

PRELIMINARY CHECKLIST OF EMERALD NETWORK HABITAT TYPES OF “DNISTER CANYON” NATIONAL NATURE PARK

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Кагало О. О., Сичак Н. М., Скібіцька Н. В., Мандзюк Л. О. Попередній конспект типів оселищ пріоритетних для Смарагдової мережа на території національного природного парку “Дністровський каньйон”. На підставі критичного аналізу наявних флорологічних, фітоценологічних і ландшафтних даних складено анотований перелік пріоритетних типів оселищ, визначених Резолюцією 4 Постійного комітету Бернської конвенції, для території національного природного парку “Дністровський каньйон”. Описи типів оселищ адаптовані для умов регіону. Матеріал є основою для подальшого аналізу функціональної репрезентативності парку в системі природоохоронних територій та екомережі Середнього Подністров'я.

Kagalo A. A., Sytschak N. N., Skibitska N. V., Mandzuk L. A. Preliminary checklist of Emerald network habitat types of “Dnister canyon” national nature park. Based on a critical analysis available florolohichnyh, fitocoenotic and landscape data there is compiled annotated list of types of habitats that are priorities for protection in accordance with Resolution 4 the Standing Committee of the Berne Convention for the territory of “Dnister canyon” national nature park. Description of habitat types are adapted to conditions of the region. The material is the basis for further functional analysis of the representativeness of the park in a system of protected areas and ecological network of Middle Transnistria.

As mentioned earlier, the formation of an ecological network in Ukraine is somewhat different way than in Europe [1, 2]. Except of protected areas existing under national law of each country's, important for the formation of the Pan-European Ecological Network is the formation of networks of protected areas Natura 2000 and Emerald network. Selecting areas for the formation of these networks is carried out according to the principles of habitat concept of biodiversity conservation under the Convention on the conservation of European wildlife and natural habitats (Berne Convention) [1].

However, the European classification of habitat types do not always take into account habitat diversity in Ukraine, due to the peculiarities of their creation and further development. Therefore, due to the need for adequate integration of Ukraine into the European system of territorial protection and conservation of biodiversity is essential inventory habitat diversity in accordance with the existing classification systems and study the allocation of new classification units, which they lack [3, 4].

This paper based on analysis of available materials for florological, syntaxonomical and landscape diversity of Middle Transnistria (Serednye Prydnistrovye) obtained during long-term studies (1986-2013). Available habitat types selected in accordance with Resolution 4 the Standing Committee of the Berne Convention. To identify the types of habitats used Interpretation manual of the EMERALD habitats. Resolution 4 version 2010. First draft (Strasbourg, 5 September, 2011) [8].

The list of habitat types to be protected by the Emerald network of Areas of Special Conservation Interest (ASCI's) under the Berne Convention was adopted in 1996 by Resolution 4 of the Standing Committee of the Convention. This list of habitat types was taken from the Palaearctic habitat classification [6].

However as the Palaearctic habitat classification is no longer supported the Standing Committee of the Convention on the conservation of European wildlife and natural habitats agreed in December 2010 to adopt a revised edition of Resolution 4 based on the

EUNIS habitats classification developed and supported by the European Environment Agency and its European Topic Centre on Biological Diversity. This change allow for future revision of Resolution 4, including the addition of new habitat types. In most cases habitat types from the Palaearctic classification had an equivalent in the EUNIS system but in some cases one Palaearctic habitat type has become two or more EUNIS classes or two or more Palaearctic classes one EUNIS class. In a small number of cases, the original habitat type will have a slightly wider definition.

Experience from the European Union's Natura 2000 network has shown the value of a guide to interpreting habitat types, many of which can be variable [7]. A draft manual to help identify the Resolution 4 habitat types was prepared by the PHARE Topic Link on Nature Conservation in 2000 (PTL-NC 2000), largely based on information derived from the PHYSIS database and focused on the central European countries included in the PHARE programme. The present version uses information from the EEA's EUNIS website 1 supplemented with information from a variety of other sources, including the PHARE manual and the European Union's Interpretation Manual of European Union Habitats (European Commission, 2007 – see Кагалю, Процъ, 2012).

Following is an annotated list of types of habitats that are priorities for protection within the Emerald Network in accordance with Resolution 4. Description of habitat types is given in the form as it is presented in the cited Interpretation manual with same correction and comments.

C Inland surface waters

C1 Surface standing waters

C1.2 Permanent mesotrophic lakes, ponds and pools

C1.2.2 Free-floating vegetation of mesotrophic waterbodies

! C1.2.2.2 Floating *Hydrocharis morsus-ranae* rafts

Description: Free-floating surface communities of Palaearctic waters rich in *Hydrocharis morsus-ranae*.

Plant communities: Hydrocharition: Hydrocharitetum morsus-ranae

Species: *Hydrocharis morsus-ranae*.

EU Habitats Directive Annex I included in 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation

! C1.2.2.3 Floating *Stratiotes aloides* rafts

Description: Free-floating communities of Palaearctic waters dominated by *Stratiotes aloides*.

Plant communities: Hydrocharition: Stratiotetum aloidis

Species: *Stratiotes aloides*

EU Habitats Directive Annex I included in 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation

C1.3 Permanent eutrophic lakes, ponds and pools

C1.3.4 Rooted floating vegetation of eutrophic waterbodies

C1.3.4.1 Shallow-water floating communities

! C1.3.4.1.1 *Ranunculus* communities in shallow water

Description: Communities dominated by water crowfoots (aquatic species of *Ranunculus*) with both submerged and floating leaves, characteristic mostly of shallow Palaearctic waters with fluctuating water levels and susceptible to occasional drying.

Plant communities: Ranunculion aquatilis (*Nymphaeion albae* p., Ranunculion

fluitantis p.); Hydrocotylo-Baldellion

Species: *Ranunculus peltatus*, *R. aquatilis*, *R. rionii*

C3 Littoral zone of inland surface waterbodies

C3.4 Species-poor beds of low-growing water-fringing or amphibious vegetation

! **C3.41** Euro-Siberian perennial amphibious communities

Description: Carpets of perennial vegetation submerged for a considerable part of the year in oligotrophic or mesotrophic lakes, ponds and pools of the boreal and nemoral zones of the Palaearctic and of mountains of the southern Palaearctic.

Plant communities: Littorelletalia including the alliances Eleocharition acicularis, Littorellion uniflorae

Species: **C3.413:** *Glyceria fluitans*, *Ranunculus flammula*, *Littorella uniflora*

EU Habitats Directive Annex I included in: 3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea

C3.43 Central Eurasian amphibious communities

! **C3.431** Ponto-Pannonic riverbank dwarf sedge communities

Description: Communities of nitrogen-rich muds and inundation zones of watercourses and lakes of the western central Eurasian steppe and pre-steppe zones, in particular of the Pannonic and sub-Pannonic plains and hills, dominated by sedges and rushes.

Plant communities: Elatino-Eleocharition ovatae p.: Dichostylidi-Gnaphalietum uliginosi, Cypero-Juncetum bufonii

Species: *Cyperus fuscus*, *C. flavescens*, *Juncus bufonius*, *Echinochloa crus-galli*, *Filaginella uliginosa* (*Gnaphalium uliginosum*)

C3.5 Periodically inundated shores with pioneer and ephemeral vegetation

C3.51 Euro-Siberian dwarf annual amphibious swards

! **C3.511** Freshwater dwarf Eleocharis communities

Description: Rare communities colonising the fluid muds of drying ponds of nemoral, boreonemoral, boreal, and, locally, steppic regions of Europe, characterised by *Eleocharis* spp. and other amphibious plants.

Plant communities: Elatino-Eleocharitenion ovatae

Species: *Eleocharis ovata*, *E. carniolica*, *Carex bohemica*, *Limosella aquatica*, *Cyperus fuscus*, *Peplis portula*, *Juncus tenageia*, *Elatine hexandra*, *E. hydropiper*

EU Habitats Directive Annex I Included in 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea

! **C3.5132** Swards of small *Cyperus* species

Description: Medio-European communities dominated by *Cyperus flavescens*, *C. fuscus* and *C. michelianus*

Plant communities: Nanocyperioni i.a.

Species: *Cyperus flavescens*, *C. fuscus* and *C. michelianus* (last species is not determined in the region)

EU Habitats Directive Annex I Included in 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea

! **C3.5133** Wet ground dwarf herb communities

Description: Varied communities, some very rare and threatened, of small annuals of

wet ground of nemoral and boreo-nemoral regions of Palearctic Eurasia.

Plant communities: Juncenion bufonii: Glycerio-Limoselletum, Stellario uliginosae-Scirpetum setaceae, Radiolenion linoidis: Ranunculo-Radioletum linoidis, Hyperico-Spergularietum rubrae, Junco-Radioletum linoidis i.a.

Species: *Juncus bufonius*, *Scirpus setaceus*, *Spergularia segetalis*, *Radiola linoides*

EU Habitats Directive Annex I Included in 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea

D Mires, bogs and fens

D5 Sedge and reedbeds, normally without free-standing water

! **D5.2** Beds of large sedges normally without free-standing water

Description: Terrestrialized stands of tall species of *Carex*, *Cladium* and *Cyperus*, stands are usually species-poor and often dominated by one species, growing on waterlogged ground. These species also grow as emergents and fringing vegetation beside water bodies (C3.2).

Plant communities: Magnocaricion elatae, Filipendulion, Calthion palustris, Molinio-Holoschoenion, Phragmition communis, Carici-Rumicion hydrolapathi.

Species: *Angelica palustris*, *Carex acuta*, *C. acutiformis*, *C. appropinquata*, *C. elata*, *C. paniculata*

EU Habitats Directive Annex I 7210: Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae

E Grasslands and lands dominated by forbs, mosses or lichens

E1 Dry grasslands

E1.1 Inland sand and rock with open vegetation

E1.11 Euro-Siberian rock debris swards

! **E1.112** *Sempervivum* or *Jovibarba* communities on rock debris

Description: Open lowland and hill rock debris swards of suboceanic climates of Western Europe and western and northern Central Europe harbouring often rare and local lowland forms of *Sempervivum* spp. or *Jovibarba* spp.

Plant communities: Alysso alyssoidis-Sedion albi: Sedo sexangularis-Sempervivetum tectorum

Species: *Sempervivum tectorum*

EU Habitats Directive Annex I included in 6110: Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi

! **E1.2** Perennial calcareous grassland and basic steppes

Description: Perennial grasslands, often nutrient-poor and species-rich, on calcareous and other basic soils of the nemoral and steppe zones and of adjacent parts of the subboreal and submediterranean zones. Includes the calcareous grasslands of central and western Europe, alvar grasslands of the Baltic region, and basic grasslands of the steppe zone.

Plant communities: Brachypodietalia phoenicoidis, Festucetalia vaginatae, Festucetalia valesiaca, Helictotricho-Stipetalia, Koelerio-Phleetalia phleoidis, Seslerietalia rigidae, Stipo pulcherrimae-Festucetalia pallentis

Species: *Cypripedium calceolus*, *Dracocephalum austriacum*, *Pulsatilla patens*, *Thesium ebracteatum*

EU Habitats Directive Annex I 6190 Rupicolous pannonic grasslands (*Stipo-Festucetalia pallentis*) 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)

E2 Mesic grasslands

E2.2 Low and medium altitude hay meadows

! E2.25 Continental meadows

Description: Lowland and collinar mesophile grasslands of the Pannonic basin, the Transylvanian basin, the lower Danubian plain, the Thracian plain and their fringing foothills, Eastern Europe and of southern Siberia.

Plant communities: Alopecurion pratensis, Arrhenatherion

Species: *Agrostis capillaris*, *Arrhenatherum elatius*, *Alopecurus pratensis*, *Festuca pratensis*, *Poa pratensis*

EU Habitats Directive Annex I included in 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

E3 Seasonally wet and wet grasslands

! E3.4 Moist or wet eutrophic and mesotrophic grassland

Description: Wet eutrophic and mesotrophic grasslands and flood meadows of the boreal and nemoral zones, dominated by grasses, rushes or *Scirpus sylvaticus*.

Plant communities: Calthion palustris, Deschampsion cespitosae, Juncion acutiflori, Cnidion venosi; Agropyro-Rumicion, Molinion caeruleae, Arrhenatherion, Cynosurion cristati, Alopecurion pratensis, Filipendulion.

Species: **E3.41:** *Caltha palustris*, *Cirsium palustre*, *C. rivulare*, *C. oleraceum*, *Carduus personata*, *Epilobium parviflorum*, *Mentha aquatica*, *Scirpus sylvaticus*, *Stachys palustris*, *Bromus racemosus*, *Crepis paludosa*, *Fritillaria meleagris*, *Geum rivale*, *Polygonum bistorta*, *Senecio aquaticus*, *Trollius europaeus*, *Lotus uliginosus*, *Trifolium dubium*, *Equisetum palustre*, *E. telmateia*, *Myosotis palustris*, *Oenanthe silaifolia*, *Gratiola officinalis*, *Inula salicina*, *Dactylorhiza majalis*, *Alopecurus pratensis*, *Festuca gigantea*, *Juncus effusus*. **E3.43:** *Deschampsia cespitosa*, *Cnidium dubium*, *Allium angulosum*, *Iris sibirica*, *Oenanthe lachenalii*, *O. silaifolia*, *Gratiola officinalis*, *Juncus atratus*. **E3.44:** *Juncus effusus*, *J. conglomeratus*, *J. inflexus*, *J. compressus*, *J. tenuis*, *Carex hirta*, *Festuca arundinacea*, *Alopecurus geniculatus*, *Rumex crispus*, *Mentha longifolia*, *M. pulegium*, *Potentilla anserina*, *P. reptans*, *Ranunculus repens*. **E3.46:** *Cirsium canum*, *Alopecurus pratensis*, *Festuca pratensis*, *Deschampsia cespitosa*, *Polygonum bistorta*, *Angelica sylvestris*, *Scirpus sylvaticus*, *Caltha palustris*, *Valeriana simplicifolia*

EU Habitats Directive Annex I subtype E3.43 = 6440: Alluvial meadows of river valleys of the Cnidion dubii

E5 Woodland fringes and clearings and tall forb stands

E5.4 Moist or wet tall-herb and fern fringes and meadows

E5.41 Screens or veils of perennial tall herbs lining watercourses

! E5.414 Continental river bank tall-herb communities dominated by *Filipendula*

Description: River bank and freshwater humid depression tall herb communities dominated by *Filipendula ulmaria* of the continental steppe zones.

Plant communities:

Species: *Filipendula ulmaria*

EU Habitats Directive Annex I 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

! E5.415 Eastern nemoral riverbanks with tall herb communities

Description: Tall herb communities of river banks in the eastern nemoral region of Europe (Note – this habitat type has not yet been formally incorporated into the EUNIS classification)

Plant communities: Calamagrostetea langsdorffii (regional status is not determined yet)
EU Habitats Directive Annex I 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

Associated Habitat types: Similar vegetation may also occur in E5.424 Eastern nemoral Tall-herb communities of humid meadows.

E5.42 Tall-herb communities of humid meadows

! **E5.423 Continental tall-herb communities of humid meadows**

Description: River bank and freshwater humid depression tall herb communities of the continental steppe zones.

Plant communities: Lythro-Euphorbion, Veronico longifoliae-Lysimachion vulgaris

Species: *Filipendula ulmaria*, *Lythrum salicaria*

EU Habitats Directive Annex I 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

! **E5.424 Eastern nemoral Tall-herb communities of humid meadows**

Description: Tall herb communities of humid meadows in the eastern nemoral region of Europe (Note – this habitat type has not yet been formally incorporated into the EUNIS classification)

EU Habitats Directive Annex I 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

Associated Habitat types: similar vegetation may also occur in E5.415 Eastern nemoral riverbanks with tall herb communities

G Woodland, forest and other wooded land

G1 Broadleaved deciduous woodland

G1.1 Riparian and gallery woodland, with dominant *Alnus*, *Betula*, *Populus* or *Salix*

! **G1.11 Riverine *Salix* woodland**

Description: Bush or arborescent formations dominated by willow (*Salix* spp.), lining flowing water and submitted to periodic flooding, developed on recently deposited alluvion. Willow brushes are particularly characteristic of rivers originating in major mountain ranges. Shrubby willow formations also constitute an element of lowland and hill riverine successions in all major biomes, often making the belt closest to the water course. Taller arborescent willow formations often constitute the next belt landwards in riverine successions of lowland western nemoral, eastern nemoral and warm-temperate humid forest regions, and a large part of the less diverse riverine systems of the steppic, mediterranean and cold desert zones. May be affected by the invasive alien species such as *Solidago canadensis*, *Aster novi-belgii*, *A. novi-anglii* and *Impatiens glandulifera*.

Plant communities: Salicetea purpureae, Salicion albae, Salicion canariensis

Species: *Aster novi-belgii*, *Impatiens glandulifera*, *Lycopus europaeus*, *Lysimachia vulgaris*, *Phalaroides arundinacea*, *Populus alba*, *Salix* sp., *Urtica dioica*

EU Habitats Directive Annex I Includes tree dominated forms of 3240 Alpine rivers and their ligneous vegetation with *Salix elaeagnos* p

Associated Habitat types: European forest types 6.12.1 Riparian forest

G1.2 Mixed riparian floodplain and gallery woodland

! **G1.21 Riverine Fraxinus - *Alnus* woodland, wet at high but not at low water**

Description: Riparian forests of *Fraxinus excelsior* and *Alnus glutinosa*, sometimes *Alnus incana*, of middle European and northern Iberian lowland or hill watercourses, on soils periodically inundated by the annual rise of the river level, but otherwise well-drained

and aerated during low-water; they differ from riparian alder woods within units G1.41 and G1.52 by the strong representation in the dominated layers of forest species not able to grow in permanently waterlogged soils.

Plant communities: Alnion glutinosae, Alnion incanae, Carpinion betuli, Fraxinion angustifoliae

Species: *Fraxinus excelsior*, *Alnus glutinosa*, *A. incana*. **G1.211:** *Carex remota*, *C. pendula*, *Equisetum telmateia*, *Rumex sanguineus*, *Lysimachia nemorum*, *Cardamine amara*, *Chrysosplenium alternifolium*, *Impatiens noli-tangere*, *Ribes rubrum*. **G1.212:** *Ribes rubrum*, *R. uva-crispa*, *Stellaria nemorum*, *Impatiens noli-tangere*, *Aconitum vulparia*, *Geum rivale*, *Athyrium filix-femina*, *Dryopteris carthusiana*, *Urtica dioica*, *Ranunculus ficaria*, *Primula elatior*, *Lamium galeobdolon*, *Filipendula ulmaria*, *Chaerophyllum hirsutum*, *Crepis paludosa*, *Aegopodium podagraria*, *Aruncus sylvestris*, *Carex remota*, *C. brizoides*

EU Habitats Directive Annex I included in 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)

Associated Habitat types: can occur as a band between larger rivers and floodplain forests such as G1.221, G1.223, G1.223 and G1.224

! **G1.6** Fagus woodland

Description: Forests dominated by beech *Fagus sylvatica* in western and central Europe, and *Fagus orientalis* and other *Fagus* species in southeastern Europe and the Pontic region. Many montane and oro-Mediterranean formations are mixed beech-fir or beech-fir-spruce forests, which are listed under G4.6 in EUNIS but included here.

Plant communities: Cephalanthero-Fagion, Fagion sylvaticae

Species: *Fagus sylvatica*. **G1.63:** *Anemone nemorosa*, *Carex pilosa*, *Galium odoratum*, *Lamium galeobdolon*, *Melica uniflora*. **G1.65:** *Acer pseudoplatanus*. **G1.66:** *Cephalanthera* spp., *Carex digitata*, *C. flacca*, *C. montana*, *C. alba*, *Brachypodium pinnatum*, *Neottia nidus-avis*, *Epipactis leptochila*, *E. microphylla* and thermophile species, transgressive of the Quercetalia pubescenti-petraeae. The bush-layer includes several calcicolous species.

EU Habitats Directive Annex I Includes: (In the region, including)

G1.63 = 9130 Asperulo-Fagetum beech forests

G1.66 = 9150 Medio-European limestone beech forests of the Cephalanthero-Fagion

G1.A Meso- and eutrophic *Quercus*, *Carpinus*, *Fraxinus*, *Acer*, *Tilia*, *Ulmus* and related woodland

! **G1.A1** *Quercus*-*Fraxinus*-*Carpinus* *betulus* woodland on eutrophic and mesotrophic soils

Description: Atlantic, medio-European and eastern European forests dominated by *Quercus robur* or *Quercus petraea*, on eutrophic or mesotrophic soils, with usually ample and species-rich herb and bush layers. *Carpinus betulus* is generally present. They occur under climates too dry or on soils too wet or too dry for beech or as a result of forest management favouring oaks.

Plant communities: Carpinion betuli

Species: *Carpinus betulus*, *Quercus robur*, *Q. petraea*. G1.A16: *Sorbus torminalis*, *Acer campestre*, *Ligustrum vulgare*, *Cornus mas*, *Ulmus minor*, *Rhamnus catharticus*, *Viola mirabilis*, *V. alba*, *V. suavis*, *Primula veris*, *Polygonatum latifolium*, *P. multiflorum*, *P. odoratum*, *Pulmonaria mollis* ssp. *mollis*, *Convallaria majalis*, *Carex montana*, *C. michelii*, *Festuca heterophylla*, *Melica uniflora*, *Poa nemoralis*. G1.A1B: *Carex brizoides*, *Anemone nemorosa*, *Corydalis solida*, *Galanthus nivalis*, *Gagea spathacea*, *G. lutea*, *Adoxa moschatellina*, *Anemone ranunculoides*, *Ranunculus ficaria*, *Leucojum vernum*.

EU Habitats Directive Annex I Subtypes: G1.A14 = 9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli

! **G1.A4** Ravine and slope woodland

Description: Cool, moist forests with a varied tree layer, especially species of *Acer*, *Tilia* and *Fraxinus* of variable dominance, most often on steep slopes. They are of considerable biohistorical and biogeographical importance, as examples of the mixed forests of the Atlantic period, preserved in stations inaccessible to beech domination.

Plant communities: Tilio platyphylli-Acerion pseudoplatani

Species: *Acer pseudoplatanus*, *Actaea spicata*, *Fraxinus excelsior*, *Lunaria rediviva*, *Ulmus glabra*, *Carpinus betulus*, *Corylus avellana*, *Quercus* sp., *Tilia cordata*. **G1.A41:** *Acer platanoides*, *Fagus sylvatica*, *Quercus robur*, *Actaea spicata*.

EU Habitats Directive Annex I 9180: Tilio-Acerion forests of slopes, screes and ravines

H Inland unvegetated or sparsely vegetated habitats

! **H1** Terrestrial underground caves, cave systems, passages and waterbodies

Description: Natural caves, cave systems, underground waters and subterranean interstitial spaces. Caves and their associated waters harbour varied, but species poor, communities of animals, fungi and algae that are restricted to them (troglobiont organisms), or are physiologically and ecologically capable of conducting their entire life cycle within them (troglophile organisms), or are dependent on them for part of the life cycle (subtroglophile organisms). Underground waters not associated with caves (stygon) and interstitial spaces harbour distinctive faunas.

Plant communities: – in fact no.

Species: Plants: bryophytes only (e.g. *Schistostega pennata*) and algal carpets at the entry of caves. Animals: Very specialised and highly endemic cavernicolous fauna. It includes underground relic forms of a fauna which has been diversified outside. This fauna is mainly composed of invertebrates which exclusively live in caves and underground waters. The cavernicolous terrestrial invertebrates are mainly coleoptera, belonging to the Bathysciinae and Trechinae families in particular, which are carnivorous and have a very limited distribution. Cavernicolous aquatic invertebrates constitute a highly endemic fauna, dominated by crustaceans (Isopoda, Amphipoda, Syncarida, Copepoda) and include many living fossils. Aquatic molluscs, belonging to the Hydrobiidae family are also found. With regard to vertebrates, caves constitute hibernation sites for most European bat species, among which many are threatened and listed on Resolution 6. Caves also shelter some very rare amphibious species like *Proteus anguinus* and several species of the *Speleomantes* genus

EU Habitats Directive Annex I 8310 Caves not open to the public

H2 Screes

H2.6 Calcareous and ultra-basic screes of warm exposures

Habitats of this type are poorly studied in the region. The presence of significant diversity carbonate outcrops of rocks of different geological age and structure gives reason to anticipate the possibility of describing a large number of new types of habitats (Скібіцька, 2013).

EU Habitats Directive Annex I Included in 8160 Medio-European calcareous scree of hill and montane levels.

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