

# General Habitat Classification System (G-NHCS) categories in Hungary

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## General Habitat Classification System (G-NHCS) categories in Hungary

### A Euhydrophyte habitats

#### A1 Free-floating surface communities with *Lemna*, *Salvinia* and *Ceratophyllum*

Blanket-like surface or subsurface vegetation of tiny floating aquatics with reduced roots, where a partly or completely submerged layer of lobed-leaved plants can develop. Characteristic species include duckweeds (*Lemna*, *Spirodela*) *Salvinia natans* and hornworts (*Ceratophyllum*).

#### A2 Free-floating surface communities with *Utricularia* and *Stratiotes*

One- or two-layered freely floating assemblage of larger plants, mostly with basal leaf rosette (e.g. *Stratiotes aloides*, *Hydrocharis*) and insectivorous species (*Utricularia*).

#### A3 Rooted submerged and floating vegetation with *Potamogeton*, *Nymphaea*, *Trapa*, etc.

Sizeable freshwater waterweeds rooting in the bottom sediment form a more or less continuous green, where reproductive parts are brought above the water surface. Typical components are

*Nymphaea alba*, *Nuphar lutea*, *Nymphoides peltata*, *Trapa natans*, *Potamogeton* and *Batrachium* species.

#### A4 Euhydrophyte communities of fens

Floating or shallow-rooted waterweed associations in dystrophic or oligotrophic waters mostly swamp lakes with *Hottonia* and *Aldrovanda* as dominants.

#### A5 Athalassal saline euhydrophyte communities

Species-poor vegetation of small, bottom-rooted, floating or submerged waterweeds in shallow saline lakes or pools. Characteristic plants are *Batrachium*, lesser *Potamogeton*, *Chara* and *Zannichellia* species.

### B Marshes

#### B1 Reed and *Typha* beds

Dense vegetation of tall, mostly hygromorphic herbaceous plants on the shore of standing freshwaters composed of *Phragmites* and *Typha*, or less frequently of *Bolboschoenus*,

*Glyceria maxima* and *Cladium mariscus*. Floating fens also belong to this category.

#### B2 *Glyceria*, *Sparganium* and *Schoenoplectus* beds

Medium-height emergent vegetation in shallow freshwaters and at lake edges, where sunshine can penetrate through the loose canopy. Typical species are *Schoenoplectus lacustris*, *Glyceria maxima*, *Sparganium erectum*, *Phalaroides arundinacea*, *Glyceria plicata* and *Sagittaria sagittifolia*.

#### B3 Water-fringing helophytic beds with *Butomus*, *Eleocharis* and *Alisma*

Sparse stands of short, mostly weak competitor marsh plants or dense vegetation of dwarf marsh species at the edge of waters. The literature often regards these as short- and dwarf reed associations. *Butomus umbellatus*, *Alisma* spp., *Eleocharis palustris* and *Equisetum fluviatile* are the characteristic species.

#### B4 Tussock sedge communities

Fine-scale mosaics of terrestrial and aquatic vegetation, where the terrestrial component is formed by column-like tufts of plants emerging from water (so-called tussocks), while depressions between these provide aquatic microhabitats. Typical tussock forming species are *Carex elata*, *C. appropinquata*, *C. rostrata* and *Calamagrostis canescens*, depressions are inhabited by e.g. *Menyanthes trifoliata*, *Carex pseudocyperus*.

#### B5 Non-tussock beds of large sedges

Dense, usually one-layered meadows flooded in spring and dominated by one sedge species e.g. *Carex acutiformis*, *C. riparia*, *C. gracilis*, *C. vulpina*, *C. vesicaria*, *C. disticha*.

#### B6 Salt marshes

Marshes on the lowlands covered by salt-rich water during the greater part of (or even throughout) the growing season, their soil contains salts in high concentration. Important species: *Bolboschoenus maritimus*, *Schoenoplectus tabernaemontani* and *Eleocharis uniglumis*.

## **C Flushes, transition mires and raised bogs**

### **C1 Soft and hard water flushes**

Oligotrophic, bryophyte-rich herbaceous plant communities in montane and colline zones at spring outlets of good water supply. Characteristic species: *Carex lepidocarpa*, *C. flava*, *Cardamine amara*, *Chrysosplenium alternifolium*, *Montia fontana*.

### **C2 Transition mires**

Localized aquatic habitats, where abiotic properties (oligotrophy, acidity), species composition and physiognomy are intermediate between those of real raised bogs with *Sphagnum* and mires lacking bogmoss. They occur in West Transdanubia and in the Hungarian Central Range mainly.

### **C3 Raised bogs**

Bigger continuous bogs covered by *Sphagnum*, relatively rich in bogmoss-associated specialist species, the habitat is extremely oligotrophic and acidic, and enjoys a favourable water supply. Appear in the North Hungarian Range and on the Beregi-sík. Typical taxa: *Sphagnum* spp., *Eriophorum vaginatum*, *Drosera rotundifolia*.

## **D Rich fens, eu- and mesotrophic meadows and tall herb communities**

### **D1 Rich fens**

Swamp meadows under stagnant water or receiving continuous water supply, thus desiccation even in late summer is avoided. Occur mostly in the lowland and colline zone. Characteristic species include *Carex davalliana*, *Schoenus nigricans*, *Sesleria*

*uliginosa*, *Juncus subnodulosus* and several orchids.

### **D2 *Molinia* meadows**

Swamp meadows inundated in spring, but drying up in summer, soil with considerable peat content, dominant grass is *Molinia*.

### **D3 Colline eu- and mesotrophic meadows**

Tallgrass meadows under spring water, drying up in summer, soil lacks peat, *Deschampsia* is characteristic. In Transdanubia and the North Hungarian Range.

### **D4 Lowland eu- and mesotrophic meadows**

Tall meadows wet throughout most part of the growing season, peat formation is not typical, poor in salt-tolerant species. Characteristic components: *Agrostis stolonifera*, *Poa trivialis*, *Alopecurus pratensis* and *Festuca pratensis*.

### **D5 Water-fringing and fen tall herb communities**

Communities of tall herbaceous dicots of high water requirements in colline and montane zone. Typical species are *Petasites* spp., *Angelica sylvestris*, *Cirsium* spp., *Filipendula ulmaria*, *Geranium palustre*.

## **E Colline and montane hay meadows, acidophilous grasslands and heaths**

### **E1 *Arrhenatherum* hay meadows**

Mesophilous hay meadows on nutrient-rich soil of valleys and terraces dominated by *Arrhenatherum elatius*, *Dactylis glomerata*, *Phleum pratense*, *Alopecurus pratensis*, etc.

### **E2 *Festuca rubra* hay meadows and related communities**

Wet mesophilous montane hay meadows with moderately acidic soil in the Hungarian Central Range and the hills of Transdanubia. Important species: *Festuca rubra*, *Cynosurus cristatus*, *Agrostis capillaris*, *Trisetum flavescens*, *Festuca pratensis*, *Helictotrichon pubescens*.

### **E3 *Cynosurion* grasslands**

Meso-xerophilous grazed meadows on limeless, nutrient-poor soils in the montane oak-hornbeam and beech zones. Dominant species are *Agrostis capillaris*, *Anthoxanthum odoratum*, *Festuca rubra*, *F. rupicola*, *F. tenuifolia* and *Danthonia decumbens*.

### **E4 *Nardus* swards**

Grazed montane grasslands dominated by *Nardus stricta* on gradually degrading acidic soils with raw humus.

### **E5 *Calluna* heaths**

Grasslands on place of clear-felled woodlands, in woodland clearings and heaths on acidic soil dominated by *Calluna vulgaris*.

## **F Halophytic habitats**

### **F1 *Artemisia* salt steppes**

Periodically wet dry shortgrass steppes usually covering large areas, rich in salt-tolerant plants, lacking or poor in non-saline steppe species, dominated by *Festuca pseudovina*, frequent codominants are *Artemisia santonicum* and *Limonium gmelini*.

### **F2 Salt meadows**

Lowland meadows with regular (mostly spring) water cover, often appearing on salt steppes or around salt marshes, dominant monocots (*Carex distans*, *Beckmannia eruciformis*, *Alopecurus pratensis*, *Agrostis stolonifera* or *Carex melanostachya*) are accompanied by dicots typical of saline soils.

### **F3 Tall herb salt meadows**

Saline meadows composed of saline grassland, meadow and loess steppe species, its physiognomy is determined by tall dicots, inundated in spring, dry in summer, occurring east of the Tisza river. Frequent characteristic species are *Aster punctatus*, *Artemisia pontica*, *Peucedanum officinale* and *Aster linosyris*.

### **F4 *Puccinellia* swards**

Meadows or sparse halophytic grasslands on the lowlands on soils with high salt content, periodically inundated (mostly in spring), and dominated by *Puccinellia*.

#### F5 Annual salt pioneer swards

Covered by water for a larger part of the growing season, saline lakes and depressions in saline steppe micromosaics dry up in summer, and the exposed mud surface becomes inhabited by halophytes, mostly annuals. Dominant species: *Camphorosma annua*, *Suaeda* spp., *Crypsis aculeata*, *Pholurus pannonicus*, *Chenopodium* spp., *Spergularia maritima*, *Salicornia europaea*.

### G Dry open grasslands

#### G1 Open sand steppes

Edaphic semi-desert-like vegetation with numerous endemic species in coarse sand on the Great Hungarian Plain. Dominant grasses are *Festuca vaginata* and *Stipa borysthena*. Further important diagnostic species: *Fumana procumbens*, *Alkanna tinctoria*, *Dianthus serotinus*, *Euphorbia seguieriana*.

#### G2 Calcareous open rock grasslands

Sparse, pioneer-like dry grasslands on calcareous rocks in the Hungarian Central Range, most frequently dominated by *Festuca pallens*.

#### G3 Acidophilous open rock grasslands

Discontinuous, pioneer-like dry grasslands on siliceous rocks in the Hungarian Central Range. Dominant grasses: *Festuca pseudodalmatica*, *Stipa tirsia*, *S. dasyphylla*, *Poa*

*pannonica*.

### H Dry and semi-dry closed grasslands

#### H1 Closed rock grasslands

Dry, mesophilous-xero-mesophilous montane grasslands with broad-leaved grasses ( e.g. *Sesleria* spp., *Bromus pannonicus*). Composition strongly influenced by bedrock properties.

#### H2 Rock steppes

Dry, more or less closed grasslands on south facing dolomite slopes in the Hungarian Central Range. Dominant monocots: *Carex humilis*, *Chrysopogon gryllus*, *Festuca rupicola*.

#### H3 Slope steppes

Closed, species-rich grasslands dominated by narrow-leaved grasses, representing the steppe zone of Eastern Europe in the colline zone. Dominant species are *Festuca rupicola*, *F. valesiaca*, *Stipa capillata*, *S. pulcherrima*, *S. tirsia* and *Festuca pseudodalmatica*.

#### H4 *Bromus erectus* - *Brachypodium pinnatum* grasslands

Species-rich xero-mesophilous secondary meadows and grasslands of different origin and species composition, preserving remnants of the woodland flora. Dominant grasses: *Bromus erectus*, *Brachypodium pinnatum*.

## H5 Closed loess and sand steppes

Closed dry grasslands on humus-rich soils developed on loess or sand. Most frequent dominant grasses are *Festuca rupicola*, *Bromus inermis* and *Bothriochloa ischaemum*.

## I Non-ruderal pioneer habitats

### I1 Amphibious communities on river gravel and sand banks

Beds of rivers and floodplain channels becoming exposed after prolonged water cover are colonized by pioneers, mostly annuals. Most usual dominants are *Cyperus* (s.l.) and *Juncus* spp.

### I2 Semi-desert vegetation on loess cliffs

Discontinuous pioneer vegetation on loess cliffs, on eroded loess-clay high riverbanks and on steep loess slopes. Most frequent species: *Kochia prostrata*, *Agropyron pectinatum*.

### I3 Pioneer vegetation on rock cliffs

Pioneer communities on natural or artificial rock surfaces.

### I4 Screens

Pioneer communities on screes of larger blocks stabilized for centuries.

## J Riverine and swamp woodlands

### J1 Willow and birch mire woodlands

Thickets or low canopy mire woodlands on soils with peat content in areas of poor drainage and in oxbow lakes. Typical species: *Salix cinerea*, *S. aurita*, *Calamagrostis canescens*, *Thelypteris palustris*.

### J2 Alder swamp woodlands

Alder and occasionally ash woodlands on peaty soil flooded even in summer, rich in swamp species (e.g. *Thelypteris palustris*, *Carex elata*). In contrast to montane alder woodlands, these communities are poor in beech woodland species.

### J3 Riverine willow shrub

Shrub along river banks, in shallows and occasionally on verges of lower floodplain oxbow lakes. Mostly *Salix* species form the canopy.

### J4 Riverine willow-poplar woodlands

Hygrophilous high woodlands on lower river terraces and less frequently along streams with *Salix* and *Populus* species in the canopy.

### J5 Riverine ash-alder woodlands

Non swamp-like hygrophilous woodlands along streams in the colline and montane zone, or occasionally on high river terraces, the canopy-forming tree species is *Alnus glutinosa*.

#### J6 Riverine oak-elm-ash woodlands

Moderately wet woodlands on high river terraces or less often along streams of the colline zone. Canopy forming species are *Quercus robur*, *Fraxinus angustifolia*, *Fraxinus excelsior* and *Ulmus laevis*. In the herb layer, species typical for the montane beech woodland zone appear (e.g. *Aegopodium podagraria*, *Allium ursinum*, *Corydalis cava*, *Galium odoratum*, *Stachys sylvatica*, *Viola sylvestris*).

### **K Fresh deciduous woodlands**

#### K1 Lowland oak-hornbeam and closed sand steppe oak woodlands

Fresh plains woodlands with closed canopy, free from floods, but moderately influenced by ground water. Canopy-forming trees are *Quercus robur* and *Carpinus betulus*, in the herb layer numerous beech woodland species occur, but plants with high water demand are rare.

#### K2 Pannonian oak-hornbeam woodlands

Characteristically mesophilous deciduous woodlands on fresh, mostly deep soils, with two-layered canopy, missing shrub stratum and well-developed early spring geophyte undergrowth. Dominant tree species are *Quercus petraea* s.l. or *Q. robur*, and *Carpinus betulus*. Usually form a continuous altitudinal belt in the Hungarian Central Range.

#### K3 Western sub-Pannonian beech and oak-hornbeam woodlands

Tall submontane deciduous woodlands of rigorous growth in West and Southwest Transdanubia, with Scotch pine and sweet chestnut as frequent canopy subordinates. The herb layer is well-developed in summer and contains sub-Atlantic-West-Balkan elements (e.g. *Primula vulgaris*, *Knautia drymeia* and *Cyclamen purpurascens*).

#### K4 Illyrian beech and oak-hornbeam woodlands

High, species-rich woodlands of good growth in South Transdanubia, with silver lime as characteristic canopy component. The shrub layer is insignificant, the herb layer contains southern elements, some of them evergreen, and is abundant in spring geophytes. Characteristic species: *Ruscus aculeatus*, *R. hypoglossum*, *Lonicera caprifolium*, *Tamus communis*, *Helleborus* spp. and *Lathyrus venetus*.

#### K5 Pannonian neutral colline and montane beech woodlands

Montane or colline, fresh or semihumid tall woodlands dominated by one species (beech), with tightly closed canopy, poorly developed shrub layer and rich early spring geophyte undergrowth.

#### K6 Ravine and slope woodlands and limestone beech woodlands

Intrazonal mixed woodlands appearing in small stands on poorly developed soils, dominated by mesophilous or beech woodland species, often preserving relict taxa. Subunits differ markedly (for details see the habitat description).

#### K7 Acidophilous fresh oak and beech woodlands

Woodlands of weak growth developed under humid climate on siliceous bedrock, the shrub layer is absent, the herb layer is usually rich in mosses. Characteristic species: *Deschampsia flexuosa*, *Luzula luzuloides*, and *Calluna*, *Genista*, *Vaccinium* and *Hieracium* spp.

## **L Closed dry deciduous woodlands**

### **L1 Closed thermophilous oak woodlands**

Medium-growth colline or montane oak woodlands with closed canopy, well-developed shrub and herb layers, and numerous species of southern distribution. The canopy is formed by *Quercus pubescens*, *Q. cerris* and in Transdanubia *Fraxinus ornus*.

### **L2 Turkey oak - sessile oak woodlands**

Climatically zonal, well-grown oak woodlands in the colline zone on deep soil. Canopy-forming trees are *Quercus petraea* s.l. and *Q. cerris*, the herb layer is dominated by grasses and sedges, while legumes are also abundant.

### **L3 Mixed relict oak woodlands on rocks**

Mixed woodlands on dolomite or limestone hills, usually in small stands, dominated by oak woodland species of sub-Mediterranean or continental origin. Subunits markedly differ (see habitat description).

### **L4 Acidophilous dry oak woodlands**

Poorly grown woodlands on siliceous bedrock. Canopy closure incomplete, the tree layer is dominated by sessile oak. The shrub layer is missing, the herb layer is composed of acidophilous and xerophilous elements. Typical species: *Genista pilosa*, *Calamagrostis arundinacea*, *Veronica officinalis* and dry grassland and meadow species.

## **M Open dry deciduous woodlands**

### **M1 White oak shrub woodlands**

*Quercus pubescens* -dominated dwarf woodlands of lower mountains forming mosaics with dry grasslands. Drought-tolerant and thermophilous species are characteristic.

### **M2 Loess steppe oak woodlands**

Climatically zonal dry oak woodlands on loess bedrock in lowlands and at adjacent foothills, the loose canopy is dominated by *Quercus robur*, *Q. cerris* and *Q. pubescens*,

the shrub layer with *Acer tataricum*, the herb layer is rich in steppe elements.

### **M3 Salt steppe oak woodlands**

Pedunculate oak woodland patches forming mosaics with tall-herb salt meadows and salt steppes, canopy height below 15 m, woodland species mix with steppe and halophytic elements.

### **M4 Open sand steppe oak woodlands**



Woodland-steppe woodlands in sand areas of the Great Hungarian Plain, appearing in very small stands dominated by *Quercus robur*. The most frequent grass species in the herb layer is *Festuca rupicola*, or occasionally *Poa angustifolia*.

#### M5 Poplar-juniper steppe woodlands

Species-poor woodlands or shrub dominated by juniper and/or white and grey poplars, forming mosaics with sand grasslands. The number of woodland species is low.

#### M6 Continental deciduous steppe thickets

Natural or occasionally secondary shrub vegetation appearing as fringe communities at edges of xerothermic woodlands or in grasslands in patches of various sizes. Usually grows on deep soil and reaches a height of ca. 1 m. Important species: *Amygdalus nana*, *Cerasus fruticosa* and lesser *Rosa* species.

#### M7 Continental deciduous rock thickets

Low-growth montane shrub on rocky places, not or only weakly associated with woodlands, constituents include rare species (*Spiraea*, *Cotoneaster*, *Amelanchier* etc.).

#### M8 Thermophilous woodland fringes

15 m wide edges of xerothermic woodlands or semi-arid grasslands turned into fringe communities. Components are shrubs or species of dry oak woodlands, woodland steppes and dry or semi-arid grasslands (e.g. *Geranium sanguineum*, *Iris variegata*, *Asphodelus albus*, *Trifolium* spp.). Polycorm-forming plants and tall herbs are also abundant.

### **N Coniferous woodlands**

#### N1 Acidophilous Scotch pine woodlands

Relict-like Scotch pine stands in West Transdanubia on limeless bedrock, in extremely acidic or variable water regime habitats, with deciduous trees mixed in the closed canopy. Mostly acidophilous plants compose the herb layer.

#### N2 Calcareous Scotch pine woodlands

Relict-like open Scotch pine woodlands in extremely dry habitats on lime containing bedrock in West Transdanubia and at Fenyőfő in the Bakony Mts. The herb layer is dominated mostly by basiphilous species.

#### N3 Spruce woodlands

*Picea abies* - dominated coniferous woodlands in West Transdanubia on limeless bedrock in habitats fed by seepage water. The canopy is closed and usually mixed with deciduous trees. The herb layer is formed by species of alpine origin.

### **O Secondary and degraded marshes and grasslands**

#### O1 Drying degraded and secondary marshes and sedge beds

Species-poor tall vegetation, main constituents are marsh and reed community species and weeds.

## O2 Disturbed mud surfaces

Monocot-dominated pioneer vegetation developing on anthropogenic influence in areas under prolonged water cover or on disturbed or degraded surfaces. Typical species: *Heliotropium supinum*, *Schoenoplectus supinus*, *Verbena supina*, *Elatine*, *Lindernia*, *Peplis*, *Centunculus*, *Echinochloa* spp.

## O3 Ruderal riverine and marsh communities

Ruderal weed vegetation in riverbeds, in channels between dikes and in dried up marshes. Characteristic components include *Chenopodium*, *Atriplex*, *Polygonum*, *Bidens* and *Xanthium* species.

## O4 Semi-ruderal riverine and marsh communities

Meadow-like vegetation near water, appearing between dikes or occasionally on floodplains, only slightly ruderal due to a moderate trampling. Typical species: *Agrostis stolonifera*, *Agropyron repens*, *Rorippa* and *Rumex* spp.

## O5 Lowland dry degraded grasslands

Heavily degraded or secondary dry grasslands on the Great Hungarian Plain usually dominated by *Festuca pseudovina* and generally used for grazing.

## O6 Lowland wet degraded grasslands

Secondary (overseeded) or gradually degrading meadow-like grasslands at sites of good water supply on the Great Hungarian Plain. Weeds slowly overgrow the site.

## O7 Colline and montane dry degraded grasslands

Weedy, secondary or regenerating dry grasslands in the colline and montane zone, developing in response to grazing, trampling or disturbance.

## O8 Colline and montane wet degraded grasslands

Weedy, secondary or regenerating wet grasslands in the colline and montane zone, developing in response to grazing, trampling or disturbance.

## O9 Secondary annual sand grasslands

Open secondary sand grasslands of mostly annual plants on the Great Plain. Typical species: *Bromus tectorum*, *B. squarrosus*, *Secale sylvestre*, *Polygonum arenarium*.

## O10 Semi-natural road verges, embankments and flood-control dams

Characterless, slowly stabilizing weedy grasslands on artificial slopes. Although these are in fact zonations of characteristically wet and dry habitats, because of the common origin and management it makes sense to treat them as a distinct habitat category.

## O11 Semi-natural vegetation of abandoned fields

Xero-mesophilous grasslands composed of ecological generalists and weeds on arable lands abandoned for years or more typically decades.

## O12 Semi-natural vegetation of abandoned vineyards and orchards

Xerophilous or xero-mesophilous, species-rich grasslands occasionally with shrubs in foothill vineyards and orchards abandoned long ago.

## O13 Trampled swards

Single-layered weed vegetation of trampled areas, composed of mainly low-growth prostrate species.

## **P Semi-natural, often secondary woodland-grassland mosaics**

### P1 Clear-cut shrub and pioneer open woodlands of native species

Transitional communities developing free from human intervention in places where the original closed woodland was clear-cut or destroyed earlier. Mostly pioneer trees and shrubs compose this low-growth vegetation.

### P2 Grasslands with spontaneously colonising trees and shrubs

Potential woodland areas reverting to woodland vegetation when abandoned sometimes after centuries of management.

### P3 Young afforestation with embedded surviving native grassland vegetation

Afforested steppe grasslands, steppe slopes, barrens, pastures and hay-meadows with remnants of the original grasslands, mainly on rocky, sandy and saline soils.

### P4 Wooded pastures

Grassland communities developed under extensive grazing, where the original or planted arboreous vegetation rules the landscape. Although numerous sorts have been distinguished according to the type of grassland, the partial or temporary good water supply is a general feature. Mainly stands with native tree species are considered here.

### P5 Sweet chestnut woodlands

Open planted sweet chestnut stands forming mosaics with semi-natural xeric or mesic grasslands.

### P6 Large parks and botanical gardens with surviving native vegetation

Palace gardens and arboretums preserving remnants or regenerated fragments of the natural mostly riverine woodland or meadow vegetation.

## **R Semi-natural closed woodlands**

### R1 Spontaneous closed woodlands of native species with semi-natural herb and shrub layer

Heterogeneously structured woodlands of native trees growing up during the course of natural vegetation regeneration in the place of earlier woodlands.

## R2 Woodlands mixed with regionally non-native tree species but with semi-natural herb and shrub layer

Mixed semi-natural woodlands with planted non-native tree species, where the shrub and herb layers have also been altered.

## R3 Plantations with colonizing semi-natural herb and shrub layer

Species-poor woodlands of native tree species or their cultivated races planted onto abandoned agricultural fields, but with regenerating shrub and herb layer.

## **S Forestry plantations**

### S1 Black-locust plantations

Monospecific *Robinia pseudo-acacia* plantations with mainly nitrophilous plants in the herb layer.

### S2 Hybrid poplar plantations

Mostly hybrid poplar races planted in rows, the herb layer is poor and characterless.

### S3 Other non-native deciduous plantations

Mainly red oak and black walnut plantations with missing shrub layer and species-poor herb layer.

### S4 Black and Scotch pine plantations

Usually monospecific plantations of Scotch pine and black pine on dry loose soils. The shrub layer is missing. Stands usually thin up as trees grow old.

### S5 Other non-native coniferous plantations

Normally monospecific plantations of spruce, fir, larch, Douglas fir or eastern white pine in fresh habitats. The shrub layer is absent.

### S6 Non-native spontaneous woodlands and shrub

Spontaneously established woodlands and shrubs of introduced or adventive woody species with high dispersal capacity.

### S7 Tree lines and small woods

Localized tree plantations in agricultural areas established to protect cultivations.

## **T Agricultural habitats**

### T1 Annual field crops

Fields of spring or overwintering autumn annual crops.

### T2 Perennial field crops

Lands of biennial or perennial forage crops.

### T3 Market gardens and horticulture

Very intensively tended garden cultures.

### T4 Rice fields

Periodically flooded rice fields.

### T5 Artificial grasslands

Artificial (sown or planted) grasslands under intensive management.

### T6 Arable land with fine scale, often low-intensity agriculture

Arable land not involved in large-field cultivation.

### T7 Coarse scale vineyards and orchards

Plantations on lowlands or hills designed for machine cultivation (tilling, pest management, pruning, harvest).

### T8 Small-scale vineyards and orchards

Orchards of 0.1 and 2 - 4 ha in size, where woody fruit plants cultivars, races or native species taken into cultivation are grown.

### T9 Kitchen gardens

Small gardens in villages or citizens' weekend gardens in the countryside.

## **U Other habitats**

### U1 Cities

Densely built-up urbanized areas of various ages, where population density is high and the extent of parks and other greens is small.

### U2 Suburbs

Built-up areas with at least 2/3 greens, which provides habitat for certain plants and animals.

### U3 Villages

Habitats determined by the structure, and past and present culture of the built-up area as well as by its environment.

### U4 Industrial, commercial, and agricultural ruderal sites

Weed vegetation on factory-yards, railway stations, farms etc. often with discarded large-size appliances.

## U5 Spoil banks

Industrial by-product mineral substrates (most frequently sand, clay, cinder, slurry and stone or gravel debris) with mostly ruderal associations representing various stages of spontaneous or recultivational succession.

## U6 Stone quarries and strip mines

Areas destroyed in the course of surface mining of minerals and rocks.

## U7 Sand, clay and gravel quarries, bare loess cliffs and diggers' pits

Usually bare or sparsely vegetated surfaces (cliffs, pits etc.) on skeleton soil or under water cover.

## U8 Running waters

Permanent surface waters flowing unidirectionally from higher to lower elevations.

## U9 Standing waters

Surface waters with no or negligible unidirectional movement.