major*, *Riparia riparia*, *Hirundo rustica*, *Hirundo daurica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippoboscus pallida*, *Hippoboscus icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Ficedula hypoleuca*, *Parus palustris*, *Parus lugubris*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

The great diversity of habitats in the area, as well as the large areas of floodplains favours the nesting of a large number of species and populations. Of these certainly or probably nest here: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Botaurus stellaris*, *Egretta garzetta*, *Ardea purpurea*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus olor*, *Aythya nyroca*, *Haliaeetus albicilla*, *Circus aeruginosus*, *Falco vespertinus*, *Porzana porzana*, *Porzana parva*, *Porzana pusilla*, *Sterna hirundo*, *Chlidonias hybridus*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocygna syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus*

rubecula, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Podiceps grisegena*, *Podiceps nigricollis*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Oenanthe oenanthe*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza schoeniclus*.

Research concerning the natural heritage of Horia commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Road DN22A Tulcea-Nalbant, DN22F Nalbant-Horia

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:

NATURA 2000 SITES: Podișul Nord Dobrogean (Site of Community Interest), Măcin-Niculițel (Special Protection Area), Pădurea Babadag (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Horia commune is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite, to which are added tufogene greenschist which occur in the central-northern part. On the south-western part of the area there was identified the Carapelit formation (Lower Carboniferous age) which is composed of conglomerates, sandstones, tuffs, schists and siltites. Within the outcrops of these types of deposits, here also occur the Paleozoic outcrops of granite gneisses and rhyolite. The Upper Cretaceous limestones deposits that outcrop in the southern part of area are composed from the Cenomanian deposits of organogenic limestones, sandy limestone and marl limestones. These rock types outcrop through the Quaternary loess layers which cover the entire area.

Based on these rock types, the various types of territorial units of soil such as Distric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on limestone, Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Greic

phaeozems (Greyi-luvic Phaeozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources - SR, 1998) occur.

LANDSCAPE

Within Horia commune territory converge three main geographical units: the southern areas of the Niculițel Plateau and Măcin Mountains, respectively the northern part of the Babadag Plateau. In the northern part of this territory the natural habitats occur on the rocky hills of the Niculițel Plateau, the highest altitude reaching 287 m on Boclușea Hill, another important elevation being Coșlușea Hill (215 m). On both hills the steppe grasslands are dominant, followed by the wooded steppe, while supra-Mediterranean forests of white oak (*Quercus pubescens*) and eastern hornbeam (*Carpinus orientalis*) occur on a more restricted area.

In the central part of the territory flows Taița, the main river of the Dobrogea Plateau, that forms an artificial lake (Acumularea Horia). There, the riparian vegetation that usually occur along this river spreads on larger areas, the reed and reed mace beds being gradually replaced towards the shores by vegetation types typical for low saline soils.

To the south of Horia locality, the altitudes rise within the Babadag Plateau, up to a maximum of 245 m on Mufactului Hill, decreasing to the southeast, still reaching 129 m within Coasta Pășunii, a hill that belongs to the Consul Mount. In these described areas the main natural vegetation is represented by steppe grasslands, the wooded steppe having a lower importance. A restricted area of massive rocks occur around the small cave “Peștera de la Moară”, which can be framed into the habitat “65 Caves”, whose description and correspondence with the *Natura 2000* habitat “8310 Caves not open to the public”, needs to be clarified by speleology specialists.

FLORA, VEGETATION, HABITATS

Globally it can be estimated a high conservation value for the vegetation types within Horia commune area. Thus, most of them are framed into priority community interest habitats, such as: 1530* (15.A21275), 40C0* (31.8B721), 62 C0* (34.92, 34.9211), 91AA* (41.73723, 41.73724).

The overall conservation status is favorable from the species inventory point of view, as most of the plant communities are low disturbed, followed by coenotaxa representative for their natural status. Only two steppe grassland plant communities have high, respectively medium levels of disturbance, mainly due to grazing.

All the mentioned locations are included in community interest sites, mainly within the Podișul Nord Dobrogean, Pădurea Babadag and less Măcin Mountains.

15.A21275 Western Pontic *Cynodon* saline beds

Trifolium fragiferum-Cynodontetum Br.-Bl. et Bolos 1958 identified adjacent to Horia Lake (HL) is an endangered plant community within the studied area

where the presence of four ruderal species indicate the upper limit of the low disturbance category, mainly due to grazing.

Key species: *Cynodon dactylon* (4; HL), *Trifolium fragiferum* (1; HL).

Other species: *Cichorium intybus* (+; HL), *Lycopus europaeus* (+; HL), *Mentha longifolia* (+; HL), *Melilotus officinalis* (+; HL), *Pulicaria dysenterica* (+; HL), *Verben officinalis* (+; HL), *Xanthium italicum* (+; HL).

22.353 Ponto-Pannonic halo-nitrophile amphibious communities

***Bolboschoenetum maritimi* Egglar 1933** from Horia Lake (HL) represents an endangered coenotaxon which can be considered as representative for its natural status, as no alien/ ruderal species were observed.

Key species: *Bolboschoenus maritimus* (4; HL), *Butomus umbellatus* (+; HL).

Other species: *Alisma plantago-aquatica* (+; HL), *Echinochloa crus-galli* (+; HL), *Polygonum hydropiper* (+; HL), *Schoenoplectus lacustris* (+; HL), *Schoenoplectus tabernaemontani* (+; HL).

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931** plant community, an endangered vegetation type within Boclugea area (HB), has one rare threatened taxon, endangered at least within this coenotaxon. It can be estimated as typical for a natural status, as no alien/ ruderal species were recorded.

Key species: *Crataegus monogyna* (1; HB), *Prunus spinosa* (2; HB).

Threatened species: *Iris sintenisii* (+; HB).

Other species:

- trees/ shrubs/ lianas: *Quercus pubescens* (1; HB);
- grasses: *Dactylis glomerata* (+; HB), *Elymus hispidus* (1; HB), *Festuca valesiaca* (+; HB), *Potentilla argentea* (+; HB), *Stipa capillata* (+; HB), *Teucrium chamaedrys* (+; HB), *Vinca herbacea* (+; HB).

34.92 Ponto-sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** from Dealul Mufatcului (HM) is vulnerable within Horia commune. The dominance variation (+-1) of the three ruderal taxa shows a medium level of these species invasive trend.

Key species: *Festuca valesiaca* (3; HM).

Other species: *Achillea setacea* (+; HM), *Bombycilaena erecta* (+; HM), *Dichanthium ischaemum* (+; HM), *Fragaria viridis* (+; HM), *Muscari neglectum* (+; HM), *Orlaya grandiflora* (+; HM), *Plantago lanceolata* (+; HM), *Poa bulbosa* (1; HM), *Stipa capillata* (+; HM), *Taraxacum erythrospermum* (+; HM), *Teucrium chamaedrys* (+; HM), *Teucrium polium* (+; HM), *Thymus pannonicus* (+; HM), *Viola arvensis* (+; HM).

***Artemisio austriacae-Poëtum bulbosae* Pop 1970** is a vulnerable coenotaxon within Horia area, where it was observed at Dealul Mufatcului (HM). *Salvia aethiopis*, the only endangered taxon, fits into the same threat category also within this plant community. This secondary coenotaxon can be considered

as having a high disturbance level, taking into account that it is largely dominated by ruderal species with a significant dominance variation (+2).

Key species: *Artemisia austriaca* (2; HM), *Poa bulbosa* (2; HM).

Threatened species: *Salvia aethiopis* (+; HM).

Other species: *Achillea setacea* (+; HM), *Capsella bursa-pastoris* (+; HM), *Erodium cicutarium* (+; HM), *Geranium rotundifolium* (+; HM), *Lamium purpureum* (+; HM), *Marrubium vulgare* (+; HM), *Plantago lanceolata* (+; HM), *Taraxacum erythrospermum* (+; HM).

Botriocholetum (Andropogonetum) ischaemi (Kist. 1937) Pop 1977 studied within Coasta Pășunii Hill (HCP), adjacent to the Muntele Consul nature reserve, can be estimated as low disturbed, taking into account the four ruderal taxa with a low dominance.

Key species: *Dichanthium ischaemum* (3; HCP).

Other species: *Chondrilla juncea* (+; HCP), *Chrysopogon gryllus* (+; HCP), *Cleistogenes bulgarica* (+; HCP), *Convolvulus cantabrica* (+; HCP), *Eryngium campestre* (+; HCP), *Euphorbia glareosa* subsp. *glareosa* (+; HCP), *Festuca valesiaca* (+; HCP), *Marrubium peregrinum* (+; HCP), *Sideritis montana* (+; HCP), *Stipa capillata* (+; HCP), *Teucrium polium* (+; HCP), *Thymus pannonicus* (+; HCP), *Verbascum banaticum* (+; HCP).

Stipetum capillatae (Hueck 1931) Krausch 1961 from Coasta Pășunii (HCP), a vulnerable coenotaxon has a low level of the ruderal species occurrence, these being represented by five such taxa.

Key species: *Stipa capillata* (4; HPM, HCP).

Other species: *Artemisia austriaca* (+; HPM), *Chondrilla juncea* (+; HPM), *Crataegus monogyna* (+; HPM), *Eryngium campestre* (+; HPM), *Eragrostis minor* (+; HPM), *Festuca valesiaca* (1; HPM, HCP), *Odontites vernus* (+; HPM), *Potentilla argentea* (+; HPM), *Sanguisorba minor* (+; HPM), *Teucrium chamaedrys* (+; HPM), *Teucrium polium* (+; HCP), *Thymus pannonicus* (+; HPM), *Verbascum banaticum* (+; HPM).

Elytrigietum hispidi (Dihoru 1970) Popescu, Sanda 1988 is an endangered plant community within Boclugea Hill (HB) and throughout the studied area. Four ruderal species indicate a low level of these taxa invasive tendencies.

Key species: *Elymus hispidus* (4; HB).

Other species: *Artemisia austriaca* (+; HB), *Chondrilla juncea* (+; HB), *Cichorium intybus* (+; HB), *Eryngium campestre* (+; HB), *Festuca valesiaca* (1; HB), *Fragaria viridis* (+; HB), *Poa angustifolia* (+; HB), *Potentilla argentea* (+; HB), *Prunus spinosa* (+; HB), *Stipa capillata* (+; HB), *Teucrium polium* (+; HB).

34.9211 Western pontic thyme steppes

Agropyro-Thymetum zygoidi Dihoru (1969) 1970 inventoried at Coasta Pășunii (HCP), has an obvious conservation importance also due to the three rare threatened species, endangered within this plant community, except the dominant *Thymus zygoides*. The only ruderal species indicates a low disturbance level.

Key species: *Thymus zygoides* (2; HCP).

Threatened species: *Potentilla bornmuelleri* (+; HCP), *Sempervivum zeleborii* (+; HCP), *Thymus zygioides* (2; HCP).

Other species: *Acer tataricum* (+; HCP), *Alyssum murale* (+; HCP), *Asperula tenella* (+; HCP), *Cerasus mahaleb* (+; HCP), *Chondrilla juncea* (+; HCP), *Cleistogenes bulgarica* (+; HCP), *Crataegus monogyna* (+; HCP), *Dichanthium ischaemum* (+; HCP), *Euphorbia agraria* (+; HCP), *Melica ciliata* (+; HCP), *Sanguisorba minor* (+; HCP), *Sedum urvillei* subsp. *hillebrandtii* (+; HCP), *Teucrium chamaedrys* (+; HCP), *Verbascum banaticum* (+; HCP).

***Festucetum callierii* Șerbănescu 1965 apud Dihoru (1969) 1970** from Pietroiul Mare Hill, adjacent to Florești Village, is an endangered plant community within Horia commune (HPM). Its conservation value is enhanced by two rare threatened species, of which *Dianthus nardiformis* is also of European importance, endangered within this coenotaxon, unlike the dominant *Festuca callieri*. Four ruderal species indicate a reduced level of disturbance.

Key species: *Festuca callieri* (3; HPM).

Threatened species: *Festuca callieri* (3; HPM), *Dianthus nardiformis* (+; HPM).

Other species: *Artemisia austriaca* (+; HPM), *Asperula tenella* (+; HPM), *Chondrilla juncea* (+; HPM), *Dichanthium ischaemum* (1; HPM), *Eryngium campestre* (+; HPM), *Leontodon crispus* (+; HPM), *Poa bulbosa* (+; HPM), *Potentilla argentea* (+; HPM), *Sanguisorba minor* (+; HPM), *Sedum urvillei* subsp. *hillebrandtii* (+; HPM), *Stipa capillata* (+; HPM), *Teucrium polium* (+; HPM), *Thymus pannonicus* (+; HPM).

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970**, studied within Coșlugea Hill (HC), has reduced species diversity and a low level of disturbance, mainly due to grazing, within the grasses layer, where three ruderal species were identified.

Key species: *Carpinus orientalis* (3; HC), *Quercus pubescens* (2; HC).

Other species: *Anthriscus cerefolium* (+; HC), *Brachypodium sylvaticum* (+; HC), *Chenopodium album* (+; HC), *Dactylis polygama* (+; HC), *Geranium pusillum* (+; HC), *Geum urbanum* (+; HC), *Stellaria media* (+; HC).

41. 73724 Moesian *Galium dasypodium*-white oak woods

***Galio dasypodi-Quercetum pubescentis* Doniță 1970** from the wooded steppe of Boclugea Hill (HB), an endangered plant community, can be considered as representative for its natural status, as the tree layer is not derived and no alien/ ruderal taxa were recorded.

Key species: *Quercus pubescens* (3; HB).

Other species:

- trees: *Pyrus pyraister* (+; HB), *Quercus dalechampii* (1; HB);

- shrubs/ lianas: *Crataegus monogyna* (+; HB), *Prunus spinosa* (+; HB), *Rosa canina* (+; HB);

- grasses: *Achillea coarctata* (+; HB), *Agrimonia eupatoria* (+; HB), *Dichanthium ischaemum* (+; HB), *Elymus hispidus* (+; HB), *Festuca valesiaca* (+; HB), *Fragaria viridis* (+; HB), *Teucrium chamaedrys* (+; HB), *Vinca herbacea* (+; HB).

53. 1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** within this habitat can be assessed as endangered in studied area of Horia Lake (HL) and Taița Valley (HT), where it can be framed into a natural status category, as no ruderal/ alien taxa were recorded.

Key species: *Phragmites australis* (5; HT, HL), *Typha latifolia* (+; HT).

Other species: *Calystegia sepium* (+; HT).

53. 1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** within this plant community, endangered within Horia Lake (HL), is in its natural status, as no alien/ ruderal taxa were recorded.

Key species: *Phragmites australis* (4; HL).

Other species: *Myriophyllum spicatum* (+; HL), *Typha angustifolia* (1; HL).

53.1122 Dry halophile *Phragmites* beds

***Astero tripolii-Phragmitetum humilis* Krisch (1972) 1974** plant community, endangered within the Horia Lake (HL), has a low level of ruderal plant invasion, as only two such species were recorded.

Key species: *Aster tripolium* (±; HL), *Phragmites australis* ssp. *australis* var. *humilis* (5; HL).

Other species: *Agrostis stolonifera* (+; HL), *Alisma plantago-aquatica* (+; HL), *Bolboschoenus maritimus* (+; HL), *Lycopus europaeus* (+; HL), *Mentha aquatica* (+; HB), *Plantago major* (+; HL), *Stachys palustris* (+; HL), *Typha angustifolia* (+; HL), *Xanthium italicum* (+; HL).

53.131 Great reed mace beds

***Typhetum angustifoliae* Pignatti 1953**, an endangered plant community from Taița Valley (HT), has a low level of disturbance, indicated by the two ruderal species.

Key species: *Typha latifolia* (4; HT).

Other species: *Calystegia sepium* (+; HT), *Lythrum salicaria* (+; HT), *Lycopus europaeus* (1; HT), *Mentha aquatica* (+; HT), *Myosoton aquaticum* (+; HT), *Polygonum lapathifolium* (+; HT), *Xanthium italicum* (+; HT).

53.132 Lesser reed mace beds

***Typhetum angustifoliae* Pignatti 1953**, from Horia Lake (HL) can be estimated as endangered and representative for its natural status, due to the absence of ruderal/ alien species.

Key species: *Typha angustifolia* (4; HL).

Other species: *Myriophyllum spicatum* (+; HL), *Phragmites australis* (1; HL), *Typha angustifolia* (1; HL).

FAUNA

Birds. Within the study avifauna of the administrative territory of the Horia commune there were inventoried 57 bird species included in the Ordinance 57/2007, of which 28 species are strictly protected, being classified in the Annex 3 of the ordinance used to establish the *Natura 2000* network: *Ciconia nigra*, *Ciconia ciconia*, *Tadorna tadorna*, *Pernis apivorus*, *Circaetus gallicus*, *Circus cyaneus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Sterna hirundo*, *Asio flammeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Caprimulgus europaeus*, *Melanocorypha calandra*, *Lulula arborea*, *Oenanthe isabellina*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Species of high conservation value from this area include: *Pernis apivorus*, *Circaetus gallicus*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Oenanthe isabellina*, *Oenanthe pleschanka*, *Sylvia nisoria*, *Emberiza hortulana*, *Anthus campestris*.

The other 29 species are protected, being classified in the Annex 4B of the ordinance which includes animal and plant species requiring strict protection: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

The rarest birds in this area from this appendix include: *Jynx torquilla*, *Motacilla cinerea*, *Prunella modularis*, *Sturnus roseus*, *Regulus regulus*, *Carduelis flammea*.

Bird species identified in the area that are not found in the two annexes of the Ordinance 57/2007, but can be found in Annex II of Law 13/ 1993, are: *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

Within Horia commune the rocky habitats, the steppe and also the agricultural and rural areas, lead to an abundance of species and populations nesting in the area, among them being: *Coracias garrulus*, *Dendrocopos syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*,

Melanocorypha calandra, Lulula arborea, Sylvia nisoria, Ficedula parva, Lanius minor, Lanius collurio. Falco tinnunculus, Athene noctua, Upupa epops, Merops apiaster, Motacilla alba, Erithacus rubecula, Phoenicurus phoenicurus, Phylloscopus sibilatrix, Phylloscopus collybita, Sitta europaea, Oriolus oriolus, Miliaria calandra, Carduelis spinus, Carduelis chloris, Carduelis cannabina, Carduelis carduelis, Buteo buteo, Caprimulgus europaeus, Riparia riparia, Hirundo rustica, Delichon urbica, Saxicola torquata, Oenanthe oenanthe, Luscinia megarhynchos, Luscinia luscinia, Acrocephalus arundinaceus, Hippolais pallida, Sylvia curruca, Sylvia communis, Sylvia borin, Sylvia atricapilla, Parus caeruleus, Parus major, Certhia familiaris, Emberiza citrinella.

Research concerning the natural heritage of Isaccea town

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PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:
Danube Delta Biosphere Reserve

NATURA 2000 SITES: Podișul Nord Dobrogean (Site of Community Interest),
Măcin – Niculițel (Special Protection Area), Delta
Dunării (Site of Community Interest, Special Protection
Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Isaccea town is characterized by the Devonian deposits of the slate schists, quartzite and grey limestones which occur in the northern part, on reduced areas. There can be found Paleozoic outcrops of granite gneisses on the western part. On the central-southern part of the area the Upper Triassic basalt veins and Carnian age diabase dikes occur among limestones with intercalations of clay schists. These types of stones outcrop through the Quaternary loess layers that cover the entire area. Alongside of the Danube course (on the northern part of the area) the Holocene psamo-pelitic deposits appear.

Based on these stones types, the various types of territorial units of soil such as Distric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998), on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Greic

phaeozems (Greyi-luvic Phaeozems, after World Reference Base for Soil Resources – SR, 1998), Typical luvisols (Haplic Luvisols, after World Reference Base for Soil Resources – SR, 1998) occur. Along the Danube River, on the alluvial deposits and alluvia, there were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

The town's territory is dominated by natural habitats, concentrated in its northern part, being mainly represented by the extensive marshes of the Danube floodplain. Their largest part is situated eastwards of Isaccea, where they have a more natural status, being in free flooding regime which justifies their inclusion in the Danube Delta Biosphere Reserve. Westwards of Isaccea the wetlands belong to different fish farms, thus having a water level control regime and consequently a less natural status.

Southwards of Isaccea the relief altitude increases gradually, the hills being covered in steppe grasslands or supra-Mediterranean white oak forests in the remnant narrow stripes of wooded steppe that border the compact Balkan forests of sessile oak, lime, hornbeam or eastern hornbeam. The latest types of forest occur on the highest hills with a maximum altitude of 222 m, situated in the south-western part of the territory, within the Niculițel Plateau.

FLORA, VEGETATION, HABITATS

Except the reed bed habitats (53.1111), all the other ones described below are framed into community interest habitats such as: 91Y0 (41.2C22), 91M0 (41.76831, 41.76833, 41.76834) including priority ones like: 62C0* (34.92), 91AA* (41.73724).

Within the studied plant communities most show no sign of disturbance, being closely followed by coenotaxa with a medium and low level of human activities influence. Within these coenotaxa the endangered ones are dominant, closely followed by vulnerable and less rare or sporadic plant communities.

The major part of these vegetation types has no threatened species within the analysed plots. Still, three of them have one threatened species each, mostly rare at the national level, respectively endangered in the respective phytocoenoses.

All the locations quoted for these vegetation types are situated within the Danube Delta, respectively Podișul Nord Dobrogean sites of community interest.

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community can be estimated as a vulnerable coenotaxon within the Isaccea territory, being studied within the clearings of the Dealul Carapelit area (IDC). There the vulnerable and rare threatened species *Crocus chrysanthus* was observed, also as vulnerable taxa within these phytocoenoses. The absence of ruderal/ alien species shows a natural status of these grasslands.

Key species: *Dichanthium ischaemum* (4; IDC).

Threatened species: *Crocus chrysanthus* (1; IDC).

Other species: *Achillea setacea* (+; IDC), *Carthamus lanatus* (+; IDC), *Crataegus monogyna* (+; IDC), *Linaria genistifolia* (+; IDC), *Quercus pubescens* (\pm -1; IDC), *Teucrium chamaedrys* (+; IDC), *Verbascum banaticum* (+; IDC), *Xeranthemum annuum* (+; IDC), *Crataegus monogyna* (+; IDC).

41.2C22 *Tilio tomentosae-Carpinetum betuli* Doniță 1968

***Tilio tomentosae-Carpinetum betuli* Doniță 1968**, a rare plant community within the Pădurea Capaclia (IPCA), can be considered as a medium disturbed coenotaxon, as the tree layer is partially derived, while the herbaceous layer has two ruderal species, but with a significant variation of their dominance (+-1).

Key species: *Quercus dalechampii* (1; IPCA), *Tilia tomentosa* (3; IPCA).

Other species:

- trees: *Acer campestre* (+; IPCA), *Carpinus betulus* (1; IPCA);
- shrubs/ lianas: *Cornus mas* (+; IPCA), *Crataegus monogyna* (+; IPCA), *Ligustrum vulgare* (+; IPCA);
- grasses/ undershrubs: *Alliaria petiolata* (+; IPCA), *Brachypodium sylvaticum* (+; IPCA), *Lamium purpureum* (+; IPCA), *Ranunculus ficaria* (+; IPCA), *Veronica hederifolia* (+; IPCA), *Viola odorata* (+; IPCA).

41.73724 Moesian *Galium dasypodium*-white oak woods

***Galio dasypodi-Quercetum pubescentis* Doniță 1970** is an endangered coenotaxon, observed within the Dealul Capaclia area (IDC), where one rare threatened taxon was recorded in the plots. It is typical for a low disturbance level, as only one ruderal taxon was observed.

Key species: *Quercus pubescens* (4; IDC).

Threatened species: *Asparagus verticillatus* (+; IDC).

Other species:

- trees: *Tilia tomentosa* (1; IDC);
- grasses/ undershrubs: *Alliaria petiolata* (+; IDC), *Anthriscus cerefolium* (+; IDC), *Festuca valesiaca* (+; IDC), *Poa nemoralis* (+; IDC), *Teucrium chamaedrys* (+; IDC), *Veronica hederifolia* (+; IDC).

41.76831 Dobrogean paeonia sessile oak forests

***Fraxino orni-Quercetum dalechampii* Doniță 1970**, a vulnerable plant community that was studied within the Dealul Capaclia area (IDC), has a low disturbed structure, as only one ruderal taxon was identified.

Key species: *Fraxinus ornus* (1; IDC), *Quercus dalechampii* (2; IDC).

Other species:

- trees: *Carpinus orientalis* (2; IDC);
- grasses/ undershrubs: *Alliaria petiolata* (+; IDC), *Dactylis polygama* (+; IDC), *Poa nemoralis* (+; IDC), *Veronica hederifolia* (+; IDC), *Viola suavis* (+; IDC).

41.76833 Dobrogean *Quercus pedunculiflora*-lime-oriental hornbeam forests

***Querco pedunculiflorae-Tilietum tomentose* Doniță 1970**, an

endangered plant community within the studied area, registered from Pădurea Capaclia area (IPCA), has a medium level of human activities impact, as the canopy is partially derived. Still, in the grasses layer only one ruderal species was observed.

Key species: *Quercus pedunculiflora* (1; IPCA), *Tilia tomentosa* (3; IPCA).

Other species:

- trees: *Acer campestre* (+; IPCA), *Carpinus betulus* (1; IPCA);
- grasses/ undershrubs: *Anthriscus cerefolium* (+; IPCA), *Arum orientale* (r; IPCA), *Geum urbanum* (+; IPCA), *Ranunculus ficaria* (+; IPCA), *Veronica hederifolia* (+; IPCA), *Viola odorata* (+; IPCA).

41.76834 Western-Pontic sessile oak-lime-oriental hornbeam-*Galanthus* forests

***Galantho plicatae-Tilietum tomentosae* Doniță 1970** is an endangered plant community which was analysed within the Dealul Capaclia area (IDC). This pytoceonosis is typical for an undisturbed habitat, as no ruderal/ alien species was noticed and the oak proportion in the canopy is optimal. The only threatened species, *Galanthus plicatus* is rare, of European importance, being endangered within the analysed phytocoenoses.

Key species: *Galanthus plicatus* (+; IDC), *Quercus dalechampii* (3, IDC), *Tilia tomentosa* (2; IDC)

Threatened species: *Galanthus plicatus* (+; IDC).

Other species:

- trees: *Carpinus orientalis* (1; IDC), *Cornus mas* (+; IDC);
- shrubs/ lianas: *Ligustrum vulgare* (+; IDC);
- grasses/ undershrubs: *Brachypodium sylvaticum* (+; IDC), *Viola suavis* (+; IDC).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924**, can be estimated as a vulnerable coenotaxon within the Danube floodplain, where it was studied downstream of Isaccea (ILD). The three non-native taxa with a significant dominance variation (+ -1) indicate a medium disturbance.

Key species: *Amorpha fruticosa* (+; ILD), *Salix alba* (+; ILD).

Other species: *Fraxinus americana* (+; ILD), *Morus alba* (+; ILD), *Rubus caesius* (+; ILD), *Vitis sylvestris* (+; ILD), *Solanum dulcamara* (+; ILD).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community is the dominant vegetation type within the marshes of the Danube floodplain, being estimated as sporadic within the Isaccea town's territory. The species inventory is representative for a natural status.

Key species: *Phragmites australis* (5; ILD), *Typha angustifolia* (+; ILD).

Other species: *Calystegia sepium* (+; ILD), *Lythrum salicaria* (+; ILD).

FAUNA

Birds. The studied avifauna of the administrative territory of the Isaccea town consists of 70 bird species included in the Ordinance 57/2007, of which 38 species are strictly protected, being classified in its Annex 3, such as: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Pernis apivorus*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Burhinus oedichnemus*, *Sterna hirundo*, *Chlidonias hybridus*, *Asio flammeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Caprimulgus europaeus*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Several species that confer a high conservation value to this area include: *Pernis apivorus*, *Circaetus gallicus*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Burhinus oedichnemus*, *Sylvia nisoria*, *Emberiza hortulana*, *Anthus campestris*.

The other 32 species are protected, being classified in the Annex 4B of the ordinance, which represent animal and plant species which require strict protection: *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

The list of the rarest birds in this area included in this appendix is represented by: *Actitis hypoleucos*, *Jynx torquilla*, *Motacilla cinerea*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Phylloscopus trochilus*, *Regulus regulus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis flammea*.

Bird species identified in the area which are not found in the two annexes of the Ordinance 57/2007 but are listed in Annex II of Law 13/ 1993, are represented by: *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Apus melba*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Among the species with breeding populations in the area there can be quoted: *Ciconia ciconia*, *Aythya nyroca*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*,

Melanocorypha calandra, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Buteo buteo*, *Caprimulgus europaeus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

Research concerning the natural heritage of Jijila commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCES: Road DN 22 Tulcea-Măcin

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: Munții Măcinului National Park

NATURA 2000 SITES: Munții Măcinului (Site of Community Interest), Măcin-Niculitel (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Jijila commune is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite that occur on reduced surfaces on the north-western part, as well as on the southern part of the studied area. The Devonian deposits are confined in the south side and are composed of the slate schists, quartzite and grey limestones and are crossed by veins of Paleozoic igneous rocks. Within the outcrops of these types of deposits, here also could be found the Paleozoic outcrops of granite gneisses. These types of stones outcrop through the Quaternary loess layers which cover eastern part of the area. On the central-western part were found Holocene psamopelitic deposits.

Based on this geological substrata, the various types of territorial units of soil such as Distric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998), on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998) occurs. Along the Danube River on the alluvial

deposits and alluvia were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-alluvial gley soils and Gleyed chernozems

LANDSCAPE

Within the Jijila commune area occur mainly artificial habitats, represented by agriculture fields which have replaced mostly the former Danube floodplain wetlands, in the northern and western part of this territory. To a lower extent also the steppe grasslands of the hilly sector of this area were replaced by arable fields. Still, in the hilly central part, certain steppe grasslands were conserved, some of them were being protected at present within the Măcin Mountains National Park. The latest represent also the highest altitudes, like the Pricopan Peak (370 m) of the whole Jijila territory, here being concentrated the most spectacular landscapes, where the steppe grasslands underline the barren massive granite megaliths. From here the relief altitudes decrease gradually towards the west and north, where the flat floodplain is now completely drained for agriculture, except the former Jijila Lake which was recently colonized by white willow.

FLORA, VEGETATION, HABITATS

Despite their reduced area, the analysed natural plant communities have a conservation value conferred by their framing into the priority community interest habitat. Within the studied coenotaxa there is an equal percentage of low, respectively medium disturbed by grazing vegetation type. The endangered plant communities prevail, except one vulnerable coenotaxon.

Most of these vegetation types have no threatened species. The only exception is *Sedo hillebrandtii*-*Polytrichetum piliferi* which has an outstanding conservation importance, mainly due to the four rare threatened species, endangered within these phytocoenoses, one of these being even critically endangered.

34.92 Ponto-Sarmatic steppes

***Medicagini-Festucetum valesiacae* Wagner 1941** plant community, an endangered coenotaxa within the studied area, was analysed within Culmea Pricopanului area (JCP) and Dealul Cadân (JDC). There can be assessed a medium degree of disturbance, indicated by two ruderal species with dominance indices framed between + and 1.

Key species: *Dichanthium ischaemum* (4; JDC).

Other species: *Achillea coarctata* (+; JDC), *Agropyron cristatum* (+; JCP), *Convolvulus cantabricus* (+; JCP), *Eryngium campestre* (+; JCP), *Marrubium peregrinum* (+; JCP), *Phlomis tuberosa* (+; JCP), *Stipa capillata* (1; JCP), *Teucrium chamaedrys* (+; JCP).

***Botriochoetum ischaemi* (Kist. 1937) Pop 1977**, an endangered plant community, was studied within Dealul Cadân area (JDC), being a coenotaxon with a reduced diversity, estimated as having a medium degree of disturbance, indicated by the dominance variation (+1) of two ruderal taxa.

Key species: *Dichanthium ischaemum* (4; JDC).

Other species: *Achillea coarctata* (+; JDC), *Convolvulus cantabricus* (+;

JDC), *Cichorium intybus* (+; JDC), *Poa bulbosa* (1; JDC), *Sanguisorba minor* (+; JDC), *Taraxacum erythrospermum* (+; JDC).

***Artemisia austriacae-Poëtum bulbosae* Pop 1970** is a vulnerable coenotaxon, being studied within Dealul Cadân (JDC) and Valea Jijilei (JVJ). Taking into account which half of the recorded species are ruderal and also the high dominance of the key species, both ruderal, the high level of disturbance due to grazing becomes obvious.

Key species: *Artemisia austriaca* (2; JVJ), *Poa bulbosa* (2-3; JDC, JVJ).

Other species: *Achillea setacea* (+; JVJ), *Cynodon dactylon* (+; JVJ), *Dichanthium ischaemum* (+; JDC), *Erodium cicutarium* (1; JDC), *Eragrostis minor* (+; JDC), *Festuca valesiaca* (+; JDC), *Plantago lanceolata* (+; JVJ), *Potentilla argentea* (+; JVJ).

***Stipetum capillatae* (Hueck 1931) Krausch 1961** can be considered an endangered plant community, being observed within the Culmea Pricopanului area (JCP) where it has only a low level of disturbance, shown by one low dominant ruderal species.

Key species: *Stipa capillata* (4; JCP).

Other species: *Alyssum murale* (+; JCP), *Convolvulus cantabricus* (+; JCP), *Festuca valesiaca* (+; JCP), *Potentilla argentea* (+; JCP), *Sanguisorba minor* (+; JCP), *Taraxacum erythrospermum* (+; JCP), *Thlaspi perfoliatum* (+; JCP).

34.921 Western Pontic thyme steppes

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974**, an endangered plant community, was studied within Dealul Cadân (JDC) and Culmea Pricopanului (JCP). Its outstanding conservation importance is also confirmed by the four rare threatened species identified in the plots, of which *Campanula romanica* is endemic and vulnerable, while *Moehringia grisebachii* is sub-endemic, both having a European importance. All these four species are endangered within these phytocoenoses, except the critically endangered *Moehringia grisebachii*. A low disturbance is shown by the presence of one ruderal species.

Key species: *Polytrichetum piliferi* (1; JDC, JCP).

Threatened species: *Campanula romanica* (+; JCP), *Festuca callieri* (+; JCP), *Moehringia grisebachii* (r; JDC, JCP), *Thymus zygioides* (+; JCP).

Other species: *Achillea coarctata* (+; JDC), *Alyssum saxatile* (+; JCP), *Chrysopogon gryllus* (+; JCP), *Dichanthium ischaemum* (+; JDC), *Erodium cicutarium* (+; JDC), *Eragrostis minor* (+; JDC), *Poa bulbosa* (+; JDC), *Rumex acetosella* (+; JCP), *Sanguisorba minor* (+; JDC), *Sedum urvillei* subsp. *hillebrandtii* (+; JDC).

FAUNA

Birds. On the territory of the Jijila commune there were identified 66 species of birds which are found in the Appendices 3 and 4B of the Ordinance 57/2007. The strictly protected bird species identified, which can be found in Appendix 3 (34 species) are represented by: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*,

Nycticorax nycticorax, *Ardeola ralloides*, *Egretta garzetta*, *Egretta alba*, *Ciconia nigra*, *Ciconia ciconia*, *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Asio flammeus*, *Caprimulgus europaeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Melanocorypha calandra*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Of the species listed above, the rarest, which give a high conservation value to the area include: *Circaetus gallicus*, *Circus macrourus*, *Circus pygargus*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco peregrinus*, *Asio flammeus*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*.

There were recorded 31 protected species which require strict protection, found in the Annex 4B of the Ordinance 57/2007, as follows: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Regulus ignicapillus*, *Muscicappa striata*, *Sitta europaea*, *Oriolus oriolus*, *Corvus corax*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. Some of the rarest birds in that annex for this area are: *Motacilla cinerea*, *Prunella modularis*, *Sturnus roseus*, *Phylloscopus trochilus*, *Muscicappa striata*, *Serinus serinus*, *Carduelis spinus*, *Carduelis flammea*.

Identified bird species not found in the two annexes of the Ordinance 57/2007 but listed in Annex II of Law 13/1993, are the following: *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Dendrocopos major*, *Picoides tridactylus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

The bird species which nest on the territory of Jijila commune include: *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Dryocopus martius*, *Melanocorypha calandra*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Muscicappa striata*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Buteo buteo*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia borin*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Emberiza citrinella*.

Research concerning the natural heritage of Luncavița commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT, Mariana CUZIC

ACCESS: Road E87 Tulcea-Galați

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: Măcin Mountains National Park

NATURA 2000 SITES: Munții Măcinului (Site of Community Interest), Măcin-Niculițel (Special Protection Area), Delta Dunării (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Luncavița commune is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite, to which are added tufogene greenschist which occur in the western part together with the Carapelit formation (Lower Carboniferous age), composed of conglomerates, sandstones, tuffs, schists and siltites. Here also can be found the Paleozoic outcrops of granite gneisses (between pre-Silurian metamorphic deposits and Lower Carboniferous age deposits). On the eastern part of the area the Upper Triassic basalt veins occur among limestones, with intercalations of clay schists. These types of stones outcrop through the Quaternary loess layers which cover entire area.

Based on these rock layers, the various types of territorial units of soil such as Dystric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Greic phaeozems (Greyi-luvic Phaeozems, after World Reference Base for Soil Resources – SR, 1998) occurs. Along the Danube River on the alluvial deposits and alluvia were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

Within this commune's territory the natural habitats occur on large areas, especially in the southern sector, where the Balkan forests cover a compact area, which overlaps two major units, Măcin Mountains westwards and Niculițel Plateau eastwards. Several rocky summits, of maximum 433 m altitude, emerge from these Balkan forests, having a mosaic vegetation of steppe grasslands surrounded by wooded steppe and/ or sub-Mediterranean forests, as transitional zones towards the Balkan forests. Within the last ones the outstanding relictary forests from Valea Fagilor occur, in the most humid and cold valley of Dobrogea, adjacent to Sorniac (Luncavița) rivulet. Along this permanent stream, several artificial lakes and ponds increase the value of this forested mountains landscape, unusual for the dry scenery of Dobrogea. The altitudes decrease gradually

northwards, where the forests are replaced by steppe grasslands on the hills and cultivated fields which occur on large areas, including on the former wetlands of the Danube floodplain, now mostly drained. Still, in the north-eastern part of this territory the previous wetland landscape, with lakes surrounded by reed beds is conserved nowadays in the area of Revărsarea and Rachelu localities.

FLORA, VEGETATION, HABITATS

The native vegetation has a high conservative value, most of it being framed into the category of community interest habitats, like 62C0* (34.9211), 91Y0 (41.2C22), 91M0 (41.76831, 41.76834). Among these, the priority habitats have an even higher importance, being represented by 1530* (15.A21275), 91X0* (41.1F), 91AA* (41.73724), 91I0* (41.7A221).

Regarding the conservation status of these natural habitats, most of them have a low level of disturbance, followed by a medium level, respectively by coenotaxa representative for a natural status. Also the major part of them is vulnerable, followed by endangered plant communities, only one coenotaxon being sporadic. The high conservation value of these habitats is also indicated by the fact that most of them have at least two threatened species, the maximum recorded being of five such taxa.

All the locations mentioned below are framed within protected areas, like Măcin Mountains National Park, included in the Munții Măcinului Site of Community Interest and Măcin-Niculițel Special Protection Area, or within Podișul Nord Dobrogean Site of Community Interest, except the section of Valea Sorniac where the habitat 15.A21275 was identified and the areas mentioned for the 53.1111 subtype.

15. A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958**, an endangered plant community within the Sorniac Valley (VS), is characterized by a low level of ruderal species' presence, with only two taxa of this kind.

Key species: *Cynodon dactylon* (2; VS), *Trifolium fragiferum* (2; VS).

Other species: *Cichorium intybus* (+; VS), *Mentha aquatica* (+; VS), *Myosoton aquaticum* (+; VS), *Ranunculus sceleratus* (+; VS), *Rumex palustris* (+; VS), *Schoenoplectus lacustris* (+; VS), *Stellaria media* (+; VS).

34.9211 Western Pontic thyme steppes

***Festucetum callierii* Șerbănescu 1965 apud Dihoru (1969) 1970** represents an endangered coenotaxon, observed within the rocky clearings of the Culmea Pietrosu area – Măcin Mountains National Park (LCP). There, besides the dominant *Festuca callieri*, other rare threatened taxon is *Scorzonera mollis*, endangered within this phytocoenosis. A medium disturbance was noticed, taking into account the dominance variation of the three ruderal taxa (+-1).

Key species: *Festuca callieri* (2; LCP).

Threatened species: *Festuca callieri* (2; LCP), *Scorzonera mollis* (+; LCP).

Other species: *Achillea coarctata* (+; LCP), *Bombacilaena erecta* (+; LCP), *Carpinus orientalis* (+; LCP), *Convolvulus cantabricus* (+; LCP), *Cruciata*

pedemontana (+; LCP), *Lamium amplexicaule* (+; LCP), *Lamium purpureum* (+; LCP), *Muscari neglectum* (+; LCP), *Myosotis stricta* (+; LCP), *Poa bulbosa* (1; LCP), *Ranunculus illyricus* (+; LCP), *Scleranthus perennis* (+; LCP), *Trifolium arvense* (+; LCP), *Verbascum banaticum* (+; LCP), *Viola kitaibeliana* (+; LCP).

41.1F Dobrogea beech forest

***Carpino-Fagetum* Paučă 1941 subas. *tilietosum tomentosae* Mititelu et alli 1977**, an endangered plant community (F: +), was recorded from the relicary beech stands from Valea Fagilor nature reserve – Luncavița commune (VF-PNMM), included in the Măcin Mountains National Park. It can be considered as representative for a natural status, as no ruderal/ alien species were recorded and the tree layer is not derived. This phytocoenosis occurs here on deep soils of a northern slope, close to a rivulet, in the most cold and humid conditions for the climax vegetation within the continental Dobrogea.

Key species: *Carpinus betulus* (1; VF-PNMM), *Fagus taurica* (1; VF-PNMM), *Fagus sylvatica* (2; VF-PNMM), *Tilia tomentosa* (1; VF-PNMM).

Other species:

- trees: *Acer platanoides* (+; VF-PNMM), *Tilia cordata* (+; VF-PNMM), *Ulmus glabra* (+; VF-PNMM);

- shrubs/ lianas: *Corylus avellana* (+; VF-PNMM), *Evonymus europaeus* (+; VF-PNMM), *Hedera helix* (+; VF-PNMM), *Sambucus nigra* (+; VF-PNMM);

- grasses/ undershrubs: *Alium ursinum* (1; VF-PNMM), *Anemone ranunculoides* (+; VF-PNMM), *Asarum europaeum* (+; VF-PNMM), *Carex pilosa* (+; VF-PNMM), *Corydalis solida* (+; VF-PNMM), *Dentaria bulbifera* (+; VF-PNMM), *Galium odoratum* (+; VF-PNMM), *Geum urbanum* (+; VF-PNMM), *Isopyrum thalictroides* (+; VF-PNMM), *Polygonatum odoratum* (+; VF-PNMM), *Ranunculus ficaria* (+; VF-PNMM), *Scilla bifolia* (+; VF-PNMM).

41.2C22 Moldo-Muntenian sessile oak-hornbeam forests

***Tilio tomentosae-Carpinetum betuli* Doniță 1968**, the most widespread habitat within the natural areas of Luncavița commune (F: III), was analysed from Valea Fagilor (VFAR), outside the nature reserve, but still within the Măcin Mountains National Park. This phytocoenosis can be considered the most typical for the coldest and humid climate recorded within this plant community throughout continental Dobrogea, as it occurs close to the beech relicary forest, in more or less similar conditions, also having *Fagus sylvatica* in a low proportion, as an indicator for this type of environment. Two rare threatened species enhance the conservation value of this phytocoenosis, both being critically endangered within this coenotaxon. Taking into account the low oak proportion in the tree layer this phytocoenosis can be estimated as having a medium level of disturbance due to human activities. Still, in the other layers no disturbance can be noticed, from the ruderal/ alien species point of view.

Key species: *Carpinus betulus* (2; VFAR), *Quercus petraea* (1; VFAR), *Tilia tomentosa* (1; VFAR).

Threatened species: *Galanthus elwesii* (r; VFAR), *Nectaroscordum siculum* subsp. *bulgaricum* (r; VFAR).

Other species:

- trees: *Acer campestre* (+; VFAR), *Acer platanoides* (+; VFAR), *Fagus sylvatica* (1; VFAR), *Ulmus glabra* (+; VFAR);
- shrubs/ lianas: *Cornus mas* (+; VFAR), *Corylus avellana* (+; VFAR), *Crataegus monogyna* (+; VFAR), *Evonymus europaeus* (+; VFAR), *Evonymus verrucosus* (+; VFAR), *Hedera helix* (1; VFAR), *Ligustrum vulgare* (+; VFAR);
- grasses/ undershrubs: *Anemone ranunculoides* (+; VFAR), *Arum orientale* (+; VFAR), *Carex pilosa* (1; VFAR), *Dentaria bulbifera* (+; VFAR), *Galium odoratum* (+; VFAR), *Isopyrum thalictroides* (+; VFAR), *Polygonatum latifolium* (+; VFAR).

41.73724 Moesian *Galium dasypodium*-white oak woods

***Galio dasypodi-Quercetum pubescentis* Doniță 1970** plant community, estimated as vulnerable (F: I), studied in the Rachelu forest area (PRL) – Podișul Nord Dobrogean Site of Community Interest, has an enhanced conservation value due to the presence of two rare threatened taxa, of which *Corydalis solida* subsp. *slivenensis* is also sub-endemic. The phytocoenosis is not derived in the tree layer, while the herbaceous layer has only one ruderal species with a reduced dominance. Thus a low disturbance level can be estimated for this phytocoenosis.

Key species: *Quercus pubescens* (2; PRL).

Threatened species: *Corydalis solida* ssp. *slivenensis* (±; PRL), *Galanthus elwesii* (+; PRL).

Other species:

- trees: *Fraxinus ornus* (3; PRL);
- shrubs/ lianas: *Crataegus monogyna* (+; PRL);
- grasses/ undershrubs: *Alliaria petiolata* (+; PRL), *Arum orientale* (+; PRL), *Brachypodium sylvaticum* (+; PRL), *Corydalis solida* (+; PRL), *Dactylis polygama* (+; PRL), *Festuca valesiaca* (+; PRL), *Geum urbanum* (+; PRL), *Tanacetum corymbosum* (+; PRL), *Veronica hederifolia* (±; PRL).

41.76831 Dobrogean paeonia sessile oak forests

***Fraxino orni-Quercetum dalechampii* Doniță 1970** is considered as vulnerable, being observed in the area of Culmea Pietrosu – Măcin Mountains National Park (LCP), where it has an outstanding conservation importance. Thus, five rare threatened taxa were identified in the same plot, of which *Corydalis solida* subsp. *slivenensis* is also sub-endemic. All these are endangered in these phytocoenoses, except the vulnerable *Smyrniium perfoliatum*. Three ruderal species indicate a low disturbance from this point of view.

Key species: *Fraxinus ornus* (1; LCP), *Quercus dalechampii* (2; LCP).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; LCP), *Lunaria annua* subsp. *pachyrhiza* (+; LCP), *Mercurialis ovata* (+; LCP), *Nectaroscordum siculum* subsp. *bulgaricum* (+; LCP), *Smyrniium perfoliatum* (1; LCP).

Other species:

- trees: *Carpinus orientalis* (2; LCP), *Quercus polycarpa* (1; LCP);
- shrubs/ lianas: *Cornus mas* (+; LCP), *Crataegus monogyna* (+; LCP);

- grasses/ undershrubs: *Alliaria petiolata* (+; LCP), *Galium aparine* (+; LCP), *Lamium purpureum* (+; LCP), *Scilla bifolia* (+; LCP), *Stellaria media* (+; LCP).

41.76833 Dobrogean *Quercus pedunculiflora*-lime-oriental hornbeam forests

***Quercus pedunculiflorae-Tilietum tomentosae* Doniță 1970** plant community is endangered within the studied territory. Its conservation value is enhanced by the presence of the sub-endemic threatened species *Corydalis solida* subsp. *slivenensis*, identified within the Chițau Forest (IPC). The only ruderal taxon shows a low disturbance within this vegetation type.

Key species: *Quercus pedunculiflora* (2; LPC), *Tilia tomentosa* (2; LPC).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; LPC).

Other species:

- trees: *Fraxinus ornus* (1; LPC);
 - shrubs/ lianas: *Cornus mas* (1; LPC), *Crataegus monogyna* (+; LPL);
 - grasses/ undershrubs: *Alliaria petiolata* (+; LPC), *Arctium lappa* (+; LPC), *Arum orientale* (+; LPC), *Corydalis solida* subsp. *solida* (+; LPC), *Gagea lutea* (+; LPC), *Geum urbanum* (+; LPC), *Leonurus cardiaca* (+; LPC), *Ranunculus ficaria* (1; LPC), *Scilla bifolia* (+; LPC), *Urtica dioica* (+; LPC).

41.76834 Dobrogean sessile oak-lime-oriental hornbeam-ash forests

***Nectaroscordo-Tilietum tomentosae* Doniță 1970** can be considered a vulnerable plant community, being inventoried from Culmea Pietrosu area – Măcin Mountains National Park (LCP), where three rare threatened species were identified, all endangered within these phytocoenoses. The canopy being partially derived, this can be interpreted as a medium level of disturbance. In the other layers there is a low degree of ruderal species presence, represented by two taxa with a reduced dominance.

Key species: *Nectaroscordum siculum* subsp. *bulgaricum* (+; LCP), *Quercus dalechampii* (1; LCP), *Tilia tomentosa* (3; LCP).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; LCP), *Galanthus elwesii* (+; LCP), *Nectaroscordum siculum* subsp. *bulgaricum* (+; LCP).

Other species:

- trees: *Acer campestre* (+; LCP), *Acer platanoides* (+; LCP), *Carpinus orientalis* (1; LCP), *Fraxinus excelsior* (+; LCP), *Sorbus torminalis* (+; LCP);
 - shrubs/ lianas: *Evonymus verrucosus* (+; LCP), *Hedera helix* (+; LCP);
 - grasses/ undershrubs: *Alliaria petiolata* (+; LCP), *Carex pilosa* (+; LCP), *Corydalis solida* subsp. *solida* (+; LCP), *Glechoma hirsuta* (+; LCP), *Lamium purpureum* (+; LCP), *Lithospermum purpureocaeruleum* (+; LCP), *Polygonatum latifolium* (+; LCP), *Scilla bifolia* (+; LCP), *Veronica hederifolia* (+; LCP).

41.7A221 Pontic *Acer tataricum*-*Quercus pedunculiflora* steppe woods

***Viola suavis-Quercetum pedunculiflorae* Doniță 1970** plant community, estimated as vulnerable (F: I) within Rachelu Forest, Luncavița commune (PRL) – Podișul Nord Dobrogean Site of Community Interest, has a high conservation value also due to the three rare threatened species, among which *Corydalis solida*

subsp. *slivenensis* is also sub-endemic, all these being considered endangered in the respective phytocoenosis. The grasses layer has only one ruderal species, with reduced coverage, so there can be assessed a general low disturbance level.

Key species: *Quercus pedunculiflora* (2; PRL).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; PRL), *Galanthus elwesii* (+; PRL), *Myrrhoides nodosa* (+; PRL).

Other species:

- trees: *Acer campestre* (1; PRL), *Fraxinus ornus* (2; PRL);

- shrubs/ lianas: *Cornus mas* (+; PRL), *Crataegus monogyna* (+; PRL), *Evonymus verrucosus* (+; PRL);

- grasses/ undershrubs: *Brachypodium sylvaticum* (+; PRL), *Corydalis solida* subsp. *solida* (+; PRL), *Geum urbanum* (+; PRL), *Veronica hederifolia* (+; PRL).

53.1111 Freshwater *Phragmites* beds

This habitat, represented by permanently flooded reed beds was identified in the pond situated downstream of Cetățuia Lake, but much larger areas occur in the wetlands northwards of Revărsarea locality. As it was mono-dominant in the analysed situations, no plots were inventoried. It can be assessed as vulnerable within the Luncavița commune's territory and representative for a natural status, as no ruderal/ alien species were observed.

FAUNA

Birds. Within the Luncavița commune's territory there were identified 87 species of birds mentioned in the appendices 3 and 4B of the Ordinance 57/2007. Strictly protected bird species identified, which can be found in Annex 3 (53 species) are represented by: *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus olor*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Porzana porzana*, *Porzana parva*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*, *Melanocorypha calandra*, *Anthus campestris*, *Phoenicurus phoenicurus*. Among the rare species, which give a high conservation value to this area, there can be quoted: *Botaurus stellaris*, *Ixobrychus minutus*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Luscinia svecica*.

There were a total of 34 protected species which can be found in Annex 4B of the Ordinance 57/2007, representing animal and plant species that require strict protection: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis*

hypoleucos, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombycilla garrulus*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Prunella modularis*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. The rarest bird species for the area are: *Motacilla cinerea*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Jynx torquilla*.

Bird species which are not found in the two annexes of the Ordinance 57/2007, but are listed in the Annex II of the Law 13/ 1993, are: *Podiceps grisegena*, *Podiceps nigricollis (caspicus)*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Charadrius dubius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Calidris ferruginea*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Ficedula hypoleuca*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Here are some of the bird species which nest in the Luncavița area: *Botaurus stellaris*, *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Circus aeruginosus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Dryocopus martius*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus arundinaceus*, *Hippolais pallid*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza schoeniclus*, *Oenanthe oenanthe*, *Alauda arvensis*, *Melanocorypha calandra*, *Turdus philomelos*, *Turdus merula*, *Miliaria calandra*.

Research concerning the natural heritage of Mahmudia commune

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PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:
Danube Delta Biosphere Reserve, Dealurile Beștepe
nature reserve

NATURA 2000 SITES: Delta Dunării (Site of Community Interest, Special
Protection Area), Beștepe-Mahmudia (Special
Protection Area)

GEOLOGY AND PEDOLOGY

Found close to the Sf. Gheorghe fault, the administrative territory of Mahmudia commune is characterized, on the mainland side, by the occurrence of Devonian deposits these are composed of the silicolite, green phyllitic clay and limestone, as well as the Middle Triassic outcrops of blackish-grey limestone and micritic limestone. All these types of rocks outcrop through the layers of Quaternary loess. Within this area, the riverbed of Danube is dug, along the Sf. Gheorghe arm, in the bed of Holocene deposits of siltite. All these types of stones are placed at the base of the current coating soils.

Within the mainland side, the great diversity of stones types is reflected in a greater variety of territorial unity of soil such as Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998). Within north-eastern side of Mahmudia county, the alluvial deposits and alluvia of Danube river provided optimal conditions for the development of wetland soil types such as Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-alluvial gley soils, Marshy-mollic alluvial gley soils, Gleyed chernozems, Calcareous-alluvial gley soils, Calcareous-marshy alluvial gley soils, Hemic-terric histosols etc.

LANDSCAPE

Within the Mahmudia commune's territory prevail the artificial habitats, represented mainly by agriculture fields and less forestry plantations, largely distributed in the northern sector, where they have replaced the former wetlands, respectively in the southern zones of the studied area, where previously was the domain of steppe grasslands. Thus, nowadays the natural habitats are concentrated mainly in the central part of this territory, the wetland vegetation of the lowlands

being represented by white willow forests along the Sf. Gheorghe branch, reed beds in the lakes and marshes of the Danube floodplain southwards of the Danube.

In this general lowland aspect the Beștepe hills represent a major change in the landscape with their inselberg aspect. These rocky summits, which reach about 200 m, represent an outstanding viewpoint over the Danube Delta to the north and east, respectively upon the Razim Lagoon to the south. Their typical vegetation is represented by steppe grasslands on the summits and the upper part of the southern slopes. The lower areas of the southern slopes are covered in forestry plantations and reduced areas of *Paliurus spina-christi* thickets. On the northern slopes the forestry plantations occur on restricted areas, while the dominant vegetation is represented by natural forests of white oak (*Quercus pubescens*) and eastern hornbeam (*Carpinus orientalis*). The steppe grasslands also occur on the slopes and ravines framed between the Beștepe hills and the Danube floodplain.

FLORA, VEGETATION, HABITATS

As a compensation for their relatively reduced area in comparison with the artificial habitats, except the subtype 53.1111, all the native vegetation types are framed into priority habitats of community interest like 1530* (15.A21275), 40C0* (31.8B731), 62C0* (34.92, 34.9211), 91AA* (41.73723), 92A0* (44.1621).

Most of the plant communities are endangered within Mahmudia commune territory, only a few being vulnerable. The major part of the coenotaxon is low disturbed, followed by the ones where was observed a medium level of ruderal/ alien species invasive tendencies. Besides these only one coenotaxon is highly disturbed while another can be considered as typical for a natural status. Their conservation value is underlined by the fact that most of them have at least one threatened species the maximum recorded being seven such taxa. The major part of these endangered taxa is endangered within the analysed coenotaxa, only a few being vulnerable or sporadic.

The locations mentioned within the studied habitats are all included in the Danube Delta Site of Community Interest, the steppe grasslands, thickets and white oak forests being included also in the Dealurile Beștepe nature reserve. The only exception is the area of Salsovia archeological site and from this point towards the Gaetic fortress from Beștepe, the sector that belongs to the Mahmudia commune's territory, which is not included in any protected area.

15.A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** plant community was assessed as endangered (F: I) in the Danube floodplain framed within the Mahmudia's commune territory (MLD). It can be considered as an example of medium disturbed phytocoenosis, as the eight ruderal species prevail largely within its inventory.

Key species: *Cynodon dactylon* (4; MLD).

Other species: *Bromus hordeaceus* (+; MLD), *Bromus sterilis* (+; MLD), *Bromus tectorum* (+; MLD), *Cannabis sativa* subsp. *spontanea* (+; MLD), *Convolvulus arvensis* (+; MLD), *Elymus repens* (+; MLD), *Polygonum aviculare* (+; MLD), *Potentilla reptans* (1; MLD), *Xanthium italicum* (+; MLD).

31.8B731 Western Pontic jasmine Christ's thorn scrub

***Asphodelino luteae-Paliuretum* Sanda et al. 1999** plant community is endangered within the Dealurile Beștepe nature reserve – Mahmudia commune (DBM) and also within the whole studied territory. There the only threatened species is the dominant *Paliurus spina-christi*, vulnerable and rare. There can be estimated a low invasive process of the non-native species (*Alanthus altissima*), while the seven ruderal species with a significant dominance variation (+-1) show a medium level of disturbance.

Key species: *Paliurus spina-christi* (3; DBM).

Threatened species: *Paliurus spina-christi* (3; DBM).

Other species:

- shrubs/ lianas: *Ailanthus altissima* (+; DBM), *Rhamnus cathartica* (+; DBM), *Rosa canina* (+; DBM);

- grasses/ undershrubs: *Achillea setacea* (+; DBM), *Agrimonia eupatoria* (+; DBM), *Artemisia austriaca* (+; DBM), *Bromus sterilis* (1; DBM), *Carthamus lanatus* (+; DBM), *Crepis sancta* (+; DBM), *Cruciata pedemontana* (+; DBM), *Geranium pusillum* (+; DBM), *Marrubium peregrinum* (+; DBM), *Medicago minima* (+; DBM), *Orlaya grandiflora* (+; DBM), *Poa angustifolia* (+; DBM), *Stellaria media* (+; DBM), *Teucrium chamaedrys* (+; DBM), *Thymus pannonicus* (+; DBM), *Vicia angustifolia* (+; DBM).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** plant community is frequent (F: IV) within the Dealurile Beștepe nature reserve (DBM), while it can be considered vulnerable at the scale of the entire studied territory. The four rare threatened taxa enhance its importance for conservation, these being endangered within this coenotaxon. Five ruderal species indicate a low invasive trend from this point of view.

Key species: *Festuca valesiaca* (3; DBM).

Threatened species: *Astragalus ponticus* (+; DBM), *Echinops ritro* subsp. *ruthenicus* (+; DBM), *Potentilla bornmuelleri* (+; DBM), *Onobrychis gracilis* (+; DBM).

Other species: *Campanula rapunculus* (+; DBM), *Crepis sancta* (+; DBM), *Crataegus monogyna* (+; DBM), *Cichorium intybus* (+; DBM), *Dichanthium ischaemum* (1; DBM), *Digitalis lanata* (+; DBM), *Eryngium campestre* (+; DBM), *Euphorbia glareosa* subsp. *glareosa* (+; DBM), *Euphorbia seguieriana* (+; DBM), *Koeleria macrantha* (+; DBM), *Leontodon crispus* (+; DBM), *Orlaya grandiflora* (+; DBM), *Sanguisorba minor* (+; DBM), *Teucrium chamaedrys* (+; DBM), *Teucrium polium* (+; DBM), *Thlaspi perfoliatum* (+; DBM), *Thymus pannonicus* (+; DBM), *Trifolium campestre* (+; DBM).

***Agropyretum pectiniformae* (Prodan 1939) Dihoru 1970** is a vulnerable plant community (F: I) analysed from Dealurile Beștepe nature reserve – Mahmudia commune (DBM), as well as between Salsovia archeological site and the Gaetic fortress from Beștepe (CSA-BCG). Within the whole commune it can be considered endangered. In the studied locations two rare threatened species

were identified, both endangered within the respective phytocoenosis. The influence of grazing obviously leads to a medium level of disturbance, indicated by the 10 ruderal species with significant dominance (+-1).

Key species: *Agropyron cristatum* (3; DBM).

Threatened species: *Knautia macedonica* (±; CSA-BCG), *Conringia austriaca* (±; DBM).

Other species: *Achillea nobilis* subsp. *neilreichii* (+ CSA-BCG), *Bromus squarrosus* (+; DBM), *Convolvulus arvensis* (+; DBM), *Cichorium intybus* (+; DBM), *Dactylis glomerata* (+; DBM), *Dichanthium ischaemum* (+; DBM), *Erodium cicutarium* (+; DBM), *Eryngium campestre* (+; DBM), *Euphorbia seguieriana* (+; DBM), *Koeleria macrantha* (+; DBM), *Linum austriacum* (+; DBM), *Marrubium peregrinum* (+; DBM), *Medicago minima* (+; DBM), *Orlaya grandiflora* (+; DBM), *Plantago lanceolata* (+; CSA-BCG), *Poa bulbosa* (1; DBM), *Potentilla argentea* (±; CSA-BCG), *Reseda lutea* (+; DBM), *Sanguisorba minor* (+; DBM), *Teucrium polium* (+; DBM), *Thymus pannonicus* (+; DBM), *Tragopogon dubius* (+; DBM), *Xeranthemum annuum* (+; DBM).

***Artemisia austriacae-Poëtum bulbosae* Pop 1970** plant community can be considered a vulnerable coenotaxon (F: I) within the Dealurile Beștepe nature reserve (DBM) – Mahmudia commune, respectively endangered in the entire studied area. Even though it has a secondary character its conservative value is underlined by the presence of four rare threatened taxa, endangered within analysed phytocoenosis. Due to grazing, there is a very intense degree of ruderal plants invasive tendencies (five species), of which some are dominant or co-dominant.

Key species: *Artemisia austriaca* (1; DBM), *Poa bulbosa* (3; DBM).

Threatened species: *Achillea leptophylla* (+; DBM), *Convolvulus lineatus* (±; DBM), *Echinops ritro* subsp. *ruthenicus* (+; DBM), *Potentilla bornmuelleri* (+; DBM).

Other species: *Echium italicum* (+; DBM), *Eryngium campestre* (+; DBM), *Marrubium peregrinum* (+; DBM), *Potentilla argentea* (+; DBM), *Stipa capillata* (+; DBM), *Teucrium chamaedrys* (+; DBM), *Thymus pannonicus* (+; DBM).

***Koelerietum macranthae* (Răv. et alii 1956) Popescu, Sanda 1988** is a vulnerable plant community which was inventoried from the Dealurile Beștepe nature reserve – Mahmudia commune (DBM), considered endangered within the whole studied area. Two rare threatened species were observed, both being endangered within this phytocoenosis. There can be estimated a low level of disturbance both due to the non-native species (*Elaeagnus angustifolia*), as well as from the ruderal taxa point of view, the six such species having a reduced dominance.

Key species: *Koeleria macrantha* (3; DBM).

Threatened species: *Onobrychis gracilis* (+; CF), *Potentilla bornmuelleri* (+; DBM).

Other species: *Acinos arvensis* (+; DBM), *Agrimonia eupatoria* (+; DBM), *Ajuga chamaepytis* (+; DBM), *Bromus tectorum* (+; DBM), *Bromus squarrosus* (+; DBM), *Dactylis glomerata* (+; DBM), *Dichanthium ischaemum* (+; DBM),

Elaeagnus angustifolia (+; DBM), *Cichorium intybus* (+; DBM), *Euphorbia seguieriana* (+; DBM), *Festuca valesiaca* (1; DBM), *Medicago minima* (1; DBM), *Plantago lanceolata* (+; DBM), *Sanguisorba minor* (+; DBM), *Teucrium chamaedrys* (+; DBM), *Teucrium polium* (+; DBM), *Thymus pannonicus* (+; DBM), *Tragopogon dubius* (+; DBM), *Veronica prostrata* (+; DBM).

***Agropyro cristati-Kochietum prostratae* Zólyomi 1958**, an endangered (F: I) plant community, was recorded at Salsovia archaeological site – Mahmudia commune (CSA), where a medium degree of ruderal species invasive trend can be deduced from the presence of five such species with a significant dominance variation (+ - 1).

Key species: *Agropyron cristatum* (3; CSA), *Bassia prostrata* (+; CSA).

Other species: *Artemisia austriaca* (1; CSA), *Bassia prostrata* (+; CSA), *Bromus squarrosus* (+; CSA), *Cynanchum acutum* (±; CSA), *Centaurea solstitialis* (±; CSA), *Euphorbia seguieriana* (+; CSA), *Eryngium campestre* (+; CSA), *Festuca valesiaca* (+; CSA), *Marrubium peregrinum* (+; DD), *Phlomis pungens* (+; CSA), *Stipa capillata* (+; CSA), *Teucrium polium* (+; CSA).

34.9211 Western Pontic thyme steppes

***Agropyro-Thymetum zygioidi* Dihoru (1969) 1970** plant community was identified within the Dealurile Beștepe nature reserve sector which belongs to the Mahmudia commune (DBM) where it can be considered vulnerable (F: I), being endangered within the whole studied territory. It can be considered as having the highest conservation value among the coenotaxa inventoried within the Mahmudia territory, as, besides its priority habitat status, it also shelters the most numerous threatened species (seven taxa). Among these *Dianthus nardiformis* is vulnerable and of European importance at the national level, while within this coenotaxon all are endangered, except the first that is vulnerable. Even though they are numerous, the ten ruderal species still have a reduced dominance and consequently they place this community within the low disturbed category.

Key species: *Agropyron ponticum* (1; DBM), *Thymus zygioides* (3; DBM).

Threatened species: *Achillea leptophylla* (+; DBM), *Dianthus nardiformis* (±; DBM), *Festuca callieri* (+; DBM), *Koeleria lobata* (+; DBM), *Potentilla bornmuelleri* (+; DBM), *Thymus zygioides* (3; DBM).

Other species: *Achillea nobilis* subsp. *neilreichii* (+; DBM), *Androsace maxima* (+; DBM), *Artemisia austriaca* (+; DBM), *Bromus squarrosus* (+; DBM), *Bombycilaena erecta* (+; DBM), *Convolvulus arvensis* (+; DBM), *Coronilla varia* (+; DBM), *Crepis sancta* (+; DBM), *Cichorium intybus* (+; DBM), *Dichanthium ischaemum* (+; DBM), *Erodium cicutarium* (+; DBM), *Eryngium campestre* (+; DBM), *Echium italicum* (+; DBM), (+; DBM), *Euphorbia seguieriana* (+; DBM), *Medicago minima* (+; DBM), *Poa bulbosa* (+; DBM), *Potentilla argentea* (+; DBM), *Sanguisorba minor* (+; DBM), *Sedum urvillei* subsp. *hillebrandtii* (+; DBM), *Teucrium polium* (+; DBM), *Tragopogon dubius* (±; DBM), *Xeranthemum annuum* (+; DBM).

***Festucetum callierii* Șerbănescu 1965** plant community was studied in the Dealurile Beștepe nature reserve (DBM), where it can be estimated as vulnerable,

being endangered within the whole studied territory. Five rare threatened species were inventoried, all endangered within this coenotaxon. The four ruderal taxa indicate a low level of disturbance.

Key species: *Festuca callieri* (3; DBM).

Threatened species: *Achillea leptophylla* (+; DBM), *Festuca callieri* (+; DBM), *Echinops ritro* subsp. *ruthenicus* (±; DBM), *Onobrychis gracilis* (+; DBM), *Thymus zygioides* (+; DBM).

Alte specii: *Arenaria serpyllifolia* (+; DBM), *Bromus squarrosus* (+; DBM), *Bombycilaena erecta* (+; DBM), *Crataegus monogyna* (+; DBM), *Digitalis lanata* (+; DBM), *Phleum phleoides* (+; DBM), *Eryngium campestre* (+; DBM), *Orlaya grandiflora* (+; DBM), *Poa bulbosa* (+; DBM), *Potentilla argentea* (+; DBM), *Sanguisorba minor* (+; DBM), *Senecio vernalis* (+; DBM), *Sedum urvillei* subsp. *hillebrandtii* (1; DBM), *Trifolium campestre* (+; DBM), *Teucrium chamaedrys* (+; DBM), *Trifolium arvense* (+; DBM).

41.73723 Moesian *Paeonia peregrina*-white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** plant community can be considered as sporadic (F: III) within the Dealurile Beștepe nature reserve – Mahmudia commune (DBM), being endangered within the whole studied area. From the two rare threatened species, both endangered within this phytocoenosis *Symphytum tauricum* is only found in few protected areas in Dobrogea. The two ruderal species with reduced contribution to the inventory of this coenotaxon show a low disturbance from this point of view.

Key taxa: *Carpinus orientalis* (2; DBM), *Quercus pubescens* (2; DBM).

Threatened species: *Myrrhoides nodosa* (+; DBM), *Symphytum tauricum* (+; DBM).

Other species:

- trees: *Fraxinus ornus* (1; DBM);

- shrubs/ lianas: *Crataegus monogyna* (+; DBM), *Rhamnus cathartica* (+; DBM);

- grasses/ undershrubs: *Brachypodium sylvaticum* (+; DBM), *Galium aparine* (+; DBM), *Geum urbanum* (+; DBM), *Parietaria officinalis* (+; DBM), *Poa nemoralis* (+; DBM), *Polygonatum latifolium* (+; DBM), *Thlaspi perfoliatum* (+; DBM), *Vinca herbacea* (+; DBM).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924** was observed as a vulnerable plant community within the Mahmudia commune territory in the Danube floodplain (MLD), along the river. Some of the stands are formed of old growth trees. There can be estimated a low level of disturbance both from the non-native species presence (*Amorpha fruticosa*, *Fraxinus americana*, *Morus alba*) as well as due to the ruderal taxa invasive trends (three species).

Key species: *Amorpha fruticosa* (+; MLD), *Salix alba* (3; MLD).

Other species:

- trees: *Fraxinus americana* (+; MLD), *Morus alba* (+; MLD);

- grasses/ undershrubs: *Arctium lappa* (+; MLD), *Artemisia annua* (+; MLD), *Bidens tripartita* (+; MLD), *Elymus repens* (+; MLD), *Mentha pulegium* (+; MLD), *Myosoton aquaticum* (+; MLD), *Potentilla reptans* (+; MLD), *Rorippa sylvestris* (+; MLD).

53.1111 Freshwater *Phragmites* beds

Scirpo-Phragmitetum W. Koch 1926, a vulnerable plant community framed into this habitat, was observed in the marshes of the Danube floodplain, southwards of the Sf. Gheorghe branch. These reed beds represent a recovered habitat which replaced the former agriculture fields that were flooded by the Danube. As they are mono-dominant in the analysed situations, no plots were recorded. Due to the absence of ruderal/ alien species, they can be considered representative for a natural status.

FAUNA

Birds. On the administrative territory of the Mahmudia commune there were identified 97 species of birds which are listed in the Appendices 3 and 4B of the Ordinance 57/2007.

The strictly protected bird species identified in the studied area, which can be found in the Annex 3 (63 species) are represented by: *Gavia stellata*, *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus olor*, *Cygnus cygnus*, *Aythya nyroca*, *Tadorna tadorna*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Burhinus oedicephalus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna sandvicensis*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*, *Melanocorypha calandra*, *Anthus campestris*, *Phoenicurus phoenicurus*, *Oenanthe isabellina*.

The rare species, which confer a high conservation value to this area include: *Botaurus stellaris*, *Ixobrychus minutus*, *Pelecanus crispus*, *Platalea leucorodia*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Luscinia svecica*.

There were identified 34 protected species which can be found in the Annex 4B of the Ordinance 57/2007, representing species that require a strict protection: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombicilla garrulus*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*,

Remiz pendulinus, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Prunella modularis*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. The rarest bird species for the area are: *Motacilla cinerea*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Jynx torquilla*.

The bird species not found in the two annexes of the Ordinance 57/2007, but can be found in Annex II of Law 13/ 1993, are: *Podiceps grisegena*, *Podiceps nigricollis* (*caspicus*), *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Charadrius dubius*, *Tringa stagnatilis*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Calidris alpina*, *Calidris ferruginea*, *Calidris alba*, *Larus melanocephalus*, *Caprimulgus europaeus*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Some of the bird species which nest within the Mahmudia territory are: *Botaurus stellaris*, *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Circus aeruginosus*, *Falco vespertinus*, *Porzana porzana*, *Sterna hirundo*, *Chlidonias hybridus*, *Chlidonias niger*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Dryocopus martius*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*. *Podiceps grisegena*, *Podiceps nigricollis*, *Buteo buteo*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza schoeniclus*, *Oenanthe oenanthe*, *Alauda arvensis*, *Melanocorypha calandra*, *Turdus philomelos*, *Turdus merula*.

Mammals. On the Mahmudia commune territory there have been identified 18 species: *Erinaceus concolor*, *Talpa europaea*, *Sorex araneus*, *Crociodura suaveolens*, *Lepus europaeus*, *Spermophilus citellus*, *Ondatra zibethicus*, *Apodemus uralensis*, *Mus musculus*, *Mus spicilegus*, *Rattus norvegicus*, *Spalax leucodon*, *Canis aureus*, *Vulpes vulpes*, *Mustela putorius*, *Mustela nivalis*, *Lutra lutra*, *Sus scrofa*. Strictly protected species of mammals found in the area, which can be found in Annex 3 of the Ordinance 57/2007, are represented by:

Spermophilus citellus, *Lutra lutra*. *Spalax leucodon* is the only species that requires strict protection, included in Annex 4B of the Ordinance 57/2007.

Research concerning the natural heritage of Maliuc commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Waterway Sulina branch

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:
Danube Delta Biosphere Reserve

NATURA 2000 SITES: Delta Dunării (Site of Community Interest, Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Maliuc commune is characterized by the Holocene deposits of siltite underlying the following types of territorial units of soil such as Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-gleyed alluvia, Calcareous-alluvial gley soils, Calcareous-mollic alluvial gley soils, Semisubmerged-alluvial gley soils, Semisubmerged-mollic alluvial gley soils, Calcareous-marshy alluvial gley soils, Marshy-mollic alluvial gley soils, Hemic-terric histosols, as well as Coprogenic limnosols, Calcareous-histic limnosols etc.

LANDSCAPE

The whole territory of Maliuc commune is framed into the fluvial Delta, where the wetland natural habitats prevail in comparison with artificial habitats, the latest being represented mainly by agriculture fields or forestry plantations.

The native habitats are dominated by reed beds and aquatic vegetation, of which the water-lily beds in bloom represent one of the main landscape attractions, like also the white willow galleries. The latest are more extended in the western part of the territory, more evolved, with more shallow waters, while towards the east the levees and this vegetation type become narrower along the channels, leaving place to the reed beds, reed mace beds and aquatic vegetation of the deeper lakes. On some of the levees grasslands dominated by *Elymus repens* also occur.

FLORA, VEGETATION, HABITATS

Even though the natural habitats occur on vast areas within this territory nearly all the recorded subtypes are not protected at the national or European level, except the community interest habitat 92A0 (44.1621).

The major part of these coenotaxa is vulnerable, the rest being framed between rare and very frequent. The subtypes characteristic for a natural status prevail, closely followed by low disturbed plant communities, while two other coenotaxa have a medium, respectively high level of ruderal and/ or non-native species invasive trends.

In general these plant communities are bare of threatened species, except the subtype 22.4311, where the only such taxon, *Trapa natans*, is endangered within this coenotaxon.

22.4311 Water-lily beds

***Myriophyllo verticillati-Nupharetum luteae* W. Koch 1926** is an aquatic plant community considered vulnerable (F: I), observed in the Eracle channel (MER), as well as in the Stipoc area (MS). The only threatened taxon is *Trapa natans*, protected by the Berne Convention. This can be considered a representative coenotaxon, as no alien/ ruderal species were observed.

Key species: *Nuphar lutea* (5; MS, MER).

Threatened species: *Trapa natans* (+; MER).

Other species: *Nymphaea alba* (+; MER), *Phragmites australis* (+; MS), *Sagittaria sagittifolia* (+; MS).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** plant community can be considered sporadic (F: III) within the Maliuc commune area. There can be assessed a medium degree of non-native species presence as *Amorpha fruticosa* reaches a dominance index of 1. Two ruderal species, with a reduced dominance, indicate a low disturbance level from this point of view.

Key species: *Amorpha fruticosa* (1; MV), *Salix alba* (4; MV).

Other species:

- shrubs/ lianas: *Rubus caesius* (+; MV);

- grasses/ undershrubs: *Arctium lappa* (+; MV), *Butomus umbellatus* (+; MV), *Lycopus europaeus* (+; MV), *Myosoton aquaticum* (+; MV), *Phragmites australis* (+; MV), *Rorippa austriaca* (+; MV), *Rumex palustris* (+; MV), *Symphytum officinale* (+; MV), *Typha angustifolia* (+; MV), *Urtica dioica* (+; MV).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926**, framed within this habitat, which represents the permanently flooded reed beds, is the most widespread plant community on the Maliuc commune territory (F:V), being studied along the Eracle channel (MER). It can be considered representative, as no alien/ ruderal plants were recorded.

Key species: *Phragmites australis* (5; MER), *Typha angustifolia* (+; MER).

Other species: *Lythrum salicaria* (+; MER), *Salix alba* (+; MER), *Salix cinerea* (+; MER), *Senecio paludosus* (+; MER).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** is a frequent plant community (F:IV) in the Stipoc area (MS). The only ruderal species identified in this plant community, *Xanthium italicum*, is a sign of a low disturbance, as it has a reduced dominance.

Key species: *Phragmites australis* (5; MS).

Other species: *Bidens tripartita* (+; MS), *Calystegia sepium* (+; MS), *Mentha aquatica* (+; MS), *Myosotis scorpioides* (+; MS), *Rorippa amphibia* (r; MS), *Rumex hydrolapathum* (+; MS), *Senecio paludosus* (+; MS), *Sium latifolium* (+; MS), *Typha angustifolia* (+; MS), *Xanthium italicum* (+; MS).

53.1122 Dry halophile *Phragmites* beds

***Astero tripolii-Phragmitetum humilis* Krisch (1972) 1974** is vulnerable in the Stipoc area (MS), where the three ruderal species indicate a low disturbance.

Key species: *Phragmites australis* subsp. *australis* var. *humilis* (5; MS).

Other species: *Bolboschoenus maritimus* (+; MS), *Calystegia sepium* (+; MS), *Galega officinalis* (+; MS), *Elymus repens* (+; MS), *Myosotis scorpioides* (+; MS), *Plantago major* (r; MS), *Potentilla reptans* (+; MS), *Trifolium fragiferum* (+; MS), *Xanthium italicum* (+; MS).

53.132 Lesser reedbeds

***Typhetum angustifoliae* Pignatti 1953**, a rare (F: II) plant community, was studied along the Eracle channel (MER) where no alien/ ruderal species were identified.

Key species: *Typha angustifolia* (5; MER).

Other species: *Nuphar lutea* (+; MER), *Salix alba* (+; MER).

Plant communities which are not framed into the Palaearctic habitats classification

***Agropyretum repentis* Felföldy 1942** is a vulnerable (F: I) plant community identified in the Stipoc levee area (MS). If *Elymus repens* is considered a typical ruderal species the level of disturbance is very high, due to its dominant position. Still, this species may also occur on undisturbed ground so in this case, along with *Xanthium italicum*, this would be an indication of low disturbance.

Key species: *Elymus repens* (4; MS).

Other species: *Bolboschoenus maritimus* (+; MS), *Calamagrostis epigeios* (+; MS), *Calystegia sepium* (+; MS), *Galega officinalis* (+; MS), *Iris pseudacorus* (+; MS), *Lythrum salicaria* (+; MS), *Phragmites australis* (1; MS), *Potentilla reptans* (+; MS), *Symphytum officinale* (+; MS), *Xanthium italicum* (+; MS).

FAUNA

Birds. On the administrative territory of the Maliuc commune there were inventoried 92 bird species which are classified within the annexes 3 and 4B of the Ordinance 57/2007. Of these 58 species are strictly protected, being found in the Annex 3 of the ordinance, like: *Gavia stellata*, *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*,

Aquila clanga, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Porzana porzana*, *Porzana parva*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hibridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna sandvicensis*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*. Among these, several more rare species for this area are represented by: *Botaurus stellaris*, *Ixobrychus minutus*, *Pelecanus crispus*, *Platalea leucorodia*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Luscinia svecica*.

There were inventoried 34 protected species which require strict protection, listed in the Annex 4B of the ordinance: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombicilla garrulus*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. Some of the rarest birds in the area included in this appendix are: *Jynx torquilla*, *Motacilla cinerea*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*.

Bird species identified in the area not classified in the two annexes of the Ordinance 57/2007 but listed in the Annex II of Law 13/ 1993, are: *Podiceps grisegena*, *Podiceps nigricollis (caspicus)*, *Bubulcus (Ardeola) ibis*, *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Charadrius dubius*, *Tringa stagnatilis*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Calidris alpina*, *Calidris ferruginea*, *Calidris alba*, *Larus melanocephalus*, *Caprimulgus europaeus*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Ficedula hypoleuca*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

The great diversity of habitats in the area favours the nesting of a large number of species and populations of bird species, of which the certain or probable nesting in the area of the Maliuc commune is estimated for: *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus olor*, *Aythya nyroca*, *Haliaeetus albicilla*,

Circus aeruginosus, Falco vespertinus, Porzana porzana, Sterna hirundo, Chlidonias hybridus, Chlidonias niger, Alcedo atthis, Coracias garrulus, Dendrocopos syriacus, Dendrocopos medius, Dryocopus martius, Sylvia nisoria, Ficedula parva, Luscinia svecica, Lanius minor, Lanius collurio, Tachybaptus ruficollis, Falco tinnunculus, Cuculus canorus, Alauda arvensis, Galerida cristata, Motacilla alba, Erithacus rubecula, Phoenicurus phoenicurus, Remiz pendulinus, Locustella naevia, Locustella luscinioides, Phylloscopus sibilatrix, Phylloscopus collybita, Regulus regulus, Muscicapa striata, Panurus biarmicus, Aegithalos caudatus, Sitta europaea, Oriolus oriolus, Miliaria calandra, Serinus serinus, Carduelis spinus, Carduelis chloris, Carduelis carduelis. Podiceps grisegena, Podiceps nigricollis, Buteo buteo, Dendrocopos major, Riparia riparia, Hirundo rustica, Delichon urbica, Saxicola rubetra, Luscinia megarhynchos, Acrocephalus schoenobaenus, Acrocephalus palustris, Acrocephalus scirpaceus, Acrocephalus arundinaceus, Hippolais pallida, Sylvia curruca, Sylvia communis, Sylvia atricapilla, Ficedula albicollis, Parus caeruleus, Parus major, Certhia familiaris, Emberiza schoeniclus.

Mammals. The total number of species found within the Maliuc area is of 17 taxa, like: *Rhinolophus hiposideros, Myotis myotis, Nyctalus noctula, Pipistrellus pipistrellus, Lepus europaeus, Mus musculus, Rattus norvegicus, Apodemus agrarius, Ondatra zibethicus, Mycomys minutus, Canis aureus, Vulpes vulpes, Nyctereutes procyonoides, Mustela putorius, Lutra lutra, Mustela lutreola, Sus scrofa, Capreolus capreolus.* Within these a few are strictly protected species, which are included in Annex 3 of the Ordinance no. 57/2007, such as: *Rhinolophus hiposideros, Myotis myotis, Lutra lutra, Mustela lutreola.* Species which require strict protection, included in the Annex 4A are represented by: *Nyctalus noctula, Pipistrellus pipistrellus.*

Research concerning the natural heritage of Măcin town

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT, Mariana CUZIC

ACCESS: Road DN 22 Tulcea-Măcin

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: Măcin Mountains National Park

NATURA 2000 SITES: Munții Măcinului (Site of Community Interest), Măcin-Niculitel (Special Protection Area), Brațul Măcin (Site of Community Interest), Dunărea Veche – Brațul Măcin (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Măcin town is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite to which are added tufogene greenschist which occur on reduced areas in the

eastern part. The Devonian deposits are confined in the north-eastern part and are composed of the slate schists, quartzite and grey limestones those are crossed by veins of Paleozoic igneous rocks. The eastern part of the area is occupied by the Carapelit formation (Lower Carboniferous age) that is composed of conglomerates, sandstones, tuffs, schists and siltites. Here also can be found the Paleozoic outcrops of granite gneisses (between pre-Silurian metamorphic deposits and Lower Carboniferous age deposits). These types of stones outcrop through the Quaternary loess layers that cover entire area.

Based on these categories of rock substrata, the various types of territorial units of soil such as Dystric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998) occur. Along the Danube River on the alluvial deposits and alluvia there were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

The general aspect of the Măcin town's territory is characterized by agriculture fields, instead of the former steppe grasslands, and by forestry plantations, which have nearly replaced all the previous white willow riparian forests and wetland vegetation. Natural habitats are still represented by reduced areas of wetland vegetation, along the Danube, but also in the area of a former salt lake (Lacul Sărat). Within the latest area, naturally drained in the last years, occur reed beds and wormwood grasslands (*Artemisia santonica*), typical for saline soils.

In the northern and eastern sectors, adjacent to this administrative limit of the town, the relief altitudes increase gradually within a rocky chain of eroded mountains, from Orliga Hill (114 m) up to Sulucu Mare Peak (370 m), the highest elevation of Culmea Pricopanului, a secondary range of Măcin Mountains. Most of this higher relief is covered in steppe grasslands, the natural thickets having a low occurrence, while isolated oaks (*Quercus pedunculiflora*, *Quercus pubescens*), grouped at the foothills, represent remnants of the former wooded steppes. Unfortunately important areas of steppe grasslands were replaced by forestry plantations, which induce a certain artificial aspect in some parts of this range, like also the active or abandoned quarries, the first situated outside the Măcin Mountains National Park, while the second are still visible on more restricted areas inside this protected area. Most of this range has still an unspoiled and spectacular mountain landscape, with characteristic natural megalithic granite formations, underlined by the golden steppe grasslands. These peaks are also outstanding viewpoints upon the Danube westwards and northwards, while to east and south the forests and then steppes that occur on the other ranges of Măcin Mountains are visible.

FLORA, VEGETATION, HABITATS

The conservation importance of the natural vegetation is obvious, as, except one plant community, all the other are priority habitats of community importance like 1530* (15.A211), 40C0* (31.8B721), 62C0* (34.92, 34.9211).

The major part of the plant communities are endangered within the Măcin area, less being vulnerable and only one rare. Among them prevail the low disturbed coenotaxa, closely followed by medium perturbed ones, only one plant community being representative for a natural status.

Most of these plant communities have no threatened taxa in the analysed situations, with the exception of the two coenotaxa from the rocky steppe, with important values of four, respectively three threatened taxa, mostly endangered within these phytocoenoses.

15.A211 Western Pontic saline steppes

***Artemisietum santonici* Soó 1947 corr. Guterm. et Mucina 1993** plant community is endangered within the Măcin territory, being identified at the Lacul Sărat area (LSM), where it can be framed into a medium level of ruderal plant invasion (four species), as these represent more than half of the number of species, some having also a significant dominance (1).

Key species: *Artemisia santonica* (3; LSM).

Other species: *Cynodon dactylon* (2; LSM), *Elymus repens* (1; LSM), *Lamium purpureum* (+; LSM), *Marrubium vulgare* (+; LSM), *Phragmites australis* (+; LSM), *Stellaria media* (+; LSM).

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931** plant community can be estimated as vulnerable within the Măcin Mountains National Park, respectively in the area of Pricopan Range (PRM), being overall endangered in the Măcin territory. There it can be considered as having a low degree of disturbance, indicated by the reduced dominance of the non-native *Prunus cerasifera* and of the three ruderal taxa.

Key species: *Crataegus monogyna* (5; PRM).

Other species:

- shrubs/ trees/ lianas: *Cerasus mahaleb* (+; PRM), *Clematis vitalba* (+; PRM), *Prunus cerasifera* (±; PRM), *Rosa canina* (+; PRM);

- grasses/ undershrubs: *Geum urbanum* (+; PRM), *Lamium purpureum* (+; PRM), *Marrubium peregrinum* (+; PRM), *Poa angustifolia* (+; PRM), *Sanguisorba minor* (+; PRM), *Urtica dioica* (+; PRM).

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** is the most common (F: IV) coenotaxon within Culmea Pricopanului (CPM), respectively rare throughout Măcin territory. A medium level of ruderal plant invasive trend can be deduced from the presence of seven such species with a reduced dominance that represents half of the recorded species number.

Key species: *Dichanthium ischaemum* (4; CPM).

Other species: *Cynodon dactylon* (+; CPM), *Eryngium campestre* (+; CPM), *Galium aparine* (+; CPM), *Cruciata pedemontana* (+; CPM), *Geranium rotundifolium* (+; CPM), *Lamium amplexicaule* (+; CPM), *Onopordum acanthium* (r; CPM), *Plantago lanceolata* (+; CPM), *Poa angustifolia* (+; CPM), *Potentilla argentea* (+; CPM), *Sanguisorba minor* (+; CPM), *Teucrium polium* (+; CPM), *Thlaspi perfoliatum* (+; CPM).

***Stipetum capillatae* (Hueck 1931) Krausch 1961** plant community, a vulnerable coenotaxa (F: I) within the Pricopan Range (PRM), endangered in the Măcin town territory, has a low disturbance level, as the five ruderal species have a reduced dominance.

Key species: *Stipa capillata* (4 PRM).

Other species: *Achillea setacea* (+; PRM), *Alyssum murale* (+; PRM), *Cichorium intybus* (+; PRM), *Echium italicum* (+; PRM), *Erodium cicutarium* (+; PRM), *Eryngium campestre* (+; PRM), *Festuca valesiaca* (1; PRM), *Lamium amplexicaule* (+; PRM), *Linaria genistifolia* (+; PRM), *Poa angustifolia* (+; PRM), *Potentilla argentea* (+; PRM), *Ranunculus illyricus* (+; PRM).

34.9211 Western Pontic thyme steppes

***Agropyro-Thymetum zygoidi* Dihoru (1969) 1970** plant community is considered vulnerable (F: I) within the Culmea Pricopanului sector that belongs to Măcin Town (CPM) – Măcin Mountains National Park, being endangered within the whole studied territory. It has a high conservation value, as four rare threatened species at the national level were inventoried. Within this plant community *Thymus zygoides* is dominant, while the other are endangered, except the vulnerable *Campanula romanica*. This phytocoenosis can be considered representative, as no ruderal/ alien species were recorded.

Key species: *Thymus zygoides* (2; CPM).

Threatened species: *Campanula romanica* (1; CPM), *Dianthus nardiformis* (+; CPM), *Festuca callieri* (+; CPM), *Thymus zygoides* (1; CPM).

Other species: *Alyssum saxatile* (+; CPM), *Asperula tenella* (+; CPM), *Dichanthium ischaemum* (+; CPM), *Potentilla argentea* (+; CPM), *Rumex acetosella* (+; CPM), *Sanguisorba minor* (+; CPM), *Sedum urvillei* subsp. *hillebrandtii* (+; CPM), *Stipa capillata* (+; CPM).

***Festucetum callierii* Șerbănescu 1965 apud Dihoru (1969) 1970** is a rare (F: II) plant community within Pricopan Range (PRM), respectively vulnerable throughout the Măcin territory. Its conservation value is enhanced by the three rare threatened taxa, among which *Campanula romanica* and *Dianthus nardiformis* are vulnerable, of European importance, the first being also endemic. Within the studied phytocoenosis *Dianthus nardiformis* can be considered vulnerable, while the other two are endangered. There can be observed a low disturbance level due to the alien species *Ailanthus altissima*, with a reduced dominance.

Key species: *Festuca callieri* (3; PRM).

Threatened species: *Campanula romanica* (+; PRM), *Dianthus nardiformis* (1; PRM), *Thymus zygoides* (+; PRM).

Other species: *Achillea coarctata* (+; PRM), *Ailanthus altissima* (±; PRM), *Alyssum murale* (+; PRM), *Asperula tenella* (+; PRM), *Crataegus monogyna* (±; PRM), *Phleum phleoides* (+; PRM), *Potentilla argentea* (+; PRM), *Ranunculus illyricus* (+; PRM), *Rumex acetosella* (+; PRM), *Sanguisorba minor* (+; PRM), *Stipa capillata* (+; PRM), *Teucrium polium* (+; PRM).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** is an endangered plant community within Măcin town territory, where it is located in narrow stripes along the Danube, in the river floodplain (MLD). There can be estimated a low level of disturbance, due to the reduced dominance of both alien (*Amorpha fruticosa*, *Fraxinus americana*) and ruderal taxa (two species).

Key species: *Amorpha fruticosa* (+; MLD), *Populus alba* (1; MLD), *Salix alba* (5; MLD).

Other species:

- trees: *Fraxinus americana* (+; MLD);
 - shrubs/ lianas: *Rubus caesius* (+; MLD);
 - grasses/ undershrubs: *Elymus repens* (+; MLD), *Butomus umbellatus* (+; MLD), *Xanthium italicum* (+; MLD).

53.1122 Dry halophile *Phragmites* beds

***Astero tripolii-Phragmitetum humilis* Krisch (1972) 1974** is a dominant (F: V) plant community in the area of Lacul Sărat (LSM), still being vulnerable within the whole studied area. The number of ruderal species (three taxa) reaches 50% of the total recorded taxa, indicating thus a medium disturbance level.

Key species: *Aster tripolium* subsp. *pannonicus* (1; LSM), *Phragmites australis* (+; LSM).

Other species: *Erophila verna* (+; LSM), *Lamium purpureum* (+; LSM), *Puccinellia limosa* (±; LSM), *Stellaria media* (+; LSM).

FAUNA

Birds. On the territory of the Măcin town there were identified 66 species of birds which can be found in the appendices 3 and 4B of the Ordinance 57/2007. The list of the strictly protected bird species identified in the area, that can be found in the Annex 3 (37 species) is the following: *Ardeola ralloides*, *Egretta garzetta*, *Ciconia ciconia*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Sterna hirundo*, *Chlidonias hybridus*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Melanocorypha calandra*, *Anthus campestris*, *Phoenicurus phoenicurus*, *Oenanthe isabelina*. Among these several rare species are more typical for this area: *Circaetus gallicus*, *Circus aeruginosus*, *Circus macrourus*, *Circus pygargus*.

There were recorded 29 protected species which can be found in the Annex 4B of the Ordinance 57/2007, like: *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Prunella modularis*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. Within the studied area the rarest species listed in this annex are: *Sturnus roseus*, *Motacilla cinerea*, *Locustella naevia*, *Locustella luscinioides*.

Another category includes the bird species not found in the two annexes of the Ordinance 57/2007, but listed in the Annex II of Law 13/ 1993, these being represented by: *Podiceps grisegena*, *Podiceps nigricollis* (caspicus), *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Caprimulgus europaeus*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Luscinia megarhynchos*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

The bird species which nest in the Măcin town area are represented by: *Ciconia ciconia*, *Falco vespertinus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Emberiza schoeniclus*, *Oenanthe oenanthe*, *Alauda arvensis*, *Melanocorypha calandra*, *Turdus philomelos*, *Turdus merula*, *Miliaria calandra*.

Research concerning the natural heritage of Mihai Bravu commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Road DN22 Tulcea-Babadag, DC 229

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: -

NATURA 2000 SITES: Deniz Tepe (Site of Community Interest, Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Mihai Bravu commune is characterized by the Middle Triassic deposits of whitish, grey and reddish limestone, rich in ammonites` fauna. The Early Jurassic deposits of loamy sandstone appear on a small surface in the north-eastern part of the area. The Upper Cretaceous limestones deposits which outcrop in the south south-western part of area are composed of the Cenomanian deposits of organogenic limestones, sandy limestone and marl limestones and these types of stones outcropping through the Quaternary loess layers that cover entire area.

Based on this rock substrata, the various types of territorial units of soil such as Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on limestone, Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Greic phaeozems (Greyi-luvic Phaeozems, after World Reference Base for Soil Resources – SR, 1998) occur. Along the Taița River on the alluvial deposits and alluvia there were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils.

LANDSCAPE

Within this commune's territory there can be noticed a certain contrast between the flat and mainly cultivated lowlands from the northern sector, which include also the Topraichioi Lake water body and the adjacent reed beds, respectively the rolling hills with steppe and wooded steppe vegetation from the southern sector. This last unit belongs to the Babadag Plateau, where the limestone sandstone outcrops especially on the summits and slopes of the hills, with a maximum altitude of 196 m, in the Aslamar Peak.

FLORA, VEGETATION, HABITATS

Nearly all the inventoried plant communities are framed community interest habitats, such as: 1530* (15.A21275), 62C0* (34.92), 91AA* (41.73723).

Most of the analysed habitats show signs of a low disturbance due to the human activities, in the case of steppe grasslands and reed beds. Still in the mesophil grasslands and sub-Mediterranean forests the level of human impact is medium, respectively high.

Some of the locations mentioned below are included in the Danube Delta site of community interest, like Topraichioi Lake, respectively within the Podișul Nord Dobrogean Site of Community Interest, such as Tâmpa Balar Bair Hill. The hills situated eastwards of the Balar Bair Valley are not framed into protected areas.

15.A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** plant community is endangered (F: +), as it was only identified so far on reduced areas close to the Topraichioi Lake. Even though the five ruderal species have a reduced dominance, the fact that they overpass in number the other native species indicates a medium disturbance due to grazing.

Key species: *Cynodon dactylon* (5; MBT).

Other species: *Calystegia sepium* (+; MBT), *Cichorium intybus* (+; MBT), *Daucus carota* subsp. *carota* (+; MBT), *Phragmites australis* (+; MBT), *Plantago major* (+; MBT), *Ranunculus sceleratus* (+; MBT), *Stellaria media* (+; MBT), *Xanthium italicum* (+; MBT).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** plant community can be estimated as vulnerable (F: I) within this territory where it was studied in the hills eastwards of Balar Bair Valley (VBB). The four rare threatened species, of which *Euphorbia nicaeensis* subsp. *cadrlateri* is also sub-endemic, represent another aspect that underline the high conservation value of these phytocoenoses, beside their priority community interest habitat status. A low disturbance due to human intervention is indicated by the three ruderal species with a reduced dominance.

Key species: *Festuca valesiaca* (3; VBB), *Medicago minima* (+; VBB).

Threatened species: *Euphorbia nicaeensis* subsp. *cadrlateri* (+; VBB), *Pimpinella tragium* subsp. *lithophila* (+; VBB), *Potentilla bornmuelleri* (+; VBB).

Other species: *Acinos arvensis* (+; VBB), *Anthemis austriaca* (+; VBB), *Asperula tenella* (+; VBB), *Bombycilaena erecta* (+; VBB), *Dichanthium ischaemum* (1; VBB), *Eryngium campestre* (+; VBB), *Leontodon crispus* (+; VBB), *Linum austriacum* (+; VBB), *Minuartia glomerata* (+; VBB), *Plantago lanceolata* (+; VBB), *Stipa capillata* (1; VBB), *Teucrium polium* (+; VBB), *Thymus pannonicus* (1; VBB).

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** is a vulnerable plant community (F: I) which was inventoried on the Tâmpa Balar Bair Hill (MBB). Its conservation value is enhanced by the three threatened species of which *Crocus reticulatus* is vulnerable, while the other two are rare at the national level.

Within this coenotaxon all these are considered endangered. The seven ruderal species indicate a low disturbance level as their dominance is reduced.

Key species: *Dichanthium ischaemum* (3; MBB).

Threatened species: *Centaurea napulifera* (+; MBB), *Crocus reticulatus* (+; MBB), *Thymus zygoides* (+; MBB).

Other species: *Centaurea solstitialis* (+; MBB), *Crysopogon gryllus* (+; MBB), *Crataegus monogyna* (+; MBB), *Cichorium intybus* (+; MBB), *Cynodon dactylon* (+; MBB), *Erodium cicutarium* (+; MBB), *Erophila verna* (+; MBB), *Eryngium campestre* (+; MBB), *Festuca valesiaca* (2; MBB), *Lamium amplexicaule* (+; MBB), *Orlaya grandiflora* (+; MBB), *Poa angustifolia* (+; MBB), *Poa bulbosa* (+; MBB), *Quercus pubescens* (+; MBB), *Stipa capillata* (+; MBB), *Taraxacum erythrospermum* (+; MBB), *Teucrium chamaedrys* (+; MBB).

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** is estimated as a vulnerable (F: II) coenotaxon within the Mihai Bravu commune, where it was recorded within the wooded pasture from the Tâmpa Balar Bair Hill (MBB). As the analyzed stand is totally derived there can be deduced a high disturbance at least in the tree layer. Still in the herbaceous layer the disturbance is low as the three ruderal species have a reduced dominance.

Key species: *Carpinus orientalis* (4; MBB).

Other species:

- trees: *Cerasus mahaleb* (±; MBB), *Fraxinus ornus* (1; MBB);

- grasses/ undershrubs: *Anthriscus cerefolium* (+; MBB), *Dactylis polygama* (+; MBB), *Dichanthium ischaemum* (±; MBB), *Festuca valesiaca* (±; MBB), *Geranium rotundifolium* (+; MBB), *Geum urbanum* (+; MBB), *Lamium purpureum* (+; MBB), *Leonurus cardiaca* (+; MBB), *Poa angustifolia* (±; MBB), *Ranunculus ficaria* (+; MBB), *Scilla bifolia* (+; MBB), *Teucrium polium* (±; MBB), *Veronica hederifolia* (+; MBB), *Viola suavis* (+; MBB).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** is estimated as a vulnerable coenotaxon within the Mihai Bravu commune where it occurs together with the related habitat 53.1111 Freshwater *Phragmites* beds represented by the same *Phragmites* community but mono-dominant, assessed also as vulnerable (F: I). Both occur within and adjacent to the Balta Toprachioi Lake (BT). Within the first habitat the only ruderal taxon *Daucus carota* subsp. *carota*, with a reduced dominance, shows a low disturbance.

Key species: *Phragmites australis* (5; MBT).

Other species: *Bolboschoenus maritimus* (+; MBT), *Calystegia sepium* (+; MBT), *Daucus carota* subsp. *carota* (+; MBT), *Ranunculus sceleratus* (+; MBT), *Salix cinerea* (+; MBT).

FAUNA

Birds. Within the studied avifauna of the administrative territory of the Mihai Bravu commune there were inventoried 57 bird species included in the Ordinance 57/2007, 28 species are strictly protected, being classified in Annex 3: *Ciconia nigra*, *Ciconia ciconia*, *Tadorna tadorna*, *Pernis apivorus*, *Circaetus gallicus*, *Circus cyaneus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Sterna hirundo*, *Asio flammeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Caprimulgus europaeus*, *Melanocorypha calandra*, *Lulula arborea*, *Oenanthe isabellina*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Among these, several species which confer a high conservation value to the area include: *Pernis apivorus*, *Circaetus gallicus*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Oenanthe isabellina*, *Oenanthe pleschanka*, *Sylvia nisoria*, *Emberiza hortulana*, *Anthus campestris*.

The other 29 species, requiring strict protection, as they are classified in the Annex 4, are: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

The rarest birds in this area included in this appendix are represented by: *Jynx torquilla*, *Motacilla cinerea*, *Prunella modularis*, *Sturnus roseus*, *Regulus regulus*, *Carduelis flammea*.

Bird species identified in the area which are not found in the two annexes of the Ordinance 57/2007 but listed in Annex II of Law 13/ 1993, are: *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

Mihai Bravu commune has an abundance of species and populations nesting in the area, among them being recorded: *Coracias garrulus*, *Dendrocopos syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Melanocorypha calandra*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Buteo buteo*, *Caprimulgus europaeus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia*

megarhynchos, Luscinia luscinia, Acrocephalus arundinaceus, Hippolais pallida, Sylvia curruca, Sylvia communis, Sylvia borin, Sylvia atricapilla, Parus caeruleus, Parus major, Certhia familiaris, Emberiza citrinella.

Research concerning the natural heritage of Mihail Kogălniceanu commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Road E87 Tulcea-Constanța

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: Dealul Deniztepe (nature reserve)

NATURA 2000 SITES: Deniz Tepe (Site of Community Interest, Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of M. Kogălniceanu commune is characterized by the Middle Triassic deposits of whitish, grey and reddish limestone, rich in ammonites fauna. The Paleozoic outcrops of granite gneisses occur on the outskirts of the Middle Triassic deposits (in anticlines) and on top of these appear the outcrop of the Upper Triassic (Carnian age) deposits of limestones with intercalations of clay schists. The Early Jurassic deposits of loamy sandstone appear on the south-western part of the area. These types of stones outcrop through the Quaternary loess layers that cover the entire area.

Based on these stones types, the various types of territorial units of soil such as Dystric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998), on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Rendzinic litosols (Eutric lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on limestone, Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Kastanic chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998) occur. Along the Telița River on the alluvial deposits and alluvia were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils.

LANDSCAPE

The landscape of this territory is mainly represented by a low plain used for agriculture, the natural habitats having a restricted distribution along several

permanent rivulets like Telița and Hagilar, where mesophylls grasslands occur on soils with a low salt concentration.

Within this plain emerge inselberg type isolated hills, like Deniztepe (166 m), or ranges of eroded mountains, the highest of them being Uzunbair (223 m). On all hills occur steppe grasslands and very restricted thickets or forest remnants.

FLORA, VEGETATION, HABITATS

All the plant communities inventoried so far are framed into priority interest habitats such as: 1530* (15.A21275), 40C0* (31.8B721), 62C0* (34.92), 91AA* (41.73723).

Most of the analysed plant communities show a low disturbance level in the case of the steppe grasslands, where the exceptions are represented by *Artemisia austriacae*-*Poëtum bulbosae* and *Thymio pannonic-Chrysopogonetum grylli* with very high, respectively medium levels of human impact. The mesophil grasslands (*Trifolio fragifero-Cynodontetum*) have a medium level of disturbance, while the thickets (*Pruno spinosae-Crataegetum*) are low disturbed. A medium disturbance is also typical for the degraded forests (*Paeonio peregrinae-Carpinetum orientalis*).

The locations mentioned below, belong to the sites of community interest Deniz Tepe (Dealul Deniztepe nature reserve), respectively Dealurile Agighiolului (including Uzunbair Hill). The floodplain of the Hagilar rivulet and Dealul Găvana Mare are situated outside protected areas.

15. A21275 Western Pontic *Cynodon* saline beds

Trifolio fragifero-Cynodontetum Br.-Bl. et Bolos 1958 is a vulnerable plant community that was studied in the floodplain of Hagilar rivulet, being also observed close to Rândunica Village (MKH). Within this coenotaxon with a restricted diversity, the two ruderal species represent half of the inventory, so they indicate a medium disturbance due to grazing.

Key species: *Cynodon dactylon* (5; MKH).

Other species: *Cichorium intybus* (+; MKH), *Potentilla reptans* (+; MKH), *Stellaria media* (+; MKH).

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub)

Pruno spinosae-Crataegetum Soó (1927) 1931 is considered a vulnerable plant community, being registered from Uzunbair Hill (Dealul Uzunbair). Its conservation value consists, among others, in the presence of three threatened taxa, of which *Crocus reticulatus* and *Paeonia peregrina* are also vulnerable. Three ruderal species with reduced dominance show a low degree of disturbance from this point of view.

Key species: *Crataegus monogyna* (3; MKU), *Prunus spinosa* (1; MKU).

Threatened species: *Asparagus verticillatus* (+; MKU), *Crocus reticulatus* (+; MKU), *Paeonia peregrina* (+; MKU).

Other species:

- shrubs/ lianas: *Carpinus orientalis* (1; MKU), *Cornus mas* (+; MKU), *Evonymus verrucosus* (+; MKU), *Ligustrum vulgare* (+; MKU), *Rosa canina* (+; MKU);

- grasses/ undershrubs: *Agropyron cristatum* (+; MKU), *Artemisia austriaca* (+; MKU), *Festuca valesiaca* (1; MKU), *Marrubium vulgare* (+; MKU), *Scilla bifolia* (+; MKU), *Stellaria media* (+; MKU), *Teucrium chamaedrys* (+; MKU), *Veronica hederifolia* (+; MKU).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941**, a vulnerable plant community in the analyzed situations, within the northern part of Dealurile Agighiolului site of community interest (MKA), shelters only one rare threatened species the low disturbance is shown by only one ruderal species with a low dominance.

Key species: *Festuca valesiaca* (5; MKA).

Threatened species: *Thymus zygioides* (+; MKA).

Other species: *Dichanthium ischaemum* (1; MKA), *Eryngium campestre* (+; MKA), *Poa bulbosa* (+; MKA), *Sanguisorba minor* (+; MKA), *Stipa capillata* (+; MKA), *Teucrium chamaedrys* (+; MKA), *Teucrium polium* (+; MKA).

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** is a vulnerable plant community studied at Uzunbair Hill (MKU) and Dealul Deniztepe nature reserve (DDt), but observed also close to Rândunica locality. The conservation value of this coenotaxon is underlined mainly by the three threatened species, considered rare at the national level of which *Crocus reticulatus* is vulnerable. While for this coenotaxon *Colchicum triphyllum* is critically endangered, the other two are endangered. A low level of disturbance is indicated by the seven ruderal species with a reduced dominance.

Key species: *Dichanthium ischaemum* (4-5; MKU, DDt).

Threatened species: *Centaurea napulifera* (±; MKU), *Colchicum triphyllum* (r; MKU), *Crocus reticulatus* (+; MKU, DDt), *Paeonia peregrina* (±; MKU).

Other species: *Bombycilaena erecta* (+; DDt), *Chrysopogon gryllus* (+; DDt), *Cichorium intybus* (+; MKU), *Cynodon dactylon* (+; DDt), *Digitalis lanata* (+; DDt), *Eryngium campestre* (+; MKU, DDt), *Euphorbia glareosa* subsp. *glareosa* (+; MKU), *Festuca valesiaca* (+-1; MKU, DDt), *Lamium purpureum* (+; DDt), *Marrubium peregrinum* (+; MKU), *Poa bulbosa* (+; DDt), *Stellaria media* (+; DDt), *Stipa capillata* (+; MKU), *Taraxacum erythrospermum* (+; DDt), *Teucrium chamaedrys* (+; MKU), *Teucrium polium* (+; MKU), *Thymus pannonicus* (+; MKU).

***Artemisio austriacae-Poëtum bulbosae* Pop 1970** can be considered a vulnerable plant community within the studied area, where it was identified on the Găvana Mare Hill (Dealul Găvana Mare), close to Rândunica Village (MKG). There only one rare threatened species was identified, this being endangered within the respective coenotaxa. There can be observed a process of non-native species (*Elaeagnus angustifolia*) invasion, with a low rate. A high level of ruderal plants invasive tendencies can be deduced from the numerous such taxa that prevail within the inventory (six species) of which *Poa bulbosa* and *Artemisia austriaca* are dominant key species.

Key species: *Artemisia austriaca* (1; MKG), *Poa bulbosa* (4; MKG).

Threatened species: *Ornithogalum sibthorpii* (1; MKG).

Other species: *Bassia prostrata* (+; MKG), *Bombycilaena erecta* (+; MKG), *Dichanthium ischaemum* (+; MKG), *Elaeagnus angustifolia* (+; MKG), *Erodium cicutarium* (+; MKG), *Eryngium campestre* (+; MKG), *Marrubium peregrinum* (+; MKG), *Ranunculus oxyspermus* (+; MKG), *Stellaria media* (+; MKG).

***Stipetum capillatae* (Hueck 1931) Krausch 1961** represents an endangered plant community within the studied territory (F: +) where the two ruderal species show a low level of invasive trend due to these kind of taxa.

Key species: *Stipa capillata* (4; MKA).

Other species: *Cynodon dactylon* (+; MKA), *Dichanthium ischaemum* (1; MKA), *Eryngium campestre* (+; MKA), *Festuca valesiaca* (1; MKA), *Marrubium peregrinum* (+; MKA), *Teucrium chamaedrys* (+; MKA), *Teucrium polium* (+; MKA).

***Thymio pannonici-Chrysopogonetum grylli* Doniță et alii 1992** plant community is considered endangered (F: +) within Deniztepe nature reserve, where only one rare threatened species was identified, estimated as endangered within the respective phytocoenosis. There can be deduced a low disturbance due to presence of one non-native taxa. The five ruderal species with a significant dominance variation (+-1) indicate a medium degree of this kind of species invasive tendencies.

Key species: *Chrysopogon gryllus* (3; DDt).

Threatened species: *Gagea szovitzii* (+; DDt).

Other species: *Achillea coarctata* (+; DDt), *Ailanthus altissima* (+; DDt), *Artemisia austriaca* (+; DDt), *Bombycilaena erecta* (+; DDt), *Dichanthium ischaemum* (1; DDt), *Digitalis lanata* (+; DDt), *Erophila verna* (+; DDt), *Eryngium campestre* (+; DDt), *Lamium amplexicaule* (+; DDt), *Poa bulbosa* (1; DDt).

41.73723 Moesian *Paeonia peregrina* - white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** plant community can be considered an endangered coenotaxon within the Mihail Kogălniceanu commune, where it was identified so far only on Uzunbair Hill (Dealul Uzunbair – MKU) as a partially derived phytocoenosis. This indicates a medium level of human impact, at least in the three layers. Still, in the herbaceous layer there is a low level of ruderal species invasion, these being represented by two taxa with a reduced dominance.

Key species: *Carpinus orientalis* (4; MKU), *Quercus pubescens* (1; MKU).

Threatened species: *Asparagus verticillatus* (+; MKU).

Other species:

- shrubs/ lianas: *Crataegus monogyna* (+; MKU), *Evonymus verrucosus* (+; MKU), *Rosa canina* (+; MKU), *Viburnum lantana* (+; MKU);

- grasses/ undershrubs: *Digitalis lanata* (+; MKU), *Festuca valesiaca* (+; MKU), *Fragaria viridis* (+; MKU), *Poa angustifolia* (+; MKU), *Scilla bifolia* (+; MKU), *Veronica hederifolia* (+; MKU), *Viola arvensis* (+; MKU).

FAUNA

Birds. On the administrative territory of the Mihail Kogălniceanu commune there were recorded 63 species of birds found in appendices 3 and 4B of the Ordinance 57/2007.

The strictly protected bird species identified in the area, which can be found in the Annex 3 (31 species) are: *Ciconia nigra*, *Ciconia ciconia*, *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Burhinus oedicephalus*, *Asio flammeus*, *Caprimulgus europaeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Melanocorypha calandra*, *Lulula arborea*, *Oenanthe isabellina*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Of the species listed above, the rarest for this area are: *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco peregrinus*, *Burhinus oedicephalus*, *Asio flammeus*, *Oenanthe isabellina*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*.

There were observed 32 protected species listed in the Annex 4B of the Ordinance 57/2007, as follows: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombycilla garrulus*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Regulus ignicapillus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Corvus corax*, *Passer hispaniolensis*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. Some of the rarest birds in this annex for this area are: *Jynx torquilla*, *Motacilla cinerea*, *Bombycilla garrulus*, *Prunella modularis*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Regulus regulus*, *Regulus ignicapillus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis spinus*, *Carduelis flammea*.

Identified bird species not found in the two annexes of the Ordinance 57/2007 but listed in the Annex II of the Law 13/ 1993, are: *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Apus melba*, *Dendrocopos major*, *Picoides tridactylus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Ficedula hypoleuca*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

Of the bird species that nest in the Mihail Kogălniceanu area some of the most important are: *Burhinus oedicephalus*, *Asio flammeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*,

Phylloscopus sibilatrix, Phylloscopus collybita, Muscicappa striata, Oriolus oriolus, Miliaria calandra, Serinus serinus, Carduelis spinus, Carduelis chloris, Carduelis cannabina, Carduelis carduelis, Hirundo rustica, Delichon urbica, Saxicola rubetra, Oenanthe oenanthe, Luscinia megarhynchos, Sylvia curruca, Sylvia borin, Sylvia atricapilla, Parus caeruleus, Parus major, Emberiza citrinella.

Research concerning the natural heritage of Nufăru commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Road DJ 222C Tulcea-Murighiol

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:
Danube Delta Biosphere Reserve

NATURA 2000 SITES: Delta Dunării (Site of Community Interest, Special Protection Area), Beștepe-Mahmudia (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Nufăru commune is characterized by the Devonian deposits of silicolite (in the central part) and Lower Triassic outcrops characterized by the presence of the green polymictic conglomerates, on the north-western part. On the remaining area the green phyllitic clay and limestone these are added to the Middle Triassic deposits of blackish-grey limestone and micritic limestone those occur through the Quaternary loess layers.

Within the mainland side, the great diversity of rock types is reflected in a greater variety of territorial units of soil such as Typical Kastanozems, Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), as well as Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-alluvial gley soils those were formed on Holocene deposits of siltite along Sf. Gheorghe branch.

LANDSCAPE

Most of this commune's territory is represented by artificial habitats, respectively agriculture fields or forestry plantations that have replaced the native vegetation of wetlands, northwards of the Sf. Gheorghe branch of the Danube, respectively the steppe grasslands, that previously occurred southwards, on Tulcea hills unit, these being also affected by wind farms.

Important areas of natural habitats can still be observed northwards and along the Danube, mainly represented by white willow forests, but also by white poplar stands. Eastwards of the commune, the Danube floodplain recovered wetlands are dominated by reed beds and reed mace beds, while on the riverbanks meet grasslands of *Elymus repens* and *Poa sylvicola*. Natural steppe grasslands occur on the slopes adjacent to these latest wetlands, but most of them are found on the wooded steppe pastures from the hills that surround the Curcuz Forest. This small forest is dominated by sub-Mediterranean white oak woods on the slopes, respectively wooded steppe forest stands of *Quercus pedunculiflora* along the valleys. This unexpected forest environment within a wider steppe landscape, together with the restricted limestone outcrops areas, which also include several small caves, has a major scenic importance within this territory, like also the panorama of the Danube floodplain, visible from these hills.

FLORA, VEGETATION, HABITATS

Even if they occur on reduced areas the major part of the plant communities recorded in this territory belongs to different habitats of community interest, such as 92A0 (44.1621), mainly priority ones which include 40C0* (31.8B721), 62C0* (34.92, 34.9211), 91AA* (41.73723), 9110* (41.7A221).

The vulnerable habitats prevail within the recorded plant communities, followed by the endangered coenotaxa. Most of the plant communities are low disturbed, followed by the medium perturbed coenotaxa. There are only two plant communities representative for a natural status, and just one that shows a high disturbance. The major part of the plant communities has no threatened species. The only exception is represented by five coenotaxa which have between one and three threatened species, nearly all being endangered.

All the locations mentioned from the Danube floodplain are included in the Danube Delta Site of Community Interest, while those indicated from the Curcuz Forest area and the loess plateau adjacent to the Danube floodplain belong to the Beștepe-Mahmudia special protection area.

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931** plant community can be estimated as endangered (F: +) within the Nufăru commune. It was analysed on the slopes of the loess plateau adjacent to the Danube floodplain (NTL). Four ruderal species with a low dominance indicate a low disturbance from this point of view.

Key species: *Prunus spinosa* (4; NTL).

Other species:

- shrubs: *Rhamnus cathartica* (+; NTL), *Ulmus procera* (+; NTL);
 - grasses/ undershrubs: *Bromus japonicus* (+; NTL), *Coronilla varia* (+; NTL), *Dactylis glomerata* (+; NTL), *Eryngium campestre* (+; NTL), *Euphorbia agraria* (+; NTL), *Cruciata pedemontana* (+; NTL), *Iris variegata* (+; NTL), *Marrubium peregrinum* (+; NTL), *Phragmites australis* (+; NTL), *Poa angustifolia* (+; NTL), *Teucrium chamaedrys* (+; NTL), *Ulmus procera* (+; NTL).

34.92 Ponto-Sarmatic steppes

***Botriochloetum ischaemi* (Kist. 1937) Pop 1977** is a vulnerable (F: II) coenotaxon within Nufăru commune, where it is mainly concentrated in the grasslands adjacent to Curcuz Forest (Pădurea Curcuz-NPC). There, only one rare threatened species was identified, endangered within this coenotaxon. Grazing effects are obvious in the medium level of disturbance indicated by the nine ruderal species that represent more than half of the inventory, regardless of their reduced dominance.

Key species: *Dichanthium ischaemum* (5; NPC).

Threatened species: *Asparagus verticillatus* (+; NPC).

Other species: *Achillea setacea* (+; NPC), *Artemisia austriaca* (+; NPC), *Bassia prostrata* (+; NPC), *Berteroa incana* (+; NPC), *Chondrilla juncea* (+; NPC), *Chelidonium majus* (+; NPC), *Convolvulus arvensis* (+; NPC), *Crataegus monogyna* (+; NPC), *Cichorium intybus* (+; NPC), *Cynodon dactylon* (+; NPC), *Eryngium campestre* (+; NPC), *Euphorbia glareosa* subsp. *glareosa* (+; NPC), *Fallopia dumetorum* (+; NPC), *Galium humifusum* (+; NPC), *Teucrium chamaedrys* (+; NPC), *Xanthium italicum* (+; NPC).

***Stipetum capillatae* (Hueck 1931) Krausch 1961**, an endangered plant community, was identified on the loess plateau adjacent to the Danube floodplain (NTL) – Nufăru commune, where one rare threatened species was observed, this being endangered within the respective phytocoenosis. The five ruderal species having a restricted dominance show a low degree of invasive trend from this point of view.

Key species: *Stipa capillata* (4; NTL).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; NTL).

Other species: *Achillea setacea* (+; NTL), *Agropyron cristatum* (+; NTL), *Bromus japonicus* (+; NTL), *Campanula sibirica* (+; NTL), *Eryngium campestre* (+; NTL), *Cruciata pedemontana* (+; NTL), *Marrubium peregrinum* (+; NTL), *Orlaya grandiflora* (+; NTL), *Papaver dubium* (+; NTL), *Poa angustifolia* (+; NTL), *Pastinaca graveolens* (+; NTL), *Phlomis pungens* (+; NTL), *Salvia nemorosa* (+; NTL), *Senecio vernalis* (+; NTL), *Tragopogon dubius* (+; NTL), *Xeranthemum annuum* (1; NTL).

***Agropyretum pectiniformae* (Prodan 1939) Dihoru 1970** is considered a vulnerable (F: I) plant community within the Nufăru commune. It was studied on the loess plateau which borders the Danube floodplain (NTL). There were observed two rare threatened species at the national level, endangered within the respective phytocoenosis. The nine ruderal species have a reduced dominance, so there can be estimated that the coenotaxon is at the upper limit of the low invasive tendencies of this kind of taxa.

Key species: *Agropyron cristatum* (3; NTL).

Threatened species: *Asparagus verticillatus* (+; NTL), *Echinops ritro* subsp. *ruthenicus* (+; NTL).

Other species: *Bassia prostrata* (+; NTL), *Bromus japonicus* (+; NTL), *Campanula sibirica* (+; NTL), *Centaurea solstitialis* (+; NTL), *Cichorium intybus* (+; NTL), *Crataegus monogyna* (+; NTL), *Dactylis glomerata* (+; NTL), *Eryngium*

campestre (+; NTL), *Euphorbia seguieriana* (+; NTL), *Cruciata pedemontana* (+; NTL), *Koeleria macrantha* (+; NTL), *Iris variegata* (+; NTL), *Marrubium peregrinum* (+; NTL), *Poa bulbosa* (+; NTL), *Pastinaca graveolens* (+; NTL), *Phlomis pungens* (+; NTL), *Plantago lanceolata* (+; NTL), *Sisymbrium orientale* (+; NTL), *Stipa capillata* (+; NTL), *Sanguisorba minor* (+; NTL), *Tragopogon dubius* (+; NTL), *Ulmus minor* (+; NTL).

34.9211 Western Pontic thyme steppes

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974** is an endangered coenotaxon that was only identified in the limestone rocky areas of Curcuz Forest (NPC). From the three rare threatened species *Euphorbia myrsinites* is also vulnerable at the national level, being critically endangered in the studied phytocoenosis, while the other two are endangered. The three ruderal species having a reduced dominance indicate a low level of disturbance, like also the presence of non-native taxon (*Amaranthus retroflexus*).

Key species: *Polytrichum piliferum* (2; NPC).

Threatened species: *Asphodeline lutea* (+; NPC), *Euphorbia myrsinites* (+; NPC), *Myrrhoides nodosa* (+; NPC).

Other species: *Amaranthus retroflexus* (+; NPC), *Bromus sterilis* (+; NPC), *Cerasus mahaleb* (+; NPC), *Cleistogenes serotina* (1; NPC), *Portulaca oleracea* (+; NPC), *Tragus racemosus* (+; NPC), *Vinca herbacea* (+; NPC).

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** is a vulnerable (F: I) plant community within Nufăru commune's territory, which forms most of the compact stands of forest within Curcuz Forest area (NPC), where just one rare threatened species was identified, this being endangered within the analysed situations. As this coenotaxon is partially derived, it can be considered as medium disturbed, at least in the tree layer, while in the herbaceous layer no ruderal/ alien species were identified.

Key species: *Carpinus orientalis* (3; NPC), *Quercus pubescens* (1; NPC).

Threatened species: *Piptatherum virescens* (+; NPC).

Other species:

- trees: *Acer tataricum* (+; NPC), *Fraxinus ornus* (1; NPC), *Ulmus procera* (+; NPC);
- shrubs: *Crataegus monogyna* (+; NPC);
- grasses/ undershrubs: *Brachypodium sylvaticum* (+; NPC), *Dactylis polygama* (+; NPC), *Glechoma hirsuta* (+; NPC), *Geum urbanum* (+; NPC).

41.7A221 Pontic *Acer tataricum-Quercus pedunculiflora* steppe woods

***Violo suavis-Quercetum pedunculiflorae* Doniță 1970** plant community is endangered (F: +) within Nufăru commune's territory, having a reduced distribution in the Curcuz Forest area (NPC), where it can be estimated as having a low level of disturbance due to the non-native species (*Conyza canadensis*). The five ruderal species show a medium degree of invasive tendencies, as their dominance is +-1.

Key species: *Acer tataricum* (1; NPC), *Quercus pedunculiflora* (2; NPC).

Other species:

- trees: *Acer campestre* (1; NPC), *Carpinus orientalis* (1; NPC), *Ulmus minor* (+; NPC);
- shrubs: *Cornus mas* (+; NPC), *Crataegus monogyna* (+; NPC), *Sambucus nigra* (+; NPC);
- grasses/ undershrubs: *Arctium lappa* (+; NPC), *Ballota nigra* (+; NPC), *Brachypodium sylvaticum* (+; NPC), *Conyza canadensis* (+; NPC), *Dactylis polygama* (+; NPC), *Glechoma hirsuta* (+; NPC), *Leonurus cardiaca* (+; NPC), *Lamium purpureum* (+; NPC), *Lychnis coronaria* (+; NPC), *Urtica dioica* (+; NPC).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924** plant community, considered vulnerable (F: I) within the Nufăru commune's territory, was inventoried in the Danube floodplain, along the Danube (NLD). The two non-native species (*Fraxinus americana*, *Morus alba*) show a low disturbance from this point of view.

Key species: *Salix alba* (5; NLD).

Other species:

- trees: *Fraxinus americana* (+; NLD), *Morus alba* (+; NLD);
- shrubs: *Rubus caesius* (+; NLD);
- grasses/ undershrubs: *Bidens tripartita* (+; NLD), *Calystegia sepium* (+; NLD), *Poa sylvicola* (+; NLD), *Solanum dulcamara* (+; NLD).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community framed within this habitat is represented by the reed beds permanently flooded, these being observed in the Danube floodplain eastwards of the Nufăru locality, being considered a vulnerable coenotaxon. As the analysed situations were all mono-dominant, no plot was inventoried.

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community, vulnerable (F: I) within the Nufăru commune's territory, can be considered as representative, as no alien/ ruderal taxa were inventoried.

Key species: *Phragmites australis* (5; NLD).

Other species: *Atriplex hastata* (+; NLD), *Alisma plantago-aquatica* (+; NLD), *Calystegia sepium* (+; NLD), *Lycopus europaeus* (+; NLD), *Mentha aquatica* (+; NLD), *Poa sylvicola* (+; NLD), *Rumex palustris* (+; NLD), *Schoenoplectus lacustris* (+; NLD), *Typha angustifolia* (+; NLD).

53.12 Common club rush beds

***Schoenoplectetum lacustris* Chouard 1924** is a vulnerable coenotaxon (F: I) within the Nufăru commune, identified in the Danube floodplain (NLD). As no ruderal/ alien species were observed, this phytocoenosis could represent an example of undisturbed vegetation.

Key species: *Schoenoplectus lacustris* (3; NLD).

Other species: *Lycopus europaeus* (+; NLD), *Mentha aquatica* (+; NLD), *Oenanthe aquatica* (+; NLD), *Poa sylvicola* (+; NLD), *Ranunculus sceleratus* (+; NLD), *Rumex palustris* (+; NLD), *Solanum dulcamara* (+; NLD), *Typha angustifolia* (+; NLD).

53.132 Lesser reed mace beds

***Typhetum angustifoliae* Pignatti 1953** is a vulnerable plant community (F: I) that was studied within the Danube floodplain (NLD) – Nufăru commune. There were inventoried a ruderal and a non-native species (*Fraxinus americana*) whose reduced dominance shows a low level of disturbance.

Key species: *Typha angustifolia* (5; NLD).

Other species:

- trees: *Fraxinus americana* (+; NLD), *Morus alba* (+; NLD);
- grasses/ undershrubs: *Alisma plantago-aquatica* (+; NLD), *Butomus umbellatus* (+; NLD), *Elymus repens* (+; NLD), *Fraxinus americana* (+; NLD), *Stachys palustris* (+; NLD), *Lysimachia nummularia* (+; NLD), *Mentha aquatica* (+; NLD), *Potentilla reptans* (+; NLD), *Rorippa sylvestris* (+; NLD), *Sium latifolium* (+; NLD), *Teucrium scordium* (+; NLD).

Plant communities which are not framed into the Palaearctic habitat classification

***Agropyretum repentis* Felföldy 1942** plant community can be considered a vulnerable coenotaxon within the Danube floodplain (NLD) of Nufăru commune. There can be estimated a high level of disturbance due to the ruderal species which prevail in the inventory, while they also reach a dominant position (*Elymus repens*).

Key species: *Elymus repens* (4; NLD).

Other species: *Hordeum murinum* (+; NLD), *Lysimachia nummularia* (+; NLD), *Mentha pulegium* (+; NLD), *Plantago major* (+; NLD), *Poa sylvicola* (+; NLD), *Potentilla reptans* (+; NLD), *Sisymbrium orientale* (+; NLD), *Vicia angustifolia* (+; NLD), *Xanthium italicum* (+; NLD).

***Poëtum sylvicolae* Buia et Al. 1959** is a vulnerable (F: I) plant community in the Nufăru commune territory that was inventoried within the Danube floodplain (NLD). There the ruderal species (four taxa) are more numerous than the other native ones and so they indicate a medium disturbance level, despite their reduced dominance.

Key species: *Poa sylvicola* (5; NLD).

Other species: *Dactylis glomerata* (+; NLD), *Hordeum murinum* (+; NLD), *Ononis arvensis* (+; NLD), *Taraxacum officinale* (+; NLD), *Verbena officinalis* (+; NLD), *Xanthium italicum* (+; NLD).

FAUNA

Birds. On the administrative territory of the Nufăru commune there were identified 96 bird species included in the appendices 3 and 4B of the Ordinance 57/2007. Of these, a total number of 59 species are strictly protected, being listed into the Appendix 3, such as: *Gavia stellata*, *Phalacrocorax pygmaeus*, *Ixobrychus*

minutus, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna caspia*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*.

Some of the rarest species listed above which give a high conservation value to this area are: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Platalea leucorodia*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus macrourus*, *Circus pygargus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco peregrinus*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hibridus*, *Asio flammeus*, *Dendrocopos medius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*.

There were identified 37 protected species, from the Annex 4B of the Ordinance 57/2007, representing animal and plant species which require strict protection: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

The rarest species in the area, included in this appendix include: *Motacilla cinerea*, *Bombycilla garrulus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Muscicapa striata*, *Corvus corax*, *Passer hispaniolensis*, *Carduelis cannabina*, *Carduelis flammea*.

A number of bird species observed here are not included in the two annexes of the Ordinance 57/2007, but can be found in Annex II of Law 13/ 1993, such as: *Podiceps grisegena*, *Podiceps nigricollis*, *Bubulcus (Ardeola) ibis*, *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Caprimulgus europaeus*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*,

Hirundo daurica, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Species which certainly or probably nest in the Nufăru commune's territory include: *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Circus aeruginosus*, *Sterna hirundo*, *Chlidonias niger*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Dryocopus martius*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Riparia riparia*, *Hirundo rustica*, *Hirundo daurica*, *Delichon urbica*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Mammals. Within the Nufăru commune's territory, 15 species were observed, respectively: *Myotis myotis*, *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Lepus europaeus*, *Ondatra zibethicus*, *Mycromys minutus*, *Mus musculus*, *Rattus norvegicus*, *Apodemus agrarius*, *Canis aureus*, *Vulpes vulpes*, *Nyctereutes procyonoides*, *Mustela putorius*, *Sus scrofa*, *Capreolus capreolus*. Strictly protected species of mammals identified there, which can be found in Annex 3 of the Ordinance 57/2007, are: *Myotis myotis* și *Lutra lutra*. The species which require a strict protection, included in Annex 4A, are represented by: *Nyctalus noctula* and *Pipistrellus pipistrellus*.

Research concerning the natural heritage of Ostrov commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT, Mariana CUZIC

ACCESS: Road DN22A, DN22F and DN22D Tulcea-Cerna, DJ222B Cerna-Ostrov

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: -

NATURA 2000 SITES: Brațul Măcin (Site of Community Interest), Dunărea Veche-Brațul Măcin (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Ostrov commune is characterized by the Upper Proterozoic metamorphic deposits of green schist or greenish phyllite these outcropping through the Quaternary loess layers which cover central-southern part of the area. The western part of the area is occupied by the Holocene psamopelitic deposits.

Based on these substrata types, the various territorial units of soil occur in this area, such as Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998). Along the Danube River on the alluvial deposits and alluvia there were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

The artificial habitats prevail within the territory of the commune, being mainly represented by arable fields and forestry plantations in the area of the former steppe grasslands and wetlands of the Danube floodplain. The remaining natural habitats are represented by white willow and black or white poplars adjacent to the Danube or reed beds along the rivulets. The slopes of the hills or loess terraces which were not used for agriculture still conserve steppe grasslands adjacent to the Danube floodplain, or concentrated in the north-eastern sector on the feet of the Ghiunghiurmez Hill or in the southern part of this territory, mainly along the Valea Roștilor rivulet, where also some more mesophil grasslands of *Poa pratensis* occur.

FLORA, VEGETATION, HABITATS

Most of the plant communities that were identified within this territory are framed into community interest habitats like 92A0 (44.1621 and 44.6612), including priority ones like 62C0* (34.92, 34.9211).

As they are spread on restricted areas, the major part of the plant communities is considered endangered or vulnerable coenotaxa, except the rare *Agropyro-Kochietum prostratae*. Most of them have no threatened species, except four plant communities which have between one and five such taxa, mostly endangered locally. The influence of grazing is obvious, as the majority of the plant communities have a medium level of disturbance, followed by low, respectively highly disturbed coenotaxa.

34.92 Ponto-Sarmatic steppes

***Cynodonti-Poëtum angustifoliae* Rapaics ex Soó 1957** can be considered a vulnerable plant community within the Ostrov commune, there being analysed

within the Valea Roștilor (VRO) area. A medium disturbance is shown by the six ruderal taxa that prevail within the inventory, with dominance variation of ± 1 .

Key species: *Cynodon dactylon* (1; VRO), *Poa angustifolia* (4; VRO).

Other species: *Bromus tectorum* (+; VRO), *Cichorium intybus* (+; VRO), *Convolvulus arvensis* (+; VRO), *Carduus thoermeri* (+; VRO), *Galium humifusum* (+; VRO), *Plantago lanceolata* (+; VRO), *Poa pratensis* (1; VRO).

Botriochloetum (Andropogonetum) ischaemi (Kist. 1937) Pop 1977, a vulnerable plant community, was studied within Movila Mavrodin (MM) and close to the Dealul Ghiunghiurmez areas (DGO). Its conservation value is enhanced by three rare threatened species, of which *Ornithogalum amphibolum* has a European importance, all being endangered within these phytocoenoses. The reduced dominance of the nine ruderal species indicates still a low influence of grazing.

Key species: *Dichanthium ischaemum* (4; MM, DGO), *Echinops ritro* subsp. *ruthenicus* (+; MM), *Ornithogalum amphibolum* (+; MM), *Thymus zygoides* (+; DGO).

Other species: *Acinos arvensis* (+; MM), *Bassia prostrata* (+; MM), *Campanula sibirica* (+; MM), *Cichorium intybus* (+; DGO), *Crepis sancta* (+; MM), *Eryngium campestre* (+; DGO), *Erysimum diffusum* (+; MM, DGO), *Euphorbia agraria* (+; MM), *Euphorbia seguieriana* (+; DGO), *Festuca valesiaca* (1; MM, DGO), *Galium aparine* (+; MM), *Haplophyllum suaveolens* (+; DGO), *Koeleria macrantha* (+; DGO), *Leontodon crispus* (+; DGO), *Linum austriacum* (+; MM), *Melica ciliata* (+; DGO), *Phleum phleoides* (+; MM), *Poa bulbosa* (+; MM), *Senecio vernalis* (+; MM, DGO), *Tragopogon dubius* (+; DGO), *Verbascum phoeniceum* (+; DGO), *Viola arvensis* (+; MM).

Artemisia austriacae-Poëtum bulbosae Pop 1970, considered a vulnerable plant community within the studied territory, was observed in the Valea Roștilor area (VRO), being typical for a high level of disturbance due to grazing, indicated by the nine ruderal species, of which two are dominant/ key taxa.

Key species: *Artemisia austriaca* (1; VRO), *Poa bulbosa* (2; VRO).

Other species: *Arenaria serpyllifolia* (+; VRO), *Bombycilaena erecta* (+; VRO), *Bromus tectorum* (1; VRO), *Cerastium dubium* (+; VRO), *Cerastium pumilum* (+; VRO), *Eryngium campestre* (+; VRO), *Euphorbia seguieriana* (+; VRO), *Galium humifusum* (+; VRO), *Hordeum murinum* (+; VRO), *Lamium amplexicaule* (+; VRO), *Medicago minima* (+; VRO), *Senecio vernalis* (+; VRO), *Veronica dillenii* (+; VRO).

Agropyretum pectiniformae (Prodan 1939) Dihoru 1970 is an endangered coenotaxon in this territory, being studied within Movila Mavrodin area (MM), where *Ornithogalum amphibolum*, a threatened species of European importance, was identified. A medium degree of ruderal taxa invasive tendencies can be observed, as the seven such species have a significant dominance variation (± 1).

Key species: *Agropyron cristatum* (3; MM).

Threatened species: *Ornithogalum amphibolum* (+; MM).

Other species: *Artemisia austriaca* (+; MM), *Bromus tectorum* (+; MM), *Bassia prostrata* (+; MM), *Bromus squarrosus* (+; MM), *Crepis sancta* (+; MM), *Dichanthium ischaemum* (+; MM), *Erysimum diffusum* (+; MM), *Euphorbia seguieriana* (+; MM), *Festuca valesiaca* (+; MM), *Galium aparine* (+; MM), *Linaria*

genistifolia (+; MM), *Linum austriacum* (+; MM), *Medicago minima* (+; MM), *Poa bulbosa* (+; MM), *Senecio vernalis* (+; MM), *Xeranthemum annuum* (+; MM).

***Agropyro cristati-Kochietum prostratae* Zólyomi 1958** a rare plant community within the studied territory, was analysed at Movila Mavrodin (MM), where one threatened species of European importance was identified, this being locally endangered within these phytocoenoses. A medium level of disturbance can be observed as shown by the presence of four ruderal species with a dominance of +-1.

Key species: *Agropyron cristatum* (1; MM), *Bassia prostrata* (2; MM).

Threatened species: *Ornithogalum amphibolum* (1; MM).

Other species: *Bromus squarrosus* (+; MM), *Cynanchum acutum* (+; MM), *Euphorbia seguieriana* (+; MM), *Erysimum diffusum* (+; MM), *Linum austriacum* (+; MM), *Medicago minima* (+; MM), *Bromus tectorum* (+; MM), *Poa bulbosa* (1; MM), *Senecio vernalis* (+; MM), *Xeranthemum annuum* (+; MM).

34.9211 Western Pontic thyme steppes

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974** was observed as an endangered coenotaxon within Valea Roștilor (VRO) and adjacent to the Dealul Ghiunghiurmez nature reserve (DGO). Its outstanding conservation importance is underlined by five rare threatened species of which the endemic *Campanula romanica* and *Dianthus nardiformis* have a European value, all these being locally endangered, except the vulnerable *Thymus zygoides*. Six ruderal species with a reduced dominance indicate a low disturbance level.

Key species: *Polytrichum piliferum* (2; VRO), *Sedum urvillei* subsp. *hillebrandtii* (1; VRO).

Threatened species: *Campanula romanica* (+; DGO), *Dianthus nardiformis* (+; VRO), *Festuca callieri* (+; DGO), *Koeleria lobata* (+; DGO), *Thymus zygoides* (+1; VRO).

Other species: *Achillea coarctata* (+; DGO), *Arenaria serpyllifolia* (+; VRO), *Bombycilaena erecta* (+; VRO), *Bromus squarrosus* (+; VRO), *Bromus tectorum* (+; VRO), *Cichorium intybus* (+; DGO), *Crataegus monogyna* (+; DGO), *Dichanthium ischaemum* (+; VRO), *Erodium cicutarium* (+; VRO), *Euphorbia seguieriana* (+; VRO), *Gypsophila pallasii* (+; VRO), *Lithospermum arvense* (+; VRO), *Medicago minima* (+; VRO), *Scleranthus perennis* (+; DGO), *Senecio vernalis* (+; DGO), *Thymus pannonicus* (+; VRO), *Verbascum banaticum* (+; DGO), *Veronica dillenii* (+; DGO).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** is a vulnerable plant community within the Ostrov territory, where it occurs along the Danube floodplain, being studied in the Piatra area (OLD). The non-native species influence is low, these being represented by *Fraxinus americana* and *Amorpha fruticosa*, with a reduced contribution to the canopy, indicating a low disturbance, as well as the only ruderal species, *Elymus repens*.

Key species: *Amorpha fruticosa* (+; OLD), *Salix alba* (5; OLD).

Other species:

- trees: *Fraxinus americana* (+; BLD);
- grasses/ undershrubs: *Elymus repens* (+; OLD), *Mentha aquatica* (+; OLD), *Rorippa amphibia* (+; OLD), *Solanum dulcamara* (+; OLD), *Stachys palustris* (+; OLD).

44.6612 Western Pontic white-black poplar galleries

***Populetum nigro-albae* Slavnic 1952**, an endangered vegetation type in this territory, was identified within the Danube floodplain, northwards of Ostrov (DVN). A low disturbance is indicated by ruderal (three species) and non-native species (*Fraxinus americana*).

Key species: *Populus alba* (2; DVN), *Populus nigra* (3; DVN).

Other species:

- grasses/ undershrubs: *Amorpha fruticosa* (+; DVN), *Rubus caesius* (+; DVN), *Elymus repens* (+; DVN), *Glechoma hederacea* (+; DVN), *Lysimachia nummularia* (+; DVN), *Myosoton aquaticum* (+; DVN), *Potentilla reptans* (+; DVN), *Rorippa sylvestris* (+; DVN), *Solanum dulcamara* (+; DVN).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** is an endangered coenotaxon within this commune, where it was studied along the Valea Roștilor rivulet (VRO). There it is nearly mono-dominant, no alien/ruderal taxa were identified that could indicate disturbance.

Key species: *Phragmites australis* (5; VRO).

Other species: *Calystegia sepium* (5; VRO).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926**, framed into this habitat, is endangered and medium disturbed within Valea Roștilor (VRO), as ruderal taxa prevail in its inventory, also with a significant dominance variation (+; 1).

Key species: *Phragmites australis* (4; VRO).

Other species: *Calystegia sepium* (+; VRO), *Bromus sterilis* (+; VRO), *Cynanchum acutum* (+; VRO), *Sambucus ebulus* (1; VRO), *Urtica dioica* (+; VRO).

Plant communities which are not framed within the Palaearctic habitat classification

***Poëtum pratensis* Răvăruț, Căzăceanu et Turenschi 1956**, a vulnerable plant community inventoried within Valea Roștilor (VRO), has a high disturbance level, as it is dominated by ruderal species, that include the key taxon *Poa pratensis*.

Key species: *Poa pratensis* (5; VRO).

Other species: *Achillea setacea* (+; VRO), *Capsella bursa-pastoris* (+; VRO), *Convolvulus arvensis* (+; VRO), *Cichorium intybus* (+; VRO), *Galium humifusum* (+; VRO), *Hordeum murinum* (+; VRO), *Mentha longifolia* (+; VRO), *Plantago lanceolata* (+; VRO), *Urtica dioica* (+; VRO).

FAUNA

Birds. On the territory of the Ostrov commune there were identified 66 species of birds mentioned in the appendices 3 and 4B of the Ordinance 57/2007. The strictly protected bird species identified in this territory, which can be found in Appendix 3 (34 species) are: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Egretta alba*, *Ciconia nigra*, *Ciconia ciconia*, *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Asio flammeus*, *Caprimulgus europaeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Melanocorypha calandra*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Of the species listed above, the rarest, which give a high conservation value to this area include: *Circaetus gallicus*, *Circus macrourus*, *Circus pygargus*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco peregrinus*, *Asio flammeus*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*.

There were observed a total of 31 protected species which can be found in Annex 4B of the Ordinance 57/2007, representing animal and plant species that require strict protection, as follows: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Regulus ignicapillus*, *Muscicappa striata*, *Sitta europaea*, *Oriolus oriolus*, *Corvus corax*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. Within this annex, some of the rarest for this area are: *Motacilla cinerea*, *Prunella modularis*, *Sturnus roseus*, *Phylloscopus trochilus*, *Muscicappa striata*, *Serinus serinus*, *Carduelis spinus*, *Carduelis flammea*.

Bird species which are not listed in the two annexes of the Ordinance 57/2007, but can be found in Annex II of Law 13/ 1993, are: *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Dendrocopos major*, *Picoides tridactylus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*.

The bird species that nest on the territory of Ostrov commune, such as: *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Dryocopus martius*, *Melanocorypha calandra*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Muscicappa striata*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*,

Serinus serinus, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Buteo buteo*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia borin*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Emberiza citrinella*.

Research concerning the natural heritage of Smârdan commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Road DN22/E87 Tulcea-Măcin

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: -

NATURA 2000 SITES: Brațul Măcin (Site of Community Interest) Dunărea Veche
- Brațul Măcin (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Smârdan commune is characterized by the Holocene psamo-pelitic deposits these underlying the alluvial deposits and alluvia where there were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-alluvial gley soils and Gleyed chernozems.

LANDSCAPE

Most of the Smârdan territory represents agriculture fields which have replaced the former wetland vegetation of the Danube floodplain. The natural habitats occur on a very restricted surface, mainly in the western part of the commune, in the free flooding areas situated between the riverbanks of the Danube and the dikes. Even in these areas most of the habitats are artificial, being represented by forestry plantations. The remaining natural habitats are represented only by a few plant communities with a low diversity of species, mainly represented by willow forests and several types of wetland meadows.

FLORA, VEGETATION, HABITATS

Even though the natural habitats occur on restricted areas, most of them are framed into community interest habitats, such as 3270 (24.52) and 90A0 (44.1621), some of them being priority ones, like 1530* (15.A21275). Still, their overall conservation status can be estimated as unfavourable, as they occur on restricted areas, all being vulnerable in the analysed territory. Also half of them are highly disturbed, while the other half shows a medium level from the ruderal species invasive trend point of view. The non-native species proportion and dominance are low for most of them, these being absent from only one plant community.

The locations where the habitats were inventoried are situated outside protected areas/*Natura 2000* sites.

15. A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** is a vulnerable plant community within the free flooding Danube floodplain (SLD). A medium level of disturbance due to grazing can be estimated as the ruderal taxa prevail in the species inventory, with a significant dominance variation (+-1). To this it can be added a low level of invasion of the alien species, these being represented by *Ambrosia artemisiifolia* and *Conyza canadensis*, both with a low dominance.

Key species: *Cynodon dactylon* (4;SLD), *Trifolium fragiferum* (+; SLD).

Other species: *Ambrosia artemisiifolia* (+; SLD), *Artemisia annua* (±; SLD), *Chenopodium album* (+; SLD), *Conyza canadensis* (±; SLD), *Mentha pulegium* (±; SLD), *Plantago major* (1; SLD), *Polygonum aviculare* (+; SLD), *Potentilla reptans* (+;SLD), *Pulicaria dysenterica* (+; SLD), *Rorippa sylvestris* (+; SLD), *Xanthium italicum* (1; SLD).

24.52 Euro-Siberian annual river mud communities

***Echinochloo-Polygonetum lapathifolii* Soó et Esiirös 1974** is a vulnerable coenotaxon within the Danube floodplain (SLD), highly disturbed as the dominant species are considered ruderal. Together with *Xanthium italicum*, these three species represent half of the species inventory that shows a medium disturbance level.

Key species: *Echinochloa crus-galli* (5;SLD), *Polygonum lapathifolium* (+; SLD).

Other species: *Bidens tripartita* (+; SLD), *Salix alba* (+; SLD), *Stachys palustris* (+; SLD), *Xanthium italicum* (+; SLD).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** is a vulnerable plant community within the Smârdan territory, where it was mainly observed and studied in the free floodplain regime part of the Danube floodplain (SLD). There can be estimated a medium disturbance, indicated by the dominance variation (+-1), as well as by five ruderal species which are equal in number with the typical taxa for this plant community. The two alien species, *Amorpha fruticosa* and *Fraxinus americana* show a low invasion process.

Key species: *Amorpha fruticosa* (+; SLD), *Salix alba* (4; SLD).

Other species:

- trees: *Fraxinus americana* (+; SLD);

- grasses: *Alisma plantago-aquatica* (+; SLD), *Bidens tripartita* (+; SLD), *Echinochloa crus-galli* (1; SLD), *Elymus repens* (+; SLD), *Mentha aquatica* (+; SLD), *Polygonum lapathifolium* (+; SLD), *Rorippa sylvestris* (+; SLD), *Solanum dulcamara* (+;SLD), *Xanthium italicum* (+;SLD).

Plant communities which are not framed within the Palaearctic habitats classification

***Xanthietum italicii* Timár 1950**, studied in the Danube floodplain (SLD), represents a vulnerable plant community, typical for a high degree of disturbance,

as it contains two ruderal species, of which one is dominant. There can be deduced also a low invasive trend of the non-native taxa like *Ambrosia artemisiifolia* and *Amorpha fruticosa*, both with a low dominance.

Key species: *Xanthium italicum* (4; SLD).

Other species: *Ambrosia artemisiifolia* (+; SLD), *Amorpha fruticosa* (+; SLD), *Glycyrrhiza echinata* (+; SLD), *Mentha pulegium* (+; SLD), *Plantago major* (+; SLD), *Pulicaria dysenterica* (+; SLD).

FAUNA

Birds. Within the Smârdan area there were identified 81 species of birds which are found in the appendices 3 and 4B of the Ordinance 57/2007. The strictly protected bird species recorded in the area, listed in the Annex 3 (48 species), are: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus olor*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Porzana porzana*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*, *Melanocorypha calandra*, *Anthus campestris*, *Phoenicurus phoenicurus*.

Among the rare species, which give a high conservation value to the area, there can be quoted: *Ixobrychus minutus*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Luscinia svecica*.

There were observed 33 protected species which can be found in the Annex 4B of the Ordinance 57/2007, that represent animal and plant species requiring strict protection: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Prunella modularis*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. The rarest bird species therein for the area are: *Motacilla cinerea*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*.

Identified bird species not found in the two annexes of the Ordinance 57/2007, but listed in the Annex II of Law 13/ 1993 which ratifies the Berne Convention, are represented by: *Podiceps grisegena*, *Podiceps nigricollis* (*caspicus*), *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Charadrius dubius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Calidris ferruginea*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*,

Saxicola rubetra, *Saxicola torquata*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Hippolais icterina*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Ficedula hypoleuca*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Some of the bird species which nest in the Smârdan area are represented by: *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Dryocopus martius*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Luscinia megarhynchos*, *Acrocephalus schoenobaenus*, *Acrocephalus arundinaceus*, *Hippolais pallid*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza schoeniclus*, *Oenanthe oenanthe*, *Alauda arvensis*, *Melanocorypha calandra*, *Turdus philomelos*, *Turdus merula*, *Miliaria calandra*.

Research concerning the natural heritage of Sulina town

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Waterway Sulina branch

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:
Danube Delta Biosphere Reserve

NATURA 2000 SITES: Danube Delta (Site of Community Interest, Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Sulina town is characterized by the Late Pleistocene sands and pelite deposits and Holocene deposits of siltite those underlying the following types of territorial units of soil such as Calcareous partially shifting sands, Calcareous psammosols, Calcareous marshy peaty psammosols, Calcareous-marshy alluvial gley soils, Semisubmerged-histic alluvial gley soils, Potentially sulfatic acid histosols, Potentially acid hemic-fibric histosols on continental part, as well as Calcareous sandy limnosols and Sali-sodic limnosols in the Musura Bay.

LANDSCAPE

Sulina territory is framed within the fluvial-maritime delta, being dominated by extensive reed beds. These include some of the largest floating reed beds in the Danube Delta, developed adjacent to the numerous lakes, usually larger and deeper than in the more evolved fluvial delta. This dominant fixed or floating reed beds and lakes, with narrow riparian forests of white willow *Salix alba* or grey willow *Salix cinerea* scrubs, are mainly typical for the areas situated southwards of the Sulina branch of the Danube.

Northwards of this branch the lakes are nearly absent, the typical landscape being an alternation of reed beds and parallel sand levees. The sandy seashore is very narrow or absent northwards of the Sulina channel, while southwards of it, especially eastwards of Sulina town the beach and sandy levees, much larger, are the main biotope for the pioneer beach vegetation, with typical species like *Eryngium maritimum*, followed towards the inland areas by other plant communities dominated by *Leymus racemosus* subsp. *sabulosus*, typical for the shifting dunes, *Tamarix ramosissima* or *Hippophaë rhamnoides* scrubs, characteristic for the fixed dunes. Towards the town of Sulina, to the mosaic of vegetation types other plant communities are added, generally dominated by species typical for saline soils, like *Salicornia europaea*, *Suaeda maritima*, *Juncus littoralis*, *Plantago coronopus* etc. Southwards, the sandy seashore gradually becomes narrower, also due to the intense coastal erosion.

FLORA, VEGETATION, HABITATS

Most of the Sulina territory is represented by natural habitats, the larger part of them being the reed beds, which are not community interest habitats. Still, regardless of their area, the community interest habitats exceed in number the unprotected habitats, which underline the overall high conservation value of the studied territory. Besides the most important of them, the priority habitats like 1530* (15.A21271, 15.A21275), numerous other community interest habitat subtypes occur in this area, such as: 1310 (15.11521, 15.145), 2120 (16.2124), 92A0 (44.6622), 92D0 (44.81412), 2190 (53.133).

The major part of the habitat subtypes is vulnerable. They are followed by endangered habitats, among these the most threatened being the grasslands framed into the 1530* (15.A21275) where the endemic threatened species *Centaurea pontica* occurs.

Most of the habitats are representative for a natural status, followed by low and less medium disturbed subtypes, taking into account the degree of ruderal species invasive trends. From the 16 habitat subtypes which were recorded in the area, only four subtypes contain non-native species. The disturbance level from this point of view is medium for two of them and high, respectively low for the other two.

All the mentioned locations are framed within the Danube Delta Biosphere Reserve and its corresponding Site of Community Interest.

15.11521 Western Pontic glasswort-seablite-saltwort swards

***Salicornietum prostratae* Sanda, Popescu 1999**, a vulnerable plant community within the pășunea Sulina (SPS) area is typical for a natural status, especially due to its specific biotope extreme conditions, that prevent the occurrence of ruderal/ alien taxa.

Key species: *Salicornia europaea* (4; SPS).

Other species: *Aster tripolium* subsp. *pannonicus* (+; SPS), *Argusia sibirica* (+; SPS), *Juncus maritimus* (+; SPS), *Puccinellia limosa* (+; SPS), *Spergularia media* (+; SPS), *Suaeda maritima* (+; SPS).

***Suaedetum maritimae* Soó 1927**, observed within the Pășunea Sulina area (SPS) as a vulnerable plant community, being devoid of ruderal/alien species, is representative for a natural status.

Key species: *Suaeda maritima* (2; SPS).

Other species: *Aster tripolium* subsp. *pannonicus* (+; SPS), *Juncus maritimus* (+; SPS), *Puccinellia distans* subsp. *limosa* (+; SPS), *Spergularia media* (+; SPS), *Salicornia europaea* (1; SPS), *Tamarix ramosissima* (+; SPS).

15.145 Western Pontic *Bassia hirsuta* communities

***Suaedo-Bassietum hirsutae* (Br.-Bl. 1928) Topa 1939** was observed as a pioneer vegetation endangered within the Sulina beach (SPL), a low disturbance being obvious, taking into account the presence of one ruderal and one non-native (*Coryza canadensis*) species, both with a reduced dominance.

Key species: *Bassia hirsuta* (2; SPL).

Other species: *Althaea officinalis* (+; SPL), *Atriplex prostrata* (r; SPL), *Coryza canadensis* (+; SPL), *Corispermum nitidum* (+; SPL), *Cynodon dactylon* (+; SPL), *Gypsophila perfoliata* (+; SPL), *Phragmites australis* (+; SPL), *Salicornia europaea* (+; SPL), *Solanum dulcamara* (+; SPL), *Xanthium italicum* (+; SPL).

15.A21271 Western Pontic tall rush salinebeds

***Juncetum littoralis* Popescu et al. 1992** is a vulnerable plant community, including in the area where it was studied, pășunea Sulina (SPS), where a low degree of ruderal and alien species invasion can be observed by the presence of one taxon for each of these categories, *Cynanchum acutum*, respectively *Elaeagnus angustifolia*. Its conservation importance is also underlined by the presence of one rare threatened species, endangered within these phytocoenoses.

Key species: *Juncus littoralis* (5; SPS).

Threatened species: *Plantago coronopus* (+; SPS).

Other species: *Atriplex hastata* (+; SPL), *Cynanchum acutum* (+; SPL), *Cynodon dactylon* (+; SPL), *Elaeagnus angustifolia* (+; SPL), *Lactuca tatarica* (+; SPL), *Spergularia media* (+; SPL), *Tamarix ramosissima* (+; SPL).

15.A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** can be considered an endangered plant community, at least the coenotaxa where *Centaurea pontica*

occur, which were only identified on very restricted locations within the Pășunea Sulina (SPS) area, between the Sulina Town and the channel adjacent to Sulina beach. These grasslands show a medium level of ruderal species invasive tendencies, being represented by six taxa which are equal in number with the typical species for this plant community, regardless of their reduced dominance. There can be deduced also a low disturbance due to the only non-native species, *Conyza canadensis*. The only threatened taxa, *Centaurea pontica*, has an exceptional importance as it is endangered and endemic within Romania, where it was only identified at Sulina and Sf. Gheorghe. Within this plant community it can be estimated as endangered to vulnerable, but taking into account the very restricted areas of the coenotaxa where this species occur, it can be considered as critically endangered within Sulina territory. It should be underlined that this species is mainly threatened by the tourism developments, roads etc.

Key species: *Cynodon dactylon* (3; SPS).

Threatened species: *Centaurea pontica* (+-1; SPS).

Other species: *Conyza canadensis* (+; SPS), *Euphorbia seguieriana* (+; SPS), *Gypsophila perfoliata* (+; SPS), *Melilotus albus* (+; SPS), *Onopordum acanthium* (+; SPS), *Portulaca oleracea* (+; SPS), *Salsola soda* (+; SPS), *Tragus racemosus* (+; SPS), *Tribulus terrestris* (+; SPS), *Tamarix ramosissima* (+; SPS), *Xanthium italicum* (+; SPS).

Trifolio fragifero-Cynodontetum Br.-Bl. et Bolos 1958 plant community was also studied separately, in other areas where *Centaurea pontica* does not occur in the respective phytocoenoses, at Sulina beach (SPL). There it can be considered as rare, a low disturbed status being indicated by the reduced dominance of a ruderal and two non-native species (*Conyza canadensis*, *Elaeagnus angustifolia*). The only threatened taxon, *Plantago coronopus*, slightly enhances the conservation importance.

Key species: *Cynodon dactylon* (4; SPL).

Threatened species: *Plantago coronopus* (+; SPL).

Other species: *Apera spica-venti* (+; SPL), *Conyza canadensis* (+; SPL), *Cynanchum acutum* (+; SPL), *Elaeagnus angustifolia* (+; SPL), *Euphorbia seguieriana* (+; SPL), *Gypsophila perfoliata* (+; SPL), *Juncus littoralis* (+; SPL), *Pulicaria dysenterica* (+; SPL), *Tamarix ramosissima* (+; SPL).

16.2124 Pontic white dunes

Elymetum gigantei Moraru 1957, a vulnerable plant community within the Sulina beach (SPL), is characterized by a medium disturbance level, both induced by one ruderal species, respectively by two non-native taxa (*Amorpha fruticosa*, *Elaeagnus angustifolia*), with a characteristic dominance variation (+-1). As compensation three rare threatened species, of which *Leymus racemosus* subsp. *sabulosus* is also vulnerable, confer a high conservation value to this coenotaxon.

Key species: *Leymus racemosus* subsp. *sabulosus* (2; SPL).

Threatened species: *Eryngium maritimum* (+; SPL), *Leymus racemosus* subsp. *sabulosus* (2; SPL), *Petasites spurius* (+; SPL).

Other species: *Amorpha fruticosa* (+; SPL), *Cynodon dactylon* (1; SPL), *Elaeagnus angustifolia* (+-1; SPL), *Hippophaë rhamnoides* (+; SPL), *Salsola soda* (+;SPL), *Secale sylvestre* (+; SPL), *Xanthium italicum* (+; SPL).

22.4312 Water chestnut carpets

***Trapaetum natans* V. Karpati 1963**, a vulnerable plant community, was observed as endangered in the channel adjacent to Sulina Town – Prospect area (SP). Within its much reduced inventory the threatened plants are represented by two taxa protected by the Berne Convention. Thus, within the studied phytocoenosis, besides the dominant *Trapa natans*, *Salvinia natans* can be estimated as vulnerable. Globally, this coenotaxon can be considered as representative for its natural status.

Key species: *Trapa natans* (4; SP).

Threatened species: *Salvinia natans* (1; SP), *Trapa natans* (4; SP).

Other species: *Typha latifolia* (+; SP).

44.6622 Danube Delta *Hippophaë* -*Populus canescens* galleries

***Calamagrostio epigei-Hippophaëtum rhamnoides* Popescu, Sanda, Nedelcu 1986** plant community is vulnerable in the Sulina beach area (SPL) where a medium level of non-native species invasion was estimated from the dominance variation (+1) of *Conyza canadensis* and *Elaeagnus angustifolia*.

Key species: *Calamagrostis epigeios* (1; SPL), *Hippophaë rhamnoides* (4; SPL).

Threatened species: *Eryngium maritimum* (+; SPL), *Trapa natans* (4; SP).

Other species: *Conyza canadensis* (+; SPL), *Elaeagnus angustifolia* (+; SPL), *Eupatorium cannabinum* (+; SPL), *Euphorbia seguieriana* (+; SPL), *Tamarix ramosissima* (+; SPL).

44.81412 Western Pontic coastal *Tamarix smyrnensis* stands

***Calamagrostio-Tamaricetum ramosissimae* Simon et Dihoru (1962) 1963**, synonymous (Sanda, Vicol, Ștefănuț 2008) with ***Tamaricetum pallasii* Borza 1931 n.n.**, a vulnerable plant community, was studied in the areas adjacent to the Sulina beach (SPL). There, the only ruderal species, *Cynanchum acutum*, shows a low invasive trend of the ruderal taxa. A high disturbance is indicated by the non-native species *Elaeagnus angustifolia*. Despite this unfavourable conservation level, two rare threatened species occur in the analysed plot, where they are both endangered.

Key species: *Tamarix ramosissima* (3; SPL).

Threatened species: *Leymus racemosus* subsp. *sabulosus* (+; SPL), *Scolymus hispanicus* (+; SPL).

Other species: *Althaea officinalis* (+; SPL), *Conyza canadensis* (+; SPL), *Cynanchum acutum* (+; SPL), *Cynodon dactylon* (+; SPL), *Gypsophila perfoliata* (+;SPL), *Juncus littoralis* (+; SPL), *Elaeagnus angustifolia* (+; SPL), *Pulicaria dysenterica* (+; SPL).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community framed into this habitat is the most widespread type of vegetation within the Sulina territory (F:V) in the studied areas the reed beds were mono-dominant, devoid of ruderal or non-native plants.

53. 1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** represents a sporadic plant community within the Sulina Nord area (SN), adjacent to the road Cardon-Sulina, at the limit between Sulina and C.A. Rosetti territories. The analysed coenotaxon can be considered as typical for a natural status, taking into account the absence of ruderal/ alien species.

Key species: *Phragmites australis* (5; SN).

Other species: *Althaea officinalis* (+; SN), *Calystegia sepium* (+; SN), *Eupatorium cannabinum* (+; SN), *Lycopus europaeus* (+; SN), *Lythrum salicaria* (+; SN), *Mentha aquatica* (+; SN), *Pulicaria dysenterica* (+; SN), *Stachys palustris* (+; SN), *Symphytum officinale* (+; SN).

53.131 Great reed mace beds

***Typhetum latifoliae* Lang 1973**, a vulnerable coenotaxon recorded from the channel adjacent to Sulina Town – Prospect area (SP), is typical for a natural status as no ruderal/ alien species were identified. It has a certain conservation importance due to the presence of two taxa protected by Bern Convention.

Key species: *Typha latifolia* (5; SP).

Threatened species: *Salvinia natans* (1; SP), *Trapa natans* (+; SP).

Other species: *Gratiola officinalis* (+; SP), *Lycopus europaeus* (+;SP), *Mentha aquatica* (+, SP), *Solanum dulcamara* (+;SP), *Tanacetum vulgare* (+;SP), *Typha angustifolia* (+; SP).

53.132 Lesser reed mace beds

***Typhetum angustifoliae* Pignatti1953**, a vulnerable plant community, was identified along the channel situated southwards of the Sulina beach (SPL), in connection with the sea. This can be considered as typical for a natural status.

Key species: *Typha angustifolia* (4; SPL).

Other species: *Alisma plantago-aquatica* (+; SPL), *Calystegia sepium* (+; SPL), *Sparganium ramosum* (+; SPL), *Schoenoplectus tabernaemontani* (+; SPL), *Typha latifolia* (+; SPL).

53.133 Laxmann`s reed mace beds

***Typhetum laxmannii* Nedelcu 1969** was identified so far only in a low dune slack adjacent to the road Cardon-Sulina (SN), thus being framed as endangered. A low disturbance is indicated by the only ruderal species *Xanthium italicum* with a reduced dominance. Only one rare threatened species, locally endangered, was observed in the plots.

Key species: *Typha laxmannii* (3; SN).

Threatened species: *Samolus valerandi* (1; SN).

Other species: *Althaea officinalis* (+; SN), *Aster tripolium* (+; SN), *Cynodon dactylon* (+; SN), *Eupatorium cannabinum* (1; SN), *Lythrum salicaria* (+; SN), *Mentha aquatica* (+; SN), *Pulicaria dysenterica* (+; SN), *Xanthium italicum* (+; SN).

Plant communities which are not framed into the Palaearctic habitats classification

***Plantaginetum coronopi* R. Tüxen 1937**, an endangered plant community within the Sulina beach (SPL) shows a low level of alien species invasive trend, these being only represented by *Elaeagnus angustifolia*. The dominant *Plantago coronopus* is also considered rare threatened taxon at the national level.

Key species: *Plantago coronopus* (2; SPL).

Threatened species: *Plantago coronopus* (1; SPL).

Other species: *Apera spica-venti* (+; SPL), *Cynodon dactylon* (1; SPL), *Gypsophila perfoliata* (+; SPL), *Elaeagnus angustifolia* (+; SPL), *Juncus littoralis* (+; SPL), *Plantago arenaria* (±;SPL), *Linum austriacum* (+; SPL), *Tamarix ramosissima* (+; SPL).

Eryngium maritimum phytocoenosis cannot be framed into the plant communities described so far in synthesis works concerning the vegetation of Dobrogea (Sanda, Arcuş 1989), or Romania (Sanda, Vicol, Ştefănuţ 2008) and thus neither in the Palaearctic habitat classification. It was inventoried within the pioneer vegetation of Sulina beach (SPL), where it has a vulnerable character. A low disturbance is visible, taking into account the reduced dominance of one ruderal taxon, respectively of the non-native *Amorpha fruticosa*. Its high conservation value is underlined by the occurrence of three rare threatened species, of which *Leymus racemosus* subsp. *sabulosus* and *Corispermum marschallii* are also vulnerable at the national level. Within this phytocoenosis, besides the dominant *Eryngium maritimum*, the other two are endangered.

Key species: *Eryngium maritimum* (3; SPL).

Threatened species: *Eryngium maritimum* (3; SPL), *Leymus racemosus* subsp. *sabulosus* (+; SPL), *Corispermum marschallii* (+; SPL).

Other species: *Amorpha fruticosa* (+; SPL), *Cynodon dactylon* (+; SPL), *Salsola soda* (+; SPL), *Xanthium italicum* (+;SPL).

FAUNA

Birds. The studies conducted within the territory of Sulina led to the identification of a number of 107 species of birds found in the annexes 3 and 4B of the Ordinance 57/2007. From these taxa 68 species are strictly protected, being classified in the Annex 3 of this ordinance: *Gavia stellata*, *Gavia arctica*, *Gavia immer*, *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Milvus milvus*, *Haliaeetus albicilla*, *Circus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*,

Accipiter brevipes, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Porzana porzana*, *Porzana parva*, *Porzana pusilla*, *Crex crex*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hibrido*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna sandvicensis*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*.

The rarest of the species listed above, which give a high conservation value to this area are: *Gavia arctica*, *Gavia immer*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus macrourus*, *Circus pygargus*, *Aquila pomarina*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Porzana porzana*, *Porzana parva*, *Porzana pusilla*, *Crex crex*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Glareola pratincola*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hibridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna sandvicensis*, *Sterna albifrons*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Luscinia svecica*.

A total of 39 species identified in the area are protected, being found in Annex 4B of the Ordinance 57/2007, representing animal and plant species that require strict protection: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Limicola falcinellus*, *Actitis hypoleucos*, *Arenaria interpres*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombycilla garrulus*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

Among the rarest birds in this area, which are included in this Annex, remember: *Limicola falcinellus*, *Arenaria interpres*, *Jynx torquilla*, *Motacilla cinerea*, *Bombycilla garrulus*, *Phoenicurus phoenicurus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Muscicapa striata*, *Sitta europaea*, *Passer hispaniolensis*, *Carduelis spinus*, *Carduelis cannabina*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

Bird species identified in the area but not classified in the two annexes of Ordinance 57/2007, which are included in the Annex II of Law 13/ 1993, are: *Podiceps grisegena*, *Podiceps auritus*, *Podiceps nigricollis*, *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Charadrius dubius*, *Tringa stagnatilis*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Calidris temminckii*, *Calidris alpina*, *Calidris ferruginea*, *Calidris alba*, *Phalaropus lobatus*, *Larus melanocephalus*, *Caprimulgus europaeus*, *Dendrocopos major*, *Picoides tridactylus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius*

senator, *Troglodytes troglodytes*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Ficedula hypoleuca*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Black Sea coastal area and the vast diversity of habitats in the area favour the nesting of a large number of species and populations of bird species, of which the certain or probable nesting in the Sulina area is estimated for: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Botaurus stellaris*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus olor*, *Aythya nyroca*, *Circus aeruginosus*, *Falco vespertinus*, *Porzana porzana*, *Porzana parva*, *Porzana pusilla*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Chlidonias niger*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus collybita*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*, *Podiceps grisegena*, *Podiceps nigricollis*, *Buteo buteo*, *Caprimulgus europaeus*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza schoeniclus*.

Research concerning the natural heritage of Tulcea town

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Road E87

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:
Danube Delta Biosphere Reserve

NATURA 2000 SITES: Delta Dunării (Site of Community Interest, Special Protection Area), Dealurile Agighiolului (Site of Community Interest)

GEOLOGY AND PEDOLOGY

Within Tulcea town and the surrounding areas, Lower Triassic outcrops occur, characterized by the presence of the green polymictic conglomerates on the top of the green phyllite and quartz-sandstone, being well studied by specialists. These types of stones outcropping through the Quaternary loess layers on small areas, especially in the Horea Hill area are accompanied by the very frequent outcrops of grey-blackish limestone. Along the Danube River (Tulcea arm) were found layers of Holocene deposits of siltite, placed at the base of the current coating soils.

Based on this rock substrata, the various types of territorial units of soil such as Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998) to which is added Mixic entiantrosols (Anthropic Regosols, after World Reference Base for Soil Resources – SR, 1998), Garbic entiantrosols (Garbic Regosols, after World Reference Base for Soil Resources – SR, 1998) and various types of Antrosols in Tulcea town were developed on the mainland side. Within north-eastern side of Tulcea town, the alluvial deposits and alluvia of Danube River provided optimal conditions for the development of wetland soil types such as Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-alluvial gley soils, Marshy-mollic alluvial gley soils, Hemic-terric histosols etc.

LANDSCAPE

The artificial habitats represent most of the Tulcea town administrative territory, the largest areas being found southwards of this locality, within the former steppe and wooded steppe area from the Tulcea hills unit. In this area, among the extensive arable fields, vineyards and forestry plantations, the native steppe grasslands or thickets still occur, especially on steep or rocky slopes that were not suitable for agriculture, mainly on the highest elevations of this territory, like the limestone hills Marca (207 m), Redi (205 m), Stânca Mare (186 m), Colina Carierei (135 m) etc.

From these summits the relief's altitude is decreasing towards the Danube floodplain and the Danube Delta. At present most of the natural wetland habitats are replaced by agricultural polders and less by forestry plantations. Still, in the northern sector of this territory, northwards of the Tulcea branch of the Danube and westwards of it, at Dunărea Veche, the native vegetation occurs on more or less compact areas, being mainly represented by white willow and white poplar riparian forests, wetland grasslands and reed or reed mace beds.

FLORA, VEGETATION, HABITATS

Despite the reduced area of the natural habitats, some of them are framed into habitats of community importance, like: 92 A0 (44.1621, 44.6611), including priority ones, such as 62C0*(34.92).

As they have a restricted distribution within the studied territory, most of the plant communities can be considered as endangered, while the rest are vulnerable. There were identified so far two threatened species both endangered in the respective phytocoenoses. The general disturbance level, mainly due to grazing, can be estimated as low, the high and medium values being noticed in only one coenotaxon each, while also only one plant community is representative for a natural status.

22.4311 Water-lily beds

***Nymphaetum albae* Vollmar 1947** plant community is an endangered coenotaxon in the Dunărea Veche area (TDV). There it can be considered as representative for a natural status, as no ruderal/ alien taxa were observed.

Key species: *Nymphaea alba* (3; TDV).

Other species: *Lemna minor* (2; TDV), *Sagittaria sagittifolia* (+; TDV), *Typha angustifolia* (+; TDV).

34.92 Ponto-Sarmatic steppes

***Cynodonti-Poëtum angustifoliae* Rapaics ex Soó 1957** plant community can be estimated as endangered at the scale of the inventoried area. There is a low level of disturbance within this coenotaxa from the ruderal taxa point of view (four species).

Key species: *Cynodon dactylon* (4; TDV).

Other species: *Bromus sterilis* (1; TDV), *Bromus tectorum* (+; TDV), *Cardaria draba* (+; TDV), *Dactylis glomerata* (+; TDV), *Euphorbia seguieriana* (+; TDV), *Hordeum geniculatum* (+; TDV), *Lolium perenne* (+; TDV), *Medicago lupulina* (+; TDV), *Tamarix ramosissima* (+; TDV), *Vicia angustifolia* (±; TDV).

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** is an endangered plant community which was identified on the slopes of the limestone hills southwards of Tulcea. The only rare threatened species identified in the plots is *Potentilla bornmuelleri*, endangered within the studied phytocoenosis. The dominance indices (+-1) of the five ruderal taxa indicate a medium influence of grazing.

Key species: *Festuca valesiaca* (3; TS).

Threatened species: *Potentilla bornmuelleri* (+; TS).

Other species: *Androsace elongata* (+; TS), *Androsace maxima* (+; TS), *Artemisia austriaca* (+; TS), *Erophila verna* (+; TS), *Inula oculus-christi* (+; TS), *Lamium amplexicaule* (+; TS), *Marrubium vulgare* (+; TS), *Muscari neglectum* (+; TS), *Poa bulbosa* (1; TS), *Stipa capillata* (+; TS), *Teucrium chamaedrys* (1; TS), *Teucrium polium* (+; TS).

***Agropyro cristati-Kochietum prostratae* Zólyomi 1958** is an endangered plant community in the Tulcea area, where it was identified within Dealul Taberei area (TT) steppe grasslands. The medium level of disturbance is obvious when taking into account that ruderal species prevail within this inventory of the coenotaxon (eight species) and also their dominance limits are significant in this sense (+-1).

Key species: *Agropyron cristatum* (2; TT), *Bassia prostrata* (1; TT).

Other species: *Achillea setacea* (+; TT), *Artemisia austriaca* (+; TT), *Bromus squarrosus* (+; TT), *Bromus tectorum* (+; TT), *Capsella bursa-pastoris* (+; TT), *Euphorbia seguieriana* (+; TT), *Kohlruschia prolifera* (+; TT), *Hordeum murinum* (+; TT), *Linaria genistifolia* (+; TT), *Marrubium peregrinum* (+; TT), *Plantago lanceolata* (+; TT), *Poa bulbosa* (1; TT), *Thymus pannonicus* (+; TT).

34.9211 Western Pontic thyme steppes

***Sedo hillebrandtii* – *Polytrichetum piliferi* Horeanu et Mihai 1974**, an endangered plant community was observed on the rocky slopes of Colnicul Hora within Tulcea town (TCH), as well as eastwards of Tulcea, on a rocky promontory, at the contact with the Danube floodplain (TE). Two threatened species were identified, of which *Campanula romanica* is an endemic taxon of international importance, both endangered within the analysed phytocoenoses. Four ruderal species indicate a low disturbance, taking into account their reduced dominance.

Key species: *Sedum urvillei* subsp. *hillebrandtii* (1; TCH), *Polytrichum piliferum* (1; TCH);

Threatened species: *Campanula romanica* (+; TCH), *Ephedra distachya* (±; TE);

Other species: *Agropyron cristatum* (+; TCH), *Artemisia austriaca* (+; TCH), *Asperula tenella* (+; TCH), *Malva sylvestris* (+; TCH), *Marrubium peregrinum* (+; TCH), *Medicago falcata* (+; TCH), *Poa bulbosa* (+; TCH), *Stipa capillata* (+; TCH).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** plant community can be considered a vulnerable coenotaxon within the Dunărea Veche area, within the territory of Tulcea town (TDV). It has a low degree of ruderal plant invasion, as only one such species was identified here, with a restricted dominance.

Key species: *Salix alba* (5; TDV).

Other species:

- shrubs: *Rubus caesius* (+; TDV);

- grasses/ undershrubs: *Bidens tripartita* (+; TDV), *Bromus sterilis* (+; TDV), *Iris pseudacorus* (+; TDV), *Lycopus europaeus* (+; TDV), *Myosoton aquaticum* (+; TDV), *Poa sylvicola* (+; TDV), *Rumex palustris* (+; TDV), *Rumex hydrolapathum* (±; TDV), *Stachys palustris* (+; TDV).

44.6611 Western Pontic white poplar galleries

***Populetum albae* (Br.-Bl. 31 pp.) Borza 37** plant community is vulnerable (F: I) within the Tulcea territory (TDV). The three non-native species (*Fraxinus americana*, *Morus alba*, *Amorpha fruticosa*), with a reduced dominance, indicate a low level of disturbance, but close to its upper limit, as they are nearly as numerous as the native non-ruderal taxa. The two ruderal species, by their restricted dominance, show also a low level of invasive trend from this point of view.

Key species: *Populus alba* (5; TDV).

Other species:

- trees: *Fraxinus americana* (+; TDV), *Morus alba* (+; TDV), *Salix alba* (+; TDV);
- shrubs/ lianas: *Amorpha fruticosa* (+; TDV), *Rubus caesius* (+; TDV), *Vitis sylvestris* (+; TDV);
- grasses/ undershrubs: *Bidens tripartita* (+; TDV), *Chenopodium album* (+; TDV), *Elymus repens* (+; TDV), *Lysimachia nummularia* (+; TDV), *Potentilla reptans* (+; TDV), *Vicia angustifolia* (+; TDV).

53.132 Lesser reed mace beds

***Typhetum angustifoliae* Pignatti 1953** plant community is evaluated as a vulnerable coenotaxon in the studied area. It has a low level of disturbance only indicated by the two non-native species (*Fraxinus americana*, *Amorpha fruticosa*), with a reduced dominance.

Key species: *Typha angustifolia* (4; TDV).

Other species: *Amorpha fruticosa* (+; TDV), *Fraxinus americana* (+; TDV), *Lythrum salicaria* (+; TDV), *Lysimachia nummularia* (+; TDV), *Mentha aquatica* (+; TDV), *Myosotis scorpioides* (+; TDV), *Oenanthe aquatica* (+; TDV), *Phragmites australis* (+; TDV), *Sagittaria sagittifolia* (+; TDV), *Schoenoplectus lacustris* (+; TDV), *Senecio paludosus* (+; TDV), *Sium latifolium* (+; TDV), *Solanum dulcamara* (+; TDV).

54.14B Iris beds

***Iretum pseudacori* Eggler 1933**, an endangered coenotaxon (F: +) within the Dunărea Veche area (TDV), has a low level of disturbance due to invasive species, both non-native (*Amorpha fruticosa*) and ruderal (*Bromus sterilis*).

Key species: *Iris pseudacorus* (3; TDV).

Other species: *Amorpha fruticosa* (+; TDV), *Bidens tripartita* (+; TDV), *Bromus sterilis* (1; TDV), *Poa sylvicola* (+; TDV), *Rubus caesius* (+; TDV), *Stachys palustris* (+; TDV), *Typha angustifolia* (+; TDV).

Plant communities which are not framed into the Palaearctic habitats classification

***Convolvulo-Agropyro repentis* Felföldy 1942** is an endangered plant community (F: +), inventoried at Dunărea Veche (TDV). The high number of ruderal species (six taxa) and their maximal dominance indicate an intense disturbance due to human activities.

Key species: *Convolvulus arvensis* (+; TDV), *Elymus repens* (5; TDV).

Other species: *Capsella bursa-pastoris* (+; TDV), *Hordeum murinum* (+; TDV), *Medicago lupulina* (+; TDV), *Mentha aquatica* (+; TDV), *Plantago major* (+; TDV), *Potentilla reptans* (+; TDV), *Rorippa sylvestris* (+; TDV), *Rumex palustris* (+; TDV), *Teucrium scordium* (+; TDV), *Xanthium italicum* (+; TDV).

***Poëtum sylvicolae* Buia et al. 1959** can be estimated so far as being endangered (F: I) within the Tulcea's territory (TDV), where the only ruderal

species observed in the plot is *Xanthium italicum*, that corresponds to a low disturbance level from this point of view.

Key species: *Poa sylvicola* (5; TDV).

Other species: *Althaea officinalis* (+; TDV), *Cynodon dactylon* (1; TDV), *Phragmites australis* (+; TDV), *Rumex palustris* (+; TDV), *Senecio paludosus* (+; TDV), *Xanthium italicum* (+; TDV).

FAUNA

Birds. On the administrative territory of Tulcea town there were identified 102 species of birds listed in the Annex 3 and 4B of the Ordinance 57/2007. Of these, a total of 63 species are strictly protected, being mentioned in the Annex 3, their presence being though important for the design of the Natura 2000 network, such as: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Botaurus stellaris*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Porzana porzana*, *Porzana parva*, *Porzana pusilla*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*.

Some of the rarest species listed above which give a high conservation value to this area are: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Platalea leucorodia*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Haliaeetus albicilla*, *Circus gallicus*, *Circus macrourus*, *Circus pygargus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco cherrug*, *Falco peregrinus*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Asio flammeus*, *Dendrocopos medius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*.

There were identified 39 protected species requiring strict protection listed within the Annex 4B of the Ordinance 57/2007: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombicilla garrulus*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*,

Aegithalos caudatus, *Sitta europaea*, *Oriolus oriolus*, *Corvus corax*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. From this appendix the rarest species in the area are represented by *Motacilla cinerea*, *Bombycilla garrulus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Muscicapa striata*, *Corvus corax*, *Passer hispaniolensis*, *Carduelis cannabina*, *Carduelis flammea*.

A number of bird species observed here are not framed in the two annexes of the Ordinance 57/2007 but can be found in Annex II of the Law 13/ 1993, like: *Podiceps grisegena*, *Podiceps nigricollis*, *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo lagopus*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Caprimulgus europaeus*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Bird species nesting certainly or probably in the Tulcea area there can be quoted: *Ciconia ciconia*, *Plegadis falcinellus*, *Cygnus olor*, *Aythya nyroca*, *Circus aeruginosus*, *Porzana pusilla*, *Sterna hirundo*, *Chlidonias niger*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Dryocopus martius*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Podiceps grisegena*, *Podiceps nigricollis*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Emberiza citrinella*.

Mammals. The total number of species identified in the city of Tulcea is of 15 taxa: *Myotis myotis*, *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Lepus europaeus*, *Ondatra zibethicus*, *Mycromis minutus*, *Mus musculus*, *Rattus norvegicus*, *Apodemus agrarius*, *Canis aureus*, *Vulpes vulpes*, *Nyctereutes procyonoides*, *Mustela putorius*, *Sus scrofa*, *Capreolus capreolus*. Strictly protected species of mammals identified in the area, which can be found in the Annex 3 of the Ordinance 57/2007, are: *Myotis myotis* and *Lutra lutra*. Species requiring strict protection included in Annex 4A, are: *Nyctalus noctula* and *Pipistrellus pipistrellus*.

Research concerning the natural heritage of Turcoaia commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT, Mariana CUZIC

ACCES: Road DN22 Tulcea-Măcin, DN 22D and DJ222H

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: -

NATURA 2000 SITES: Brațul Măcin (Site of Community Interest), Dunărea Veche-Brațul Măcin (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Turcoaia commune is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite, to which are added tufogene greenschist which occur in the south-east part. The Silurian deposits of sandstones, limestones and marls occupy also the south-eastern part of the area, along with the Devonian deposits (which also occur in the north-western part of the area) of the slate schists, quartzite and grey limestones. The Carapelit formation (Lower Carboniferous age) which is composed of conglomerates, sandstones, tuffs, schists and siltites occurs on reduced areas. Also there can be found the Paleozoic outcrops of alkaline granite, in frame the outcrops of these types of deposits. These types of stones outcrop through the Quaternary loess layers that cover the entire area.

Based on theserock substrata, the various types of territorial units of soil such as Distric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998) occur. Along the Danube River on the alluvial deposits and alluvia there were developed Calcareous alluvial soils, Calcareous-gleyed alluvial soils and Calcareous-alluvial gley soils.

LANDSCAPE

The landscape of this territory is dominated by artificial habitats, like agriculture fields, forestry plantations and extensive stone quarries. The natural habitats are mainly represented by steppe grasslands, their largest areas being concentrated on Iacobdeal Hill, the highest elevation (341 m), which is also a viewpoint westwards upon the Danube, respectively eastwards towards the Măcin Mountains. Unfortunately this hill is spoiled by quarries which have replaced large areas of the previous steppe grasslands and thickets. Some other steppe grasslands also occur eastwards of Iacobdeal, in the area of Bujorul Românesc (161 m), as well as northwards, around the Troesmis roman fortress and in the Iglița area. The latest also represents an attractive viewpoint over the Danube bend and the massive silhouette of Iacobdeal Hill.

The wetland vegetation was mainly observed in the area of the Turcoaia ponds, northwards of the locality, in the Danube floodplain, while in the free flooding area between the Danube riverbanks and the adjacent dikes most of the former white willow forests were replaced by forestry plantations.

FLORA, VEGETATION, HABITATS

All the steppe grasslands and thickets which were identified in this area are priority habitats of community interest, like 40C0* (31.8B731) and 62C0* (34.92, 34.9211), the wetland forest being framed into the community interest habitat 92A0 (44.162, 44.6612), unlike the other types of wetland vegetation that are not protected.

Within the analysed plant communities prevails the endangered ones, while the vulnerable coenotaxa have a lower importance. Among the wetland plant communities two are representative for a natural status, two are medium disturbed, while one is low disturbed. Among the four steppe grassland and thicket types two are medium disturbed, the other two being characteristic for a high, respectively low degree of ruderal species invasive trend.

While the wetland communities have no threatened species, the steppe grasslands and thickets, except *Botriochloetum ischaemi*, contain at least one such species, the maximum recorded being of four taxa of this type.

31.8B731 Western Pontic jasmine Christ's thorn scrub

***Asphodelino luteae-Paliuretum* Sanda et al. 1999**, an endangered plant community analysed from Iacobdeal Hill – Turcoaia commune (TI), can be framed into the medium disturbance category, due to the eight ruderal species which are the most numerous within this phytocoenosis inventory versus the other taxa. The only threatened species is the dominant *Paliurus spina-christi*, vulnerable and rare within the coenotaxa.

Key species: *Paliurus spina-christi* (4; TI).

Threatened species: *Paliurus spina-christi* (4; TI).

Other species:

- shrubs: *Crataegus monogyna* (+; TI);

- grasses/ undershrubs: *Agropyron cristatum* (+; TI), *Artemisia austriaca* (+; TI), *Dichanthium ischaemum* (+; TI), *Erodium cicutarium* (+; TI), *Galium aparine* (+; TI), *Geranium rotundifolium* (+; TI), *Lamium amplexicaule* (+; TI), *Poa bulbosa* (+; TI), *Ranunculus oxyspermus* (+; TI), *Senecio vernalis* (+; TI), *Stellaria media* (+; TI).

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977**, a vulnerable plant community from Iacobdeal Hill, Turcoaia commune (TI), show a medium degree of disturbance, underlined by the numerous ruderal species (nine taxa) and their dominance variation (+-1).

Key species: *Dichanthium ischaemum* (3; TI).

Other species: *Achillea coarctata* (+; TI), *Convolvulus cantabricus* (+; TI), *Cerastium dubium* (+; TI), *Cichorium intybus* (+; TI), *Eryngium campestre* (+; TI), *Festuca valesiaca* (+; TI), *Geranium rotundifolium* (+; TI), *Lamium amplexicaule* (+; TI), *Poa bulbosa* (1; TI), *Scleranthus annuus* (+; TI), *Sedum urvillei* subsp. *hillebrandtii* (+; TI), *Senecio vernalis* (+; TI), *Stellaria media* (+; TI), *Teucrium polium* (+; TI).

***Artemisia austriacae-Poëtum bulbosae* Pop 1970**, an endangered plant community from Iacobdeal Hill, Turcoaia commune (TI), is in this case a typical indicator of an intense grazing, that allows the significant invasive development of the key species, but also of other two ruderal taxa. Despite grazing, two rare threatened species were identified. Among these, *Dianthus nardiformis* is vulnerable taxa of European importance. Both species are endangered in the area, at least within the studied phytocoenosis.

Key species: *Artemisia austriaca* (1; TI), *Poa bulbosa* (2; TI).

Threatened species: *Dianthus nardiformis* (+; TI), *Thymus zygoides* (+; TI).

Other species: *Achillea coarctata* (+; TI), *Dichanthium ischaemum* (1; TI), *Eryngium campestre* (+; TI), *Erophila verna* (+; TI), *Sedum urvillei* subsp. *hillebrandtii* (+; TI), *Taraxacum erythrospermum* (+; TI).

34.9211 Western Pontic thyme steppes

***Agropyro-Thymetum zygoidi* Dihoru (1969) 1970**, considered endangered, has the highest conservation value among the studied coenotaxa, especially due to the four rare threatened species. Within these *Dianthus nardiformis* is vulnerable and of European importance. All these can be considered endangered within this plant community, except the dominant *Thymus zygoides*. There can be estimated a low level of the ruderal species (four taxa) invasive trend.

Key species: *Thymus zygoides* (3; TI).

Threatened species: *Dianthus nardiformis* (+; TI), *Festuca callieri* (+; TI), *Koeleria lobata* (+; TI), *Thymus zygoides* (3; TI).

Other species: *Artemisia austriaca* (+; TI), *Dichanthium ischaemum* (1; TI), *Eryngium campestre* (+; TI), *Erophila verna* (+; TI), *Myosotis stricta* (+; TI), *Poa bulbosa* (+; TI), *Scleranthus perennis* (+; TI), *Sedum urvillei* subsp. *hillebrandtii* (+; TI), *Stipa capillata* (+; TI).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** was inventoried as a vulnerable vegetation type, in the Danube floodplain (TLD), as well as on a recently formed island on the river (TON). There can be deduced a medium disturbance, taking into account the reduced dominance of the only alien taxon, *Amorpha fruticosa*, but mainly the significant dominance index of *Xanthium italicum*.

Key species: *Amorpha fruticosa* (+; TLD, TON), *Populus nigra* (+-1; TON, TLD), *Salix alba* (4; TON, TLD).

Other species:

- trees: *Ulmus laevis* (+; TLD);
- shrubs/ lianas: *Rubus caesius* (1; TLD);

- grasses/ undershrubs: *Bidens tripartita* (+1; TLD), *Bryonia alba* (+1; TLD), *Solanum dulcamara* (+; TLD), *Symphytum officinale* (+; TLD), *Xanthium italicum* (1; TON).

44.6612 Western Pontic white-black poplar galleries

***Populetum nigro-albae* Slavnic 1952** plant community can be considered vulnerable within the Danube floodplain (TLD), framed within the Turcoaia territory. There a medium influence of human activities is obvious, due to the occurrence of two alien species with a significant variation of their dominance (+-1), despite the low contribution of ruderal species, represented by only one species.

Key species: *Populus nigra* (3; TLD).

Other species:

- trees: *Fraxinus americana* (1; TLD), *Salix alba* (1; TLD);

- shrubs/ lianas: *Amorpha fruticosa* (+; TLD), *Rubus caesius* (+; TLD);

- grasses/ undershrubs: *Elymus repens* (+; TLD), *Calystegia sepium* (+; TLD), *Solanum dulcamara* (+; TLD).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community was mainly observed as an endangered coenotaxon within the ponds northwards of Turcoaia (TE) where this coenotaxon is nearly mono-dominant. It can be estimated as representative for a natural status, as no ruderal/ alien species were identified.

Key species: *Phragmites australis* (5; TE), *Typha angustifolia* (1; TE).

53.131 Great reed mace beds

***Typhetum latifoliae* Lang 1973** can be considered an endangered coenotaxon within the studied area, where the only ruderal species, *Echinochloa crus-galli*, indicates a reduced disturbance.

Key species: *Typha latifolia* (4; TLD).

Other species: *Echinochloa crus-galli* (+; TLD), *Lycopus europaeus* (+; TLD), *Typha angustifolia* (1; TLD).

53.132 Lesser reed mace beds

***Typhetum angustifoliae* Pignatti 1953**, an endangered plant community has a very low diversity within the ponds northwards of Turcoaia (TE) and no alien/ ruderal species.

Key species: *Typha angustifolia* (5; TE).

Other species: *Phragmites australis* (1; TE), *Ranunculus sceleratus* (+; TE).

FAUNA

Birds. The studied avifauna of the administrative territory of the Turcoaia commune includes 75 bird species from the appendices 3 and 4B of the Ordinance 57/2007 of which 44 species are strictly protected, being classified in the Annex 3 of the ordinance, used to establish the *Natura 2000* network, such as: *Gavia stellata*, *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola*

ralloides, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Tadorna tadorna*, *Pernis apivorus*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Burhinus oediconemus*, *Sterna hirundo*, *Chlidonias hybridus*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Caprimulgus europaeus*, *Melanocorypha calandra*, *Oenanthe isabellina*, *Sylvia nisoria*, *Ficedula parva*, *Emberiza hortulana*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

Species which confer a high conservation value to the area include: *Gavia stellata*, *Tadorna tadorna*, *Pernis apivorus*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Aquila clanga*, *Falco cherrug*, *Falco peregrinus*, *Burhinus oediconemus*, *Oenanthe isabellina*, *Oenanthe pleschanka*, *Sylvia nisoria*, *Emberiza hortulana*, *Anthus campestris*.

The other 31 species are protected, being classified in Annex 4B of the ordinance, representing animal and plant species requiring strict protection: *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

The rarest birds in this area, included in Appendix 4B include: *Actitis hypoleucos*, *Motacilla cinerea*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Regulus regulus*, *Muscicapa striata*, *Serinus serinus*, *Carduelis flammea*.

Bird species identified in the area which are not listed in the two annexes of the Ordinance 57/2007, but can be found in Annex II of Law 13/ 1993 are: *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, *Apus melba*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Aquatic and steppe habitats along with the agricultural and rural areas, lead to an abundance of species and populations nesting in the area like: *Ixobrychus minutus*, *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Tadorna tadorna*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dryocopus martius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*,

Phoenicurus phoenicurus, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Buteo buteo*, *Caprimulgus europaeus*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola torquata*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Emberiza citrinella*.

Research concerning the natural heritage of Văcăreni commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT

ACCESS: Road DN 22/E87 Tulcea-Măcin

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE: Danube Delta Biosphere Reserve

NATURA 2000 SITES: Danube Delta (Special Protection Area), Măcin-Niculitel (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Văcăreni commune is characterized by the pre-Silurian metamorphic deposits of the grey or greenish phyllite and quartzite that occur on small surfaces on the southern part of the studied area. Also here are represented Paleozoic outcrops of granite gneisses, as well as Upper Triassic deposits of limestones with intercalations of clay schists. These types of stones outcrop through the Quaternary loess layers that cover the central-southern part of the area. On the north side there were found Holocene psamo-pelitic deposits.

Based on these stones types, the various types of territorial units of soil such as Distric litosols (Dystric Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on granite gneisses, Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Typical kastanozems (Calcaro-calcic Kastanozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Greic phaeozems (Greyi-luvic Phaeozems, after World Reference Base for Soil Resources – SR, 1998) occur. On the alluvial deposits and alluvia of the northern area, the following types of soils were developed: Calcareous alluvial soils, Calcareous-gleyed alluvial soils, Calcareous-alluvial gley soils and Gleyed chernozems.

LANDSCAPE

The commune's territory lies mostly in the former Danube floodplain, drained at present, a flat low area situated in the northern part of this zone. The only natural or semi-natural habitats in this sector have very reduced areas, being mainly represented by artificial water bodies in the drainage channels.

From these lowlands, in the southern sector of this territory, the altitudes increase to a maximum of 128 m in the peak of Dealul Cadân. On its slopes and also on the declivities of the low hills and plateaux, between the floodplain and the foothills of the Măcin Mountains, restricted areas of steppe grasslands still occur, heavily fragmented by agricultural fields.

FLORA, VEGETATION, HABITATS

Even though the natural habitats represent a reduced proportion within the studied territory all of the observed plant communities are framed into priority habitats of community importance, such as 1530* (15.21275), 40C0* (31.8B721), 62C0* (34.92).

The restricted surface of the natural habitats is visible also in the dominance of the endangered plant communities, followed by vulnerable ones. No threatened species was identified within the studied situations. There is generally a low disturbance of the of the vegetation types, medium and high levels being recorded in only one type plant community for each.

15. A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** is an endangered coenotaxon which was studied in the area of the former Gârla Ciulinețu (VGC). A medium disturbance due to grazing can be observed. Thus, except the key species *Cynodon dactylon*, all the other are ruderal, their dominance variation being also significant for this level (+1).

Key species: *Cynodon dactylon* (4; VGC).

Other species: *Artemisia annua* (1; VGC), *Geranium pusillum* (+; VGC), *Lamium purpureum* (+; VGC), *Malva pusilla* (+; VGC), *Stellaria media* (+; VGC), *Xanthium italicum* (+; VGC).

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931**, an endangered plant community within the commune's area, was identified within Valea Jijilei area (VVJ), where it is low disturbed, as only one ruderal taxa was observed in the respective location.

Key species: *Crataegus monogyna* (3; VVJ).

Other species:

- trees: *Ulmus minor* (+; VVJ).

- grasses/ undershrubs: *Alliaria petiolata* (+; VVJ), *Calamagrostis epigeios* (+; VVJ), *Corydalis solida* subsp. *solida* (+; VVJ), *Fragaria viridis* (+; VVJ), *Geum urbanum* (+; VVJ), *Marrubium vulgare* (+; VVJ), *Scilla bifolia* (+; VVJ), *Teucrium chamaedrys* (+; VVJ), *Viola odorata* (+; VVJ).

34.92 Ponto-Sarmatic steppes

***Cynodonti-Poëtum angustifoliae* Rapaics ex Soó 1957**, an endangered plant community within the Văcăreni area, was studied within the Dealul Cadân (VDC) area, where grazing induces a low disturbance, visible in the presence of four ruderal taxa.

Key species: *Cynodon dactylon* (2; VDC), *Poa angustifolia* (2; VDC).

Other species: *Artemisia austriaca* (+; VDC), *Dichanthium ischaemum* (+; VDC), *Erodium cicutarium* (+; VDC), *Euphorbia seguieriana* (+; VDC), *Geranium pusillum* (+; VDC), *Potentilla argentea* (+; VDC), *Plantago lanceolata* (+; VDC), *Thymus pannonicus* (+; VDC).

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community can be considered vulnerable within the whole studied territory, where it was recorded from Dealul Cadân (VDC), being also observed in the Valea Jijilei area. Grazing influence is obvious, taking into account the six ruderal taxa, even with a reduced dominance, which is at the upper limit of the low disturbance level.

Key species: *Dichanthium ischaemum* (5; VDC).

Other species: *Agropyron cristatum* (+2; VDC), *Artemisia annua* (+; VDC), *Artemisia austriaca* (+; VDC), *Cichorium intybus* (+; VDC), *Erodium cicutarium* (+; VDC), *Festuca valesiaca* (+; VDC), *Medicago minima* (+; VDC), *Plantago lanceolata* (+; VDC), *Poa bulbosa* (+; VDC), *Sedum urvillei* subsp. *hillebrandtii* (+; VDC), *Taraxacum erythrospermum* (+; VDC).

***Artemisia austriacae-Poëtum bulbosae* Pop 1970**, a vulnerable coenotaxon that was observed within Dealul Cadân area (VDC), as usual is an indicator of a high level of disturbance due to grazing, taking into account the dominance indices of the three ruderal species (+2) of which two are key taxa.

Key species: *Artemisia austriaca* (-1; VDC), *Poa bulbosa* (2; VDC).

Other species: *Artemisia annua* (1; VDC), *Asperula tenella* (1; VDC), *Cynodon dactylon* (1; VDC), *Dichanthium ischaemum* (+; VDC), *Euphorbia seguieriana* (+; VDC), *Medicago minima* (+; VDC), *Sanguisorba minor* (+; VDC), *Thymus pannonicus* (+; VDC).

FAUNA

Birds. On the administrative territory of the Văcăreni commune there were observed 94 bird species included in the Ordinance 57/2007. Of these, 57 species are strictly protected being listed on the Annex 3: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Branta ruficollis*, *Aythya nyroca*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna caspia*, *Sterna albifrons*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos*

syriacus, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*, *Lanius minor*, *Lanius collurio*.

Some of the rarest species listed above which give a high conservation value to the area are: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Platalea leucorodia*, *Branta ruficollis*, *Aythya nyroca*, *Haliaeetus albicilla*, *Circus gallicus*, *Circus macrourus*, *Circus pygargus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco peregrinus*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hibridus*, *Asio flammeus*, *Dendrocopos medius*, *Lulula arborea*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Luscinia svecica*.

There were identified 37 protected species, found in the Annex 4B of the Ordinance 57/2007, such as: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Remiz pendulinus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Passer hispaniolensis*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. The rarest species in the area from this appendix include: *Motacilla cinerea*, *Bombycilla garrulus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Muscicapa striata*, *Corvus corax*, *Passer hispaniolensis*, *Carduelis cannabina*, *Carduelis flammea*.

A number of bird species observed here are not included in the two annexes of the Ordinance 57/2007, but can be found in Annex II of Law 13/ 1993: *Podiceps grisegena*, *Podiceps nigricollis*, *Mergus albellus*, *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Tringa ochropus*, *Tringa glareola*, *Calidris minuta*, , *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Hirundo daurica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus schoenobaenus*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Regulus ignicapillus*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Bird species which certainly or probably nest in the Văcăreni territory include: *Egretta alba*, *Ardea purpurea*, *Ciconia ciconia*, *Cygnus olor*, *Aythya nyroca*, *Circus aeruginosus*, *Sterna hirundo*, *Chlidonias niger*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Cuculus canorus*, *Alauda arvensis*, *Galerida cristata*, *Dryocopus martius*, *Acrocephalus*

paludicola, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Lanius minor*, *Lanius collurio*, *Tachybaptus ruficollis*, *Falco tinnunculus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Riparia riparia*, *Hirundo rustica*, *Hirundo daurica*, *Delichon urbica*, *Oenanthe oenanthe*, *Luscinia megarhynchos*, *Luscinia luscinia*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia atricapilla*, *Parus caeruleus*, *Parus major*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Mammals. On the territory of Văcăreni commune were observed 15 mammal species like: *Myotis myotis*, *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Lepus europaeus*, *Ondatra zibethicus*, *Mycromis minutus*, *Mus musculus*, *Rattus norvegicus*, *Apodemus agrarius*, *Canis aureus*, *Vulpes vulpes*, *Nyctereutes procyonoides*, *Mustela putorius*, *Sus scrofa*, *Capreolus capreolus*.

Strictly protected species of mammals identified in this area, which are listed in the Annex 3 of the Ordinance 57/2007, are: *Myotis myotis* și *Lutra lutra*. Species requiring strict protection, included in Annex 4A, are: *Nyctalus noctula* and *Pipistrellus pipistrellus*.

Research concerning the natural heritage of Valea Teilor commune

Mihai PETRESCU, Viorel CUZIC, Valentin PANAIT, Laura DOXAN

ACCESS: Road E87 Tulcea-Niculitel, DJ229

PROTECTED AREAS OF NATIONAL/ INTERNATIONAL IMPORTANCE:
Carasan-Teke nature reserve, Edirlen nature reserve
(partially)

NATURA 2000 SITES: Podișul Nord Dobrogean (Site of Community Interest),
Măcin-Niculitel (Special Protection Area)

GEOLOGY AND PEDOLOGY

The administrative territory of Valea Teilor commune is characterized by the two types of geological subunits as follows Consul Sub-unit and Niculițel Sub-unit. The Consul Sub-unit is composed of pre-Alpine formations (volcanic breccia, conglomerates polygenic, red silt, jasper red porphyritic tuffs) and Alpine Triassic formations (Middle Triassic Age which consist of limestone, dolomitic limestone and dolomite with different colours). Of pre-Alpine formations (consist of volcanic

breccia, polygenic conglomerates, red siltite, porphyritic tuffs) and Alpine Middle Triassic formations (consist of limestone, dolomitic limestone and dolomite with different colours). The Consul Sub-unit consists of Middle Triassic formations of limestone, dolomitic limestone and dolomite with different colours. These types of stones outcrop through the Quaternary loess layers which cover the entire area.

Based on these stones types, the various types of territorial units of soil such as Eutric litosols (Eutric Leptosols, after World Reference Base for Soil Resources – SR, 1998), Rendzinic litosols (Eutri-lithic Leptosols, after World Reference Base for Soil Resources – SR, 1998) – on limestone, Calcaric regosols (Calcaric Regosols, after World Reference Base for Soil Resources – SR, 1998), Subrendzinic chernozems (Endoleptic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Greic phaeozems (Greyi-luvic Phaeozems, after World Reference Base for Soil Resources – SR, 1998), Calcaric chernozems (Calcaro-calcic Chernozems, after World Reference Base for Soil Resources – SR, 1998), Typical luvisols (Haplic Luvisols, after World Reference Base for Soil Resources – SR, 1998) occurs.

LANDSCAPE

The Valea Teilor commune's territory lies within the Niculițel Plateau, a forested hilly area which surrounds the locality, with maximum altitudes situated in its western part, on Boclucea Hill highest peaks (411 m). The latest, together with some other summits, are rocky, usually devoid of compact forest vegetation, replaced either by steppe grasslands or mosaic wooded steppe vegetation like Carasan Hill (352 m) or other lower ones – Teke, Malciu etc. Other high hills are mainly covered with more or less compact forest like Dealul Bujorilor (352 m). The commune's territory is dominated by natural habitats, mainly represented by Balkan forests of sessile oak, lime, hornbeam or eastern hornbeam. These forest massifs have an overall horseshoe distribution, partially surrounding the Valea Teilor locality towards east, north and west. In the adjacent areas of these forests also occur, on less extensive areas, steppe grasslands or wooded steppe transitional zones. The few rivulets, like Lodzova, Valea Teilor, Alba, enhance the landscape attractiveness, especially when crossing forested or steppe grasslands.

FLORA, VEGETATION, HABITATS

The Valea Teilor territory has an overall high conservation value, as there prevail the natural habitats, nearly all the analysed plant communities being framed into community interest habitats, priority ones, like 62C0* (34.92, 34.9211), 91AA* (41.73723, 41.73724), 91Y0* (41.2C22, 41.76834). Most of the plant communities have at least one threatened taxon, the maximum being of three such species. Most of these are endangered, followed by critically endangered and less by vulnerable species within the studied situation.

The vulnerable plant communities prevail, while the endangered, rare and sporadic have a lower importance. There can be observed an equal proportion of medium respectively low disturbed plant communities, only one of these being

representative for a natural status. All the mentioned locations are framed within the Podișul Nord Dobrogean Natura 2000 Site (SCI).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941**, a vulnerable plant community studied at Muchea Goală (VTMG), has an enhanced conservation importance due the two rare and vulnerable species identified in the plots. A slight disturbance due to grazing is shown by the reduced dominance of two ruderal species.

Key species: *Festuca valesiaca* (4; VTMG).

Threatened species: *Crocus chrysanthus* (+; VTMG), *Paeonia peregrina* (+-1; VTMG).

Other species: *Chrysopogon gryllus* (+; VTMG), *Convolvulus cantabricus* (+; VTMG), *Crataegus monogyna* (+; VTMG), *Dactylis glomerata* (+; VTMG), *Dichanthium ischaemum* (+; VTMG), *Eryngium campestre* (+; VTMG), *Filipendula vulgaris* (+; VTMG), *Lamium purpureum* (+; VTMG), *Ranunculus illyricus* (+; VTMG), *Stipa capillata* (+; VTMG), *Teucrium chamaedrys* (+; VTMG), *Veronica jacquinii* (+; VTMG).

***Botriochoetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community can be estimated as vulnerable within the studied area, there being observed within the Valea Cișmelei (VTC) area. Two ruderal species with a reduced dominance indicate a low disturbance.

Key species: *Dichanthium ischaemum* (5; VTC).

Other species: *Achillea coarctata* (+; VTC), *Agrimonia eupatoria* (+; VTC), *Cichorium intybus* (+; VTC), *Crataegus monogyna* (+; VTC), *Dactylis glomerata* (+; VTC), *Eryngium campestre* (+; VTC), *Galium humifusum* (+; VTC), *Medicago falcata* (+; VTC), *Potentilla argentea* (+; VTC).

34.9211 Western Pontic thyme steppes

***Festucetum callierii* Șerbănescu 1965 apud Dihoru (1969) 1970** a plant community vulnerable in the Valea Teilor commune's area, can be considered as being disturbed, as indicated by the dominance variation limits of the ruderal species. It should underlined the presence of two threatened species, rare at the national level of which *Crocus chrysanthus* is also vulnerable, both endangered within the plots.

Key species: *Festuca callieri* (3; VTM).

Threatened species: *Crocus chrysanthus* (+; VTM), *Potentilla bornmuelleri* (+; VTM).

Other species: *Asperula tenella* (+; VTM), *Cichorium intybus* (+; VTM), *Dichanthium ischaemum* (+; VTM), *Echium italicum* (+; VTM), *Eryngium campestre* (+; VTM), *Poa bulbosa* (1; VTM), *Potentilla argentea* (+; VTM), *Sanguisorba minor* (+; VTM), *Teucrium polium* (+; VTM), *Thymus pannonicus* (+; VTM).

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974** is an endangered type of vegetation which was identified within Dealul lui Malciu (VTM)

area, where the only threatened taxon is the rare *Festuca callieri*, that can be considered vulnerable within these phytocoenoses. A reduced influence of human activities is indicated by just one ruderal species.

Key species: *Polytrichum piliferum* (1; VTM), *Sedum urvillei* subsp. *hillebrandtii* (+; VTM).

Threatened species: *Festuca callieri* (+1; VTM).

Other species: *Artemisia austriaca* (+; VTM), *Asperula tenella* (+; VTM), *Thymus pannonicus* (+; VTM).

41.2C22 Moldo-Muntenian sessile oak-hornbeam forests

***Tilio tomentosae-Carpinetum betuli* Doniță 1968** plant community, the most widespread type of forest, sporadic within the whole studied territory, was inventoried within Piscul Părului (VTP), where a medium disturbance is suggested by the reduced contribution to the herbaceous layer of ruderal species and mainly by the partially derided canopy.

Key species: *Carpinus betulus* (2; VTP), *Quercus dalechampii* (1; VTP), *Tilia tomentosa* (2; VTM).

Other species:

- trees: *Cerasus avium* (+; VTP);
- grasses/ undershrubs: *Alliaria petiolata* (+; VTP), *Dactylis polygama* (+; VTP), *Geum urbanum* (+; VTP), *Veronica hederifolia* (+; VTP).

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970**, a vulnerable type of sub-Mediterranean forest which occur also on the Boclușea Hill (VTB), has a conservation value not only as a priority community interest habitat, but also due to the two rare threatened taxa recorded within the plots and outside these, of which *Crocus chrysanthus* is also vulnerable, both species being endangered in the plots. Its medium degree of disturbance is indicated by the partially derived canopy.

Key species: *Carpinus orientalis* (4; VTB), *Quercus pubescens* (1; VTB).

Threatened species: *Crocus chrysanthus* (±; VTB), *Myrrhoides nodosa* (+; VTB).

Other species:

- shrubs: *Cornus mas* (1; VTB), *Crataegus monogyna* (+; VTB);
- grasses/ undershrubs: *Anthriscus cerefolium* (+; VTB), *Brachypodium sylvaticum* (+; VTB), *Geum urbanum* (+; VTB), *Stipa capillata* (+; VTB), *Verbascum phoeniceum* (+; VTB), *Veronica hederifolia* (+; VTB), *Viola odorata* (+; VTB).

41.73724 Moesian *Galium dasypodium*-white oak woods

***Galio dasypodi-Quercetum pubescentis* Doniță 1970** is a vulnerable plant community recorded within the wooded steppe area of Dealul Boclușea (VTB), where its remarkable conservation importance is also obvious, taking into account the three rare threatened taxa identified in the same plot, of which *Crocus chrysanthus* is also vulnerable at the national level, still being critically

endangered within these phytocoenoses. The other two taxa are endangered within the plots. This can be considered a typical example of an undisturbed habitat, as no ruderal/alien taxon was observed, while the canopy is not derived.

Key species: *Quercus pubescens* (4; VTB).

Threatened species: *Centaurea napulifera* (+; VTB), *Crocus chrysanthus* (r; VTB), *Iris sintenisii* (+; VTB).

Other species:

- trees: *Acer campestre* (+; VTB), *Fraxinus ornus* (1; VTB);
 - shrubs: *Crataegus monogyna* (+; VTB), *Prunus spinosa* (+; VTB);
 - grasses/ undershrubs: *Festuca valesiaca* (+; VTB), *Filipendula vulgaris* (+; VTB), *Fragaria viridis* (+; VTB), *Geum urbanum* (+; VTB), *Lithospermum purpureocaeruleum* (+; VTB).

41.76831 Dobrogean paeonia sessile oak forests

***Fraxino orni-Quercetum dalechampii* Doniță 1970** is a vulnerable coenotaxon within this territory, being studied in the Dealul Boclușea area (VTB) where it can be estimated as low disturbed as only one ruderal species was observed in the analyzed situations.

Key species: *Fraxinus ornus* (1; VTB), *Quercus dalechampii* (2; VTB).

Other species

- trees: *Carpinus orientalis* (2; VTB);
 - shrubs: *Crataegus pentagyna* (+; VTB);
 - grasses/ undershrubs: *Alliaria petiolata* (+; VTB), *Brachypodium sylvaticum* (+; VTB), *Geum urbanum* (+; VTB), *Ranunculus ficaria* (+; VTB), *Veronica hederifolia* (+; VTB).

41.76833 Dobrogean *Quercus pedunculiflora*-lime-oriental hornbeam forests

***Querco pedunculiflorae-Tilietum tomentosae* Doniță 1970**, a vulnerable plant community, can be estimated as medium disturbed, taking into account the partially derived canopy and the presence in one plot of the non-native species *Robinia pseudoacacia* with a significant dominance (1). The herbaceous layer is low disturbed, as only two ruderal taxa, with a low dominance, were observed. The coenotaxon was analysed within the Piscul Părului area (VTP), where old growth oak trees were recorded.

Key species: *Quercus pedunculiflora* (1; VTP), *Tilia tomentosa* (2; VTP).

Other species:

- trees: *Acer platanoides* (+; VTP), *Carpinus betulus* (2; VTB), *Cerasus avium* (+; VTP), *Robinia pseudoacacia* (1; VTP);
 - grasses/ undershrubs: *Alliaria petiolata* (+; VTP), *Anthriscus sylvestris* (+; VTP), *Arum orientale* (+; VTP), *Lamium purpureum* (+; VTP), *Loranthus europaeus* (+; VTP), *Ranunculus ficaria* (+; VTP), *Viola odorata* (+; VTP).

41.76834 Western-Pontic sessile oak-lime-oriental hornbeam-*Galanthus* forests

***Galantho plicatae-Tilietum tomentosae* Doniță 1970** is a rare type of forest that occurs also within the Boclugea Hill (VTB), where the key species *Galanthus plicatus* represents also the only rare threatened species that was observed. Still, it contributes to the conservation value of this plant community taking into account its European importance. Within this phytocoenosis it can be considered as critically endangered in the analysed situations. There can be assessed an overall medium degree of conservation, as the canopy is partially derived. Still, in the herbaceous layer only one ruderal species was recorded.

Key species: *Galanthus plicatus* (r; VTB), *Quercus dalechampii* (1; VTB), *Tilia tomentosa* (2; VTB).

Threatened species: *Galanthus plicatus* (r; VTB).

Other species:

- trees: *Carpinus orientalis* (2; VTB), *Sorbus torminalis* (+; VTB);
- shrubs: *Crataegus pentagyna* (+; VTB);
- grasses/ undershrubs: *Alliaria petiolata* (+; VTB), *Brachypodium sylvaticum* (+; VTB), *Potentilla micrantha* (+; VTB), *Ranunculus ficaria* (+; VTB), *Veronica hederifolia* (+; VTB).

Plant communities which are not framed within the Palaearctic habitat classification

***Populetum tremulae-Carpinetum* Tüber 1991-1992** was recorded as an endangered plant community with much reduced distribution in the studied territory, the framing of these phytocoenoses. Within this coenotaxon is provisory as, so far this is the only plant community described from Romania (Sanda, Vicol, Ștefănuț 2008) having *Populus tremula* as a key species. A low disturbance is only shown by the ruderal species *Poa bulbosa* an accidental presence that originates in the adjacent steppe meadows of the Boclugea Hill (VTB).

Key species: *Carpinus betulus* (+, VTB), *Populus tremula* (3; VTB).

Other species:

- trees: *Quercus petraea* (+, VTB);
- shrubs: *Coryllus avellana* (+, VTB), *Crataegus monogyna* (+; VTB), *Rubus caesius* (+; VTB);
- grasses/ undershrubs: *Agrimonia eupatoria* (+, VTB), *Brachypodium sylvaticum* (+; VTB), *Geum urbanum* (+; VTB), *Festuca valesiaca* (+, VTB), *Poa bulbosa* (+; VTB), *Potentilla micrantha* (+; VTB).

FAUNA

Birds. On the territory of the Valea Teilor commune there were identified 62 species of birds which can be found in the Appendices 3 and 4B of the Ordinance 57/2007. Strictly protected bird species identified here, which can be found in the Annex 3 (33 species) are: *Ciconia ciconia*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Sterna*

hirundo, *Chlidonias hibridus*, *Chlidonias niger*, *Asio flammeus*, *Alcedo atthis*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Melanocorypha calandra*, *Anthus campestris*, *Phoenicurus phoenicurus*.

Of the rare species, which give a high conservation value area, the most representative are: *Circaetus gallicus*, *Circus aeruginosus*, *Circus macrourus*, *Circus pygargus*.

There were recorded 29 protected species that can be found in the Annex 4B of the Ordinance 57/2007, like: *Falco tinnunculus*, *Falco subbuteo*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Prunella modularis*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*. The rarest bird species therein for this area are: *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Sturnus roseus*, *Motacilla cinerea*.

Identified bird species not found in the two annexes of the Ordinance 57/2007 but listed in the Annex II of the Law 13/ 1993, are: *Accipiter gentilis*, *Accipiter nisus*, *Buteo buteo*, *Buteo buteo vulpinus*, *Buteo lagopus*, *Falco columbarius*, *Caprimulgus europaeus*, *Dendrocopos major*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Lanius senator*, *Troglodytes troglodytes*, *Saxicola rubetra*, *Luscinia megarhynchos*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia borin*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus cristatus*, *Parus caeruleus*, *Parus major*, *Certhia familiaris*, *Emberiza citrinella*, *Emberiza schoeniclus*.

Bird species which nest in the Valea Teilor area include: *Ciconia ciconia*, *Falco vespertinus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*, *Falco tinnunculus*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Remiz pendulinus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Sitta europaea*, *Oriolus oriolus*, *Miliaria calandra*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*, *Riparia riparia*, *Hirundo rustica*, *Delichon urbica*, *Saxicola rubetra*, *Luscinia megarhynchos*, *Acrocephalus scirpaceus*, *Acrocephalus arundinaceus*, *Hippolais pallida*, *Sylvia curruca*, *Sylvia communis*, *Sylvia atricapilla*, *Ficedula albicollis*, *Parus caeruleus*, *Parus major*, *Emberiza schoeniclus*, *Oenanthe oenanthe*, *Alauda arvensis*, *Melanocorypha calandra*, *Turdus philomelos*, *Turdus merula*, *Miliaria calandra*.

CHAPTER II

Contributions to the knowledge of the natural heritage of some protected natural areas in the Dobrogea Plateau

This chapter presents the results of the research aiming at replenishing proper data previously published (PETRESCU, 2007; PETRESCU *et alii*, 2006; CUZIC, PETRESCU, 2006 etc.) regarding the natural heritage of the protected areas in Tulcea and Constanța Counties, in order to reveal its conservation value. Where data allow, the preliminary assessment of the conservation status of the protected species and habitats, mainly of those that not were inventoried within the previous studies, is presented. For Tulcea County the amassed data allow mainly the presentation of flora, vegetation, habitats and fauna related aspects. For Constanța County only aspects concerning the flora, vegetation and habitats will be mentioned. All the protected areas are legally established, being of national importance, except nature reserves which are still proposals for the national level, for which these aspects are mentioned apart. All these protected areas, legally established or proposed, are also protected at the European level, their territory being included in the *Natura 2000* network. For Tulcea County data on the territories of the areas protected at the national level are presented, taking into account that the remaining *Natura 2000* sites surfaces are mentioned in chapter I, within other studies conducted simultaneously for the administrative territories of the communes and towns. For Constanța County data both from the legally established reserves, and from some proposed reserves included in the *Natura 2000* sites, are displayed. Even if the respective reserves are not yet approved at the national level, the presentation of these natural areas under these denominations allows strict comparison of data with those mentioned in previous publications regarding the same areas (PETRESCU, 2007; PETRESCU *et alii*, 2006; CUZIC, PETRESCU, 2006 etc.).

Research concerning the natural heritage of some protected areas from Tulcea County

Mihai PETRESCU, Viorel CUZIC, Cristina DINU, Adina Maria RĂDULESCU

This paper presents the results of the recent research (2011-2013), which represents additions and updates of the proper studies previously conducted concerning the landscape, flora, habitats, bird species of 19 protected areas legally established or protected within the plateau part of Tulcea County; they are mentioned in alphabetical order.

BEIDAUD

The landscape nature reserve, with an area of 1121.00 ha, framed within the Beidaud commune's territory, was established by the Government Decision 2151/ 2004. At present it is included in the Podișul Nord Dobrogean Site of Community Interest. To the already published data (PETRESCU, 2007), results of the recent field investigations listed below can be added.

The endangered, vulnerable, respectively rare plant communities are equal in number, followed by just one frequent coenotaxon. Most of the analysed plant communities are low disturbed, closely followed by highly perturbed coenotaxa, only one of them showing signs of a medium level of the ruderal species invasion. Half of the coenotaxa have an enhanced conservation value, as they contain between one and five threatened species, most of these being endangered, the upper extreme value being sporadic.

FLORA, VEGETATION, HABITATS

31.A21111 Western Pontic sand pioneer grass swards

***Brometum tectorum* Bojko 1934** plant community is a vulnerable coenotaxon, as result of a very intense grazing, being concentrated especially close to rivulets or springs, on dry soils, within the Beidaud reserve (B). Together with the dominant *Bromus tectorum* other seven ruderal taxa reach more than half of the number of species in the plots, showing an intense disturbance.

Key species: *Bromus tectorum* (3; B).

Other species: *Arenaria serpyllifolia* (+; B), *Bombycilaena erecta* (+; B), *Bromus hordeaceus* (+; B), *Capsella bursa-pastoris* (±; B), *Carduus thoermeri*

(+; B), Cichorium intybus (+; B), Dichanthium ischaemum (+; B), Erodium cicutarium (+; B), Eryngium campestre (+; B), Festuca valesiaca (+; B), Hordeum murinum (+; B), Medicago minima (1; B), Myosotis stricta (+; B), Poa bulbosa (1; B), Ranunculus oxyspermus (±; B).

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931** plant community, vulnerable (F: I) within the Beidaud reserve (B), shows a low level of disturbance, according to the presence of seven ruderal species with a reduced dominance.

Key species: *Crataegus monogyna* (4; B).

Other species:

- trees/ shrubs.: *Carpinus orientalis* (1; B), *Ulmus minor* (+; B);
 - grasses/ undershrubs: *Achillea setacea* (+; B), *Anthriscus caucalis* (+; B), *Bryonia alba* (+; B), *Capsella bursa-pastoris* (+; B), *Carduus thoermeri* (+; B), *Convolvulus arvensis* (+; B), *Eryngium campestre* (+; B), *Festuca valesiaca* (+; B), *Fragaria viridis* (+; B), *Geranium lucidum* (+; B), *Plantago lanceolata* (+; B), *Poa nemoralis* (+; B), *Potentilla argentea* (+; B), *Sedum urvillei* subsp. *hillebrandtii* (+; B), *Stellaria media* (+; B), *Thymus pannonicus* (+; B), *Urtica dioica* (1; B), *Viola suavis* (1; B).

34.92 Ponto-Sarmatic steppes

***Cynodonti-Poëtum angustifoliae* Rapaics ex Soó 1957** plant community, that can be estimated as an endangered coenotaxon within the Beidaud reserve (B), has a low disturbance level, both from the point of view of non-native species, represented by *Vicia sativa*, as well as regarding the ruderal species invasive trend (seven taxa).

Key species: *Cynodon dactylon* (1; B), *Poa angustifolia* (4; B).

Other species: *Achillea setacea* (+; B), *Bromus hordeaceus* (+; B), *Bromus tectorum* (+; B), *Capsella bursa-pastoris* (+; B), *Carduus thoermeri* (+; B), *Dichanthium ischaemum* (+; B), *Festuca valesiaca* (+; B), *Galium humifusum* (+; B), *Cruciata pedemontana* (+; B), *Geranium pusillum* (+; B), *Lamium amplexicaule* (+; B), *Medicago minima* (+; B), *Myosotis stricta* (+; B), *Plantago lanceolata* (+; B), *Potentilla argentea* (+; B), *Ranunculus oxyspermus* (+; B), *Vicia sativa* (+; B).

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** plant community is dominant (F: IV) within the Beidaud reserve (B), where within this plot there was only identified *Sedum caespitosum* as a rare threatened plant, endangered at the local level. A medium level of ruderal plant invasion is indicated by the five such species and their dominance variation.

Key species: *Festuca valesiaca* (3; B), *Medicago minima* (1; B).

Threatened species: *Sedum caespitosum* (+; B).

Other species: *Bromus tectorum* (1; B), *Capsella bursa-pastoris* (+; B), *Carpinus orientalis* (+; B), *Cerastium pumilum* (+; B), *Dichanthium ischaemum* (+; B), *Erodium cicutarium* (+; B), *Eryngium campestre* (+; B), *Galium humifusum* (+; B), *Cruciata pedemontana* (+; B), *Myosotis stricta* (+), *Poa bulbosa* (+), *Vicia sativa* (+; B).

Artemisio austriacae-Poëtum bulbosae Pop 1970 plant community, rare within Beidaud reserve (B), shelters two rare threatened species, both endangered at the local level, despite the intense grazing, obvious from the dominance (+ - 2) of the six ruderal species.

Key species: *Poa bulbosa* (2; B).

Threatened species: *Festuca callieri* (+; B), *Sedum caespitosum* (+; B).

Other species: *Arenaria serpyllifolia* (+; B), *Bombycilaena erecta* (+; B), *Bromus tectorum* (1; B), *Cerastium pumilum* (1; B), *Cichorium intybus* (+; B), *Dichanthium ischaemum* (+; B), *Eryngium campestre* (+; B), *Hordeum murinum* (+; B), *Medicago minima* (1; B), *Senecio vernalis* (+; B), *Silene conica* (+; B), *Thymus pannonicus* (+; B).

34.9211 Western Pontic thyme steppes

Festucetum callierii Șerbănescu 1965 apud Dihoru (1969) 1970, a rare plant community from Beidaud reserve (B), shelters three rare threatened species, among which *Campanula romanica* is also vulnerable and of European importance. A low level of ruderal plants invasive tendencies can be estimated, these being represented by three species with a reduced dominance.

Key species: *Festuca callieri* (3; B).

Threatened species: *Campanula romanica* (1; B), *Dianthus nardiformis* (+; B), *Festuca callieri* (3; B).

Other species: *Cichorium intybus* (+; B), *Dichanthium ischaemum* (+; B), *Eryngium campestre* (+; B), *Herniaria glabra* (+; B), *Phleum phleoides* (+; B), *Potentilla argentea* (+; B), *Pulsatilla balcana* (+; B), *Rumex acetosella* (1; B), *Scleranthus perennis* (+; B), *Scorzonera austriaca* (+; B), *Senecio vernalis* (+; B), *Thymus pannonicus* (+; B).

Sedo hillebrandtii-Polytrichetum piliferi Horeanu et Mihai 1974, an endangered (F: +) plant community, inventoried within the Beidaud reserve (B), has an enhanced conservation value due to the presence of five rare threatened species. Within these, *Campanula romanica* and *Moehringia grisebachii* are vulnerable, of European importance, the first being also endemic while the second is sub-endemic. Within the analysed plot all these can be considered endangered, except *Festuca callieri* which is vulnerable. This phytocoenosis can be also estimated as having a low level of ruderal species invasion, as only *Poa bulbosa* fits into this category.

Key species: *Polytrichum piliferum* (2; B).

Threatened species: *Campanula romanica* (+; B), *Festuca callieri* (+; B), *Moehringia grisebachii* (+; B), *Sedum caespitosum* (±; B).

Other species: *Bombycilaena erecta* (+; B), *Myosotis stricta* (±; B), *Poa bulbosa* (±; B), *Potentilla argentea* (+; B), *Ranunculus illyricus* (+; B), *Rumex acetosella* (+; B).

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970**, a rare plant community from Beidaud reserve (B), has one rare and sub-endemic threatened plant *Corydalis solida* subsp. *slivenensis*, endangered within this phytocoenosis. The coenotaxon has a high level of disturbance as is totally derived, but has a low level of disturbance due to the ruderal species invasion, indicated by the seven such species with reduced dominance.

Key species: *Carpinus orientalis* (5; B).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; B).

Other species:

- trees: *Cerasus mahaleb* (±; B);

- grasses/ undershrubs : *Arum orientale* (+; B), *Bromus sterilis* (+; B), *Bromus tectorum* (+; B), *Corydalis solida* subsp. *solida* (+; B), *Cichorium intybus* (±; B), *Festuca valesiaca* (+; B), *Lamium purpureum* (+; B), *Poa nemoralis* (+; B), *Ranunculus illyricus* (+; B), *Scilla bifolia* (+; B), *Senecio vernalis* (+; B), *Stellaria media* (1; B), *Taraxacum erythrospermum* (+; B), *Thlaspi perfoliatum* (+; B), *Viola arvensis* (+; B).

37.242 Floodswards

***Junco inflexi-Menthetum longifoliae* Lohmeyer 1953**, an endangered coenotaxon, is typical for the water fringe vegetation of the rivulets within the Beidaud reserve (B), along which it forms narrow phytocoenosis, low disturbed by grazing, where only one ruderal species with reduced dominance was identified.

Key species: *Mentha logifolia* (4; B).

Other species: *Glyceria plicata* (+; B), *Lycopus europaeus* (+; B), *Mentha aquatica* (+; B), *Mysoton aquaticum* (+; B), *Plantago major* (+; B), *Potentilla reptans* (+; B), *Ranunculus sceleratus* (+; B).

Plant communities that are not framed into the Palaearctic classification

***Poëtum pratensis* Răvăruț, Căzăceanu et Turenschi 1956**, a vulnerable plant community, occurs on the humid stripes of soil situated along the rivulets in the Beidaud reserve (B), the most suitable areas for grazing. Thus there is an obvious intense level of disturbance also underlined by this phytocoenosis inventory where, except *Achillea setacea*, all the species are ruderal, including the dominant *Poa pratensis*.

Key species: *Poa pratensis* (5; B).

Other species: *Achillea setacea* (+; B), *Capsella bursa-pastoris* (+; B), *Hordeum murinum* (+; B), *Lamium amplexicaule* (+; B), *Lamium purpureum* (+; B), *Plantago major* (+; B), *Poa bulbosa* (+; B), *Sclerochloa dura* (+; B).

BIRDS

In the Beidaud reserve, of the 47 identified species of birds that can be found in annexes of the Ordinance 57/2007, 25 are strictly protected, being classified in Annex 3: *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Crex crex*, *Burhinus oedicephalus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Melanocorypha calandra*, *Lulula arborea*, *Emberiza hortulana*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

There are identified a total of 22 protected species, species that are found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

DEALUL CĂLUGĂRU-IANCINA

Framed within the Jurilovca commune, with an area of 126.01 ha, this protected area was established by the Government Decision 2151/ 2004. The landscape reserve is situated on the rocky slopes adjacent to the Razim lagoon, that reach 61,6 m on the highest hill summits, being framed within the Delta Dunării Site of Community Interest. The recent field researches were concentrated on the habitats listed below, several other being already published from this area (PETRESCU, 2007).

Among the studied vegetation types the most frequent are the vulnerable coenotaxa, to which a rare, respectively a sporadic plant community can be added. Except one highly disturbed coenotaxon, all the others are low disturbed. While half of the plant communities have no threatened species, the others contain generally one such taxa. Only one plant community has a conservation value enhanced by three species, endangered within these phytocoenoses, like all the others threatened taxa.

FLORA, VEGETATION, HABITATS

15.A21273 Western Pontic *Agropyron elongatus* saline beds

Agropyretum elongati I. Șerbănescu 1965 plant community, analyzed as vulnerable within Dealul Călugăru-Iancina nature reserve (DCI), has a low participation of ruderal species (three taxa).

Key species: *Elymus elongatus* (3; DCI).

Other species: *Achillea setacea* (+; DCI), *Artemisia santonica* (+; DCI), *Cichorium intybus* (+; DCI), *Cynodon dactylon* (2; DCI), *Dactylis glomerata* (+; DCI), *Daucus carota* subsp. *carota* (+; DCI), *Ononis spinosa* (+; DCI), *Phragmites australis* (+; DCI), *Teucrium scordium* (+; DCI), *Verbena officinalis* (+; DCI).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941**, a sporadic plant community, analysed within the Dealul Călugăru-lancina nature reserve (DCI), can be considered representative for a very low impact of human activities, as it only includes one ruderal species with a reduced dominance. Beside this, the three rare threatened species observed in the plot enhance its conservation value.

Key species: *Festuca valesiaca* (4; DCI).

Threatened species: *Convolvulus lineatus* (+; DCI), *Echinops ritro* subsp. *ruthenicus* (+; DCI), *Thymus zygioides* (+; DCI).

Other species: *Asperula tenella* (+; DCI), *Campanula sibirica* (+; DCI), *Carduus thoermeri* (+; DCI), *Dichanthium ischaemum* (+; DCI), *Euphorbia seguieriana* (+; DCI), *Koeleria macrantha* (+; DCI), *Linaria genistifolia* (r; DCI), *Medicago falcata* (+; DCI), *Stipa capillata* (+; DCI), *Teucrium polium* (+ DCI).

***Artemisia austriacae-Poëtum bulbosae* Pop 1970**, a secondary plant community, vulnerable in this area, was studied within the Dealul Călugăru-lancina nature reserve (DCI), Jurilovca commune. This represents the result of overgrazing, obvious in the case of the key species dominance (1-2). These occur together with other four ruderal species. Altogether these indicate an intense ruderal species invasion process, as they also represent more than half of this phytocoenosis inventory.

Key species: *Artemisia austriaca* (1; DCI), *Poa bulbosa* (2; DCI).

Other species: *Agropyron cristatum* (1; DCI), *Asperula tenella* (+; DCI), *Bassia prostrata* (+; DCI), *Centaurea solstitialis* (+; DCI), *Eryngium campestre* (+; DCI), *Festuca valesiaca* (1; DCI), *Marrubium peregrinum* (+; DCI), *Medicago minima* (+; DCI), *Onopordum acanthium* (+; DCI).

***Agropyretum pectiniformae* (Prodan 1939) Dihoru 1970**, a rare (F: II) plant community, was inventoried within Dealul Călugăru-lancina nature reserve (DCI), where the seven ruderal species recorded within the plot indicate a low influence of grazing.

Key species: *Agropyron cristatum* (3; DCI).

Other species: *Elymus elongatus* (+; DCI), *Artemisia annua* (+; DCI), *Artemisia santonica* (+; DCI), *Bassia prostrata* (+; DCI), *Carduus thoermeri* (+; DCI), *Centaurea solstitialis* (+; DCI), *Consolida regalis* (+; DCI), *Cynodon dactylon* (2; DCI), *Chondrilla juncea* (+; DCI), *Crataegus monogyna* (+; DCI), *Eryngium campestre* (+; DCI), *Galium humifusum* (+; DCI), *Phragmites australis* (r; DCI), *Salvia nemorosa* (+; DCI), *Teucrium polium* (+; DCI), *Sambucus ebulus* (+; DCI).

***Stipetum capillatae* (Hueck 1931) Krausch 1961** plant community, inventoried as vulnerable within Dealul Călugăru-lancina nature reserve (DCI), has a medium level of ruderal species contribution to its structure, underlined by

the dominance variation (+-1) within the seven such taxa. Only one rare threatened species, endangered at least within this phytocenosis, was identified.

Key species: *Stipa capillata* (4; DCI).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; DCI).

Other species: *Achillea coarctata* (+; DCI), *Agropyron cristatum* (+; DCI), *Artemisia austriaca* (+; DCI), *Carduus thoermeri* (+; DCI), *Carthamus lanatus* (+; DCI), *Consolida regalis* (+; DCI), *Eryngium campestre* (+; DCI), *Euphorbia seguieriana* (+; DCI), *Festuca valesiaca* (+; DCI), *Inula oculus-christi* (+; DCI), *Marrubium peregrinum* (+; DCI), *Medicago minima* (+; DCI), *Poa bulbosa* (1; DCI), *Teucrium polium* (+; DCI), *Thymus pannonicus* (+; DCI).

34.9211 Western Pontic thyme steppes

***Teucrio polii-Melicetum ciliatae* V. Pușcaru et alii 1978**, a vulnerable plant community, studied within Dealul Călugăru-lancina nature reserve (DCI), has a low dominance of ruderal species, five taxa being framed in this category. There is just one rare threatened species in the recorded plot, endangered within the respective phytocenosis.

Key species: *Melica ciliata* (3; DCI), *Teucrium polium* (+; DCI).

Threatened species: *Thymus zygoides* (+; DCI).

Other species: *Achillea coarctata* (+; DCI), *Agropyron cristatum* (1; DCI), *Asperula tenella* (+; DCI), *Bromus squarrosus* (+; DCI), *Carduus thoermeri* (+; DCI), *Carthamus lanatus* (+; DCI), *Cichorium intybus* (+; DCI), *Convolvulus cantabricus* (+; DCI), *Echium italicum* (+; DCI).

BIRDS

Within the reserve Călugăru-lancina were inventoried 83 species of birds that are found in the Annexes of Ordinance 57/2007, of which 58 species are strictly protected and listed in Annex 3: *Gavia stellata*, *Gavia arctica*, *Gavia immer*, *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Tadorna ferruginea*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Crex crex*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna sandvicensis*, *Sterna albifrons*, *Chlidonias niger*, *Coracias garrulus*, *Dendrocopos syriacus*, *Picus canus*, *Dryocopus martius*, *Melanocorypha calandra*, *Sylvia nisoria*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

There have been identified 25 protected species, species that are found in Annex 4B of the Ordinance 57/2007: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*,

Phylloscopus collybita, *Regulus ignicapillus*, *Muscicapa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Oriolus oriolus*, *Corvus corax*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*.

CAPUL DOLOȘMAN

Even though it is included in the Danube Delta Biosphere Reserve and within the Danube Delta Site of Community Interest, the strictly protected area Capul (Cape) Doloșman (125 ha), belongs to the Dobrogea Plateau, being represented by a rocky promontory situated between the Razim, respectively the Golovița lagoons. Most of the plant communities are vulnerable within this protected area, followed by endangered, respectively rare coenotaxa.

Due to grazing the major part of the plant communities have a medium level of disturbance, closely followed by low perturbed coenotaxa, only one vegetation type being highly influenced by human activities. Half of the analysed coenotaxa have one threatened species each, mainly endangered within these plant communities. The only exception is *Agropyro-Thymetum zygoidi* plant community where a high level of five threatened taxa was recorded.

FLORA, VEGETATION, HABITATS

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931**, a vulnerable (F: I) plant community from Cape Doloșman (CDO), taking into account that the five ruderal species are more numerous than the other taxa, can be estimated as having a medium level of disturbance.

Key species: *Prunus spinosa* (4; CDO).

Other species:

- shrubs/ trees: *Pyrus pyraister* (1; CDO), *Rhamnus cathartica* (1; CDO), *Rosa canina* (+; CDO);
- grasses/ undershrubs: *Agropyron cristatum* (+; CDO), *Anthriscus cerefolium* (+; CDO), *Bromus sterilis* (+; CDO), *Carduus thoermeri* (+; CDO), *Crepis sancta* (+; CDO), *Geranium pusillum* (+; CDO).

31.8B731 Western Pontic jasmine Christ's thorn scrub

***Asphodelino luteae-Paliuretum* Sanda et alii 1999** can be estimated as an endangered coenotaxon at Cape Doloșman (CDO). The only threatened species, vulnerable and rare is the dominant *Paliurus spina-christi*. It can be considered a low disturbed habitat, taking into account the reduced dominance of the four ruderal species.

Key species: *Paliurus spina-christi* (4; CDO).

Threatened species: *Paliurus spina-christi* (4; CDO).

Other species:

- shrubs/ trees (within the shrub layer)/ lianas: *Evonymus verrucosus* (+; CDO), *Rosa canina* (+; CDO);
- grasses/ undershrubs: *Agropyron cristatum* (+; CDO), *Anthriscus cerefolium* (+; CDO), *Convolvulus cantabricus* (+; CDO), *Geranium rotundifolium*

(+; CDO), *Marrubium vulgare* (+; CDO), *Poa angustifolia* (+; CDO), *Stellaria media* (+; CDO), *Veronica hederifolia* (+; CDO).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** is a vulnerable plant community at Cape Doloșman (CDO). Six ruderal taxa that represent half of this phytocoenosis species inventory, with a low dominance, indicate a medium disturbance.

Key species: *Festuca valesiaca* (4; CDO).

Other species: *Agropyron cristatum* (1; CDO), *Artemisia dzevanovskyi* (+; CDO), *Bassia prostrata* (+; CDO), *Erodium cicutarium* (+; CDO), *Erophila verna* (+; CDO), *Geranium rotundifolium* (+; CDO), *Lamium purpureum* (+; CDO), *Marrubium peregrinum* (+; CDO), *Poa bulbosa* (+; CDO), *Taraxacum erythrospermum* (+; CDO).

***Artemisio austriacae-Poëtum bulbosae* Pop1970** represents a vulnerable coenotaxon within Cape Doloșman (CDO). There was identified only one rare threatened taxa, estimated as endangered within this plant community. Due to the eight ruderal taxa, that include the dominant/ co-dominant *Artemisia austriaca* and *Poa bulbosa*, this coenotaxon can be considered as highly disturbed.

Key species: *Artemisia austriaca* (1; CDO), *Poa bulbosa* (2; CDO).

Threatened species: *Astragalus dolichophyllus* (+; CDO).

Other species: *Agropyron cristatum* (+; CDO), *Arenaria serpyllifolia* (+; CDO), *Bassia prostrata* (+; CDO), *Convolvulus arvensis* (+; CDO), *Erodium cicutarium* (+; CDO), *Eryngium campestre* (+; CDO), *Euphorbia seguieriana* (+; CDO), *Festuca valesiaca* (+; CDO), *Geranium pusillum* (+; CDO), *Lamium amplexicaule* (+; CDO), *Marrubium peregrinum* (+; CDO), *Medicago minima* (+; CDO), *Silene conica* (+; CDO), *Teucrium chamaedrys* (+; CDO).

***Agropyretum pectiniformae* (Prodan 1939) Dihoru 1970**, a vulnerable plant community within Cape Doloșman (CDO) has a low disturbance level due to the ruderal species invasion, indicated by the seven such species with a reduced dominance.

Key species: *Agropyron cristatum* (3; CDO).

Other species: *Achillea coarctata* (+; CDO), *Artemisia dzevanovskyi* (+; CDO), *Crepis sancta* (+; CDO), *Eryngium campestre* (+; CDO), *Euphorbia seguieriana* (+; CDO), *Galium aparine* (+; CDO), *Geranium pusillum* (+; CDO), *Cruciata pedemontana* (1; CDO), *Lamium amplexicaule* (+; CDO), *Marrubium peregrinum* (+; CDO), *Medicago minima* (+; CDO), *Myosotis stricta* (+; CDO), *Senecio vernalis* (+; CDO).

***Agropyro cristati-Kochietum prostratae* Zólyomi 1958**, a rare plant community, studied within the Cape Doloșman (CDO), where it can be considered rare, has one rare threatened species, endangered within this coenotaxa. A low level of ruderal species invasion can be observed, taking into account the five such taxa with reduced dominance.

Key species: *Agropyron cristatum* (1; CDO), *Bassia prostrata* (3; CDO).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; CDO).

Other species: *Artemisia dzevanovsky* (+; CDO), *Calystegia sepium* (+; CDO), *Cynanchum acutum* (+; CDO), *Falcaria vulgaris* (+; CDO), *Hyoscyamus niger* (r; CDO), *Lactuca tatarica* (+; CDO), *Papaver dubium* (+; CDO), *Urtica dioica* (+; CDO).

34.9211 Western Pontic thyme steppes

***Agropyro-Thymetum zygoidi* Dihoru (1969) 1970**, a vulnerable coenotaxon at Cape Doloşman (CDO), has a high conservation value, enhanced by five mostly rare threatened taxa, of which *Centaurea jankae* is also endangered and endemic for Dobrogea. Two ruderal species with a reduced dominance indicate a low disturbed coenotaxon.

Key species: *Thymus zygoides* (2; CDO).

Threatened species: *Centaurea jankae* (±; CDO), *Festuca callieri* (1; CDO), *Koeleria lobata* (+; CDO), *Pimpinella tragi* subsp. *lithophila* (+; CDO), *Thymus zygoides* (2; CDO).

Other species: *Artemisia dzevanovskyi* (+; CDO), *Bassia prostrata* (+; CDO), *Cerastium pumilum* (+; CDO), *Crepis sancta* (+; CDO), *Gypsophila pallasii* (+; CDO), *Lamium amplexicaule* (+; CDO), *Medicago minima* (+; CDO), *Taraxacum erythrospermum* (+; CDO).

44.4 Mixed oak-elm-ash forests of great rivers

***Fraxino-Ulmetum Oberdorfer* 53** is a vulnerable plant community within Cape Doloşman (CDO). There the five ruderal taxa, that represent half of the species inventory, indicate a medium degree of ruderal plant invasive trend.

Key species: *Ulmus minor* (5; CDO).

Other species:

- shrubs/ lianas: *Crataegus monogyna* (+; CDO), *Evonymus europaeus* (+; CDO);

- grasses/ undershrubs: *Anthriscus cerefolium* (+; CDO), *Anthriscus sylvestris* (+; CDO), *Chelidonium majus* (+; CDO), *Lamium purpureum* (+; CDO), *Ligustrum vulgare* (+; CDO), *Urtica dioica* (+; CDO), *Veronica hederifolia* (+; CDO).

Plant communities that are not framed within the Palaearctic habitat classification

***Ziziphus jujuba* phytocoenosis** occurs on very restricted areas within Cape Doloşman area (CDO) thus being framed into the endangered category. There the only threatened species, *Asparagus verticillatus*, is rare within the phytocoenosis. The dominant *Ziziphus jujuba* shrubs avoid grazing, thus only four ruderal species with a low dominance being observed.

Key species: *Ziziphus jujuba* (4; CDO).

Threatened species: *Asparagus verticillatus* (2; CDO).

Other species: *Anthriscus cerefolium* (+; CDO), *Ballota nigra* (+; CDO), *Consolida regalis* (+; CDO), *Elymus hispidus* (+; CDO), *Lithospermum*

purpureocaeruleum (+; CDO), *Marrubium peregrinum* (+; CDO), *Onopordum acanthium* (+; CDO), *Taraxacum serotinum* (+; CDO).

***Artemisia dzevanovskiyi* phytocoenosis**, vulnerable within the protected area, has a high conservative value, the dominant species being quoted in Romania only within Cape Doloșman (CDO). The medium level of disturbance due to grazing can be estimated by the analysis of the abundance-dominance (+-1) of the seven ruderal species.

Key species: *Artemisia dzevanovskiyi* (4; CDO).

Other species: *Achillea coarctata* (+; CDO), *Agropyron cristatum* (+; CDO), *Artemisia annua* (+; CDO), *Artemisia austriaca* (1; CDO), *Bromus squarrosus* (+; CDO), *Centaurea diffusa* (+; CDO), *Carduus thoermeri* (+; CDO), *Convolvulus cantabricus* (+; CDO), *Cichorium intybus* (+; CDO), *Linaria genistifolia* (+; CDO), *Medicago minima* (+; CDO), *Phleum phleoides* (+; CDO), *Stipa capillata* (+; CDO), *Teucrium polium* (+; CDO), *Tragopon dubius* (+; CDO), *Xeranthenum annuum* (+; CDO).

BIRDS

Within the Capul Doloșman reserve there were identified 81 species of birds that can be found in annexes of the Ordinance 57/2007, of which 56 species are strictly protected and contained in Annex 3: *Gavia stellata*, *Gavia arctica*, *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Tadorna ferruginea*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Crex crex*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hibridus*, *Sterna (Gelochelidon) nilotica*, *Sterna caspia*, *Sterna sandvicensis*, *Sterna albifrons*, *Chlidonias niger*, *Coracias garrulus*, *Dendrocopos syriacus*, *Picus canus*, *Melanocorypha calandra*, *Sylvia nisoria*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

A total number of 24 protected species, that are found in Annex 4B of the Ordinance 57/2007, were also observed: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus trochilus*, *Phylloscopus collybita*, *Regulus ignicapillus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Oriolus oriolus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*.

CASIMCEA

Established by the Government Decision 2151/2004 on 137 ha, the geological and landscape reserve conserves the oldest traces of life discovered in Romania. The protected area is located on several rocky and loess slopes adjacent to the Casimcea River, framed between 145 and 230.4 m.

All the studied coenotaxa are framed into priority habitats of community importance 62C0* (34.92; 34.9211), being from very frequent to endangered. Most of them have an enhanced conservation importance by the presence of four to five threatened species, mostly endangered within the analysed situations. There is an overall low influence of grazing, except *Medicagini minimae-Festucetum valesiacae*, with a medium level of disturbance.

FLORA, VEGETATION, HABITATS

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiacae* Wagner 1941**, a very frequent vegetation type, the most widespread plant community within the grasslands of the reserve, is obviously affected by a medium level of grazing, underlined by the four ruderal species with a significant dominance variation (+-1).

Key species: *Festuca valesiaca* (3; C), *Medicago minima* (+; C).

Other species: *Achillea setacea* (+; C), *Agropyron cristatum* (+; C), *Artemisia austriaca* (+; C), *Berteroa incana* (+; C), *Cynodon dactylon* (+; C), *Dichanthium ischaemum* (+; C), *Erodium cicutarium* (+; C), *Eryngium campestre* (1; C).

34.9211 Western Pontic thyme steppes

***Festucetum callierii* Șerbănescu 1965 apud Dihoru (1969) 1970** is a rare coenotaxon within the reserve with a remarkable conservation importance indicated by the five rare threatened species, of which *Dianthus nardiformis*, *Campanula romanica* and *Moehringia grisebachii* are also of European importance. Within these phytocoenoses all these are considered endangered, except the dominant *Festuca callierii*. The three ruderal species with a reduced dominance indicate a low influence of grazing.

Key species: *Festuca callierii* (3; C).

Threatened species: *Campanula romanica* (+; C), *Dianthus nardiformis* (±; C), *Festuca callierii* (+; C), *Moehringia grisebachii* (+; C), *Thymus zygioides* (+; C).

Other species: *Artemisia austriaca* (+; C), *Asperula tenella* (+; C), *Centaurea diffusa* (+; C), *Chondrilla juncea* (+; C), *Dichanthium ischaemum* (+; C), *Eryngium campestre* (+; C), *Euphorbia seguieriana* (+; C), *Sedum urvillei* subsp. *hillebrandtii* (+; C), *Stipa capillata* (+; C), *Thymus pannonicus* (+; C).

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974**, an endangered coenotaxon, has a high ecological importance also due to the four rare threatened species of which *Dianthus nardiformis* and *Moehringia grisebachii* are vulnerable, of European importance. All these are endangered in the analysed situations. A low disturbance is indicated by the three ruderal species.

Key species: *Polytrichum piliferum* (2; C).

Threatened species: *Dianthus nardiformis* (+; C), *Festuca callieri* (1; C), *Moehringia grisebachii* (+; C), *Thymus zygioides* (+; C).

Other species: *Asperula tenella* (+; C), *Digitaria sanguinalis* (+; C), *Eragrostis minor* (+; C), *Eryngium campestre* (+; C), *Euphorbia seguieriana* (+; C), *Stipa capillata* (+; C).

BIRDS

In the Casimcea reserve were identified 34 species of birds found in the annexes of the Ordinance 57/2007, of which 20 species are strictly protected and listed in Annex 3: *Pernis apivorus*, *Milvus migrans*, *Circus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Melanocorypha calandra*, *Ficedula parva*, *Emberiza hortulana*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

A total of 14 protected species are found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Phoenicurus phoenicurus*, *Phylloscopus collybita*, *Muscicappa striata*, *Oriolus oriolus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*.

COLȚANII MARI

The landscape nature reserve, established by the Government Decision 2151/2004 on 53.04 ha protects one of the most spectacular green schist cliffs of Central Dobrogea, that border several rocky hills of around 100 m altitude adjacent to the Casimcea River.

All studied coenotaxa are framed into priority community interest habitats 62C0* (34.92; 34.9211), ranking from frequent to vulnerable within the reserve. The high conservation value can be deduced also from the presence of four to five threatened taxa identified within most of the plant communities. There is a general low degree of ruderal/ non-native species invasive tendencies, characteristic for the coenotaxa accessible for grazing, while *Medicagini minimae-Festucetum valesiaca* shows a medium level of disturbance from this point of view.

FLORA, VEGETATION, HABITATS

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** is a frequent plant community within the reserve, where it represents the most widespread coenotaxon. The medium level of grazing is reflected by the six ruderal species and *Ailanthus altissima*, a non-native taxon, that represent together more than half of the recorded species within these phytocoenoses, still having a low dominance.

Key species: *Festuca valesiaca* (3; CoM), *Medicago minima* (+; CoM).

Other species: *Ailanthus altissima* (+; CoM), *Artemisia austriaca* (+; CoM), *Cichorium intybus* (+; CoM), *Chondrilla juncea* (+; CoM), *Cichorium intybus* (+; CoM).

CoM), *Dichanthium ischaemum* (1; CoM), *Echium italicum* (+; CoM), *Eryngium campestre* (+; CoM), *Poa bulbosa* (+; CoM), *Thlaspi perfoliatum* (+; CoM).

34.9211 Western Pontic thyme steppes

***Festucetum callierii* Șerbănescu 1965 apud Dihoru (1969) 1970** a sporadic coenotaxon, has a high ecological value also due to the five rare threatened species identified in the studied situations. Of these two are vulnerable, having European importance (*Dianthus nardiformis* and *Campanula romanica*), the last being also endemic and of community interest. A low influence of grazing is shown by the presence of only one ruderal taxon with a reduced dominance.

Key species: *Festuca callieri* (3; CoM).

Threatened species: *Campanula romanica* (1; CoM), *Dianthus nardiformis* (2; CoM), *Festuca callieri* (3; CoM), *Sempervivum zebeborii* (+; CoM), *Stachys angustifolia* (+; CoM).

Other species: *Alyssum murale* (+; CoM), *Asperula tenella* (+; CoM), *Dichanthium ischaemum* (1; CoM), *Eryngium campestre* (+; CoM), *Filipendula vulgaris* (+; CoM), *Linaria genistifolia* (+; CoM), *Melica ciliata* (+; CoM), *Potentilla argentea* (+; CoM), *Stipa capillata* (+; CoM).

***Sedo hillebrandtii*-*Polytrichetum piliferi* Horeanu et Mihai 1974**, a vulnerable plant community, has an outstanding conservation value, mainly due to the five rare threatened species of which the vulnerable *Campanula romanica* and *Moehringia grisebachii* have European importance. Being typical for rocky substrata, less accessible for grazing, there can be observed a low level of ruderal taxa invasion, as only one such species was identified.

Key species: *Polytrichum piliferum* (1; CoM), *Sedum urvillei* subsp. *hillebrandtii* (1; CoM).

Threatened species: *Allium saxatile* (+; CoM), *Campanula romanica* (+; CoM), *Festuca callieri* (+; CoM), *Moehringia grisebachii* (+; CoM), *Silene compacta* (+; CoM).

Other species: *Agropyron cristatum* (+; CoM), *Asperula tenella* (+; CoM), *Asplenium septentrionale* (+; CoM), *Chelidonium majus* (+; CoM), *Cotoneaster integerrimus* (+; CoM), *Polypodium vulgare* (+; CoM), *Potentilla argentea* (+; CoM), *Rosa canina* (+; CoM), *Sedum maximum* (+; CoM).

BIRDS

From the 20 species of birds that are found in annexes of the Ordinance 57/2007, identified in the area, 12 are strictly protected and mentioned in Annex 3: *Pernis apivorus*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Lanius minor*, *Lanius collurio*.

A total of eight species identified are quoted in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Upupa epops*, *Merops apiaster*, *Motacilla alba*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*.

COȘARU MARE

The nature reserve is a proposal of a protected area at the national level on a reduced surface of only 5.263 ha close to Slava Rusă village. Even though it was not, so far, legally established at the national level, its territory is nevertheless protected at the European scale, as it belongs to the Podișul Nord Dobrogean *Natura 2000* site (SCI).

The reserve lies on a hill slope with a reduced declivity where the limestone substratum outcrops. This favours the development of numerous threatened species, having in the same time a palaeontological importance.

All the studied plant communities are framed into the 34.92 Ponto-Sarmatic steppes habitat, included in the 62C0* Ponto-Sarmatic steppes habitat of community importance. They are representative for their natural status, as no alien/ ruderal taxon was recorded in the analysed plots. It is important also to underline that their conservation value is outstanding due to their abundant threatened species, among which the most important is the endemic and endangered *Centaurea jankae*, which was not quoted before from this location.

34.92 Ponto-Sarmatic steppes

***Stipo ucrainicae-Festucetum valesiaca* Dihoru (1969) 1970** plant community is dominant within the nature reserve, being one of the best preserved samples of this kind throughout the Dobrogea Plateau. Thus, no alien/ ruderal taxon was identified within the studied areas. Its conservation value is outstanding, due to the identification in only one plot of seven threatened species, mostly rare, of which *Euphorbia nicaeensis* subsp. *dobrogeensis* is sub-endemic and *Centaurea jankae* is endemic and endangered at the national level. Within this plant community all the threatened taxa can be considered as rare.

Key species: *Festuca valesiaca* (3; CM).

Threatened species: *Achillea clypeolata* (+; CM), *Centaurea jankae* (+; CM), *Echinops ritro* subsp. *ruthenicus* (+; CM), *Euphorbia nicaeensis* subsp. *dobrogeensis* (+; CM), *Globularia punctata* (+; CM), *Koeleria lobata* (+; CM), *Onosma visianii* (+; CM), *Potentilla bornmuelleri* (+; CM).

Other species: *Convolvulus cantabricus* (+; CM), *Crataegus monogyna* (+; CM), *Dichanthium ischaemum* (1; CM), *Fraxinus ornus* (+; CM), *Jurinea mollis* (+; CM), *Melampyrum arvense* (+; CM), *Stachys recta* (+; CM), *Stipa pulcherrima* (1; CM), *Teucrium chamaedrys* (+; CM).

34.9211 Western Pontic thyme steppes

***Agropyro-Thymetum zygoidi* Dihoru (1969) 1970** can be estimated as a vulnerable vegetation type within reserve, where its conservation importance is enhanced by the five taxa recorded in the same plot, of which *Euphorbia nicaeensis* subsp. *dobrogeensis* is also sub-endemic. These species are rare at the national level, while within the analysed phytocoenosis they are also mostly rare. Still among them *Satureja coerulea* is vulnerable and *Thymus zygoides* rare. This phytocoenosis is typical for its natural status, as no alien/ ruderal species were recorded.

Key species: *Thymus zygoides* (2; CM).

Threatened species: *Euphorbia nicaeensis* subsp. *dobrogensis* (+; CM), *Globularia punctata* (+; CM), *Pimpinella tragium* subsp. *lithophila* (+; CM), *Satureja caerulea* (1; CM), *Thymus zygoides* (2; CM).

Other species: *Campanula sibirica* (+; CM), *Cotinus coggygria* (+; CM), *Fraxinus ornus* (+; CM), *Koeleria brevis* (+; CM), *Leontodon crispus* (+; CM), *Onosma visianii* (+; CM), *Linum tenuifolium* (+; CM), *Stipa pulcherrima* (+; CM).

DEALUL BUJORULUI

The nature reserve, with an area of 50.8 ha, shared by Ciucurova and Nalbant communes, was legally established through the Law 5/2000. Framed between 100-200 m altitudes the reserve is situated on a southern slope in the northern part of the Babadag limestone plateau. Even though it is dominated by supra-Mediterranean and wooded steppe white oak forest, in the reserve also occur isolated fragments of steppe grasslands within the areas with shallow soils, where also the limestone substrata outcrops.

The studied plant communities rank from endangered to very frequent. Most of the coenotaxa have at least two threatened species, all endangered in the analysed situations. A general low disturbance level can be noticed, the most widespread forest type, *Paeonio peregrinae-Carpinetum orientalis* being even undisturbed in the analysed plots. All coenotaxa belong to priority community interest habitats, respectively 62CO* (34.92), 91AA* (41.73723), 91I0* (41.7A221).

FLORA, VEGETATION, HABITATS

34.92. Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** is a vulnerable plant community within the reserve, where its conservation importance is also underlined by the two rare threatened species, both endangered within the studied plots. A possible slight disturbance is indicated by only one ruderal taxon.

Key species: *Dichanthium ischaemum* (3; DBu).

Threatened species: *Achillea clypeolata* (+; DBu), *Asparagus verticillatus* (+; DBu).

Other species: *Adonis vernalis* (+; DBu), *Chrysopogon gryllus* (1; DBu), *Cleistogenes serotina* (+; DBu), *Digitalis lanata* (+; DBu), *Festuca valesiaca* (+; DBu), *Linaria genistifolia* (+; DBu), *Marrubium peregrinum* (+; DBu), *Melica ciliata* (+; DBu), *Orlaya grandiflora* (+; DBu), *Phlomis tuberosa* (+; DBu), *Pyrus pyraeaster* (+; DBu), *Teucrium chamaedrys* (+; DBu), *Teucrium polium* (+; DBu), *Verbascum banaticum* (+; DBu).

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** is a very frequent coenotaxon dominant within the protected area. It can be considered as typical for a natural status as no ruderal/ alien taxa were recorded.

Key species: *Carpinus orientalis* (2; DBu), *Quercus pubescens* (2; DBu).

Other species:

- trees: *Acer campestre* (+; DBu), *Cerasus mahaleb* (+; DBu), *Fraxinus ornus* (1; DBu);

- shrubs/ lianas: *Crataegus monogyna* (+; DBu), *Evonymus verrucosus* (+; DBu), *Ligustrum vulgare* (+, DBu);

- grasses/ undershrubs: *Brachypodium sylvaticum* (+; DBu), *Dactylis polygama* (+; DBu).

41.7A221 Pontic *Acer tataricum*-*Quercus pedunculiflora* steppe woods

***Viola suavis-Quercetum pedunculiflorae* Doniță 1970**, an endangered forest type mainly found as narrow stripes on the deep soils of the valley that borders the lower part of the reserve. Its conservation value is enhanced by two rare threatened species, endangered locally within these phytocoenoses. A low level of ruderal species influence is indicated by three such species.

Key species: *Acer tataricum* (2; DBu), *Quercus pedunculiflora* (2; DBu).

Threatened species: *Asparagus verticillatus* (+; DBu), *Mercurialis ovata* (+; DBu).

Other species:

- trees: *Acer campestre* (1; DBu), *Fraxinus excelsior* (+; DBu);

- shrubs/ lianas: *Clematis vitalba* (+; DBu), *Cornus mas* (+; DBu), *Crataegus pentagyna* (+; DBu), *Evonymus europaeus* (+; DBu), *Leonurus cardiaca* (+; DBu), *Ligustrum vulgare* (+; DBu);

- grasses/ undershrubs: *Ballota nigra* (+; DBu), *Urtica dioica* (+; DBu), *Viola odorata* (+; DBu).

BIRDS

From the 48 species of birds that are found in annexes of the Ordinance 57/2007, 21 species are strictly protected and listed in Annex 3: *Pernis apivorus*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Caprimulgus europaeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*.

There were identified 27 protected species, mentioned in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Otus scops*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Corvus corax*, *Passer hispaniolensis*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

DEALUL DENIZTEPE

The landscape nature reserve, established by the Government Decision 2151/ 2004 on an area of 305 ha represents an isolated sandstone hill that dominates with its 278 m altitude the surrounding low plains.

Besides the dominant and medium disturbed *Botriochloetum ischaemi* plant community, the other analysed coenotaxon, *Artemisia austriaca*-*Poëtum bulbosae*, is vulnerable and highly disturbed by overgrazing. Both coenotaxa belong to priority habitats of community importance 62C0 (34.92).

FLORA, VEGETATION, HABITATS

34.92. Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977**, a very frequent coenotaxon within the reserve, where it represents the most widespread vegetation type, can be framed into the medium disturbed category, the grazing influence being obvious in the high percentage of ruderal species that represent more than half of the inventory.

Key species: *Dichanthium ischaemum* (5; DDt).

Other species: *Artemisia austriaca* (+; DDt), *Ceratocarpus arenarius* (+; DDt), *Chondrilla juncea* (+; DDt), *Cichorium intybus* (+; DDt), *Cynodon dactylon* (+; DDt), *Eragrostis minor* (+; DDt), *Erodium cicutarium* (+; DDt), *Galium humifusum* (+; DDt), *Poa bulbosa* (+; DDt), *Potentilla argentea* (+; DDt), *Taraxacum erythrospermum* (+; DDt).

***Artemisia austriacae-Poëtum bulbosae* Pop 1970**, a vulnerable plant community within the nature reserve, typical for overgrazing, has a high level of disturbance, indicated by the dominance of the ruderal species that also include the key species.

Key species: *Artemisia austriaca* (2; DDt).

Other species: *Bromus squarrosus* (+; DDt), *Centaurea diffusa* (+; DDt), *Ceratocarpus arenarius* (+; DDt), *Cynodon dactylon* (+; DDt), *Dichanthium ischaemum* (+; DDt), *Eryngium campestre* (+; DDt), *Festuca valesiaca* (+; DDt).

BIRDS

A total of 46 species of birds identified in this reserve are included in the annexes of the Ordinance 57/2007; 26 of these are strictly protected, being found in Annex 3: *Ciconia nigra*, *Ciconia ciconia*, *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Crex crex*, *Burhinus oedicephalus*, *Asio flammeus*, *Coracias garrulus*, *Picus canus*, *Dryocopus martius*, *Melanocorypha calandra*, *Lulula arborea*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

The other 20 species are protected and can be found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Sturnus roseus*, *Phylloscopus collybita*, *Regulus*

regulus, *Muscicappa striata*, *Oriolus oriolus*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Coccothraustes coccothraustes*.

DEALUL LUNG

This represents a proposal of geological and landscape reserve on an area of 2.347 ha, within the Slava Cercheză commune, in the central part of the Babadag Plateau. It is protected at the European level as it represents a fragment of the Podișul Nord Dobrogean *Natura 2000* site. Besides the dominant *Botriochloetum* (*Andropogonetum*) *ischaemi* plant community, the other two are endangered, respectively vulnerable. All the analysed plant communities have a high conservation importance mainly due to the presence of at least two threatened species with an outstanding maximum of six such taxa. These vegetation types are undisturbed, except *Stipo ucrainicae-Festucetum valesiaca* with a low level of ruderal species invasion. All these phytocoenoses are framed into priority habitats of community importance, respectively 62C0* (34.92, 34.9213).

34.92 Ponto-Sarmatic steppes

***Botriochloetum* (*Andropogonetum*) *ischaemi* (Kist. 1937) Pop 1977** can be considered as a very frequent plant community within the nature reserve where it represents the main vegetation type. Its conservation value is remarkable taking into account also the three rare threatened species of which *Euphorbia nicaeensis* subsp. *dobrogensis* is also sub-endemic. As no ruderal/ alien taxa were observed it can be estimated as a sample of undisturbed grassland of this type.

Key species: *Dichantium ischaemum* (3; DL).

Threatened species: *Achillea clypeolata* (+; DL), *Euphorbia nicaeensis* subsp. *dobrogensis* (+; DL), *Sternbergia colchiciflora* (r; DL).

Other species: *Asperula tenella* (+; DL), *Cephalaria uralensis* (+; DL), *Chrysopogon gryllus* (+; DL), *Cleistogenes bulgarica* (+; DL), *Convolvulus cantabricus* (+; DL), *Festuca valesiaca* (1; DL), *Linaria genistifolia* (+; DL), *Orlaya grandiflora* (+; DL), *Prunus spinosa* (+; DL), *Stipa capillata* (+; DL), *Sideritis montana* (+; DL), *Teucrium polium* (+; DL), *Thymus pannonicus* (+; DL).

***Saturejetum coeruleae* Cristurean et Ionescu-Țeculescu 1970** an endangered coenotaxon that occurs on the outcrops of the limestone substrata, has the highest conservation value within the reserve, as it concentrates six rare threatened species, all endangered within the studied areas, except the dominant *Satureja coerulea*. It can be considered a typical example of an undisturbed phytocoenosis of this kind.

Key species: *Satureja coerulea* (2; DL).

Threatened species: *Achillea clypeolata* (+; DL), *Euphorbia nicaeensis* subsp. *dobrogensis* (2; DL), *Koeleria lobata* (+; DL), *Potentilla bornmuelleri* (+; DL), *Satureja coerulea* (+; DL), *Thymus zygioides* (+; DL).

Other species: *Asperula tenella* (+; DL), *Cephalaria uralensis* (+; DL), *Cleistogenes bulgarica* (+; DL), *Convolvulus cantabricus* (+; DL), *Fraxinus ornus* (+; DL), *Teucrium polium* (+; DL).

34.9213 Western Pontic feathergrass steppes

***Stipo ucrainicae-Festucetum valesiaca* Dihoru (1969) 1970**, is a vulnerable coenotaxon with an enhanced conservation value due to the two rare threatened species, locally endangered. It has a low degree of ruderal species invasive tendencies, these being represented by three such taxa with a low dominance.

Key species: *Achillea clypeolata* (+; DL), *Festuca valesiaca* (3; DL).

Threatened species: *Achillea clypeolata* (+; DL), *Euphorbia nicaeensis* subsp. *dobrogeensis* (+; DL).

Other species: *Artemisia austriaca* (+; DL), *Cephalaria uralensis* (+; DL), *Cleistogenes bulgarica* (+; DL), *Convolvulus cantabricus* (+; DL), *Dichanthium ischaemum* (1; DL), *Eryngium campestre* (+; DL), *Medicago falcata* (+; DL), *Prunus spinosa* (+; DL), *Sideritis montana* (+; DL), *Stipa capillata* (1; DL), *Teucrium polium* (+; DL), *Thymus pannonicus* (+; DL), *Tragus racemosus* (+; DL), *Verbascum banaticum* (+; DL).

DEALUL MÂNDREȘTI

The landscape nature reserve, with an area of 5.00 ha, framed within the Niculițel commune, is situated on the western slopes of the Mândrești Hill, having a maximum altitude of 60 m. Established by the Government Decision 2151/2004, it is included in the Podișul Nord Dobrogean Site of Community Interest. Within the recent field studies, beside the already published data (PETRESCU, 2007), there were made several observations on the habitats listed below.

FLORA, VEGETATION, HABITATS

31.8B731 Western Pontic jasmine Christ's thorn scrub

***Asphodelino luteae-Paliuretum* Sanda et al. 1999** can be considered a rare (F: II) plant community within the Dealul Mândrești nature reserve, even though *Paliurus spina-christi* is widespread in this area, but as isolated shrubs, not as compact phytocoenosis. Besides the dominant *Paliurus spina-christi*, another vulnerable and rare threatened species is *Paeonia peregrina*, endangered within the analysed phytocoenosis. There can be assessed a low level of disturbance from the alien species point of view (*Ailanthus altissima*), while the dominance variation (+-1) of the seven ruderal taxa indicates a medium level of their invasive trend.

Key species: *Paliurus spina-christi* (3; DM).

Threatened species: *Paeonia peregrina* (+; DM), *Paliurus spina-christi* (3; DM).

Other species:

- shrubs/trees/ lianas: *Ailanthus altissima* (+; DM), *Artemisia austriaca* (+; DM);

- grasses/ undershrubs: *Achillea setacea* (+; DM), *Galium aparine* (+; DM), *Geranium rotundifolium* (+; DM), *Lamium purpureum* (+; DM), *Phlomis tuberosus* (+; DM), *Poa bulbosa* (1; DM), *Potentilla taurica* (+; DM), *Marrubium peregrinum* (+; DM), *Medicago minima* (1; DM), *Sideritis montana* (+; DM), *Taraxacum erythrospermum* (+; DM), *Teucrium chamaedrys* (+; DM), *Teucrium polium* (+; DM), *Thlaspi perfoliatum* (+; DM), *Vinca herbacea* (+; DM).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiacae* Wagner 1941** is a vulnerable (F: I) coenotaxa in the Dealul Mândrești nature reserve (DM), where three rare threatened species were observed, of which *Paliurus spina-christi* is also vulnerable. While the last is also vulnerable, the other two are endangered within this phytocoenosis. Taking into account the limits of variation (+-1) of the five ruderal species dominance, there can be deduced a medium level of human activities impact.

Key species: *Festuca valesiaca* (2; DM), *Medicago minima* (+; DM).

Threatened species: *Asparagus verticillatus* (+; DM), *Paliurus spina-christi* (1; DM), *Potentilla bornmuelleri* (+; DM).

Other species: *Arenaria serpyllifolia* (+; DM), *Cerastium dubium* (+; DM), *Convolvulus cantabricus* (+; DM), *Crataegus monogyna* (+; DM), *Dichanthium ischaemum* (+; DM), *Erodium cicutarium* (+; DM), *Lamium purpureum* (+; DM), *Muscari neglectum* (+; DM), *Poa bulbosa* (1; DM), *Sanguisorba minor* (+; DM), *Sideritis montana* (+; DM), *Stipa capillata* (1; DM), *Taraxacum erythrospermum* (+; DM), *Teucrium chamaedrys* (+; DM), *Teucrium polium* (+; DM), *Thlaspi perfoliatum* (+; DM), *Vinca herbacea* (+; DM).

***Artemisia austriacae-Poëtum bulbosae* Pop 1970** is the most widespread (F: III) plant community within the Dealul Mândrești nature reserve (DM). The threatened species identified so far are represented by two rare taxa of which *Paliurus spina-christi* is vulnerable and rare at the national level, both being endangered within this coenotaxon. The seven ruderal species have a significant variation of the dominance (+-2) that indicates a high level of disturbance.

Key species: *Artemisia austriaca* (+; DM), *Poa bulbosa* (2; DM).

Threatened species: *Paliurus spina-christi* (+; DM), *Potentilla bornmuelleri* (+; DM).

Other species: *Arenaria serpyllifolia* (+; DM), *Asperula tenella* (+; DM), *Bombacilaena erecta* (+; DM), *Convolvulus cantabricus* (+; DM), *Crataegus monogyna* (+; DM), *Crepis sancta* (+; DM), *Dichanthium ischaemum* (1; DM), *Erodium cicutarium* (+; DM), *Eryngium campestre* (+; DM), *Festuca valesiaca* (1; DM), *Medicago minima* (+; DM), *Sedum urvillei* subsp. *hillebrandtii* (+; DM), *Senecio vernalis* (+; DM), *Sideritis montana* (+; DM), *Taraxacum erythrospermum* (+; DM), *Thlaspi perfoliatum* (+; DM), *Thymus pannonicus* (+; DM), *Vinca herbacea* (+; DM).

Plant communities which are not framed into the Palaearctic habitats classification

Fraxino-Ulmetum Oberdorfer 53 is an endangered (F: +) plant community represented by an isolated phytocoenosis that occurs in a small depression, slightly more humid than the general conditions of the reserve. It is not adjacent to the Danube or other major river, so it cannot be framed into the 44.4 habitat. A low level of ruderal plants invasive tendencies can be deduced from the presence of seven such species with a reduced dominance.

Key species: *Ulmus minor* (3; DM).

Threatened species: *Asparagus verticillatus* (+; DM), *Paliurus spina-christi* (+; DM).

Other species:

- shrubs/ lianas: *Crataegus monogyna* (1; DM);
 - grasses/ undershrubs: *Anthriscus cerefolium* (+; DM), *Cichorium intybus* (+; DM), *Erodium cicutarium* (+; DM), *Festuca valesiaca* (+; DM), *Galium aparine* (+; DM), *Geranium rotundifolium* (+; DM), *Lamium purpureum* (+; DM), *Ornithogalum orthophyllum* (+; DM), *Marrubium vulgare* (+; DM), *Phlomis tuberosus* (+; DM), *Salvia nutans* (+; DM), *Thlaspi perfoliatum* (+; DM), *Vinca herbacea* (+; DM), *Viola arvensis* (+; DM).

BIRDS

Of the 47 identified species of birds that can be found in annexes of the Ordinance 57/2007, 17 are strictly protected, being included in Annex 3: *Ciconia ciconia*, *Haliaeetus albicilla*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Falco vespertinus*, *Coracias garrulus*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Emberiza hortulana*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

There were identified 18 protected species, listed in Annex 4B of the Ordinance 57/2007: *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus ignicapillus*, *Muscicappa striata*, *Oriolus oriolus*, *Corvus corax*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*.

EDIRLEN

The mixed nature reserve was established by the Government Decision 2151/ 2004 on an area of 25.50 ha within the Frecăței and Valea Teilor communes, Tulcea County. The protected area is located within the Niculițel Plateau, within 189-340.7 m altitude, being dominated by Balkan forests. On restricted areas the outcrops of massive magmatic rocks favour the occurrence of steppe grasslands, usually surrounded by transition stripes of sub-Mediterranean forests.

Most of the studied plant communities are endangered, this being the case of the steppe grasslands and rock vegetation, while the Balkan forests are the

most frequent habitat, except *Galantho plicatae-Tilietum tomentosae* Doniță 1970 which is vulnerable. The major part of the coenotaxa has one threatened taxon, with a maximum of four species in the case of the *Sedo hillebrandtii-Polytrichetum piliferi* plant community. A low disturbance level is observed for most of the plant communities, except the *Botriochloetum ischaemi* coenotaxon, with a medium degree of ruderal species invasion. All coenotaxa are framed into the habitats of community interest category, two of them being priority ones.

FLORA, VEGETATION, HABITATS

34.92. Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977**, an endangered plant community within the Edirlen reserve (E), has an endangered conservation value due to the identification of one rare threatened taxon, critically endangered, at least in these phytocenoses. The habitat is medium disturbed, as indicated by the three species with dominance indices of ± 1 .

Key species: *Dichanthium ischaemum* (4; E).

Threatened species: *Sternbergia colchiciflora* (r; E).

Other species: *Achillea coarctata* (+; E), *Alyssum murale* (+; E), *Artemisia austriaca* (1; E), *Bromus squarrosus* (+; E), *Carpinus orientalis* (+; E), *Chondrilla juncea* (+; E), *Cotinus coggygria* (+; E), *Festuca valesiaca* (1; E), *Fragaria viridis* (+; E), *Potentilla argentea* (+; E), *Teucrium chamaedrys* (+; E), *Teucrium polium* (+; E), *Verbascum banaticum* (+; E).

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974** coenotaxon can be considered endangered within the reserve. Its remarkable conservation value is underlined by the four rare threatened species, of which *Moehringia grisebachii* has European importance. All these are estimated as endangered within these phytocenoses. A low disturbance is shown by the three ruderal species with reduced dominance.

Key species: *Polytrichum piliferum* (2; E).

Threatened species: *Achillea ochroleuca* (\pm ; E), *Festuca callieri* (+; E), *Moehringia grisebachii* (+; E), *Silene compacta* (+; E).

Other species: *Achillea coarctata* (+; E), *Carpinus orientalis* (+; E), *Chondrilla juncea* (+; E), *Cotinus coggygria* (+; E), *Dichanthium ischaemum* (+; E), *Eryngium campestre* (+; E), *Fraxinus ornus* (+; E), *Poa bulbosa* (+; E), *Rosa canina* (+; E), *Stachys recta* (+; E), *Verbascum banaticum* (+; E).

41.76831 Dobrogean paeonia sessile oak forests

***Fraxino orni-Quercetum dalechampii* Doniță 1970**, a very frequent coenotaxon that represents the dominant vegetation type in the reserve, has one rare threatened species, locally endangered within the plots where it was identified. A very low degree of ruderal species invasive tendencies can be deduced from the presence of only one such species.

Key species: *Quercus dalechampii* (2; E).

Threatened species: *Piptatherum virescens* (+; E).

Other species:

- trees: *Carpinus orientalis* (1; E), *Fraxinus ornus* (1; E), *Quercus polycarpa* (+; E), *Tilia tomentosa* (+; E);
- shrubs/ lianas: *Cornus mas* (1; E), *Crataegus monogyna* (+; E);
- grasses/ undershrubs: *Asparagus tenuifolius* (+; E), *Dactylis polygama* (+; E), *Fragaria viridis* (+; E), *Geum urbanum* (+; E), *Leonurus cardiaca* (+; E), *Poa nemoralis* (+; E), *Viola odorata* (+; E).

41.76834 Western-Pontic sessile oak-lime-oriental hornbeam-*Galanthus* forests

***Galantho plicatae-Tilietum tomentosae* Doniță 1970** plant community can be considered vulnerable within the nature reserve. Only one ruderal taxon was observed, that indicates a low invasive trend of this kind of species.

Key species: *Quercus dalechampii* (1; E), *Tilia tomentosa* (3; E).

Other species:

- trees: *Acer platanoides* (+; E), *Carpinus orientalis* (1; E), *Cerasus mahaleb* (+; E);
- shrubs/ lianas: *Cornus mas* (1; E), *Evonymus verrucosus* (+; E);
- grasses/ undershrubs: *Anthriscus cerefolium* (+; E), *Geum urbanum* (+; E), *Poa nemoralis* (+; E), *Thlaspi perfoliatum* (+; E), *Viola odorata* (+; E), *Viola suavis* (+; E).

BIRDS

In the reserve there were identified 55 species of birds that are found in annexes of the Ordinance 57/2007, of which 25 species are strictly protected, being found in Annex 3: *Pernis apivorus*, *Milvus migrans*, *Circus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Caprimulgus europaeus*, *Asio flammeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

There were identified 30 protected species found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Bombicilla garrulus*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Sturnus roseus*, *Locustella naevia*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus ignicapillus*, *Muscicapa striata*, *Sitta europaea*, *Oriolus oriolus*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

ENISALA NATURE RESERVE

The landscape nature reserve, with an area of 57.36 ha, is framed within Sarichioi commune, being established by the Government Decision 2151/ 2004. It lies on a limestone rocky hill that dominates the Razim Lagoon with its altitude of 110.01 m. From there are also visible the steppe and forest areas of the Babadag Plateau. At present it is also included in the Danube Delta Site of Community Interest. To the already published data (PETRESCU, 2007), the recent field studies added the description of the following habitats. These habitats are mainly rare within this reserve, the extreme values being framed between frequent and endangered. Most of them are low disturbed, the medium and high levels being represented by one plant community each. Except one coenotaxon half of the others have one threatened species. The other half has an outstanding conservation importance, mainly due to the high number of threatened taxa (3-13).

FLORA, VEGETATION, HABITATS

31.8B731 Western Pontic jasmine Christ's thorn scrub

***Asphodelino luteae-Paliuretum* Sanda et al. 1999** plant community was identified on restricted areas within the Enisala nature reserve (En), thus being considered endangered. It shelters three rare threatened species, from which *Paliurus spina-christi* is also vulnerable, being dominant within the plot, where the other two species can be considered endangered. The six ruderal species with a reduced dominance indicate a low level of this kind of species invasive tendency.

Key species: *Paliurus spina-christi* (4; En).

Threatened species: *Asparagus verticillatus* (+; En), *Euphorbia myrsinites* (+; En), *Paliurus spina-christi* (4; En).

Other species: *Achillea setacea* (+; En), *Artemisia austriaca* (+; En), *Bromus tectorum* (+; En), *Carduus thoermeri* (+; En), *Carthamus lanatus* (+; En), *Convolvulus cantabricus* (+; En), *Elymus hispidus* (+; En), *Erodium cicutarium* (+; En), *Eryngium campestre* (+; En), *Inula oculus-christi* (+; En), *Kohlruschia prolifera* (+; En), *Medicago minima* (+; En), *Thymus pannonicus* (+; En).

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** plant community is the most widespread (F: IV) within the Enisala nature reserve, where only one threatened species, the vulnerable and rare *Euphorbia myrsinites* was observed, as a local endangered taxa. The six ruderal species with a low dominance indicate a low invasive trend.

Key species: *Festuca valesiaca* (4; En), *Medicago minima* (1; En).

Threatened species: *Euphorbia myrsinites* (+; En).

Other species: *Agropyron cristatum* (+; En), *Artemisia austriaca* (+; En), *Bombycilaena erecta* (+; En), *Bromus squarrosus* (+; En), *Bromus tectorum* (+; En), *Convolvulus cantabricus* (+; En), *Dichanthium ischaemum* (+; En), *Erodium cicutarium* (+; En), *Eryngium campestre* (+; En), *Inula oculus-christi* (+; En),

Plantago lanceolata (+; En), *Teucrium chamaedrys* (+; En), *Teucrium polium* (+; En), *Thymus pannonicus* (+; En).

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community, identified within the Enisala nature reserve (En), can be considered rare (F: II). It has a low degree of both non-native species presence (*Ailanthus altissima*), as well as of ruderal plant invasion, the six such species having a reduced dominance.

Key species: *Dichanthium ischaemum* (3; En).

Other species: *Achillea setacea* (+; En), *Agropyron cristatum* (+; En), *Ailanthus altissima* (+; En), *Artemisia austriaca* (+; En), *Asperula tenella* (+; En), *Bassia prostrata* (+; En), *Bromus squarrosus* (+; En), *Chondrilla juncea* (+; En), *Eryngium campestre* (+; En), *Festuca valesiaca* (+; En), *Marrubium peregrinum* (+; En), *Medicago falcata* (+; En), *Nigella arvensis* (+; En), *Scabiosa ochroleuca* (+; En), *Stipa capillata* (1; En), *Teucrium polium* (+; En), *Thymus pannonicus* (+; En), *Xeranthemum annuum* (+; En).

***Stipetum capillatae* (Hueck 1931) Krausch 1961** plant community, recorded within Enisala nature reserve (En), where it can be considered endangered (F: +), has just one threatened species, the vulnerable and rare *Euphorbia myrsinites*, endangered within this coenotaxon. There can be observed a low level of invasion of alien species (*Ailanthus altissima*) and a medium degree in the case of the ruderal species, the five such taxa having a significant dominance variation (+-1).

Key species: *Stipa capillata* (1; En).

Threatened species: *Euphorbia myrsinites* (±; En).

Other species: *Agropyron cristatum* (1; En), *Artemisia austriaca* (+; En), *Ailanthus altissima* (+; En), *Bassia prostrata* (+; En), *Bromus squarrosus* (+; En), *Chondrilla juncea* (+; En), *Cynodon dactylon* (+; En), *Dichanthium ischaemum* (+; En), *Eryngium campestre* (+; En), *Linaria genistifolia* (+; En), *Marrubium peregrinum* (1; En), *Medicago falcata* (+; En), *Nigella arvensis* (+; En), *Teucrium chamaedrys* (+; En), *Teucrium polium* (+; En), *Thymus pannonicus* (±; En), *Xeranthemum annuum* (1; En).

***Artemisia austriacae-Poëtum bulbosae* Pop 1970** is a secondary plant community, assessed as vulnerable within the Enisala nature reserve, where the intense level of grazing is indicated by the significant dominance of ruderal key species, as well as of the other ten such taxa, that largely prevail.

Key species: *Artemisia austriaca* (1; En), *Poa bulbosa* (2; En).

Threatened species: *Centaurea salonitana* (r; En).

Other species: *Agropyron cristatum* (1; En), *Carduus thoermeri* (+; En), *Erodium cicutarium* (+; En), *Eryngium campestre* (+; En), *Festuca valesiaca* (+; En), *Kohlrauschia prolifera* (+; En), *Marrubium peregrinum* (+; En), *Plantago lanceolata* (+; En), *Teucrium polium* (+; En), *Tragus racemosus* (+; En), *Tribulus terrestris* (+; En), *Xeranthemum annuum* (+; En).

34.9211 Western Pontic thyme steppes

***Agropyro-Thymetum zygoidi* Dihoru (1969) 1970**, a rare plant community from Enisala nature reserve, has an outstanding conservation value also due to the high number of threatened species (12 taxa), mostly rare like *Euphorbia myrsinites*, *Dianthus nardiformis* and *Campanula romanica*, the last two being of European importance. Beside the dominant *Thymus zygoides* within this phytocoenosis all the other threatened taxa can be considered endangered. Two ruderal species with a reduced dominance indicate a low level of invasive tendencies.

Key species: *Agropyron ponticum* (1; En), *Thymus zygoides* (3; En).

Threatened species: *Agropyron ponticum* (1; En), *Allium saxatile* (+), *Artemisia alba* (±; En), *Campanula romanica* (+; En), *Dianthus nardiformis* (+; En), *Euphorbia myrsinites* (+; En), *Festuca callieri* (+; En), *Koeleria lobata* (+; En), *Minuartia adenotricha* (+; En), *Paronychia cephalotes* (±; En), *Pimpinella tragi* subsp. *lithophila* (+; En), *Sempervivum zeleborii* (+; En), *Thymus zygoides* (3; En).

Other species: *Asperula tenella* (+; En), *Asplenium ruta-muraria* (+; En), *Cephalaria uralensis* (+; En), *Sedum urvillei* subsp. *hillebrandtii* (+; En), *Stachys recta* (+; En), *Teucrium polium* (+; En), *Tribulus terrestris* (+; En), *Tragus racemosus* (+; En).

***Sedo hillebrandtii-Polytrichetum piliferi* Horeanu et Mihai 1974** plant community can be considered rare within the Enisala nature reserve, where it has a high conservation value, underlined by the six rare threatened taxa, among which *Euphorbia myrsinites*, *Dianthus nardiformis* and *Campanula romanica* are also vulnerable, the two latest being of European importance. All of them can be framed into the “endangered” category, at least within the analysed areas. There can be observed a low invasive trend of both introduced species (*Ailanthus altissima*) and ruderal ones (six taxa).

Key species: *Polytrichum piliferum* (1; En), *Sedum urvillei* subsp. *hillebrandtii* (1; En).

Threatened: *Allium saxatile* (±; En), *Campanula romanica* (±; En), *Dianthus nardiformis* (+; En), *Euphorbia myrsinites* (+; En), *Paronychia cephalotes* (+; En), *Pimpinella tragi* subsp. *lithophila* (+; En).

Other species: *Ailanthus altissima* (±; En), *Arenaria serpyllifolia* (+; En), *Asperula tenella* (+; En), *Asplenium ruta-muraria* (±; En), *Bromus squarrosus* (+; En), *Bromus tectorum* (+; En), *Convolvulus arvensis* (+; En), *Crepis sancta* (+; En), *Melica ciliata* (+; En), *Minuartia glomerata* (+; En), *Poa bulbosa* (+; En), *Sideritis montana* (+; En), *Stachys recta* (+; En), *Tribulus terrestris* (+; En).

BIRDS

In the Enisala reserve were inventoried 50 species of birds that are found in annexes of the Ordinance 57/2007, of which 33 species are strictly protected and contained in Annex 3: *Phalacrocorax pygmaeus*, *Ixobrychus minutus*, *Egretta garzetta*, *Ciconia nigra*, *Ciconia ciconia*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*,

Circus macrourus, *Circus pygargus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Pandion haliaetus*, *Falco vespertinus*, *Falco peregrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna albifrons*, *Chlidonias niger*, *Coracias garrulus*, *Dendrocopos syriacus*, *Picus canus*, *Melanocorypha calandra*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

There were identified 17 protected species found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Phylloscopus collybita*, *Regulus ignicapillus*, *Muscicappa striata*, *Oriolus oriolus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*.

KORUM TARLA RESERVE

The botanical nature reserve was established on an area of 2.00 ha, by the Law 5/ 2000, within the administrative territory of the Babadag town. Beside the already published data (PETRESCU, 2007), the recent field studies have identified the threatened plant *Sophora jaubertii* within *Agropyretum repentis* plant community.

***Agropyretum repentis* Felföldy 1942** plant community, even though is not framed into a community interest habitat, still has a conservation importance in the analysed plot, due to the co-dominant *Sophora jaubertii*, a vulnerable and rare threatened taxa, protected within Romania only in this nature reserve. The dominant *Elymus repens*, together with other two ruderal species with a lower dominance could be interpreted as indicators for an intensely disturbed phytocoenosis.

Key species: *Elymus repens* (3; KT).

Threatened species: *Sophora jaubertii* (2; KT).

Other species: *Agrimonia eupatoria* (+; KT), *Bombycilaena erecta* (+; KT), *Brachypodium sylvaticum* (+; KT), *Bromus commutatus* (+; KT), *Digitalis lanata* (+; KT), *Lathyrus tuberosus* (+; KT), *Lychnis coronaria* (+; KT), *Origanum vulgare* (+; KT), *Plantago lanceolata* (+; KT), *Poa angustifolia* (+; KT), *Potentilla argentea* (1; KT), *Trifolium campestre* (+; KT).

LACUL TRAIAN

The nature reserve with an area of 326 ha is protected by the Government Decision 2151/2004, being located in the Danube Floodplain, within the Cerna commune's territory. It includes the Traian Lake, the reed beds, marshes, halophilous and mesophil vegetation and a reduced area of steppe grasslands.

The major part of the identified coenotaxa is vulnerable within the reserve, except the sporadic *Scirpo-Phragmitetum*. Only the two types of steppe grasslands have an enhanced conservation value by the presence of one threatened species for each one of them. These coenotaxa are also framed within priority habitats of community importance, 62C0* (34.92). All the analysed plant communities are low disturbed, especially by grazing.

FLORA, VEGETATION, HABITATS

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community, estimated as vulnerable within the reserve, located on the loess slopes in its southern part, has an enhanced conservation importance due to one rare threatened species identified in the plots, locally endangered. Grazing induces a low modification of the inventory by the presence of only one ruderal plant with a reduced dominance.

Key species: *Dichanthium ischaemum* (4; LT).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; LT).

Other species: *Agropyron cristatum* (+; LT), *Artemisia austriaca* (+; LT), *Cynodon dactylon* (+; LT), *Medicago falcata* (+; LT), *Stipa capillata* (+; LT), *Teucrium polium* (+; LT), *Thymus pannonicus* (+; LT), *Xeranthemum annuum* (+; LT).

***Stipetum capillatae* (Hueck 1931) Krausch 1961**, a vulnerable coenotaxon has one rare threatened species identified in the plots. Three ruderal species indicate a low alteration of the natural structure.

Key species: *Stipa capillata* (4; LT).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; LT).

Other species: *Agropyron cristatum* (+; LT), *Bassia prostrata* (+; LT), *Carduus thoermeri* (+; LT), *Consolida regalis* (+; LT), *Cynodon dactylon* (+; LT), *Eragrostis minor* (+; LT), *Dichanthium ischaemum* (+; LT), *Salvia nemorosa* (+; LT), *Teucrium polium* (+; LT), *Xeranthemum annuum* (+; LT).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W.Koch 1926** a sporadic plant community that represents the dominant vegetation within the reserve, with a very poor species inventory shows a low disturbance aspect due to the presence of one ruderal species.

Key species: *Phragmites australis* (5; LT), *Typha angustifolia* (1; LT), *Typha latifolia* (+; LT).

Other species: *Xanthium italicum* (+; LT).

53.132 Lesser reed mace beds

***Typhetum angustifoliae* Pignatti 1953** plant community framed in this habitat is considered vulnerable (F: I) in the Mlaștina Hergheliei reserve (MH), where a low degree of disturbance is only indicated by one ruderal and one alien species (*Elaeagnus angustifolia*), both with a reduced dominance.

Key species: *Typha angustifolia* (5; LT).

Other species: *Nymphoides peltata* (+; LT), *Phragmites australis* (+; LT), *Schoenoplectus tabernaemontani* (+; LT), *Typha laxmannii* (+; LT), *Xanthium italicum* (+; LT).

BIRDS

In the Traian Lake reserve were identified 86 species of birds that are included in annexes of the Ordinance 57/2007; 59 of these are strictly protected, being found in Annex 3: *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Cygnus cygnus*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Tadorna ferruginea*, *Pernis apivorus*, *Milvus migrans*, *Haliaeetus albicilla*, *Circaetus gallicus*, *Circus aeruginosus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco cherrug*, *Falco peregrinus*, *Porzana porzana*, *Crex crex*, *Recurvirostra avosetta*, *Himantopus himantopus*, *Calidris alpina*, *Charadrius alexandrinus*, *Larus minutus*, *Sterna hirundo*, *Chlidonias hybridus*, *Sterna (Gelochelidon) nilotica*, *Sterna sandvicensis*, *Sterna albifrons*, *Chlidonias niger*, *Coracias garrulus*, *Dendrocopos syriacus*, *Picus canus*, *Melanocorypha calandra*, *Acrocephalus paludicola*, *Acrocephalus melanopogon*, *Sylvia nisoria*, *Ficedula parva*, *Emberiza hortulana*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

The other 27 species that are protected, fit into Annex 4B of the Ordinance 57/2007, are: *Tachybaptus ruficollis*, *Falco tinnunculus*, *Falco subbuteo*, *Actitis hypoleucos*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Sturnus roseus*, *Locustella naevia*, *Locustella luscinioides*, *Phylloscopus collybita*, *Regulus regulus*, *Regulus ignicapillus*, *Muscicappa striata*, *Panurus biarmicus*, *Aegithalos caudatus*, *Oriolus oriolus*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*.

MĂGURELE

The landscape nature reserve was established on an area of 292.00 ha, by the Government Decision 2151/ 2000, within Topolog commune, being included in the Podișul Nord Dobrogean Site of Community Interest. Beside the already published data (PETRESCU, 2007), the recent field inventories were concentrated on the habitats listed below. While these plant communities are framed between frequent and endangered, all of them are only low disturbed. Two coenotaxa are framed into priority habitats of community interest 40C0* (31.8B721) and 62C0* (34.92). No threatened plants were identified within these inventories.

FLORA, VEGETATION, HABITATS

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegum* Soó (1927) 1931** plant community is vulnerable (F: I) within the reserve, where a low disturbance can be deduced from the presence of the non-native taxa *Ailanthus altissima*, having a reduced dominance.

Key species: *Crataegus monogyna* (4; M), *Prunus spinosa* (+; M).

Other species:

- shrubs/ lianas: *Rosa canina* (+; M);
- grasses/ undershrubs: *Alyssum murale* (+; M), *Berberis vulgaris* (+; M), *Festuca valesiaca* (1; M), *Fragaria viridis* (+; M), *Poa angustifolia* (+;M).

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community dominates the steppe grasslands of the reserve, where the low disturbance is shown by two ruderal species with reduced dominance.

Key species: *Dichanthium ischaemum* (5; M).

Other species: *Agropyron cristatum* (+; M), *Alyssum murale* (+; M), *Crataegus monogyna* (+; M), *Cichorium intybus* (+; M), *Eryngium campestre* (+; M), *Festuca valesiaca* (+; M), *Koeleria macrantha* (+; M), *Poa angustifolia* (+; M).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** is an endangered plant community within the Măgurele nature reserve (M), with a low disturbance level, indicated by only one ruderal species with a restricted dominance.

Key species: *Phragmites australis* (5; M).

Other species: *Ligustrum vulgare* (+; M), *Plantago major* (+; M), *Rosa canina* (+; M), *Salix alba* (+; M), *Tussilago farfara* (+; M).

BIRDS

Within the Măgurele reserve there were inventoried 46 species of birds that can be found in the annexes of the Ordinance 57/2007; 22 species of these are strictly protected and listed in Annex 3: *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Buteo rufinus*, *Aquila pomarina*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Caprimulgus europaeus*, *Asio flammeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Melanocorypha calandra*, *Sylvia nisoria*, *Ficedula parva*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

There were identified 24 protected species, species that are found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Motacilla flava*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phoenicurus ochruros*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Muscicappa striata*, *Sitta europaea*, *Oriolus oriolus*, *Serinus serinus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

PECENEAGA

Located in the western part of Tulcea County, at the north-western limit of the Casimcea Plateau, within the Peceneaga commune, the landscape nature reserve, with an area of 132.00ha, was established by the Government Decision 2151/ 2004.

The highest summits of the reserve reach an altitude of 130 m in its central part, these rocky heights being the most important viewpoint over the cloughs developed in the surrounding loess deposits, framed by the loops of the adjacent Brațul Măcin arm of the Danube River.

The most frequent plant community is *Botriochloetum ischaemi*, the other two identified coenotaxa being vulnerable, respectively endangered. These are framed within priority community interest habitats 62C0*, the first coenotaxon corresponding to the 34.92 subtype. The other plant communities belong to the 34.9211 subtype. The first plant community has a low level of disturbance, unlike the other two with a medium level. Still, the latest two have a higher number of threatened species (5-6). Most of these threatened species are endangered locally, except the vulnerable *Festuca callieri* and the rare *Thymus zygoides*.

FLORA, VEGETATION, HABITATS

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** is the most widespread plant community within this nature reserve, where it can be considered frequent. In the studied plots one rare threatened species, *Centaurea gracilentia* was identified, this being locally endangered within these phytocoenoses. A general low degree of ruderal and non-native species invasive trend can be deduced from the presence of two ruderal and one alien taxa, *Ailanthus altissima*, all having a reduced dominance.

Key species: *Dichanthium ischaemum* (5; Pe).

Threatened species: *Centaurea gracilentia* (+; Pe).

Other species: *Ailanthus altissima* (+; Pe), *Artemisia austriaca* (+; Pe), *Cephalaria uralensis* (+; Pe), *Chondrilla juncea* (+; Pe), *Euphorbia seguieriana* (+; Pe), *Gypsophila pallasii* (+; Pe), *Helichrysum arenarium* (+; Pe), *Linaria genistifolia* (+; Pe), *Linum austriacum* (+; Pe), *Sideritis montana* (+; Pe), *Verbascum banaticum* (+; Pe), *Xeranthemum annuum* (+; Pe).

34.9211 Western Pontic thyme steppes

***Agropyro-Thymetum zygoidi* Dihoru (1969) 1970**, estimated as vulnerable within the reserve, has an outstanding conservation importance mainly due to the six rare threatened species, of which *Dianthus nardiformis* is also vulnerable having an European distribution and importance. These threatened taxa are mainly endangered within the respective phytocoenosis, except the vulnerable *Festuca callieri* and the rare *Thymus zygoides*. Grazing influence is obvious, taking into account the medium level of disturbance indicated by the three ruderal taxa with +-1 dominance values.

Key species: *Thymus zygoides*(2; Pe).

Threatened species: *Allium guttatum* (+; Pe), *Allium saxatile* (+; Pe), *Centaurea gracilentia* (+; Pe), *Dianthus nardiformis* (+; Pe), *Festuca callieri* (1; Pe), *Thymus zygioides* (2; Pe).

Other species: *Asperula tenella* (+; Pe), *Bombycilaena erecta* (+; Pe), *Cleistogenes bulgarica* (+; Pe), *Dichanthium ischaemum* (+; Pe), *Eragrostis minor* (+; Pe), *Eryngium campestre* (+; Pe), *Poa bulbosa* (1; Pe).

***Sedo hillebrandtii*-*Polytrichetum piliferi* Horeanu et Mihai 1974**, an endangered coenotaxon has a conservation value comparable to *Agropyro-Thymetum zygioidi*, with its five rare threatened taxa of which *Dianthus nardiformis* is of European importance. All these are endangered within these plots. A medium level of disturbance can be estimated from the presence of three ruderal species with significant dominance indices (+-1) and of *Ailanthus altissima*, non-native taxa.

Key species: *Polytrichum piliferum* (-1; Pe), *Sedum urvillei* subsp. *hillebrandtii* (-1; Pe).

Threatened species: *Allium guttatum* (+-; Pe), *Centaurea gracilentia* (+; Pe), *Dianthus nardiformis* (+-; Pe), *Festuca callieri* (+-; Pe), *Thymus zygioides* (+; Pe).

Other species: *Ailanthus altissima* (+; Pe), *Cynodon dactylon* (+; Pe), *Dichanthium ischaemum* (+; Pe), *Eryngium campestre* (+; Pe), *Kohlruschia prolifera* (+; Pe), *Poa bulbosa* (1; Pe), *Portulaca oleracea* (+; Pe), *Sanguisorba minor* (+; Pe), *Sideritis montana* (+; Pe), *Stipa capillata* (+-; Pe), *Teucrium chamaedrys* (+; Pe).

BIRDS

In the reserve there were identified 31 bird species in annexes of the Ordinance 57/2007, 16 of which are strictly protected, being found in Annex 3: *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Burhinus oedicnemus*, *Coracias garrulus*, *Lanius minor*, *Lanius collurio*.

A total of 15 species are protected and can be found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Oriolus oriolus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*.

TROESMIS

This represents a proposed landscape nature reserve of 93.26 ha, that was not yet approved at the national level. Still it is protected as part of Brațul Măcin Site of Community Interest. Located within the Turcoaia commune, the reserve lies on a loess plateau with steep slopes towards the Danube River. The geological substrata, of different Palaeozoic rock formations are visible in the outcrops of the Iglia Hill, continuously eroded by the Danube. The most frequent

plant community in the reserve is the sporadic *Artemisia austriacae*-*Poëtum bulbosae* Pop 1970, which is also typical for a high disturbance due to grazing. The other two coenotaxa are rare, respectively vulnerable, both having a medium degree of ruderal plant invasive tendencies.

FLORA, VEGETATION, HABITATS

15.A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** represents a vulnerable plant community within the Troesmis nature reserve (T). A medium disturbance can be estimated as the ruderal and no-native species prevail in its inventory. These are represented by three ruderal and one alien taxon *Amorpha fruticosa*, all with a reduced dominance.

Key species: *Cynodon dactylon* (4; T).

Other species: *Amorpha fruticosa* (+; T), *Mentha pulegium* (+; T), *Plantago major* (+; T), *Potentilla reptans* (+; T), *Rorippa sylvestris* (1; T), *Pulicaria dysenterica* (+; T), *Xanthium italicum* (+; T).

34.92 Ponto-Sarmatic steppes

***Artemisia austriacae-Poëtum bulbosae* Pop 1970**, a sporadic plant community within the reserve, is the result of a high pressure of grazing upon the steppe grasslands, confirmed by the ruderal taxa that exceed the other species, while also the key species that belong to this category have a significant dominance.

Key species: *Artemisia austriaca* (2; T), *Poa bulbosa* (2; T).

Other species: *Asperula tenella* (+; T), *Bassia prostrata* (+; T), *Chondrilla juncea* (+; T), *Cynodon dactylon* (2; T), *Erodium cicutarium* (+; T), *Galium humifusum* (+; T), *Portulaca oleracea* (+; T), *Thymus pannonicus* (+; T), *Tragus racemosus* (+; T), *Tribulus terrestris* (+; T).

***Agropyro cristati-Kochietum prostratae* Zólyomi 1958** a rare coenotaxon within the reserve, is medium disturbed by grazing, most of the species being ruderal with a dominance variation of + -1.

Key species: *Agropyron cristatum* (+; T), *Bassia prostrata* (3; T).

Other species: *Artemisia annua* (+; T), *Bromus squarrosus* (+; T), *Bromus tectorum* (+; T), *Ceratocarpus arenarius* (+; T), *Tribulus terrestris* (+; T).

BIRDS

There were identified 33 species of birds that are found in the annexes of the Ordinance 57/2007, of which 19 species are strictly protected and listed in Annex 3: *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Melanocorypha calandra*, *Ficedula parva*, *Emberiza hortulana*, *Anthus campestris*, *Lanius minor*, *Lanius collurio*.

A total of 14 of the identified species are protected and can be found in

Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Phoenicurus phoenicurus*, *Phylloscopus collybita*, *Muscicappa striata*, *Oriolus oriolus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*.

VALEA MAHOMENCEA

Being one of the most representative protected areas for the climax steppe of Central Dobrogea, the reserve was established by the Government Decision 2151/2004 on 1029 ha. The reserve includes the loess or green schists slopes adjacent to the Mahomencea rivulet and its tributaries, being located within the Casimcea commune, within Central Dobrogea.

Among the studied coenotaxa prevails the endangered ones, followed by vulnerable, rare and very frequently. Most of them have between one and three species, being low disturbed by grazing, except *Scirpo-Phragmitetum*, with no visible influence of this factor. The major part of them represent priority habitats of community importance like 41AA* (31.8B721) and 62C0 (34.92; 34.9211).

FLORA, VEGETATION, HABITATS

31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub

***Pruno spinosae-Crataegetum* Soó (1927) 1931** is a vulnerable coenotaxon mainly found in the valleys and ravines. The reduced accessibility for grazing explains the low degree of ruderal species invasion.

Key species: *Crataegus monogyna* (3; VM).

Other species:

- trees/ shrubs: *Ligustrum vulgare* (+; VM), *Pyrus pyraster* (+; VM), *Rhamnus cathartica* (+; VM), *Rosa canina* (1; VM);
- grasses/ undershrubs: *Achillea setacea* (+; VM), *Agropyron cristatum* (+; VM), *Ballota nigra* (+; VM), *Vinca herbacea* (+; VM), *Xeranthemum annuum* (+; VM), *Viola odorata* (+; VM).

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977**, a very frequent plant community, dominant within the grasslands, spread on most of the reserve, has one rare threatened species identified within the plots. A low influence of grazing is indicated by four ruderal taxa with a reduced dominance.

Key species: *Dichanthium ischaemum* (4; VM).

Threatened species: *Tanacetum millefolium* (+; VM).

Other species: *Achillea setacea* (+; VM), *Agropyron cristatum* (+; VM), *Carduus thoermeri* (r; VM), *Chondrilla juncea* (+; VM), *Cichorium intybus* (+; VM), *Crataegus monogyna* (+; VM), *Euphorbia glareosa* subsp. *glareosa* (+; VM), *Euphorbia seguieriana* (+; VM), *Festuca valesiaca* (+; VM), *Linaria genistifolia* (+; VM), *Stipa capillata* (+; VM), *Xeranthemum annuum* (+; VM).

***Stipetum capillatae* (Hueck 1931) Krausch 1961** an endangered plant community, has one vulnerable threatened species *Dianthus nardiformis*, of European importance, locally endangered within these phytocoenoses. Two ruderal species indicate a reduced level of disturbance due to grazing.

Key species: *Stipa capillata* (4; VM).

Threatened species: *Dianthus nardiformis* (3; VM).

Other species: *Chondrilla juncea* (+; VM), *Dichanthium ischaemum* (+; VM), *Eryngium campestre* (+; VM), *Euphorbia seguieriana* (+; VM), *Festuca valesiaca* (1; VM), *Potentilla argentea* (+; VM), *Teucrium polium* (+; VM), *Thymus pannonicus* (+; VM).

34.9211 Western Pontic thyme steppes

***Festucetum callierii* Șerbănescu 1965 apud Dihoru (1969) 1970**, a rare vegetation type, has remarkable conservation value, as four rare threatened species were identified in the plots, locally endangered, except the dominant key species *Festuca callieri*. Of these, the endemic *Campanula romanica* has an international importance, being also a species of community interest. Two ruderal taxa indicate a low level of grazing.

Key species: *Festuca callieri* (2; VM).

Threatened species: *Campanula romanica* (+; VM), *Festuca callieri* (2; VM), *Sempervivum zeleborii* (+; VM), *Stachys angustifolia* (+; VM).

Other species: *Alyssum saxatile* (+; VM), *Asperula tenella* (+; VM), *Chrysopogon gryllus* (+; VM), *Chondrilla juncea* (+; VM), *Crataegus monogyna* (+; VM), *Dichanthium ischaemum* (1; VM), *Eryngium campestre* (+; VM), *Rosa canina* (+; VM), *Verbascum banaticum* (+; VM).

53.112 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W.Koch 1926**, an endangered plant community, is represented by narrow water fringe vegetation adjacent to some rivulets. No disturbance due to alien/ ruderal species was observed.

Key species: *Phragmites australis* (5; VM).

Other species: *Cornus sanguinea* (+; VM), *Mentha longifolia* (+; VM), *Rubus caesius* (+; VM), *Xanthium italicum* (1; VM).

BIRDS

In the reserve were identified 31 species of birds that can be found in the annexes of the Ordinance 57/2007, 16 of which are strictly protected, being quoted in Annex 3: *Pernis apivorus*, *Milvus migrans*, *Circus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Aquila clanga*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Burhinus oedicephalus*, *Coracias garrulus*, *Lanius minor*, *Lanius collurio*.

There were identified 15 protected species that can be found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Upupa epops*, *Merops apiaster*, *Motacilla flava*, *Motacilla alba*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicapa striata*, *Oriolus oriolus*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis carduelis*.

VALEA OILOR

One of the smallest nature reserves in the Dobrogea region northwards of Ciucurova, with an area of 0.35 ha, this protected area was established by the Law 5/2000 in order to insure the protection of a mixed oak wood of *Quercus pubescens* with a shrub layer of *Syringa vulgaris*, but also of the threatened species *Paeonia peregrina*. This white oak forest is framed into the priority habitat of community interest 91AA* (41.73723).

FLORA, VEGETATION, HABITATS

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** is the only plant community identified in the reserve, while *Syringa vulgaris* occurs as a shrub layer under the white oak canopy or at its edge. The presence of a non-native species *Prunus cerasifera* and a ruderal taxon show a certain low disturbance.

Key species: *Carpinus orientalis* (3; VO), *Quercus pubescens* (2; VO).

Threatened species: *Paeonia peregrina* (+; VO);

Other species:

- trees: *Fraxinus ornus* (1; VO), *Prunus cerasifera* (+; VO), *Quercus pedunculiflora* (+; VO), *Ulmus procera* (+; VO);

- shrubs/ lianas: *Crataegus monogyna* (+; VO), *Evonymus europaeus* (±; VO), *Prunus spinosa* (+; VO), *Syringa vulgaris* (1; VO);

- grasses/ undershrubs: *Alliaria petiolata* (+; VO), *Althaea cannabina* (+; VO), *Asparagus tenuifolius* (+; VO), *Brachypodium sylvaticum* (+; VO), *Geum urbanum* (+; VO), *Leonurus cardiaca* (+; VO), *Lithospermum purpureocaeruleum* (+; VO), *Polygonatum latifolium* (+; VO).

BIRDS

In reserve were inventoried 56 species of birds that are found in the annexes of the Ordinance 57/2007, of which 22 species are strictly protected and listed in Annex 3: *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Circus cyaneus*, *Circus macrourus*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Hieraaetus pennatus*, *Falco vespertinus*, *Falco peregrinus*, *Caprimulgus europaeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Picus canus*, *Dryocopus martius*, *Lulula arborea*, *Sylvia nisoria*, *Ficedula parva*, *Lanius minor*, *Lanius collurio*.

There were identified 24 protected species, species that are found in Annex 4B of the Ordinance 57/2007: *Falco tinnunculus*, *Falco subbuteo*, *Upupa epops*, *Merops apiaster*, *Picus viridis*, *Jynx torquilla*, *Motacilla alba*, *Prunella modularis*, *Erithacus rubecula*, *Phoenicurus phoenicurus*, *Phylloscopus trochilus*, *Phylloscopus sibilatrix*, *Phylloscopus collybita*, *Regulus regulus*, *Muscicappa striata*, *Sitta europaea*, *Oriolus oriolus*, *Corvus corax*, *Carduelis spinus*, *Carduelis chloris*, *Carduelis cannabina*, *Carduelis carduelis*, *Carduelis flammea*, *Coccothraustes coccothraustes*.

Research concerning the natural heritage of some protected areas from Constanța County

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This paper presents the results of the recent research (2011-2013) which represent additions and updates of the proper studies previously conducted concerning the landscape, flora and habitats of 15 protected areas legally established or protected within the plateau part of Constanța County; they are mentioned in alphabetical order.

ALIMAN-URLUIA

Aliman-Urluia is a proposal of nature reserve (PETRESCU, 2007) that is at present included in the Aliman-Urluia Site of Community Interest, being framed within the Aliman and Ion Corvin communes' territories. Beside the already published data (PETRESCU, 2007), the recent field inventories were focused on several plant communities listed below.

Within the analysed coenotaxa two are rare, one sporadic and one vulnerable. Most of the plant communities are low disturbed, while one is considered representative for a natural status. The major part of the plots has between one and two threatened taxa, of which all are endangered within the respective plant communities, except the critically endangered *Galanthus elwesii*.

34.92 Ponto-Sarmatic steppes

***Medicagini minimae-Festucetum valesiaca* Wagner 1941** plant community, that was identified in the area of Dealul lui Pleașcă, between Urluia and Adâncata (A) can be considered rare (F: II) within the site, where only one vulnerable threatened species was identified so far, endangered within this phytocoenosis. Four ruderal species, with a reduced dominance show a low level of disturbance.

Key species: *Festuca valesiaca* (3; A).

Threatened species: *Crocus reticulatus* (+; A).

Other species: *Achillea setacea* (+; A), *Cichorium intybus* (+; A), *Dactylis glomerata* (+; A), *Dichanthium ischaemum* (2; A), *Eryngium campestre* (+; A), *Euphorbia glareosa* subsp. *glareosa* (+; A), *Marrubium peregrinum* (+; A), *Rosa canina* (+; A), *Teucrium chamaedrys* (+; A), *Teucrium polium* subsp. *capitatum* (+; A).

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community, estimated as sporadic (F: III) within the site, was inventoried in the Șarpu Valley (Valea Șarpu), there being observed one vulnerable threatened species, endangered within the respective coenotaxon. A low degree of ruderal

species invasive tendencies is indicated by the five such taxa with a reduced dominance.

Key species: *Dichanthium ischaemum* (3; VȘ).

Threatened species: *Crocus reticulatus* (+; VȘ).

Other species: *Agropyron cristatum* (+; VȘ), *Crataegus monogyna* (+; VȘ), *Cichorium intybus* (+; VȘ), *Cynodon dactylon* (1; VȘ), *Dactylis glomerata* (1; VȘ), *Euphorbia glareosa* subsp. *glareosa* (+; VȘ), *Linaria genistifolia* (+; VȘ), *Marrubium peregrinum* (+; VȘ), *Onopordum acanthium* (+; VȘ), *Quercus pedunculiflora* (1-2; VȘ), *Rosa canina* (+; VȘ), *Stipa capillata* (1; VȘ), *Teucrium polium* (+; VȘ), *Tragopogon dubius* (+; VȘ).

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** plant community is rare (F: II) within the Aliman-Urului community interest site, but occurs on most of the natural forest from Șarpu Valley (VȘ). The lack of ruderal/ non-native species indicates a natural status.

Key species: *Carpinus orientalis* (2; VȘ), *Quercus pubescens* (2; VȘ).

Other species:

- trees: *Cerasus mahaleb* (+; VȘ), *Fraxinus ornus* (+; VȘ).

- shrubs/ lianas: *Clematis vitalba* (+; VȘ), *Cornus mas* (1; VȘ), *Cornus sanguinea* (+; VȘ), *Crataegus monogyna* (+; VȘ), *Evonymus verrucosus* (+; VȘ), *Hedera helix* (+; VȘ).

- grasses/ undershrubs: *Arum orientale* (+; VȘ), *Brachypodium sylvaticum* (+; VȘ), *Scilla bifolia* (+; VȘ).

41.7A221 Pontic *Acer tataricum-Quercus pedunculiflora* steppe woods

***Violo suavis-Quercetum pedunculiflorae* Doniță 1970** is a vulnerable coenotaxon within the Aliman-Urului community interest site, where it was inventoried in the lower part of the slopes in the Șarpu Valley (VȘ). Its conservation value is enhanced by the two rare threatened species. While *Mercurialis ovata* is endangered within this coenotaxon, *Galanthus elwesii* can be considered critically endangered. A low disturbance is shown by the three ruderal taxa that occur in the analysed plot.

Key species: *Quercus pedunculiflora* (3; VȘ).

Threatened species: *Galanthus elwesii* (r; VȘ), *Mercurialis ovata* (+; VȘ).

Other species:

- trees: *Acer campestre* (+; VȘ), *Cerasus mahaleb* (+; VȘ), *Ulmus procera* (1; VȘ).

- shrubs/ lianas: *Cornus mas* (1; VȘ), *Cornus sanguinea* (+; VȘ), *Crataegus monogyna* (+; VȘ), *Evonymus europaeus* (+; VȘ), *Hedera helix* (1; VȘ), *Staphylea pinnata* (+; VȘ).

- grasses/ undershrubs: *Anthriscus cerefolium* (+; VȘ), *Arum orientale* (+; VȘ), *Corydalis solida* subsp. *solida* (+; VȘ), *Lamium purpureum* (+; VȘ), *Ranunculus ficaria* (+; VȘ), *Scilla bifolia* (+; VȘ), *Urtica dioica* (+; VȘ), *Veronica hederifolia* (+; VȘ).

BAȘPUNAR

The reserve represents a proposal of protected area that was not yet approved at the national level. Still it is protected at the European level as a part of the *Natura 2000* site (SCI) Dumbrăveni-Valea Urluia, Lacul Vederioasa (18.714 ha). It is represented by the steppe grasslands, thickets, rocky areas and other natural habitats within the valleys Bașpunar and Urluia framed between the localities Independența, Fântâna Mare and Petroșani.

The vegetation has mainly a steppe aspect, the dry grasslands being found both on the limestone plateaux and slopes, as well as in the valleys with a loess substratum. A distinctive feature of the landscape is represented by the rocky limestone cliffs with saxicolous vegetation, their associated screes being usually covered by steppe thickets of Christ's thorn (*Paliurus spina-christi*).

The natural habitats identified so far are community interest priority ones, respectively 40C0* (31.8B731) and 62C0* (34.92). The dominant plant community is *Botriochloetum ischaemi*, the other two being rare within the reserve. Among the threatened plants at the national level, within the reserve *Jasminium fruticans* and *Euphorbia nicaeensis* subsp. *dobrogensis* can be estimated as endangered. Most of the plant community are low disturbed, only one of them having a medium level of ruderal species invasive tendencies.

31.8B731 Western Pontic jasmine Christ's thorn scrub

Asphodelino luteae-Paliuretum Sanda et alii 1999 can be considered a rare coenotaxon within a studied area, these thickets being mainly found on the rocky slopes of the valleys, where, besides the dominant *Paliurus spina-christi*, another rare threatened species was identified, assessed as endangered within these phytocoenoses. A low level of ruderal species invasion is indicated by three species of this kind with a low dominance.

Key species: *Paliurus spina-christi* (4; Ba).

Threatened species: *Jasminium fruticans* (+; Ba), *Paliurus spina-christi* (4; Ba).

Other species: *Artemisia annua* (+; Ba), *Carthamus lanatus* (+; Ba), *Convolvulus cantabricus* (+; Ba), *Dichanthium ischaemum* (+; Ba), *Kohlruschia prolifera* (+; Ba), *Marrubium peregrinum* (+; Ba), *Melica ciliata* (+; Ba), *Sideritis montana* (+; Ba), *Teucrium polium* (+; Ba), *Xeranthemum annuum* (+; Ba).

34.92 Ponto-Sarmatic steppes

Botriochloetum (Andropogonetum) ischaemi (Kist. 1937) Pop 1977 belongs to the priority habitats of community importance, being the most frequent within the steppe grasslands, with a wide distribution on all relief forms. In its composition was identified the rare threatened species *Satureja coerulea*, locally endangered. The dominance of *Poa bulbosa* (1) shows a medium intensity grazing, even if the other four species have a low dominance.

Key species: *Dichanthium ischaemum* (3; Ba).

Threatened species: *Satureja coerulea* (+; Ba).

Other species: *Acinos arvensis* (+; Ba), *Chondrilla juncea* (+; Ba), *Cynodon dactylon* (+; Ba), *Eryngium campestre* (+; Ba), *Euphorbia glareosa* subsp. *glareosa* (+; Ba), *Heliotropium europaeum* (+; Ba), *Nigella arvensis* (+; Ba), *Poa bulbosa* (1; Ba), *Setaria viridis* (+; Ba), *Sideritis montana* (+; Ba), *Teucrium chamaedrys* (+; Ba), *Teucrium polium* (+; Ba), *Thymus pannonicus* (+; Ba), *Xeranthemum annuum* (+; Ba).

***Saturejetum coeruleae* Cristurean et Ionescu-Țeculescu 1970** is a rare plant community, typical for the limestone plateaux, the upper part of the slopes and in general for the shallow rocky soils, having a low dominance. In this subtype of priority habitat of community interest there were recorded two rare threatened taxa, respectively the dominant *Satureja coerulea* and the locally endangered *Euphorbia nicaeensis* subsp. *dobrogensis*. Three ruderal species show a reduced level of disturbance due to grazing.

Key species: *Satureja coerulea* (3; Ba).

Threatened species: *Euphorbia nicaeensis* subsp. *dobrogensis* (+; Ba), *Satureja coerulea* (3; Ba).

Other species: *Adonis vernalis* (+; Ba), *Agropyron cristatum* (+; Ba), *Allium inaequale* (+; Ba), *Asperula tenella* (+; Ba), *Convolvulus cantabricus* (+; Ba), *Crataegus monogyna* (+; Ba), *Dichanthium ischaemum* (1), *Digitalis lanata* (+; Ba), *Eryngium campestre* (+; Ba), *Euphorbia agraria* (+; Ba), *Euphorbia glareosa* subsp. *glareosa* (+; Ba), *Salvia nutans* (+; Ba), *Sanguisorba minor* (+; Ba), *Sideritis montana* (+; Ba), *Stipa capillata* (+; Ba), *Teucrium chamaedrys* (+; Ba), *Teucrium polium* (+; Ba), *Thymus pannonicus* (+; Ba), *Tribulus terrestris* (+; Ba), *Xeranthemum annuum* (+; Ba).

PĂDUREA BRATCA NATURE RESERVE

The mixed nature reserve, established by the Government Decision 2151/2004, on the basis of botany, zoology, forestry, landscape natural heritage components, with an area of 66.7 ha, is framed within the Olțina commune. It is situated on the slopes adjacent to the Danube River with a maximum altitude of 120 m, being included in the Canaralele Dunării Site of Community Interest. Beside the already published data (PETRESCU, 2007), the recent field researches led to the identification of the habitats listed below.

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae-Carpinetum orientalis* Doniță 1970** plant community covers most of the Pădurea Bratca nature reserve (F: IV). The high conservative value of the analysed areas is completed by four rare threatened taxa, of which *Corydalis solida* subsp. *slivenensis* is sub-endemic, *Crocus reticulatus* is vulnerable and *Ruscus aculeatus* is of European importance. All these are endangered within these phytocoenoses. While the canopy is not derived, in the grasses layer there is only one ruderal species that shows a low disturbance.

Key species: *Carpinus orientalis* (2; PBt), *Quercus pubescens* (2; PBt).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; PBt), *Crocus reticulatus* (+; PBt), *Piptatherum virescens* (+; PBt), *Ruscus aculeatus* (+; PBt).

Other species:

- trees: *Fraxinus ornus* (1; PBt);
- shrubs/ lianas: *Cornus mas* (+; PBt), *Evonymus verrucosus* (+; PBt), *Hedera helix* (1; PBt);
- grasses/ undershrubs: *Arabis turrita* (+; PBt), *Corydalis cava* (+; PBt), *Corydalis solida* subsp. *solida* (+; PBt), *Dactylis polygama* (+; PBt), *Muscari neglectum* (+; PBt), *Scilla bifolia* (+; PBt), *Veronica hederifolia* (+; PBt).

41.76833 Dobrogean *Quercus pedunculiflora*-lime-oriental hornbeam forests

***Quercus pedunculiflorae-Tilietum tomentosae* Doniță 1970**, recorded from Pădurea Bratca nature reserve (PBt), can be estimated as a rare (F: II) plant community. The grasses layer can be considered as representative for a natural status, as no ruderal/ alien species were recorded. Still the tree layer is partially derived, which indicates a medium level of disturbance.

Key species: *Quercus pedunculiflora* (1; PBt), *Tilia tomentosa* (2; PBt).

Other species:

- trees: *Acer campestre* (+; PBt), *Carpinus orientalis* (1; PBt), *Cerasus mahaleb* (+; PBt), *Fraxinus ornus* (1; PBt), *Sorbus torminalis* (+; PBt);
- shrubs/lianas: *Cornus mas* (+; PBt), *Hedera helix* (1; PBt), *Sambucus nigra* (+; PBt);
- grasses/undershrubs: *Arabis turrita* (+; PBt), *Geum urbanum* (+; PBt), *Polygonatum latifolium* (+; PBt), *Melica uniflora* (+; PBt), *Dactylis polygama* (+; PBt).

44.4 Mixed oak-elm-ash forests of great rivers

***Fraxino-Ulmetum* Oberdorfer 53**, identified within Pădurea Bratca nature reserve (PBt), is a vulnerable plant community, where one rare threatened species was observed, endangered within this phytocoenosis. The only ruderal species, *Ballota nigra*, shows a low disturbance.

Key species: *Ulmus procera* (3; PBt).

Threatened species: *Piptatherum virescens* (+; PBt).

Other species:

- trees: *Acer campestre* (1; PBt), *Carpinus orientalis* (1; PBt), *Cerasus mahaleb* (+; PBt), *Fraxinus ornus* (+; PBt), *Sambucus nigra* (+; PBt);
- shrubs/lianas: *Cornus mas* (+; PBt), *Crataegus monogyna* (+), *Ligustrum vulgare* (+; PBt);
- grasses/ undershrubs: *Ballota nigra* (+; PBt), *Brachypodium sylvaticum* (+; PBt), *Dactylis polygama* (+; PBt), *Geum urbanum* (+; PBt).

CANARALELE DIN PORTUL HÂRȘOVA

The nature reserve with an area of 5.30 ha, are situated adjacent to the Danube, on spectacular coral reef limestone formations that overlap the green schist substrata of the Casimcea Plateau of Central Dobrogea, being framed within the Hârșova town's territory – Constanța County.

The limestone cliffs vegetation is represented by the rare plant community *Parietario serbicae-Alysetum saxatilis*, while the scree with shallow soils are covered by steppe grasslands framed into the rare *Agropyron cristatum* coenotaxon. While the first plant community has only a low level of ruderal/ non-native species invasion, the second, being more accessible for grazing, shows a medium disturbance. In each of these two coenotaxa only the same rare threatened species, *Allium flavum* subsp. *tauricum*, was identified. Both plant communities are framed into the same priority habitat of community interest 62C0* (34.92).

34.92 Ponto-Sarmatic steppes

***Parietario serbicae-Alysetum saxatilis* (Mihai et alii 1964) Mititelu et alii 1993** plant community, rare (F: II) within the Canaralele Hârșovei nature reserve (CHS), has only one rare threatened plant in the analysed area. A low influence of both ruderal and alien *Amorpha fruticosa* species can be deduced from the presence of only one taxon in each of these two categories.

Key species: *Alyssum saxatile* (CHS).

Threatened species: *Allium flavum* subsp. *tauricum* (+; CHS).

Other species: *Agropyron cristatum* (+; CHS), *Asperula tenella* (+; CHS), *Bassia prostrata* (+; CHS), *Cynodon dactylon* (+; CHS), *Linaria genistifolia* (+; CHS), *Melica ciliata* (+; CHS), *Reseda lutea* (+; CHS), *Sedum maximum* (+; CHS), *Verbascum banaticum* (+; CHS), *Amorpha fruticosa* (+; CHS).

***Agropyro cristati-Kochietum prostratae* Zólyomi 1958** is a rare (F: II) plant community within the Canaralele Hârșovei nature reserve, where just one rare threatened species was observed so far. The medium level of invasive trend of the ruderal plants is obvious, as despite their low dominance, the number of this kind of taxa (seven species) exceeds the other species.

Key species: *Agropyron cristatum* (+; CHS).

Threatened species: *Allium flavum* subsp. *tauricum* (+; CHS).

Other species: *Asperula tenella* (+; CHS), *Chenopodium album* (+3; CHS), *Centaurea diffusa* (+; CHS), *Chondrilla juncea* (+; CHS), *Eryngium campestre* (+; CHS), *Galium humifusum* (+; CHS), *Malva sylvestris* (+; CHS), *Onopordum acanthium* (+; CHS), *Verbascum banaticum* (+; CHS), *Tribulus terrestris* (+; CHS), *Sedum urvillei* subsp. *hillebrandtii* (+; CHS).

CANARAUA FETII

Established by the Law 5/ 2000, with an area of 168.30 ha, the nature reserve is framed within Băneasa commune, being at present included in the Pădurea și Valea Canaraua Fetii-Iortmac Site of Community Interest. Beside the already published data (PETRESCU, 2007), the recent field researches led to the updated description of the habitats listed below.

Most of the analysed plant communities can be considered vulnerable and low disturbed, except the endangered *Sedo hillebrandtii*-*Polytrichetum piliferi* and *Paeonio peregrinae*-*Carpinetum orientalis*, both representatives for a natural status. All these plant communities have two threatened species, except *Quercetum pedunculiflorae-cerris*, with three such taxa, endangered within this coenotaxon, this being the most widespread threat category in the studied situations.

31.8B731 Western Pontic jasmine Christ's thorn scrub

***Rhamno catharticae-Jasminietum fruticantis* (Mihai et alii 1964) Mititelu et alii 1993**, plant community can be estimated as vulnerable (F: I) within the Canaraua Fetii nature reserve (CFR), where, besides the dominant *Jasminium fruticans*, considered rare at the national level, another threatened taxa is the vulnerable *Crocus flavus*, endangered within this phytocoenosis. The four ruderal species with a reduced dominance indicate a low degree of disturbance.

Key species: *Jasminium fruticans* (4; CFR), *Crocus flavus* (+; CFR).

Threatened species: *Jasminium fruticans* (4; CFR), *Crocus flavus* (+; CFR).

Other species:

- grasses/ undershrubs: *Cleistogenes serotina* (+; CFR), *Crepis sancta* (+; CFR), *Elymus hispidus* (1; CFR), *Galium aparine* (+; CFR), *Lamium purpureum* (+; CFR), *Orlaya grandiflora* (+; CFR), *Phleum phleoides* (+; CFR), *Polygonatum latifolium* (+; CFR), *Vinca herbacea* (+; CFR), *Viola arvensis* (+; CFR).

34.9211 Western Pontic thyme steppes

***Sedo hillebrandtii*-*Polytrichetum piliferi* Horeanu et Mihai 1974** plant community is endangered within the reserve, where no ruderal/ alien species were observed.

Key species: *Polytrichum piliferum* (1; CFR), *Sedum urvillei* subsp. *hillebrandtii* (2; CFR).

Other species: *Alyssum saxatile* (+; CFR), *Arabis turrita* (+; CFR), *Asperula tenella* (+; CFR), *Campanula sibirica* (+; CFR), *Cleistogenes serotina* (+; CFR), *Convolvulus cantabricus* (+; CFR), *Cotinus coggygria* (+; CFR), *Koeleria macrantha* (+; CFR), *Scleranthus perennis* (1; CFR), *Sedum maximum* (+; CFR), *Sideritis montana* (+; CFR), *Teucrium chamaedrys* (+; CFR).

41.73723 Moesian *Paeonia peregrina* – white oak woods

***Paeonio peregrinae*-*Carpinetum orientalis* Doniță 1970**, a sporadic plant community, shelters two threatened species, of which *Crocus flavus* is vulnerable.

This can be considered a representative sample of this habitat, as it is not derived and no ruderal/ alien species were recorded.

Key species: *Carpinus orientalis* (2; CFR), *Quercus pubescens* (3; CFR).

Threatened species: *Asparagus verticillatus* (+; CFR), *Crocus flavus* (+; CFR).

Other species:

- trees: *Cerasus mahaleb* (+; CFR), *Fraxinus ornus* (+; CFR);
- shrubs/ lianas: *Cotinus coggygria* (+; CFR), *Crataegus monogyna* (+; CFR), *Rosa canina* (+; CFR);
- grasses/ undershrubs: *Alliaria petiolata* (+; CFR), *Arabis turrita* (+; CFR), *Brachypodium sylvaticum* (+; CFR), *Cleistogenes serotina* (+; CFR), *Dactylis polygama* (+; CFR), *Galium aparine* (+; CFR), *Muscari neglectum* (+; CFR), *Tanacetum corymbosum* (+; CFR), *Sedum maximum* (+; CFR).

41.76812 Moesio-Danubian oriental hornbeam *Quercus cerris* forest

***Carpino orientalis-Quercetum cerris* Oberdorfer 1948**, a vulnerable plant community, has an enhanced conservation value due to the presence of four rare threatened species, of which *Corydalis solida* subsp. *slivenensis* is also sub-endemic, while *Crocus flavus* is vulnerable. The three ruderal species with a reduced dominance indicate a low level of disturbance from this point of view.

Key species: *Carpinus orientalis* (1; CFR), *Quercus cerris* (4; CFR).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; CFR), *Crocus flavus* (+; CFR), *Mercurialis ovata* (+; CFR), *Piptatherum virescens* (+; CFR).

Other species:

- trees: *Cerasus mahaleb* (+; CFR), *Fraxinus ornus* (1; CFR).
- shrubs/ lianas: *Crataegus monogyna* (+; CFR), *Ligustrum vulgare* (+; CFR).
- grasses/ undershrubs: *Anthriscus cerefolium* (+; CFR), *Corydalis cava* subsp. *marshalliana* (+; CFR), *Corydalis solida* subsp. *solida* (1; CFR), *Dactylis polygama* (+; CFR), *Geranium rotundifolium* (+; CFR), *Geum urbanum* (+; CFR), *Glechoma hirsuta* (+; CFR), *Lychnis coronaria* (+; CFR), *Muscari neglectum* (+; CFR), *Polygonatum latifolium* (+; CFR), *Scilla bifolia* (+; CFR), *Stellaria media* (+; CFR), *Veronica hederifolia* (+; CFR), *Viola suavis* (+; CFR).

41.76833 Dobrogean *Quercus pedunculiflora*-lime-oriental hornbeam forests

***Quercus pedunculiflorae-Tilietum tomentosae* Doniță 1970** plant community is a vulnerable coenotaxon where two threatened species were recorded, of these *Corydalis solida* subsp. *slivenensis* being also sub-endemic. One ruderal species with a reduced dominance indicate a low level of disturbance.

Key species: *Quercus pedunculiflora* (2; CFR), *Tilia tomentosa* (2; CFR).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; CFR), *Mercurialis ovata* (+; CFR).

- trees: *Acer campestre* (1; CFR);
- shrubs/ lianas: *Cornus mas* (+; CFR), *Evonymus verrucosus* (+; CFR), *Sambucus nigra* (+; CFR);

- grasses/ undershrubs: *Adoxa moschatellina* (+; CFR), *Anemone ranunculoides* (+; CFR), *Arum orientale* (+; CFR), *Brachypodium sylvaticum* (+; CFR), *Corydalis cava* subsp. *marschalliana* (+; CFR), *Corydalis solida* subsp. *solida* (+; CFR), *Gagea lutea* (+; CFR), *Lamium purpureum* (+; CFR), *Polygonatum latifolium* (+; CFR), *Ranunculus ficaria* (1; CFR), *Veronica hederifolia* (+; CFR).

41.7A223 Pontic *Acer tataricum*-*Q.cerris*-*Q.pedunculiflora* steppe woods

Quercetum pedunculiflorae-cerris (Morariu 1944) Doltu, Popescu, Sanda 1980 can be considered a vulnerable plant community within the reserve, where it worth to underline the presence of three rare threatened species, among these *Ruscus aculeatus* being also listed in the Habitat Directive. It can be considered a representative phytocoenosis, as this old-growth stand is not derived, and it has a low level of ruderal species invasion, these being only represented by *Veronica hederifolia*.

Key species: *Quercus cerris* (2; CFR), *Quercus pedunculiflora* (2; CFR).

Threatened species: *Corydalis solida* subsp. *slivenensis* (+; CFR), *Mercurialis ovata* (+; CFR), *Ruscus aculeatus* (±; CFR).

Other species:

- trees: *Acer campestre* (+; CFR), *Carpinus orientalis* (1; CFR), *Fraxinus ornus* (±; CFR), *Tilia tomentosa* (+; CFR);

- shrubs/ lianas: *Cornus mas* (1; CFR), *Hedera helix* (+; CFR);

- grasses/ undershrubs: *Anemone ranunculoides* (+; CFR), *Arum orientale* (+; CFR), *Galium aparine* (+; CFR), *Geum urbanum* (+; CFR), *Polygonatum latifolium* (+; CFR), *Ranunculus ficaria* (+; CFR), *Scilla bifolia* (+; CFR), *Veronica hederifolia* (+; CFR), *Viola suavis* (+; CFR).

DUNELE MARITIME DE LA AGIGEA

The botanical nature reserve, with an area of 25.00 ha, is framed within the Constanța town administrative territory, being established by the Law 5/ 2000. At present it is included within the Dunele marine de la Agigea Site of Community Interest. So far there were inventoried the two habitats listed below. One of these coenotaxa is included in priority habitats of community interest, respectively 6260* (34.A2111).

16.2124 Pontic white dunes

Convolvuletum persici (Borza 1931 n.n.) Sanda et alii 1998 plant community can be estimated as vulnerable (F: I) within the Dunele maritime de la Agigea nature reserve (DMAG). There, besides the dominant *Convolvulus persicus*, another rare threatened plant, also vulnerable, is *Leymus racemosus* subsp. *sabulosus*, endangered within this coenotaxon. Three ruderal species indicate a low disturbance from this point of view, as they have a reduced dominance.

Key species: *Convolvulus persicus* (3; DMAG).

Threatened species: *Convolvulus persicus* (3; DMAG), *Leymus racemosus* subsp. *sabulosus* (+; DMAG).

Other species: *Bromus tectorum* (+; DMAG), *Chondrilla juncea* (+; DMAG), *Consolida regalis* (+; DMAG), *Medicago falcata* (+; DMAG), *Scabiosa argentea* (+; DMAG), *Secale sylvestre* (+; DMAG), *Stachys recta* (+; DMAG).

34.A2111 Western Pontic sand pioneer swards

***Secali sylvestris-Brometum tectorum* Harghitai 1940** plant community can be estimated as frequent (F: IV) within the Dunele maritime de la Agigea nature reserve (DMAG). Two rare threatened species, *Convolvulus persicus* and *Ephedra distachya*, were identified, the first being vulnerable, while the second is endangered within this coenotaxa. A low degree of ruderal plant occurrence can be deduced from the presence of only one such species, with a reduced dominance.

Key species: *Bromus tectorum* (+; DMAG), *Secale sylvestre* (2; DMAG).

Threatened species: *Convolvulus persicus* (+; DMAG), *Ephedra distachya* (+; DMAG).

Other species: *Centaurea arenaria* (+; DMAG), *Cynanchum acutum* (+; DMAG), *Euphorbia seguieriana* (+; DMAG), *Medicago falcata* (+; DMAG), *Melica ciliata* (+; DMAG), *Scabiosa argentea* (+; DMAG), *Sideritis montana* (+; DMAG).

LACUL DUNĂRENI

The mixed nature reserve was mainly established for the protection of the landscape and fauna, being located within Aliman and Ion Corvin communes, with an area of 703.00 ha. During the recent field studies a few plant communities were described, beside the already published data (PETRESCU, 2007). Most of these plant communities are vulnerable and representative for a natural status, only one being rare and another low disturbed. One plant community is included in the priority habitat of community interest 1530* (15.A21275). No threatened species were identified in these coenotaxa.

15.A21275 Western Pontic *Cynodon* saline beds

***Trifolium fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** plant community is estimated as vulnerable (F: I) within the Lacul Dunăreni nature reserve (LD). The three ruderal species and the non-native *Elaeagnus angustifolia* indicate still a low disturbance, as their dominance is reduced.

Key species: *Cynodon dactylon* (3; LD), *Trifolium fragiferum* (1; LD).

Other species: *Elaeagnus angustifolia* (±; LD), *Elymus repens* (1; LD), *Potentilla reptans* (1; LD), *Ranunculus sceleratus* (+; LD), *Setaria viridis* (+; LD), *Xanthium italicum* (+; LD).

53.132 Lesser reed mace beds

***Typhetum angustifoliae* Pignatti 1953** can be considered a vulnerable (F: I) plant community, representative for its natural composition, as no alien/ ruderal taxa were identified.

Key species: *Typha angustifolia* (5; LD).

Other species: *Alisma plantago-aquatica* (+; LD), *Cynodon dactylon* (+; LD), *Lythrum salicaria* (+; LD), *Phragmites australis* (+; LD).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community framed in this habitat represents the reed beds located on humid soils of the Dunăreni Lake (LD), where it can be considered a rare (F: II) coenotaxon, while the mono-dominant reed beds, framed into the same plant community, but in the 53.1111 habitat, occur on larger areas, being sporadic (F: III) in the reserve.

Key species: *Phragmites australis* (5; LD), *Typha angustifolia* (+; LD).

Other species: *Calystegia sepium* (+; LD), *Potentilla reptans* (+; LD), *Xanthium italicum* (+; LD).

LACUL VEDEROASA

The landscape and zoological reserve, with an area of 517.00 ha, is included in the Aliman commune's territory, respectively in the Dumbrăveni-Valea Urului-Lacul Vederöasa Site of Community Interest. Beside the already published data (PETRESCU, 2007), within the recent field inventories there were detailed the habitats listed below. The major part of these plant communities are vulnerable and low disturbed, only two of them being rare, respectively typical for a natural status. Two plant communities are included in the priority habitats of community interest 1530* (15.A21275) and 62C0* (34.92). No threatened plants were observed in the plots.

15.A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** plant community is assessed as rare (F: II) within the Vederöasa Lake nature reserve (LV), where the two ruderal species identified show a low disturbance level.

Key species: *Cynodon dactylon* (5; LV), *Trifolium fragiferum* (+; LV).

Other species: *Elymus repens* (+; LV), *Bolboschoenus maritimus* (+; LV), *Centaurea calcitrapa* (+; LV), *Mentha pulegium* (+; LV), *Potentilla reptans* (+; LV), *Typha angustifolia* (+; LV).

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community from Vederöasa Lake nature reserve (LV) is considered vulnerable (F: I). There can be deduced a low disturbance level from the reduced dominance of the

two non-native species (*Ailanthus altissima*, *Elaeagnus angustifolia*), as well as of the three ruderal taxa.

Key species: *Dichanthium ischaemum* (5; LV).

Other species: *Achillea setacea* (+; LV), *Agrimonia eupatoria* (+; LV), *Ailanthus altissima* (+; LV), *Cichorium intybus* (+; LV), *Elaeagnus angustifolia* (+; LV), *Eryngium campestre* (+; LV), *Festuca valesiaca* (+; LV), *Minuartia glomerata* (+; LV), *Poa bulbosa* (+; LV), *Teucrium chamaedrys* (+; LV), *Xeranthemum annuum* (+; LV).

44.921 Grey willow scrub

***Calamagrosti-Salicetum cinereae* Soó et Zólyomi in Soó 1955**, a vulnerable plant community within the Vederoasa Lake nature reserve (F: I), has a low level of ruderal plant presence, these being only represented by a few individuals of *Urtica dioica*.

Key species: *Salix cinerea* (3; LV).

Other species: *Berula erecta* (+; LV), *Iris pseudacorus* (+; LV), *Phragmites australis* (+; LV), *Typha angustifolia* (+; LV), *Typha latifolia* (+; LV), *Urtica dioica* (+; LV).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W. Koch 1926** plant community, included in this habitat represents the reed beds that occur on humid soils adjacent to the Vederoasa Lake (LV), than can be considered rare (F: II) within the nature reserve. Still the permanent mono-dominant flooded reed beds, included in the same plant community, but in the 53.1111 habitat, represent the main vegetation type of this reserve (F: IV). No alien/ ruderal species were identified.

Key species: *Phragmites australis* (5; LV), *Schoenoplectus lacustris* (+; LV), *Typha angustifolia* (+; LV), *Typha latifolia* (+; LV).

Other species: *Berula erecta* (+; LV), *Mentha aquatica* (+; LV), *Salix cinerea* (+; LV).

53.13 Reed mace beds

***Typhetum angustifoliae* Pignatti 1953** plant community is vulnerable (F: I), within the Vederoasa Lake nature reserve (LV). It can be considered as close to its natural status, as no alien/ ruderal taxa were observed.

Key species: *Typha angustifolia* (5; LV).

Other species: *Alisma plantago-aquatica* (+; LV), *Berula erecta* (+; LV), *Lythrum salicaria* (+; LV), *Mentha aquatica* (+; LV), *Ranunculus sceleratus* (+; LV), *Salix alba* (+; LV).

LOCUL FOSILIFER ALIMAN

The paleontological nature reserve, with an area of 15.00 ha according to the Law 5/ 2000, belongs to the Aliman commune, being included in the Aliman-Adamclisi Site of Community Interest. Even though it is not a botanical reserve, within the recent studies one plant community was studied on the slopes situated under the limestone cliffs of the reserve, framed into the priority community interest habitat 62C0* (34.92).

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community, identified within the Punctul (Locul) Fosilifer Aliman (PFAL), included in the Aliman-Urului proposed reserve and site of community interest, has no ruderal species, but only one non-native taxon, *Ailanthus altissima*, with a reduced dominance.

Key species: *Dichanthium ischaemum* (2; PFAL).

Other species: *Agrimonia eupatoria* (+; PFAL), *Ailanthus altissima* (±; PFAL), *Brachypodium sylvaticum* (1; PFAL), *Calamagrostis epigeios* (+; PFAL), *Cerasus mahaleb* (+; PFAL), *Clematis vitalba* (+; PFAL), *Clinopodium vulgare* (+; PFAL), *Crataegus monogyna* (1; PFAL), *Dactylis glomerata* (1; PFAL), *Festuca valesiaca* (±; PFAL), *Quercus pubescens* (+; PFAL), *Rosa canina* (+; PFAL), *Sanguisorba minor* (+; PFAL).

LOCUL FOSILIFER CREDINȚA

The paleontological reserve is framed within the Cobadin commune, with an area of 6.00 ha, according to the Law 5/ 2000, being included in the Dumbrăveni-Valea Urului-Lacul Vederoasa Site of Community Interest. The vegetation of this reserve is only represented by steppe grasslands, within which the recent studies have described only one plant community, framed into the priority community interest habitat 62C0* (34.92).

34.92 Ponto-Sarmatic steppes

***Botriochloetum (Andropogonetum) ischaemi* (Kist. 1937) Pop 1977** plant community, inventoried in the Punctul Fosilifer Credința nature reserve (PFC), shows a low level of disturbance, as only two ruderal species with a reduced dominance were identified.

Key species: *Dichanthium ischaemum* (2; PFC).

Other species: *Asperula tenella* (+; PFC), *Festuca valesiaca* (1; PFC), *Marrubium peregrinum* (+; PFC), *Poa bulbosa* (+; PFC), *Sedum urvillei* subsp. *hillebrandtii* (+; PFC), *Sideritis montana* (+; PFC), *Teucrium chamaedrys* (+; PFC), *Teucrium polium* (+; PFC), *Thymus pannonicus* (1; PFC).

MLAȘTINA HERGHELIEI

Established by the Government Decision 1581/2005, the nature reserve, with an area of 98 ha, lies within the Mangalia town's administrative territory. It includes the Mlaștina Hergheliei Lake and its surrounding wetlands. The dominant plant community *Scirpo-Phragmitetum* W.Koch 1926 framed into two unprotected habitat types, 53.1111 Freshwater *Phragmites* beds, a frequent vegetation type, nearly mono-dominant and undisturbed, permanently flooded, respectively 53.1121 Dry freshwater *Phragmites* beds, a vulnerable type that occurs on humid soils, that is low disturbed. The most accessible for grazing is *Trifolio-Cynodontetum* Br.-Bl. et Bolos 1958 a vulnerable plant community with a medium level of ruderal species invasive tendencies. Still, it has a conservation value being framed into the priority habitat of community interest 1530* (15.A21275).

15.A21275 Western Pontic *Cynodon* saline beds

***Trifolio fragifero-Cynodontetum* Br.-Bl. et Bolos 1958** plant community can be estimated as vulnerable within the Mlaștina Hergheliei (MH). The ruderal species prevail within the inventory (eight species) with a significant variation of their dominance (+-1) that indicates a medium disturbance. There is still a low level of alien species invasive tendencies (*Elaeagnus angustifolia*, *Robinia pseudoacacia*).

Key species: *Cynodon dactylon* (2; MH), *Trifolium fragiferum* (1; MH).

Other species: *Elymus repens* (1; MH), *Cichorium intybus* (+; MH), *Daucus carota* subsp. *carota* (+; MH), *Elaeagnus angustifolia* (+; MH), *Lolium perenne* (+; MH), *Melilotus albus* (+; MH), *Plantago major* (+; MH), *Potentilla reptans* (1; MH), *Robinia pseudoacacia* (+; MH), *Xanthium italicum* (+; MH).

53.1111 Freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W.Koch 1926** plant community included in this habitat holds most of the Mlaștina Hergheliei area (MH) (F: IV), where it is nearly mono-dominant and undisturbed.

Key species: *Phragmites australis* (5; MH).

Other species: *Solanum dulcamara* (+; MH).

53.1121 Dry freshwater *Phragmites* beds

***Scirpo-Phragmitetum* W.Koch 1926** plant community framed in this habitat is considered vulnerable (F: I) in the Mlaștina Hergheliei reserve (MH), where a low degree of perturbation is only indicated by one ruderal and one alien (*Elaeagnus angustifolia*), both with a reduced dominance.

Key species: *Phragmites australis* (5; MH).

Other species: *Althaea officinalis* (+; MH), *Arctium lappa* (+; MH), *Calystegia sepium* (+; MH), *Elaeagnus angustifolia* (+; MH), *Lythrum salicaria* (+; MH), *Potentilla reptans* (+; MH), *Pulicaria dysenterica* (+; MH), *Rubus caesius* (+; MH), *Sium latifolium* (+; MH).

OSTROAVELE TROINA MARE - BALABAN

This is a proposal of nature reserve that was not yet lawfully approved at the national level, but it is protected within the Canaralele Dunării Site of Community Interest. The reserve includes a sector of the Danube River adjacent to the Constanța County, between the kilometric landmarks 296-274 and it includes the islands Fasolele, Podul de Piatră, Balaban, Troina Mare, Țării, Boascicul Mare. Beside the already published data (PETRESCU, 2007), within the recent field research there were described the habitats listed below. Within the reserve the most frequent are the rare coenotaxa, followed by the vulnerable and endangered ones. All plant communities have a medium level of disturbance due to the non-native and ruderal species, in the only one case being also recorded a low level of ruderal plant invasive trend. Half of the recorded coenotaxa include a rare threatened species, *Periploca graeca*, endangered within the analysed plant communities.

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.** plant community is rare in the nature reserve and within the Ostrovul Țării Island (OT), respectively sporadic within Balaban Island (Ostrovul Balaban-OB). Its conservation importance is enhanced by the presence of the rare threatened species *Periploca graeca*, endangered within these phytocoenoses. There can be estimated a medium level of non-native species invasive tendencies, these being represented by five species (*Amorpha fruticosa*, *Amaranthus retroflexus*, *Ambrosia artemisiifolia*, *Gleditsia triacanthos*, *Conyza canadensis*) that together with the six ruderal ones overpass in number the native typical species.

Key species: *Amorpha fruticosa* (+; OB, OT), *Salix alba* (5; OB, OT).

Threatened species: *Periploca graeca* (+; OT).

Other species:

- trees: *Gleditsia triacanthos* (+; OT);
- shrubs/ lianas: *Rubus caesius* (+; OT);
- grasses/ undershrubs: *Amaranthus retroflexus* (+; OB), *Ambrosia artemisiifolia* (+; OB), *Bidens tripartita* (+; OB, OT), *Conyza canadensis* (+; OT), *Glechoma hederacea* (+; OT), *Plantago major* (+; OT), *Polygonum aviculare* (+; OT), *Rorippa sylvestris* (+; OB, OT), *Solanum dulcamara* (+; OT), *Solanum nigrum* (+; OB, OT), *Setaria pumila* (+; OB), *Xanthium italicum* (+; OB, OT).

44.4 Mixed oak-elm-ash forests of great rivers

Fraxino-Ulmetum Oberdorfer 53 plant community is vulnerable (F: I) in the reserve and rare (F: II) within the Podul de Piatră Island (Ostrovul Podul de Piatră-OPP). There, a medium level of non-native species invasion can be estimated, taking into account the four such species (*Fraxinus americana*, *Morus alba*, *Amorpha fruticosa*, *Prunus cerasifera*) and their dominance variation limits (+-1).

Key species: *Ulmus laevis* (4; OPP).

Other species:

- trees: *Fraxinus americana* (1; OPP), *Morus alba* (+; OPP);
- shrubs/ lianas: *Amorpha fruticosa* (+; OPP), *Cornus mas* (\pm ; OPP), *Crataegus monogyna* (+; OPP), *Prunus cerasifera* (+; OPP), *Rubus caesius* (+; OPP);
- grasses/ undershrubs: *Aristolochia clematitis* (+; OPP).

44.6611 Western Pontic white poplar galleries

***Populetum albae* (Br.-Bl. 31 pp.) Borza 37** plant community is endangered (F: I) in the reserve, respectively vulnerable (F: I) within the island Podul de Piatră (OPP), where it is represented by an old growth stand. The only rare threatened plant is *Periploca graeca*, endangered within the respective phytocoenosis. A medium level of disturbance due to the non-native species is indicated by the two such species (*Fraxinus americana*, *Amorpha fruticosa*) with a significant dominance variation (+-1).

Key species: *Populus alba* (4; OPP).

Threatened species: *Periploca graeca* (+; OPP).

Other species:

- trees: *Aristolochia clematitis* (+; OPP), *Fraxinus americana* (+; OPP), *Morus alba* (1; OPP), *Rubus caesius* (+; OPP), *Ulmus laevis* (1; OPP);
- shrubs/ lianas: *Amorpha fruticosa* (1; OPP), *Cornus sanguinea* (+; OPP), *Crataegus monogyna* (+; OPP);
- grasses/ undershrubs: *Fallopia dumetorum* (+; OPP), *Glechoma hederacea* (+; OPP), *Salix alba* (\pm ; OPP).

44.6612 Western Pontic white-black poplar galleries

***Populetum nigro-albae* Slavnic 1952** plant community, rare within the reserve and Podul de Piatră Island (Ostrovul Podul de Piatra – OPP) is representative for a close to natural uneven structure with old-growth trees, that reach about 1.00 m in diameter. Unfortunately the species composition is not that representative as there was recorded a medium level of non-native species invasion (*Fraxinus americana*, *Amorpha fruticosa*, *Morus alba*, *Conyza canadensis*) with a significant dominance variation (+-1). To this it can be added a low degree of ruderal species contribution to the inventory and dominance, these being represented by four species. It is important to underline the presence of the rare threatened species *Periploca graeca*, endangered within this phytocoenosis.

Key species: *Populus alba* (+; OPP), *Populus nigra* (4; OPP).

Threatened species: *Periploca graeca* (+; OPP).

Other species:

- trees: *Fraxinus americana* (+; OPP), *Morus alba* (+; OPP), *Salix alba* (+; OPP);
- shrubs/lianas: *Amorpha fruticosa* (1; OPP);
- grasses/ undershrubs: *Aristolochia clematitis* (+; OPP), *Bidens tripartita* (+; OPP), *Chenopodium album* (+; OPP), *Conyza canadensis* (+; OPP), *Elymus*

repens (+; OPP), Fallopia dumetorum (+; OPP), Glechoma hederacea (+; OPP), Plantago major (+; OPP), Xanthium italicum (+; OPP).

PĂDUREA ESECHIOI

Established by the Law 5/ 2000 the nature reserve, with an area of 26.00 ha, is located within the south-western part of the Constanța County, within the Ostrov commune. It lies on the slopes situated southwards of the Bugeac Lake.

From the two plant communities studied there recently, *Quercetum cerris* is the most frequent within the nature reserve, while *Galio dasypodi-Quercetum pubescentis* is endangered, being mainly found in the upper part of the slopes, on more dry soils. These are framed into community interest habitats like 91M0 (41.7691), even priority ones such as 91AA*(41.73724).

Only within *Quercetum cerris* plant community there were identified two rare threatened taxa, endangered respectively vulnerable within the studied types of vegetation. There can be estimated an overall favourable status of this reserve, as the dominant *Quercetum cerris* is undisturbed, while *Galio dasypodi* shows only a low level of ruderal/ alien species invasive tendencies.

41.73724 Moesian *Galium dasypodium*-white oak woods

***Galio dasypodi-Quercetum pubescentis* Doniță 1970**, an endangered plant community within the Pădurea Esecchio nature reserve (PE) is considered low disturbed, due to the three ruderal taxa with a reduced dominance.

Key species: *Quercus pubescens* (4; PE).

Other species:

- trees: *Cerasus mahaleb* (+; PE), *Pyrus pyraister* (+; PE);
 - shrubs/ lianas: *Crataegus monogyna* (+; PE), *Rosa canina* (+; PE), *Brachypodium sylvaticum* (+; PE), *Ballota nigra* (+; PE), *Dichanthium ischaemum* (+; PE), *Euphorbia agraria* (+; PE), *Fragaria viridis* (+; PE), *Geum urbanum* (+; PE), *Leonurus cardiaca* (+; PE), *Teucrium chamaedrys* (+- Es), *Thalictrum minus* (+; PE).

41.7691 Getic white Cinquefoil quercus *cerris* forests

***Quercetum cerris* Georgescu 1941**, the most widespread type of vegetation within the nature reserve, has an endangered conservation value, indicated by the two rare threatened species, of which *Myrrhoides nodosa* is endangered, while *Piptatherum virescens* is vulnerable within the analysed phytocoenoses. This coenotaxon also represents an example of an undisturbed habitat, as no ruderal/alien taxa were identified.

Key species: *Quercus cerris* (4; PE).

Threatened species: *Myrrhoides nodosa* (+; PE), *Piptatherum virescens* (+; PE).

Other species:

- trees: *Fraxinus ornus* (+; PE), *Quercus pubescens* (1; PE);
- shrubs/ lianas: *Cornus mas* (+; PE), *Crataegus monogyna* (+; PE);
- grasses/ undershrubs: *Brachypodium sylvaticum* (+; PE), *Dactylis polygama* (+; PE), *Poa nemoralis* (+; PE), *Vincetoxicum hirundinaria* (+; PE).

PEREȚII CALCAROȘI DE LA PETROȘANI

The geological reserve, also considered a nature monument, with an area of 4.80 ha according to the Law 5/ 2000, is framed within the Deleni commune, being included in the Dumbrăveni-Valea Urluia-Lacul Vederoasa Site of Community Interest. Within preliminary recent studies there was studied one plant community typical for the heavily grazed rocky slopes underneath the limestone cliffs of the reserve. Still this coenotaxon is framed into the priority community interest habitat 62C0* (34.92).

34.92 Ponto-Sarmatic steppes

***Artemisio austriacae-Poëtum bulbosae* Pop 1970** plant community, identified within the Pereții Calcaroși de la Petroșani (PCP) nature reserve, has a high level of ruderal plant invasion, among the five such species being also included the dominant *Poa bulbosa*.

Key species: *Poa bulbosa* (2; PCP).

Other species: *Agropyron cristatum* (1; PCP), *Alyssum saxatile* (+; PCP), *Asperula tenella* (+; PCP), *Cichorium intybus* (+; PCP), *Dichanthium ischaemum* (1; PCP), *Erodium cicutarium* (+; PCP), *Eryngium campestre* (+; PCP), *Marrubium peregrinum* (+; PCP), *Medicago minima* (+; PCP), *Muscari racemosum* (+; PCP), *Sedum urvillei* subsp. *hillebrandtii* (+; PCP), *Teucrium polium* (+; PCP), *Xeranthemum anuum* (+; PCP).

POMAȘTELE – PUIUL ZĂTOACEI

This proposal of nature reserve is not yet approved at the national level, but is already protected as part of the Canaralele Dunării Site of Community Interest. The reserve is situated within and along the Danube River sector adjacent to the Constanța County, being framed between the kilometric landmarks 259-251 and it includes Varoș Hill (DV), as well as Pomaștele-Puiul Zătoacei and Varoș islands. Within the recent field research, besides the already published data (PETRESCU, 2007), there were studied the habitats listed below.

44.6612 Western Pontic white-black poplar galleries

***Populetum nigro-albae* Slavnic 1952** is estimated as a rare (F: II) plant community within Ostrovul (island) Pomaștele-Puiul Zătoacei (OPPZ). The four alien invasive taxa (*Morus alba*, *Amorpha fruticosa*, *Conyza canadensis*, *Ambrosia artemisiifolia*) show a medium level of this factor, as they exceed in number the native species typical for this phytocoenosis. The only ruderal species *Elymus repens*, having a reduced dominance, indicate a low disturbance from this point of view.

Key species: *Populus nigra* (5; OPPZ).

Other species:

- trees: *Morus alba* (+; OPPZ), *Ulmus laevis* (+; OPPZ);
- shrubs/ lianas: *Amorpha fruticosa* (+; OPPZ);
- grasses/ undershrubs: *Ambrosia artemisiifolia* (r; OPPZ), *Conyza canadensis* (1; OPPZ), *Elymus repens* (+; OPPZ), *Solanum dulcamara* (+; OPPZ).

44.1621 Lower Danube willow galleries

***Salicetum albae* Issler 1924 s.l.**, a rare plant community (F: II) within Ostrovul (island) Pomaștele-Puiul Zătoacei (OPPZ), has a low invasive trend level regarding the non-native species (*Amorpha fruticosa*). A medium degree of ruderal plants invasion can be deduced from the presence of four such species that represent 50% of the native species' inventory.

Key species: *Amorpha fruticosa* (+; OPPZ), *Populus nigra* (+ OPPZ), *Salix alba* (5; OPPZ).

Other species:

- grasses/ undershrubs: *Artemisia annua* (+; OPPZ), *Cyperus glomeratus* (+; OPPZ), *Plantago major* (+; OPPZ), *Portulaca oleracea* (+; OPPZ), *Potentilla reptans* (+; OPPZ), *Solanum nigrum* (+; OPPZ), *Xanthium italicum* (+; OPPZ).

SEIMENII MARI

Established by the Law 5/2000, this paleontological reserve with an area of only 0.50 ha, is situated on the Danube riverbank in southern Dobrogea, Constanța County, within the Seimenii Mari commune. Only one native plant community, *Agropyretum repentis*, was identified adjacent to the barren cliffs of the reserve, the rest being covered in the adventive *Lycium barbarum* thickets.

***Agropyretum repentis* Felföldy 1942** is frequent (F: IV) within the Seimenii Mari nature reserve (SM), where it represents the dominant plant community, having an unusual species inventory, a mixture of wetland and steppe taxa, as a result of its transition character. There only the rare threatened species *Echinops ritro* subsp. *ruthenicus* was identified so far, endangered locally. The two alien species (*Amorpha fruticosa*, *Lycium barbarum*) and the six ruderal ones, due to their low dominance, indicate a reduced influence of human activities.

Key species: *Elymus repens* (4; SM).

Threatened species: *Echinops ritro* subsp. *ruthenicus* (+; SM).

Other species: *Agropyron cristatum* (+; SM), *Amorpha fruticosa* (+; SM), *Artemisia austriaca* (+; SM), *Bassia prostrata* (+; SM), *Cichorium intybus* (+; SM), *Consolida regalis* (+; SM), *Convolvulus arvensis* (+; SM), *Cynodon dactylon* (+; SM), *Galium humifusum* (+; SM), *Lycium barbarum* (+; SM), *Melilotus albus* (+; SM), *Nigella arvensis* (+; SM), *Poa angustifolia* (+; SM), *Rosa canina* (+; SM), *Salvia nemorosa* (+; SM), *Sideritis montana* (+; SM), *Tragopogon dubius* (+; SM).

VALUL LUI TRAIAN

This small nature reserve (5.00 ha), located within Valul lui Traian commune, Constanța County, on the limestone plateaux of southern Dobrogea, has a linear aspect, as it overlaps archaeological structures oriented east-west. Thus the northern slopes and the plane summits are usually dominated by shrub formations, like the frequent *Pruno spinosae* -*Crataegum* plant community, while on the southern declivities these are interrupted by steppe grasslands represented by rare (*Agropyretum pectiniformae*), respectively endangered (*Agropyro cristati-Kochietum prostratae*) coenotaxa. The only threatened species identified in the studied phytocoenoses is *Asparagus verticillatus*, endangered locally. All these coenotaxa show a medium disturbance level from the ruderal/ alien invasive trend point of view, favoured by the vicinity of arable fields and other activities like grazing. These plant communities are all included into priority habitats of community interest.

31.8B721 Ponto-Sarmatic steppes

***Pruno spinosae*-*Crataegum* Soó (1927) 1931** is a frequent plant community in the reserve (VTR), at least in its eastern part, despite the medium level of disturbance indicated by the ruderal species (five taxa) and alien taxon (*Amaranthus retroflexus*), that represent together half of the inventory. One rare threatened taxa *Asparagus verticillatus* was identified as endangered within the plots.

Key species: *Crataegus monogyna* (2; VTR), *Prunus spinosa* (2; VTR).

Threatened species: *Asparagus verticillatus* (+; VTR).

Other species: *Rhamnus cathartica* (1; VTR), *Humulus lupulus* (+; VTR), *Viburnum lantana* (+; VTR), *Amaranthus retroflexus* (+; VTR), *Artemisia vulgaris* (+; VTR), *Ballota nigra* (+; VTR), *Bromus sterilis* (1; VTR), *Consolida regalis* (+; VTR), *Hyoscyamus niger* (+; VTR), *Sambucus ebulus* (+; VTR), *Thalictrum minus* (+; VTR).

***Agropyretum pectiniformae* (Prodan 1939) Dihoru 1970**, a rare plant community, has a medium level of disturbance, as the ruderal (six species) and alien taxa (*Ambrosia artemisiifolia*, *Amaranthus retroflexus*), with a significant variation of their dominance the (r-1), prevail within the analysed plots.

Key species: *Agropyron cristatum* (3; VTR).

Other species: *Ambrosia artemisiifolia* (r; VTR), *Artemisia vulgaris* (+; VTR), *Amaranthus retroflexus* (+; VTR), *Abutilon theophrasti* (r; VTR), *Achillea setacea* (+; VTR), *Artemisia austriaca* (1; VTR), *Centaurea solstitialis* (+; VTR), *Ceratocarpus arenarius* (+; VTR), *Cynodon dactylon* (1; VTR), *Euphorbia agraria* (+; VTR), *Marrubium peregrinum* (+; VTR), *Prunus spinosa* (+; VTR).

Agropyro cristati-Kochietum prostratae Zólyomi 1958, an endangered plant community, is characterized by a medium disturbance level that can be estimated from the high number of ruderal (seven species), that, together with the non-native *Amaranthus retroflexus*, represent half of the recorded taxa.

Key species: *Agropyron cristatum* (2; VTR), *Bassia prostrata* (1; VTR).

Other species: *Amaranthus retroflexus* (+; VTR), *Artemisia vulgaris* (+; VTR), *Artemisia austriaca* (1; VTR), *Centaurea solstitialis* (+; VTR), *Consolida regalis* (+; VTR), *Cynodon dactylon* (1; VTR), *Elymus hispidus* (+; VTR), *Euphorbia agraria* (+; VTR), *Limonium latifolium* (+; VTR), *Marrubium peregrinum* (+; VTR), *Poa bulbosa* (+; VTR), *Salvia nemorosa* (+; VTR), *Prunus spinosa* (+; VTR), *Thalictrum minus* (+; VTR).

REZUMAT

Cuvinte cheie: arie protejată, asociație, amenințat, balcanic, cenotaxon, dezvoltare durabilă, Dobrogea, floră, geologie, habitat, Natura 2000, sit, sol, specie, stepic, submediteranean, peisaj, pedologie, pontic, ponto-sarmatic, Tulcea, vegetație.

Dezvoltarea durabilă a județelor Tulcea și Constanța, având în vedere importanța de prim rang din punct de vedere ecologic a Dobrogei presupune în primul rând conservarea *in situ*, atât în interiorul, cât și în afara ariilor protejate, a speciilor și habitatelor protejate, în special a celor de interes comunitar, pentru care instituțiile administrative centrale și locale au numeroase responsabilități la nivel național și european.

În acest context, deși județul Tulcea a constituit obiectul a numeroase cercetări, acestea au fost concentrate îndeosebi în zona Deltei Dunării, pentru restul acestei zone datele existente fiind mai puțin detaliate și/ sau actualizate. Din acest motiv Institutul de Cercetări Eco-Muzeale "Gavrilă Simion" Tulcea a inițiat realizarea unei evaluări actualizate, de ansamblu, a patrimoniului natural al acestei regiuni, defalcată în raport cu unitățile administrativ-teritoriale (orașe, comune). Pe lângă importanța științifică a unor astfel de cercetări, ce pot servi ca bază în clarificarea, detalierea și actualizarea unor date privind existența, răspândirea, starea de conservare a unor specii și habitate protejate, un alt obiectiv îl constituie facilitarea accesării de fonduri naționale și europene la nivelul fiecărei unități teritorial-administrative, prin posibilitățile de utilizare a rezultatelor cercetărilor prezentate parțial în lucrarea de față, pentru: administrarea pe baze științifice a patrimoniului natural din zonele aflate sub jurisdicția autorităților locale, atât în interiorul, cât și în afara ariilor protejate; realizarea capitolelor privind patrimoniul natural al fiecărei comune/oraș în cadrul cererilor de finanțare; accesarea unor fonduri compensatorii etc.

Pentru ariile protejate din Podișul Dobrogei, cercetate pe teritoriile administrative ale localităților din județul Tulcea, în capitolul I sunt prezentate numai datele rezultate în perioada derulării acestor cercetări, într-un singur an, alături de inventarierea efectuată în afara acestor arii în perioada respectivă. În capitolul II, pentru aceleași rezervații sunt prezentate mai amplu alte date din teren, rezultate în cadrul unor cercetări efectuate în alte perioade decât cele expuse în capitolului I.

În cadrul capitolului II sunt prezentate cercetările ce au ca principale obiective completarea și detalierea datelor proprii publicate anterior (PETRESCU, 2007; PETRESCU *et alii*, 2006; CUZIC, PETRESCU, 2006 etc.) cu privire la patrimoniul natural din cadrul ariilor protejate din județele Tulcea și Constanța,

reliefarea importanței conservative și supravegherea stării de conservare a speciilor și habitatelor protejate, cu prioritate a celor ce nu au fost semnalate în studiile precedente. Pentru județul Tulcea, datele acumulate permit prezentarea în principal a aspectelor privind flora și habitatele, completate cu rezultatele cercetărilor recente asupra faunei respectivelor arii protejate. În cazul județului Constanța vor fi expuse numai date referitoare la floră și habitate.

Toate ariile protejate prezentate sunt legal constituite, fiind de importanță națională, precum și a rezervațiilor aflate în stadiul de propunere, pentru care acest aspect este menționat la fiecare în parte. Aproape toate aceste arii protejate, constituite sau propuse, sunt ocrotite legal și la nivel european, teritoriul acestora fiind inclus în rețeaua Natura 2000. Pentru județul Tulcea sunt expuse date privind teritoriul ariilor protejate de nivel național, având în vedere că restul suprafețelor din siturile Natura 2000 sunt prezentate în alte studii, efectuate în paralel asupra teritoriilor administrative ale comunelor și orașelor. În cazul județului Constanța sunt prezentate atât date din rezervațiile naturale constituite cât și din afara acestora, din cadrul siturilor Natura 2000, ce includ și unele rezervații propuse. Chiar dacă respectivele arii protejate propuse nu sunt încă sau nu vor fi aprobate la nivel național, prezentarea suprafețelor naturale respective sub aceste denumiri permite conectarea și compararea riguroasă a datelor cu cele prezentate în publicații anterioare (PETRESCU, 2007) privind aceleași zone.

METODE DE CERCETARE

Metodele utilizate în ambele capitole ale lucrării de față în descrierea speciilor, habitatelor/cenotaxonilor, a aspectelor geologice și pedologice sunt prezentate succint în continuare.

Floră, vegetație, habitate, peisaj. Cercetările de teren au constatat în observații pe itinerar și în efectuarea de relevee conform metodei Braun-Blanquet, în general în suprafețe de inventariere de 100 mp. Cenotaxonii cu suprafețe mai mici de 100 mp au fost considerați fragmente de asociații, în aceste situații nefiind amplasate relevee. În foarte puține situații, în special în cazul unor habitate forestiere cu arbori înalți, au fost amplasate și relevee de 200 mp, atunci când distribuția spațială a principalelor specii edificatoare/dominante nu a putut fi evidențiată în suprafețe de inventariere de 100 mp. În respectivele suprafețe de inventariere abundența-dominanța speciilor este estimată conform scării Braun-Blanquet (IVAN, 1979). Într-o anumită asociație, acoperirile speciilor identificate numai în afara releveelor sunt subliniate în text, fiind înregistrată și acoperirea acestora în raport cu o suprafață de inventariere de 100 mp. De asemenea, sunt subliniate și siturile în care speciile au fost identificate numai în afara releveelor.

În cadrul lucrării, inventarul floristic al zonelor studiate este prezentat sintetic, cumulat, fiind reprezentat prin listele de specii menționate pentru fiecare cenotaxon din cadrul habitatelor descrise. În cadrul asociației respective, pentru fiecare specie, în paranteză, sunt menționate limitele de variație ale acoperirii, urmate de indicarea siturilor în care a fost identificat taxonul.

Pentru fiecare habitat sunt prezentate asociațiile componente, precum și

speciile inventariate în cadrul acestora. Astfel, pentru fiecare asociație sunt indicate în primul rând speciile cele mai importante pentru conservare, respectiv cele caracteristice și/sau edificatoare principale, apoi speciile amenințate. Restul speciilor, pentru păduri și tufărișuri, sunt grupate în funcție de principalele straturi ale fitocenozelor ce corespund, în linii mari, și celor mai importante grupe de forme biologice (arbori, arbuști/liane, ierburi/subarbuști etc.), majoritatea acestora fiind utilizate cu denumirile respective în lucrările de fitocenologie, inclusiv în cazul tabelelor brute (IVAN, 1979).

Denumirile habitatelor corespund bazei de date PHYSIS (DEVILLIERS, DEVILLIERS-TERSHUREN, LINDEN, 1996) în care este expusă clasificarea habitatelor palearctice, pentru fiecare dintre acestea fiind menționată și corespondența cu habitatele de interes comunitar, în conformitate cu *Manualul de Interpretare a habitatelor Uniunii Europene* - EUR 27 (EUROPEAN COMMISSION, 2007). Într-o altă categorie se încadrează cenotaxonii ce nu sunt cuprinși încă în sistemul de clasificare a habitatelor palearctice, aceștia fiind menționați separat. Corespondența între asociațiile sinonime a fost efectuată în baza publicațiilor *Vademecum ceno-structural privind covorul vegetal din România* (SANDA, 2002), *Sintaxonomia grupărilor vegetale din Dobrogea și Delta Dunării* (SANDA, ARCUȘ, 1999), *Biodiversitatea ceno-structurală a învelișului vegetal din România* (SANDA, VICOL, ȘTEFĂNUȚ, 2008). Nomenclatura botanică este în conformitate cu lucrările *Flora ilustrată a României* (CIOCĂRLAN, 2000; CIOCĂRLAN, 2009), *Flora Deltei Dunării* (CIOCĂRLAN, 1994); *Conspectul cormofitelor spontane din România* (SANDA, 1998) și *Lista roșie a plantelor superioare din România* (OLTEAN et alii, 1994). Ultima lucrare a fost utilizată pentru denumirile speciilor din *Lista roșie națională*, menținându-se abrevierea "ssp." conform acestei publicații. Trebuie precizat că taxonii amenințați au fost determinați până la nivel de subspecie, acolo unde acest lucru a fost necesar pentru încadrarea în listele roșii naționale și europene. Restul taxonilor au fost determinați la nivel de specie, pentru denumirile acestora fiind utilizate celelalte patru publicații. În text trimiterele la *Lista roșie națională* se referă la lucrarea *Lista roșie a plantelor superioare din România* (OLTEAN et alii, 1994), iar cele privind *Lista roșie europeană* respectiv la publicația *European Red List of Globally Threatened Animals and Plants* (D46)(UNITED NATIONS, 1991).

Apresiasi preliminară a importanței și stării de conservare a speciilor amenințate, respectiv a cenotaxonilor/habitatelor, ca bază în estimarea priorităților de conservare, s-a făcut prin stabilirea unor categorii de amenințare la nivel local (al zonelor studiate). Pentru primele trei trepte (periclitat, vulnerabil, rar) denumirile corespund categoriilor IUCN (OLTEAN et alii, 1994). Pentru următoarele trei trepte, ce pot fi asimilate categoriei de amenințare IUCN „neamenințat”, au fost utilizate categoriile de frecvență (sporadic, frecvent, foarte frecvent) menționate în lucrarea *Flora ilustrată a României* (CIOCĂRLAN 2000). Pentru speciile amenințate s-a stabilit în plus și o corespondență între cele șase categorii de amenințare de mai sus și scara Braun-Blanquet de evaluare a abundenței-dominanței în cadrul releveelor, la care a fost adăugată și o șaptea treaptă, „periclitat critic”. Aceasta este aplicabilă în cazul speciilor ierboase cu

acoperire neglijabilă, cu mai puțin de cinci indivizi/relevu, pentru care se poate considera că populațiile sunt foarte slab reprezentate, fiind în pragul dispariției locale. Pentru estimarea preliminară a categoriei de amenințare a habitatelor/cenotaxonilor a fost utilizată o formă adaptată a scării Braun-Blanquet, cu șase trepte (periclitat-foarte frecvent). Aceasta s-a făcut prin aprecierea limitelor procentuale din traseul parcurs în zona cercetată între care a fost întâlnit habitatul/cenotaxonul respectiv. Deși această metodă implică un grad ridicat de subiectivism, ea este practică și expeditivă, în situația în care nu există posibilitatea realizării unor lucrări de cartare.

Corespondența dintre indicii de abundență – dominanță, frecvența habitatului și categoriile de amenințare pentru specii și cenotaxoni

| Indici de abundență – dominanță (specii) | Categoria de amenințare | Frecvența habitatului în zona studiată (% din traseul parcurs) |
|--|-------------------------|--|
| r – <5 exemplare/relevu, cu acoperire neglijabilă | periclitat critic | - |
| + – ≤ 1 % acoperire | periclitat | + – ≤ 1 % |
| 1 – 1-10 % acoperire | vulnerabil | I – 1-10 % |
| 2 – 10-25 % acoperire | rar | II – 10-25 % |
| 3 – 25-50 % acoperire | sporadic | III – 25-50 % |
| 4 – 50-75 % acoperire | frecvent | IV – 50-75 % |
| 5 – 75-100 % acoperire | foarte frecvent | V – 75-100 % |

Starea de conservare a speciilor și habitatelor/cenotaxonilor a fost apreciată preliminar prin încadrarea în categorii de amenințare. Astfel, cu cât o specie sau un habitat/cenotaxon sunt încadrate într-o categorie de amenințare mai ridicată (vulnerabil, periclitat etc.) cu atât starea de conservare poate fi considerată mai scăzută, respectiv mai apropiată de nivelul nefavorabil. În plus, în cazul habitatelor/cenotaxonilor, cu cât numărul de specii amenințate identificate în cadrul acestora este mai mare, se poate estima că starea de conservare este mai bună, având în vedere că, în general, acest fel de taxoni sensibili la impactul activităților umane, sunt considerați indicatori ai stării mediului.

Descrierea peisajului urmărește după caz prezentarea principalelor componente ale acestuia, respectiv a aspectelor geomorfologice și hidrologice, corelate cu principalele caracteristici ale covorului vegetal, cu sublinierea eventualelor zone de mare valoare estetică din aceste puncte de vedere.

Faună. Identificarea și inventarierea speciilor de păsări și mamifere s-a efectuat prin metoda studiului pe itinerar, parcurgându-se același traseu din cadrul zonelor cercetate la fiecare deplasare. Pentru efectuarea acestor operațiuni a fost folosită aparatura optică de specialitate, respectiv binoclul și luneta pentru

observații ornitologice. Toate speciile au fost identificate prin studii proprii. Pentru încadrarea taxonomică a speciilor s-au utilizat determinatoare de specialitate (LINȚIA, 1954; MUNTEANU, 2000, 2001; WEBER *et alii*, 1994). Pentru fiecare zonă studiată au fost menționate listele cu speciile de păsări care se regăsesc în anexele cuprinse în O.U.G. nr. 57/ 2007 și în Legea nr. 13/1993.

Geologie, pedologie. Prezentul studiul s-a bazat pe materiale cartografice tematice și imagini satelitare, în format digital, precum și pe date din studiile de teren efectuate în diferite puncte ale județului Tulcea. Toate aceste date au fost corelate între ele, în scopul obținerii unei imagini exacte a structurii geologice și a învelișului de soluri, în zonele studiate. Datele digitale (care, în unele cazuri, nu sunt disponibile în scopuri comerciale) au provenit din diferite surse, cum ar fi:

- Harta Geologică a României scara 1: 200000, foile: Focșani (L-35-XXII), Brăila (L-35-XXVIII), Tulcea (L-35-XXIX), Sulina (L-35-XXX), Călărași (L-35-XXXIV), Constanța (L-35-XXXV), Mangalia (K-35-V), publicate de Institutul Geologic al României și oferite în format digital de geo-spatial.org (earth.unibuc.ro);
- Mozaicul ASTER GDEM Ver2 produs de METI și NASA în cooperare cu Japan-US ASTER Science Team (www.gdem.aster.ersdac.or.jp);
- Harta unităților de relief (format *shapefiles*) oferită de geo-spatial.org (earth.unibuc.ro);
- Harta atributelor (scara 1: 1000000) obținută pe baza European Soil Database v2 (format de fișiere Google Earth) realizată de European Soil Data Centre (ESDAC) și oferită prin intermediul European Soil Portal (eusoils.jrc.ec.europa.eu);
- ESDB v2 – Raster Library 1kmx1km (format *shapefiles*) produs de European Soil Data Centre (ESDAC) și oferită prin intermediul European Soil Portal (eusoils.jrc.ec.europa.eu);
- Hărțile CORINE Land Cover (format *shapefiles*) realizate de European Environment Agency la scara 1:100000 în 2006 (www.eea.europa.eu).

În primul rând, prelucrarea datelor s-a realizat prin conversia acestora din WGS84 în sistemul de proiecție Stereo 70, asamblarea mozaicului ASTER GDEM Ver2, a Hărții Geologice a României, precum și a straturilor tematice CORINE Land Cover. Apoi, datele au fost încărcate ca straturi tematice în aplicația Quantum GIS și analizate în corelație cu informațiile obținute în urma studiilor de teren.

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- *** *CORINE Land Cover maps*, European Environment Agency, 2006, <http://www.eea.europa.eu/>.
- *** *ESDB v2 - Raster Library 1kmx1km*, European Soil Data Centre (ESDAC), European Soil Portal, 2012, <http://eusoils.jrc.ec.europa.eu/>.
- *** *Harta Geologică a României scara 1: 200000 (foile: Focșani, Brăila, Tulcea, Sulina, Călărași, Constanța, Mangalia)*, Institutul Geologic al României, digitizate de geo-spatial.org, <http://earth.unibuc.ro/>.
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Abbreviations

- SCI - Site of Community Interest
- SPA - Special Protection Area

PLATES



Pruno spinosae-Crataegetum and *Festucetum callierii* plant communities
– Valea Mahomencea nature reserve



Fraxino orni-Quercetum dalechampii plant community – Edirlen nature reserve



Botriochloetum (Andropogonetum) ischaemi plant community, with the codominant *Digitalis lanata* – Mihail Kogălniceanu commune



Festucetum callierii plant community – Măcin town



Gymnospermium altaicae-Celtetum glabratae plant community
– Greci commune



Teucrio polii-Melicetum ciliatae plant community
– Dealul Călugăru-lancina nature reserve



Carpino-Fagetum subas. tilietosum tomentosae plant community
– Luncavița commune



Stratiotetum aloidis plant community – Chilia commune



Salicetum albae plant community – Maliuc commune



Agropyretum pectiniformae plant community – Beștepe commune



Sedo hillebrandtii-*Polytrichetum piliferi* plant community on limestone cliffs
– Canaraua Fetii nature reserve



Medicagini minimae-*Festucetum valesiacae* plant community
– Mahmudia commune



Asphodelino luteae-Paliuretum plant community - Enisala nature reserve



- *Fraxino-Ulmetum* and *Pruno spinosae-Crataegetum* plant communities -
Capul Doloșman nature reserve



Botriochloetum ischaemi and *Scirpo-Phragmitetum* plant communities- Lacul Traian nature reserve



Botriochloetum ischaemi plant community with the codominant *Paeonia peregrina* - Dealul Bujorului nature reserve



Centaurea napulifera - Cerna commune



Crocus chrysanthus – Isaccea town



Scorzonera mollis – Luncavița commune



Euphorbia myrsinites – Enisala nature reserve

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Paper text: Arial, 11 points, sentence case, Alignment Justified, paragraph 1 line, paragraph indentation first line 1 cm, will have the following structure: **Introduction, Materials and Methods, Results and Discussion, Conclusions, References** (to be written on row separate from the remaining text, with bold letters). Latin names shall be italicized.

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BĂNĂRESCU, P., 1964, *Pisces – Osteichthyes*, in *Fauna R.P.R.*, XIII, Academiei R.P.R. Publishing House, Bucharest.

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POPESCU-GORJ, A., COSTEA, Elena, 1961, *Cercetări hidrobiologice și piscicole în bălțile Oltinei*, Hidrobiologia, 2, Academiei R.P.R. Publishing House, Bucharest: 23-125.

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*

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Only materials scientifically documented, consisting of studies, articles, notes, reviews, will be accepted.

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