

NATURAL HABITATS AND VASCULAR PLANTS (SPORE AND SEMINAL) OF NATURE CONSERVATION SIGNIFICANCE ON THE TERRITORY OF THE KYUSTENDIL MUNICIPALITY

I. Natural habitats

Natural habitats are specific units of the biosphere and an important element of biodiversity. These are a complex of the natural conditions at a certain location (climate, waters, geological varieties, soils, altitude and the respective communities of plants, animals, microorganisms and fungi. The conservation of the natural habitats ensures the future of the related organisms, including humankind. Their management and maintenance in a favourable nature conservation state is the objective of the European Environmental Network “Natura 2000“, according to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (HD 92/43 EEC, as well as to the National Environmental Network, according to Biodiversity Act (BA) of the Republic of Bulgaria.

In this respect, the natural habitats on the territory of the Kyustendil Municipality, of conservation significance, have been determined, based on these fundamental regulatory documents and the typology, codes and nomenclatures, specified therein, conservation priority (marked with an asterisk (*, e.g. 40A0*, and also using specialized technical references (standard forms for the protected areas of the Ministry of Environment and Waters and scientific references (Kavrakova et al. (ed.) 2009; Biserkov et al. (ed.) 2015; Tsoneve & Gusev 2017).

Among the current standard forms for the protected areas, within which the Kyustendil Municipality is situated, only the types of habitats (38 types or 42% of all habitats in Bulgaria, actually localized on its territory and having characteristics (area and structure, allowing them to be incorporated in a potential tourist product, focused on introduction and studying of the biodiversity, have been selected.

Review and characteristics of the natural habitats

Fresh-water habitats

3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation

The natural habitat consists of parts of the riverbed (coves and pools, with slower running water, where alluvium collects) of slow-current waters and riverbed, occupied at certain points by communities of macrophytes (attached water plants – with submerged or floating leaves). Characteristics for the valleys of Rivers Ogosta, Iskar, Vit, Osam, Yantra, Maritsa, Tundzha, Ropotamo, Veleka etc. *On the territory of the Kyustendil municipality it is registered along River Struma, in the section between the Village of Polska Skakavitsa and the Village of Dvorishte.* In the areas with slower running water, as well as in coves and pools there are some specific species of hydrophytes (water plants, the buds and annual shoots are covered with water) such as the *Potamogeton crispus*, *Potamogeton natans*, *Potamogeton pectinatus*, *Ceratophyllum demersum*. The areas, near the banks and the shallower parts are inhabited by communities of hygrophytes (hydrophilic plants) such as the *Butomus umbellatus*, *Typha latifolia*, *Mentha aquatica*, *Berula erecta*, *Carex* spp, *Persicaria hydropiper*.

TEMPERATE HEATH AND SCRUB

4060 Alpine and Boreal heaths

This natural habitat is composed of communities of small, dwarf or prostrate shrub communities with small, needle-shaped, egg-shaped and elliptic leaves, distributed in the alpine and sub-alpine zones of the mountains. Characteristic for the high Bulgarian mountains – Rila, Pirin, Stara (Western and Central) Planina, Western Rhodope Mountain, Vitosha, Belasitsa and The Western Near-Border Mountains. There are 8 sub-types, depending on the dominant scrub species. *On the territory of the Kyustendil municipality this habitat is only observed in the high, non-wooded areas of the Osogovo Mountain.* A specific feature of this habitat is that within the boundaries of its distribution in the mountain, the dominant terrains are those, inhabited by communities of *Chamaecytisus absinthioides*, a heath of the Legumes family, with greyish-blue indumentum of the leaf and stems and bright yellow flowers, locally referred to as the “*chernotrav*“, which are the result of the excessive use as pastures in the past. Other widely distributed sub-types are the communities, dominated by berries, such as the *Vaccinium myrtillus*, *V. vitis-idaea* and *V. uliginosum* and those of the *Bruckenthalia spiculifolia*. These are specific for drier, sunny and rocky slopes. The formations of *Juniperus sibirica* have very limited distribution, which is the main difference from other mountains. These heaths also incorporate numerous herbaceous species, characteristic for the sub-alpine zone.

4090 Endemic oro-Mediterranean heaths with gorse

This natural habitat is composed of communities of tuft-like, spike heaths of the Genus *Astragalus*. On the territory of the Kyustendil municipality it is represented solely by formations of *Astragalus angustifolius*, the scrubs of which consist of numerous stems, lying on the ground and forming dense cushion-shaped tufts, 25 cm high, and with a diameter of 80 cm. *Some of the most representative communities of this type are distributed in the lands of the Villages of Gorno Uyno, Poletintsi, Zlogosh, Polska Skakavitsa and the Videnski Part of the Konyavska Mountain – Viden Peak and Trigrad Peak.* Nationwide its distribution is limited to the hills and low mountains in various parts of the country – West Bulgaria (Golo Bardo, Zemen Mountain, Paramun Mountain, Konyavska Mountain, Sredna Gora (the Village of Petrich, Sofia Region, the valley of River Struma (Village of Sushitsa, Blagoevgrad Region, Pirin (Vihren and Orelek Peaks, Slavyanka (Shabran and Gotsev Vrah Peaks, Central Rhodope Mountain (Village of Trigrad and Zabardo, Eastern Stara Planina (Village of Sedlarovo and Glushnik, Sliven Region, Village of Lozenets, Yambol Region and Village of Kamchiya Burgas Region). These communities occupy eroded terrains where the foundation rocks are uncovered. Apart from the dominant species, there are also numerous tuft-like cereal grasses and semi-shrubs and perennial grasses, rich in essential oils –*Achillea clypeolata*, *Satureja montana* subsp. *kitaibelii*, *Teucrium polium*, *Artemisia alba*, *Fumana procumbens* etc.. Their appearance is that of dry mountains in Mediterranean, Asia Minor and Caucasus.

40A0* Subcontinental peri-Pannonic scrub

This natural habitat is composed of steppic, draught-resistant grass and scrub communities dominated by low bushes, distributed in areas with continental or Sub-Mediterranean climate, most often on limestone, predominantly on eroded humus-carbonate soils. Distributed in the Northeastern Bulgaria, and the North Blacksea Shore, Southwest Bulgaria – South Vitosha, Lyulin, Lozen Mountain, Golo Bardo, Chepan Mountain, Zemen Mountain, Konyavska Mountain and isolated population in limited areas of Eastern Stara Planina and Tundzha hilly plain. *On the territory of the Kyustendil municipality, on the slopes of the Viden Part of the Konyavska Mountain and in the area of the Village of Polska Skakavitsa in the Zemen Mountain, characteristic specimens of this habitat may be observed, distinguished for their preserved structure and numerous species.* The main dominants include the *Amygdalu nana* and *Rosa pimpineifoli*. Certain isolated areas are very rarely dominated by other scrub in the Rosales family, such as *Amelanchier ovalis* (local name – Borovka, *Cotoneaster* spp. Apart from the

dominants, there are also many tuft-like cereal grasses and semi-shrubs and perennial grasses, rich in essential oils –*Hyssopus officinalis*, *Achillea clypeolata*, *Satureja montana* subsp. *kitaibelii*, *Artemisia alba* etc.

Sclerophyllous scrub

5130 *Juniperus communis* formations on heaths or calcareous grasslands

This natural habitat is composed of communities of *Juniperus communis* on calcareous grasslands – individual specimens or scrub groups without any dense overgrowth, often in complexes with drought-resistant scrub and grasslands. Distributed in the oak and beech zone. Most common in South Bulgaria – the southern slopes of Stara Planina, Sredna Gora, Pirin, Central Rhodope Mountain, Vitosha, Osogovo Mountain etc. *On the territory of the Kyustendil municipality this habitat is relatively rare, observed in isolated areas on the slopes of the highlands between the Village of Poletintsi and the Village of Polska Skakavitsa and in some confined areas in the Osogovo Mountain.* They are of a secondary origin and have formed as a result of the felling of forest communities to make room for pastures. Some of the characteristic plants in this habitat are *Juniperus communis*, various species of *Rosa* spp., *Crataegus monogyna*, various species of *Festuca* spp., *Carlina vulgaris*, *Euphorbia cyparissias*, *Dichanthium ischaemum*, *Chrysopogon gryllus*, *Bromus inermis*, *Salvia nemorosa*, *Eryngium campestre*, *Plantago media*.

5210 Arborescent matorral with *Juniperus* spp.

This natural habitat is composed of evergreen sclerophyllous scrub, dominated by *Juniperus deltoides* = *J. oxycedrus*, mainly in the southern parts of Bulgaria (Valley of River Struma, the Valley of River Mesta, Eastern Rhodope Mountain, Besaparski Hills and Kraishite, in transitive-mediterranean mild and dry climate. . These communities occupy heavily eroded, poor forest soils incl. stony and rocky areas. *On the territory of the Kyustendil municipality more significant populations are observed in the lands of the Village of Poletintsi and Village of Polska Skakavitsa.* They are most often manifested as the final phase of degradation of dry oak forests, after systematic fires, felling, goats pasturing and subsequent soil erosion of the slopes of the pre-mountain and hilly plains. The formation of scrub and grass complex is very characteristic, and these are dominated by *Chrysopogon gryllus*, *Dichanthium ischaemum*, *Poa bulbosa*, *Thymus* spp., *Rhodax canus*, *Astragalus onobrychis*. Also observed are individual trees or groups of *Quercus pubescens*, *Carpinus orientalis*, *Fraxinus ornus*, *Jasminum fruticans*, *Pyrus amygdaliformis* etc., being remnants of the former forests.

NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS

6110* Rupicolous calcareous or basophilic grasslands of the *Alyso-Sedion albi*

This natural habitat is composed of succulent and drought-resistant grasslands with abundant mosses, lichen and small grasses, predominantly annual species or various grasses, such as *Sedum album*, *S. acre*, *S. hispanicum*. Encountered in calcareous areas, with very poor soil and uncovered limestone rocks. Also including some rock ledges, these formations occupy a narrow strip on the terrace of the limestone wall. Usually with very small areas, e.g. in limestone fields, these are distributed in spots. A characteristic feature is that plantation develops during winter, spring and autumn, while the rocks offer sufficient moisture, and the moss is then fresh and characteristically green. These communities are to be found throughout Bulgaria, but only on calcareous substrates, up to 700-1000 m a.s.l. The most typical locations with such habitat are

observed in the Predbalkan, the dry valleys of the Ludogorie, the canyons in the Danube Valley, low mountains in West Bulgaria (Sofia Region). *On the territory of the Kyustendil Municipality representative specimens of this habitat can be observed on the calcareous terrains of the Rishki and Viden Part of the Konyavska Mountain, in the Struma Gorge near the Village of Polska Skakavitsa and Deyanov Dol upstream of the Village of Gorno Uyno.* Early spring observations are possible. Some of the species, which can be seen, include *Cerastium* spp., *Sempervivum* spp., *Erophila verna*, *Ornithogalum* spp., *Saxifraga tridactylites* etc. Due to the small areas it occupies, this habitat is predominantly observed in combination with grasslands, dominated by perennial cereal grasses and sparse, light forests and scrub.

6150 Siliceous alpine and boreal grasslands

This natural habitat is composed of grasslands of low to medium-sized grasses, inhabiting acidic soils on siliceous terrains, characteristic for the alpine zone (usually at altitudes over 2500 m a.s.l.) in the Bulgarian high mountains – Rila and Pirin and fragmentarily, in lower areas in Stara Planina, Vitosha and Osogovo Mountain. *On the territory of the Kyustendil municipality these can only be observed in the higher, ridge areas of the peaks Ruen and Choveko, where they do not form a clearly expressed zone and are fragmentarily distributed over 2000 m. a.s.l.* The most characteristic elements of this habitat type are the communities, dominated by the endemic for the Balkans *Sesleria comosa* and *Juncus trifidus*. These belong to the psychrophite communities. The plants in these communities, are adapted to existence in humid and cool areas in the northern latitudes and high mountains. The most suitable areas are the vast ridges and slant or steep slopes with moderate or lower humidity. Characteristic plants in this habitat are *Sesleria comosa*, *Juncus trifidus*, *Festuca airoides*, *Agrostis rupestris*, *Cetraria islandica*, *Campanula alpina*, *Homogyne alpina*, *Antennaria dioica*, *Omalotheca supina*, *Dianthus microlepis*, *Arenaria biflora*, *Veronica bellidioides*.

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

This natural habitat is composed of dry (xerotherme) to semidry (mesoxerotherme) grasslands (meadows and pastures) on calcareous substrates, dominated by medium to high cereal plants – *Chrysopogon gryllus*, *Dichanthium ischaemum*, various species of *Stipa* spp., *Festuca valesiaca* and more seldom perennial *Bromus* spp. These are distributed throughout Bulgaria, at the borders of the oak and beech zone, often in the former locations of destroyed forests, up to 1000 m. a.s.l. *These communities are characteristic for the West Bulgaria, and on the territory of the Kyustendil Municipality they can be found in the lowest parts of the southern slopes of the Osogovo Mountain and Lisets Mountain, the slopes of the Rishki and Viden Part of the Konyavska Mountain, adjacent parts of the Zemen Mountain and hilly terrains to the west of the lands of the Village of Poletintsi and Village of Dolni Koriten.* These are characterized by the diverse species, and the grasslands often include beautiful and attractive plants, as one of their most characteristic features is the presence of various members of the *Orchidaceae* family, some of which are of conservational significance. Some of the other characteristic plants in this habitat are *Brachypodium pinnatum*, *Bromus inermis*, *B. moesiacus*, *Anthyllis vulneraria*, *Carex caryophyllea*, *Centaurea scabiosa*, *Filipendula vulgaris*, *Convolvulus cantabrica*, *Medicago falcata*, *Anacamptis pyramidalis*, *Gymandenia conopsea*, *Ophrys scolopax* ssp. *cornuta*, *Orchis mascula*, *Orchis militaris*, *O. purpurea*, *O. ustulata*, *O. tridentata*, *Himantoglossum jankae*, *Scabiosa columbaria*, *Veronica prostrata*, *V. teucrium*, *Helianthemum nummularium*, *Fumana procumbens*, *Adonis vernalis*, *Anemone sylvestris*, *Silene otites*, *Thymus* spp.) etc.

In the cases, where the habitat is rich in orchids, it is a conservation priority as per HD 92/43/EEC.

6220* Pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea*

This natural habitat is composed of drought-resistant grasslands dominated by annual cereal species on bare rocky and stony terrains with poor or absent soil. A characteristic feature is that these plants are green only during springtime, because the prevailing grass species are ephemeral and emepheroids, having a very short development period until mid-May. This habitat is to be found in isolated dry eroded areas in South Bulgaria, in areas with clearly expressed Mediterranean climate influence – Southern and Central parts of the valley of River Struma, Golo Bardo, Aytos Mountain, East Rhodope Mountain, the south parts of the Valley of River Mesta, Tundzha and Maritsa, Strandzha and South Blacksea Shore. *On the territory of the Kyustendil municipality these can be observed in the lowest parts of the southern slopes of Konyavska and Zemen Mountain, in very limited areas.* Among the annual cereal plants some of the characteristics species include various species of *Bromus* spp., *Brachypodium distachyon*, *Aegilops* spp., *Cynosurus echinatus* etc. Often, as co-dominant species, there are low to medium-height perennial cereal grasses, such as the *Poa bulbosa*, *Cynodon dactylon*, *Dichanthium ischaemum* etc. These communities also include annual *Trifolium* spp. species, *Valerianella microcarpa*, *Linaria pelisseriana*, *Parentucellia latifolia*, *Silene subconica*, as well as aromatic semi-shrubs of the *Thymus* spp. genus and bulbous and legume plants of the genera *Allium* spp., *Muscari* spp., *Ophrys* spp. etc. The pasturing of agricultural animals is a decisive factor for the formation and maintenance of the habitat, since the perennial grasses, trees and scrub are eliminated, favouring the distribution of annual plants.

6230* * Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas

This natural habitat is composed of perennial grasslands dominated by *Nardus stricta* – a cereal plant, resistant to pasturing and threading by agricultural animals. From environmental perspective, these are closed (they have a compact turf, hydrophilic or relatively dry. Characterized by numerous species. In the past they were intensively used as pastures. Distributed in the mountainous areas throughout Bulgaria on siliceous substrates in the sub-alpine zone and within the coniferous and beech forest zones (1600 – 2100 m a.s.l.). *On the territory of the Kyustendil municipality this habitat is chiefly observed in the forest-free zone of the Osogovo Mountain.* Characteristic plants, which can be observed at the boundaries of areas of the habitat, are the *Agrostis capillaris*, *Deschampsia caespitosa*, *Alchemilla* spp., *Bruckenthalia spiculifolia*, *Festuca nigrescens*, *Festuca airoides*, *Hypericum maculatum*, *Potentilla ternata*, *P. erecta*, *Viola dacica*, *Gentianella bulgarica* etc.

62A0 Eastern sub-mediterranean dry grasslands

This natural habitat is composed of succulent grasslands, inhabiting eroded slopes, most often facing south, on very shallow and degraded humus-carbonate soils, chiefly on limestone, marls, marbles and sandy-clay broken rocks. The communities are without dense turf, at certain locations, on uncovered base-rock without any soil and consist mainly of plants, adjusted to inhabiting calcium-rich soils (calciphiles). Characterized by a higher share of plants, common for the southern regions - Sub-Mediterranean and Mediterranean species, as well as multiple Balkan endemics. Distributed in pre-mountains and mountains of South-western and South Bulgaria, up to 1200 m. a.s.l.). In very typical and representative form, this habitat is observed in calcareous low mountains in West Bulgaria, Besaparski Hills, Strandzha (near Malko Tarnovo) etc. *On the territory of the Kyustendil municipality these habitats can be observed in Zemen and Konyavska Mountain.* The communities are dominated by semi-scrub and herbaceous species such as *Artemisia alba*, *Satureja montana*, *Asperula purpurea* and *Agropyron cristatum*, *Festuca valesiaca*, *F. dalmatica*, *Stipa pennata* agg., *Melica ciliata*, *Koeleria* spp., *Sesleria rigida* and *S. latifolia*). Other characteristic plants are *Bromus*

moesiacus, *Asphodelus albus*, *Chrysopogon gryllus*, *Edraianthus serbicus*, *Iris reichenbachii*, *Pulsatilla montana*, *Hyssopus officinalis*, *Teucrium polium*, *T. montanum*, *Hypericum rumeliacum*, *Allium flavum*) etc.

62D0 Oro-Moesian acidophilous grasslands

This natural habitat is composed of closed (with dense turf) grasslands on acidic or neutral soils, adjusted to cold high-mountain conditions (mainly southern slopes). They are characteristic for the high mountains of the central part of The Balkan Peninsula. In Bulgaria they inhabit Stara Planina, Rila, Pirin, Western Rhodope Mountain, Vitosha, Osogovo Mountain, Slavyanka, in the sub-alpine zone, in the interval 1800 – 2500 m. a.s.l. *On the territory of the Kyustendil municipality these habitats can be observed in the Osogovo Mountain – the slopes of the Ruen Peak and the neighbouring high peaks.* The most common are communities, the grass portion of which is dominated by various cereal species such as the Balkan endemic *Festuca valida*, *Festuca rubra*, *Bellardiochloa violacea*, *Deschampsia flexuosa*, *Seleria comosa* etc. Another specific feature is the presence of Balkan endemics such as *Lilium jankae*, *Aquilegia aurea* etc. Other characteristic plants in this habitat are *Calamagrostis arundinacea*, *Genista depressa*, *Gentiana punctata*, *Armeria rumelica*, *Anthoxanthum odoratum* etc.

6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

This natural habitat consists of hydrophilic communities dominated by the cereal grass *Molinia caerulea*, distributed on over-humid and marshland, soils with low nutrient content, and even stony soils. These are also observed near peat deposits in plain areas, near mountain rivers and springs in the mountain and sub-alpine zone, on acidic soils or degraded peat soils. Distributed in Stara Planina, Rila, Pirin, Western Rhodope Mountain, Vitosha and Osogovo Mountain. Characterized by the relatively few species, included in this habitat and the absence of a thick layer of sphagnum mosses. Other characteristic plants in the habitat, which may be observed are various *Carex* spp. species, *Sanguisorba officinalis*, *Deschampsia caespitosa*, different members of *Dactylorhiza* spp., *Succisa pratensis*, *Scirpus sylvaticus*, *Potentilla erecta* etc.

6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

This natural habitat is composed of plant communities in the shape of “narrow strips“ (1-3 m wide) of grasses up to 1,5-2 m high, along river and stream banks, developing on flooded or over-humid soils or another substrates (sand, gravel). Also referred to as tall herb communities. The habitat is developed throughout Bulgaria, along the banks of all rivers in the plains, pre-mountain and the mountains. On the territory of the Kyustendil municipality the following two sub-types are encountered and can be observed:

1. *Tall herb communities along water courses, in the lower mountain zone and in plain areas (the lower reaches of the rivers in the Osogovo Mountain, River Struma and its tributaries and valleys).* These are communities, developed in open areas, without much shade, near running water in the valleys, most often on gravel or clay substrate. In the pre-mountainous areas some of the more common communities are those of the *Petasites hybridus*, which impresses with its enormous leaves, as well as the presence of species such as *Filipendula ulmaria*, *Chaerophyllum hirsutum*, *Angelica pancicii*, *Caltha palustris* etc. The presence of particular species in an area depends on the level of shades and the nitrogen content in soil. In open areas, without much shade and with higher nitrogen content (a good indicator is the presence of nettle *Urtica dioica*, the following plants are common: *Angelica sylvestris*, cutleaf waterparsnip *Berula erecta*,

Calystegia sepium, Epilobium hirsutum, Eupatorium cannabinum, Humulus lupulus, Leonurus cardiaca, Lycopus europaeus, Lythrum salicaria, Mentha aquatica, M. longifolia, Rubus caesius, Scrophularia umbrosa.

2. Tall herb communities along water courses in mountain and sub-alpine zones (in the Osogovo Mountain from the lower levels of the beech forests to the highest peaks). Of particular interests are these communities in the sub-alpine zone, where some herbaceous plants reach 2 m, and some of them are endemics of the high mountains on the Balkan peninsula. Such species are *Cirsium apendiculatum, Angelica pancicii, Deschampsia caespitosa, Athyrium filix-femina, Chaerophyllum hirsutum, Geum coccineum*. Although with a lower number of species, these communities also enter the forest zone. Other Characteristic species are *Carex hirta, Caltha palustris, Epilobium angustifolium, Doronicum austriacum, Alchemilla* spp., *Geum rivale, Hypericum maculatum, Juncus effusus, Mentha longifolia*) etc.

6510 Lowland hay meadows

This natural habitat is composed of the low-land hay meadows of riverside terraces and lower points in plains and lowlands, on rich meadow soils, well wetted, where water is accumulated - both ground and surface water. These are observed throughout Bulgaria up to 600 - 800 (1000) m a.s.l. predominantly in high fields and valleys (especially in West Bulgaria) at approximately 300-600 m a.s.l. *On the territory of the Kyustendil municipality there are also many specimens locally in the valleys along River Struma.* The typical hay meadows incorporate numerous species. The hay-collecting activities are decisive for their existence. The dominant species are cereal grasses: *Poa sylvicola, Alopecurus pratensis, Festuca pratensis, Elymus repens*). In case of drying and abandonment of the hay collection activities, the *Arrhenatherum elatius* often increases its share, to become dominant. A little less common dominant species are *Deschampsia caespitosa* – on over-humid soils, *Poa pratensis, and after threading - Lolium perenne, Bromus commutatus*) etc.

6520 Mountain hay meadows

This natural habitat is composed of meadow communities, developing on humid and relatively rich soil in the mountains. The most characteristic and representative are the communities in the Western Rhodope Mountain, but these can also be observed in Stara Planina, Rila, Pirin, Western Near-Border mountains etc. *Within the Kyustendil Municipalities, these may be observed in the Osogovo Mountain and the Viden part of the Konyavska Mountain.* These communities are observed in plain areas and on slopes, but most often through a secondary method – replacing destroying forests. The most characteristic and common dominants are *Agrostis capillaris, Festuca nigrescens, Festuca pratensis, Poa sylvicola, Cynosurus cristatus* is also quite common and it is an indicator of increased impact of grazing. If not regularly cut, and grazing is allowed, the spiky and ruderal species increase their share. Such species are *Carduus nutans, Carlina acanthifolia, Cirsium ligulare, Rumex alpinus, Veratrum lobelianum, Verbascum longifolium*) etc.

RAISED BOGS AND MIRES AND FENS

7140 Transition mires and quaking bogs

This natural habitat is composed of communities of low sedges and peat or brown mosses, distributed in the sub-alpine zone between 1700 – 2200 m. a.s.l. Over-humidity, due to high ground waters, flowing surface waters and high air humidity, is a characteristic feature. In the mountains, often above the upper forest boundary – Rila, Pirin, Western and Central Stara Planina, Vitoshka and at lower levels in the Western Rhodope Mountain and Sredna Gora. *On*

the territory of the Kyustendil municipality such mires are only observed in the highest parts – the Begbunar area etc. Characteristic plants, which may be observed in their habitat, apart from peat mosses (*Sphagnum* spp.) are the *Deschampsia caespitosa*, *Eriophorum angustifolium* and *E. latifolium*, *Carex acuta*, *C. nigra*, *Succisa pratensis*, *Geum coccineum*, *Cirsium heterotrichum*, *Parnassia palustris*, *Potentilla erecta*, *Pinguicula balcanica*, as well as *Senecio supalpinus*, a protected species, only inhabiting the Osogovo Mountain in the Republic of Bulgaria.

7220* * Petrifying springs with tufa formation (Cratoneurion)

This habitat is distributed in areas with Karst-forming rocks– лиместоне or marble, with active deposition of tufa from petrifying running waters. Tufa formations are then accumulated in springs or waterfalls and at places, where water penetrates or flows over rock walls. This habitat is more common for the calcareous areas of Bulgaria: Western and Central Balkan, Pirin, Central Rhodope Mountain, Devetaki and Shumen plateau, The Western Near-Border Mountains, The North Blacksea Shore, the Iskar Gorge, Zemen Gorge etc. *On the territory of the Kyustendil municipality it is observed in the area of the “Polska Skakavitsa” Waterfall – one of the most beautiful landmarks in the area.* The vegetation of the rock slopes, flooded by River Shiroki Dol is part of the *Cratoneurion commutatum* and is dominated mainly by aquatic calciphile mosses. As a result of the constant flow of petrifying water, the moss turfs and “curtains“, flowing down the rock slopes or steeps and eroded banks, are saturated with limestone, forming solid tufa and porous calcareous cones. This is an extremely attractive and vulnerable habitat, which requires special efforts for conservation and rules for proper behaviour during visits.

Rocky habitats

8110 Siliceous scree of the montane to snow levels

This natural habitat is composed of barren or partially covered with plantation siliceous scree with rocks and stones of varying sizes on steep slopes in the high parts of the mountains Rila, Pirin, Vitosha, Stara Planina. *Within the Kyustendil Municipalities, these may be observed in the high non-forested part of the Osogovo Mountain.* The plant component on the scree is scarce, as in most cases the communities occupy small part of their area. Characteristic are plant micro-groups, often separate tufts, attached at certain places with stabilized soil substrate. Some of the characteristic plants in this habitat are *Doronicum columnae*, *Gentiana punctata*, *Juncus trifidus*, *Pleuropterygium undulatum*, etc.

8210 Calcareous rocky slopes with chasmophytic vegetation

This natural habitat is composed of plant communities and groups on cracks in the bare, vertical or slant calcareous walls, rock formations and complexes. In Bulgaria this habitat is observed in the Ludogorie, Predbalkan, Pirin,

Vitosha, Rhodope Mountain, Slavyanka, Stara Planina. On the territory of the Kyustendil municipality these can be found in the Videnski Part of the Konyavska Mountain and Zemen Mountain – the River Struma Gorge at the Village of Razhdavitsa and Polska Skakavitsa. Shady, rock areas are often inhabited by *Cystopteris fragilis*, *Asplenium trichomanes*, and the open, sunlit areas - *Ceterach officinarum*, *Asplenium ruta-muraria*, *Achillea ageratifolia*, *Micromeria cristata*, *Alyssum saxatile*, *Rhodax canus*, *Artemisia alba*, *Satureja montana*, *Inula aschersoniana*, as well as the protected species *Campanula versicolor*, The Mediterranean element, encountered in the area of the Village of Razhdavitsa.

8220 Siliceous rocky slopes with chasmophytic vegetation

This natural habitat is composed of plantation in cracks on vertical siliceous rocks - single large rocks, rock walls and rock complexes in the mountains - Rila, Rhodope Mountain, Vitosha, Osogovo Mountain, Stara Planina, Pirin and other mountains in Bulgaria. It consists of open rock groups, with composition, varying, depending on the direction of the slope. Some typical specimens include *Silene lerchenfeldiana*, *Asplenium septentrionale*, *Jovibarba heuffelii*, *Scrophularia aestivalis*, *Hieracium sparsum*, etc.

8230 Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii

This natural habitat is composed of open and almost lacking perennial plants siliceous rock substrates below 1000 m.a.s.l. Naturally, it occupies small areas. These are chiefly bare rock surfaces. A specific feature is that the colonization of the rocks is carried out by terophytes (annual plants and low succulents) (drought-resistant plants with well-developed water-carrying tissues in their vegetative organs) in combination with an abundance of mosses and lichen, which undergo anabiosis during summertime. The habitat is found in the plains, pre-mountainous and the mountainous areas of Bulgaria, mainly in South Bulgaria. *On the territory of the Kyustendil municipality it is found in the lower parts of the Osogovo Mountain.* Some characteristic plants include *Sedum acre*, *S. annuum*, *Scleranthus perennis*, *Anagalis arvensis*, *Veronica verna*, *Poa bulbosa*, mosses and lichen.

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8310 Caves not open to the public

These are the caves and rock niches, significant for the conservation of bats and cave invertebrates. This habitat is very common in calcareous areas of Bulgaria (Predbalkan, Stara Planina, Rhodope Mountain and Danube Valley etc.). In the Kyustendil Municipality this habitat is found in Zemen and Konyavska Mountain in the area of the Villages of Tavalichevo, Tsarvenyano, Polska Skakavitsa, Poletintsi, Razhdavitsa, Maarachevo and Radlovtsi. The most characteristic caves are merely several dozen meters long, with a displacement of up to 20 meters. Although small, these are interesting from bio-speleological perspective, and some of them remain unstudied. Unfortunately many of them are endangered, due to being subject to vandalism and attacks by treasure-hunters.

Forests

9110 *Luzulo-Fagetum* beech forests

This natural habitat is composed of forests of *Fagus sylvatica* subsp. *sylvatica*, growing on poor, and sometimes eroded, acidic, dry to humid soils in the altitude interval from 800 to 1600 m. a.s.l. At certain higher areas, the beech forms mixed communities with *Abies alba* and *Pinus sylvestris*. Some additional tree species with isolated specimens in the formations are *Sorbus aucuparia*, *Populus tremula*, *Carpinus betulus*). The undergrowth hosts *Vaccinium myrtillus* and more seldom *Rubus idaeus*. Most often the herbaceous level is dominated by the *Luzula luzuloides*, *Lerchenfeldia flexuosa*, *Calamagrostis arundinacea*). Distributed in Stara Planina, Rila, Rhodope Mountain, Belasitsa, Sredna Gora, Lozen Mountain, Osogovo Mountain, Vratsa Mountain, Vitosha etc. *Within the Kyustendil Municipalities, these may be observed in the Osogovo Mountain.* Characteristic for this habitat type are the and *Oxalis acetosella*, *Poa nemoralis*, *Prenanthes purpurea* and some moss species such as *Dicranum scoparium*, *Polytrichum juniperinum*, *P. formosum*). *Geranium macrorrhizum* is also to be found on stony terrains, with uncovered rocks and scree.

9130 Asperulo-Fagetum beech forests

This natural habitat is composed of medium-humid (mesophilic) beech forests, developing on neutral or near neutral soils. This is the most common habitat in the beech zone (800 - 1600 m a.s.l.) of the mountains Stara Planina, Vitosha, Rila, Rhodope Mountain, Pirin, Ruy, Osogovo Mountain, Belasitsa, Sredna Gora, Vlahina, Vratsa, Konyavska, Lozen and Vasilyovska mountains, Mikre Hills etc. *Within the Kyustendil Municipalities, these may be observed in the Osogovo Mountain and Konyavska Mountain.* This habitat is dominated by clear stands of *Fagus sylvatica* subsp. *sylvatica*, joined in higher areas by *Abies alba* *Pinus sylvestris*. The herbaceous level is richer and with diverse species, compared to the other types of beech forests. The most common herbaceous species are *Galium odoratum*, *Anemone nemorosa*, *Lamiastrum galeobdolon*, *Cardamine bulbifera*, *Aremonia agrimonoides* and *Melica uniflora*. Some of the characteristic plants in this habitat include also *Mycelis muralis*, *Sanicula europaea*, *Viola reichenbachiana*, *Symphytum tuberosum*, *Allium ursinum*, *Mercurialis perennis*, *Corydalis* spp., *Pulmonaria* spp., etc.

9150 Medio-European limestone beech forests of the Cephalanthero-Fagion

This natural habitat is composed of heat-loving (thermophilic) pure or mixed beech forests. These forests occupy terrains chiefly on southern slopes of the mountains on limestone or sandstone. Distributed in Stara Planina, Rhodope Mountain, Vitosha, Lyulin, Predbalkan, Osogovo, Ruy, Rila, Golo Bardo, Sredna Gora, Pirin, Lozen, Vasilyovska Mountain, Dragoevska Mountain, Mikre Hills, Momino plateau, Shumen plateau, Preslav Mountain. *On the territory of the Kyustendil municipality these are observed on larger areas in the Konyavska Mountain and in separate localities in the Osogovo Mountain.* The most common species in the trees level is *Fagus sylvatica* subsp. *sylvatica*, which is sometimes combined with *Tilia tomentosa*, *Carpinus betulus*, *Quercus cerris*. The undergrowth is inhabited by the common hawthorn, *Acer campestre*, privet, *Cornus mas*. A specific feature of these beech communities is that the herbaceous level incorporates some orchids, as the most common are members of the genus *Cephalanthera* spp. and *Epipactis* spp. as well as species, characteristic for the warm oak forests, such as *Physospermum cornubiense*, *Lathyrus niger*, *L. laxiflorus*, *Galium pseudoaristatum*, *Mycelis muralis*, *Euphorbia amygdaloides*, *Viola odorata*, *Hedera helix*, *Carex sylvatica*, *Brachypodium pinnatum*, *Neottia nidus-avis*, *Dactylorhiza cordigera*, *Rubus hirtus*, *Helleborus odoratus*, *Glechoma hederacea*, *G. hirsuta*, *Tamus communis*) etc.

9170 Galio-Carpinetum oak-hornbeam forests

This natural habitat is composed of mixed, moderately humid (mesophilic) forests dominated by *Quercus petraea* subsp. *petraea*=*Q. dalechampii* and common hornbeam, also including

specimens of *Carpinus betulus*, *Fagus sylvatica* subsp. *sylvatica*, *Tilia cordata* and *T. platyphyllos*. The herbaceous level is dominated by *Cardamine bulbifera*, *Convallaria majalis*, *Festuca heterophylla*, *Mercurialis perennis*). These forests develop in the lower part of the beech zone (over 500 m. a.s.l.). They are closely related to the mesophilic beech forests. Distributed in Western Stara Planina, with a more limited presence in Central and Eastern Stara Planina, Predbalkan, Vitosha, Sredna Gora, Northeastern Rila, the northern slopes of the Western Rhodope Mountain etc. *Within the Kyustendil Municipalities, these may be observed in the Konyavska Mountain, Zemen Mountain and Osogovo Mountain.* Characteristic plants in this habitat are also *Acer platanoides*, *A. campestre*, *Sorbus torminalis*, *S. domestica*, *Ligustrum vulgare*, *Scilla bifolia*, *Poa nemoralis*, *Stellaria holostea*.

9180* *Tilio-Acerion* forests of slopes, screes and ravines

This natural habitat is composed of mixed deciduous forests, developing in lower parts of the scree and steep rock slopes, with deposited soils, most often calcareous and less often siliceous. In most cases the stand of trees consists of *Acer pseudoplatanus*, *Fraxinus excelsior*, *Fagus sylvatica* subsp. *Sylvatica*, *Ulmus glabra*, *Tilia cordata*. The herbaceous level is represented by species, characteristic for the beech forests, such as *Mercurialis perennis*, *Actaea spicata*, members of *Corydalis* spp. It is chiefly distributed in Stara Planina, Western Rhodope Mountain, Rila, Vitosha etc. *Within the Kyustendil Municipalities, these may be observed in the Konyavska Mountain, Zemen Mountain and Osogovo Mountain.* Some of the other characteristic plants in this habitat are *A. hyrcanum*, *Lunaria rediviva*, *Ulmus glabra*, *Allium ursinum*, *Corylus avellana*, oak species - *Quercus* spp., *Anemone nemorosa*, members of *Corydalis* spp., *Primula veris*.

91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

This natural habitat is composed of forests along water courses, developing in permanently or regularly flooded areas. The plants are developed here on rich alluvial soils. Characteristic species are the communities along the water courses, consisting of *Alnus glutinosa* in the lower mountain zone and more seldom *Alnus incana*, in forests and middle reaches of rivers in the mountains. In the lower parts, also characteristic are the river forests dominated by *Salix caprea*, *Salix fragilis*, *S. alba*). These are encountered throughout Bulgaria, near rivers in the low (500 - 1000 m. a.s.l. and medium (1000 - 1500 m. a.s.l.) mountain zone. *Within the Kyustendil Municipalities, these may be observed in the Konyavska Mountain, Zemen Mountain and Osogovo Mountain.* Some of the other characteristic plants in this habitat are *Fraxinus excelsior*, *Carex remota*, *C. sylvatica*, *Sambucus racemosa*, members of *Equisetum* spp., *Angelica sylvestris*, *Lycopus europaeus*, *Rumex sanguineus*, *Stellaria nemorum*, *Clematis vitalba*, *Euonymus latifolius*, etc.

91H0 Pannonian woods with *Quercus pubescens*

This natural habitat is composed of sparse, draught-resistant and heat-loving oak forests, dominated by *Quercus pubescens*. These are developed on very dry, often south-facing locations, with skeletal, shallow soils on calcareous substrates, uncovered as rock formations of different sizes. Due to the continental conditions and anthropogenic impact, these forests are predominantly fragmented and resemble scrub. The species, incorporated in their composition, are abundant, often including succulent species, characteristic for the dry pastures or areas, surrounding forests. This habitat is related to the calcareous hills at places with continental climate. It is distributed in the Predbalkan, parts of the Danube Valley, Northeastern Bulgaria, pre-mountain and low mountains in West Bulgaria. *Within the Kyustendil Municipalities, these may be observed in the Konyavska Mountain and Osogovo Mountain.* Characteristic plants in

this habitat are *Quercus frainetto*, *Q. cerris*, *Fraxinus ornus*, *Carpinus orientalis*, *Sorbus domestica*, *Cornus mas*, *Geranium sanguineum*, *Pyrus pyraeaster*, *Buglossoides purpureocaerulea*, *Filipendula vulgaris*, *Euphorbia polychroma*, *Orchis purpurea*, *Laser trilobum*, *Helleborus odoratus*, (*Althaea cannabina*, *Chamaecytisus albus*, *Potentilla micrantha*, *Tanacetum corymbosum*) etc.

91M0 Pannonian-Balkan turkey oak- sessile oak forests

This natural habitat is composed of succulent oak forests, dominated mainly by *Quercus cerris*, *Q. frainetto*, and in the higher parts – also by *Quercus petraea* subsp. *petraea*=*Q. dalechampii*. These are observed on diverse rock substrate, in dry, but relatively rich grey forest and cinnamon soils. They form the dry oak zone between 150 - 600 (800) m. a.s.l. in areas with continental or transient continental climate – the southern slopes of Stara Planina, Sredna Gora, Thracian Valley and Tundzha Valley, East Rhodope Mountain, Sakar, Strandzha, the valley of River Struma, the Valley of River Mesta. *Within the Kyustendil Municipalities, these may be observed in the Konyavska Mountain, Zemen Mountain and Osogovo Mountain.* Some of the other characteristic plants in this habitat are *Ligustrum vulgare*, *Euonymus europaeus*, *Festuca heterophylla*, *Brachypodium sylvaticum*, *Poa nemoralis*, *Genista carinalis*, *Clinopodium vulgare*, *Potentilla micrantha*, *Tanacetum corymbosum*, *Campanula persicifolia*, *Viscaria vulgaris*, *Lychnis coronaria*, *Galium pseudoaristatum*, *Lathyrus niger*, *Silene italica*, *Smyrniium perfoliatum*, *Helleborus odoratus*, (*Lapsana communis*) etc.

91AA* Eastern white oak woods

This natural habitat is composed of xerothermic forests, dominated by *Quercus pubescens*, observed in areas with transitive-Mediterranean, transitive-continental and euxinic climate. Distributed in South Bulgaria – chiefly in the Thracian Valley, Tundzha Valley, East Rhodope Mountain, Blacksea Shore and in the valleys of Rivers Struma and Mesta. *On the territory of the Kyustendil municipality these are observed in limited locations, only in the lower parts of the Osogovo Mountain and Konyavska Mountain.* Soils are lean and eroded, often revealing parts of the foundation rocks. The characteristic species include numerous tree, herbaceous and scrub species, penetrating from the surrounding forests, scrub, glades and open rock terrain. The tree level, dominated or co-dominated by *Quercus pubescens*, reaches a height of 5-6 m. The trees are heavily branched and often with curved trunks. Apart from *Quercus pubescens* another co-dominant species is *Carpinus orientalis*, joined also by *Acer campestre*, *Fraxinus ornus*. Some of the other characteristic plants in this habitat are *Colutea arborescens*, *Coronilla emerus* subsp. *emeroides*, *Cotinus coggygria*, *Althaea cannabina*, *Dactylis glomerata*, *Dictamnus albus*, etc.

91BA Moesian silver fir forests

This natural habitat is composed of forests of *Abies alba* subsp. *alba*, pure or mixed with *Fagus sylvatica* subsp. *sylvatica*, *Picea abies* and *Pinus sylvestris*, etc. Distributed in the mountains, in shady areas in the lower parts of the slopes, on acidic, deep, humid and well-drained soils. Observed in the Rhodope Mountains, Rila, Pirin, Osogovo Mountain, Stara Planina, Slavyanka and Belasitsa at altitudes from 450 to 2000 m. a.s.l. *On the territory of the Kyustendil municipality these are very rarely encountered in the Osogovo Mountain.* Some of the other characteristic plants in this habitat are *Rubus idaeus*, *Aegopodium podagraria*, *Athyrium filix-femina*, *Cardamine bulbifera*, *Dryopteris filix-mas*, *Euphorbia amygdaloides*, *Galium odoratum*, *Mycelis muralis*, *Sanicula europaea*, *Vaccinium myrtillus*) etc.

91CA Rhodopide and Balkan Range Scots pine forests

This natural habitat is composed of forests, dominated by *Pinus sylvestris*, on sunny mountain slopes, predominantly on siliceous and more rarely on calcareous terrains. These have a diverse structure and include numerous species. Root communities (or fragments thereof) are mainly observed on the southern slopes of Rhodope Mountain, Rila, Pirin, Osogovo and to a lesser degree in Plana, Vitosha, Lozen Mountain, Slavyanka, Stara Planina and Ograzhden. Widely distributed in Bulgaria are secondary scots pine communities, emerging at the place of other forests or grasslands. *On the territory of the Kyustendil municipality these are only to be found in the Osogovo Mountain.* Apart from *Pinus sylvestris*, the tree species often include *Picea abies*, *Abies alba*, *Fagus sylvatica* subsp. *sylvatica* and *Quercus petraea* subsp. *petraea*=*Q. dalechampii*. Some of the other characteristic plants in this habitat are *Juniperus communis*, *Chamaecytisus absinthioides*, *R. idaeus*, *Calamagrostis arundinacea*, *Luzula luzuloides*, *Vaccinium myrtillus*, *Dactylis glomerata*, *Euphorbia amygdaloides*, *Fragaria vesca*, *Pteridium aquilinum*, etc.

92A0 *Salix alba* and *Populus alba* galleries

This natural habitat is composed of forest galleries, dominated by *Salix alba* and *S. fragilis*, *Populus alba*, *P. nigra*. Chiefly observed in the south parts of Bulgaria. *On the territory of the Kyustendil municipality they can be found along the River Struma valley.* Other characteristic plants in this habitat are *Alnus glutinosa*, *Ulmus minor*, *Cornus sanguinea*, *Calystegia sepium*, etc.

9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio- Piceetea*)

This natural habitat is composed of coniferous forests of northern (boreal) type, dominated by *Picea abies*, and in some cases, co-dominated by *Abies alba* and *Pinus sylvestris*. They inhabit siliceous areas with acidic soils in Rila, Rhodope Mountain, Pirin, to a more limited extent Vitosha, Stara Planina and Western Near-Border mountains. *Within the Kyustendil Municipalities, these may be observed in the Osogovo Mountain.* Some of the other characteristic plants in this habitat are members of *Vaccinium* spp., *Luzula luzuloides*, *L. sylvatica*, *Calamagrostis arundinacea*, *Melampyrum sylvaticum*, *Oxalis acetosella*, *Dryopteris filix-mas*, *Moehringia pendula* and various mosses.



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