

## THE 4<sup>TH</sup> LEVEL CORINE LAND COVER NOMENCLATURE FOR THE PHARE COUNTRIES

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### 1. Introduction

Land cover is a material manifestation of natural and socio-economic processes (land use) on the Earth's surface. It is spatially differentiated by its physiognomic and morphostructural attributes, and indicates the intensity of the processes and changes within the landscape. Identification of land cover is a prerequisite for analysing causes and consequences, assessing the human impact on landscape, and solving the problems of ecological stability in the spheres of decision making and planning.

Identification and mapping of land cover (e.g. using the CORINE Land Cover Project nomenclature at scale 1:100 000, Heymann et al. 1994) generalise the actual image of the landscape in time of acquisition of the satellite data. These data constitute a source of information on land cover (e.g. at different scales). The cited CORINE land cover (CLC) nomenclature at scale 1:100 000 – ranging from urban (industrial), agricultural, forest and semi-natural areas to categories such as alpine meadows, wetlands, etc. – also indicates the rate of human impact (Feranec et al. 1998).

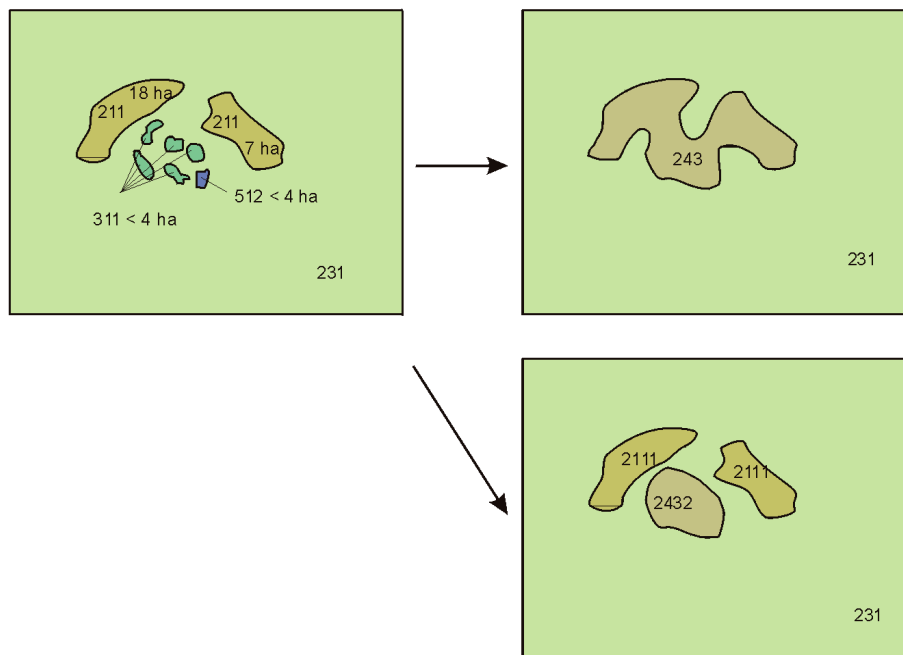
Elaboration of a more detailed land cover nomenclature at scale 1:50 000 was one of the PTL/LC activities (Feranec and Otahel 1998). This scale is more adequate for precise observation of the regional and local peculiarities of land cover than 1:100 000 scale. However, an important condition of the work was the respect for the logic of the structure of CLC classes, observation of the proceeding level, in this case the level three.

### 2. Characteristics of the third level of CLC classes allowing for a more detailed delimitation in the fourth level – scale 1:50 000

For the itemisation of CLC classes it is necessary to know which characteristics are the determining ones for the delimitation of the 4th level classes at scale 1:50 000. We suggest the following characteristics:

- *Mapping size (the smallest unit mapped) of land cover objects*

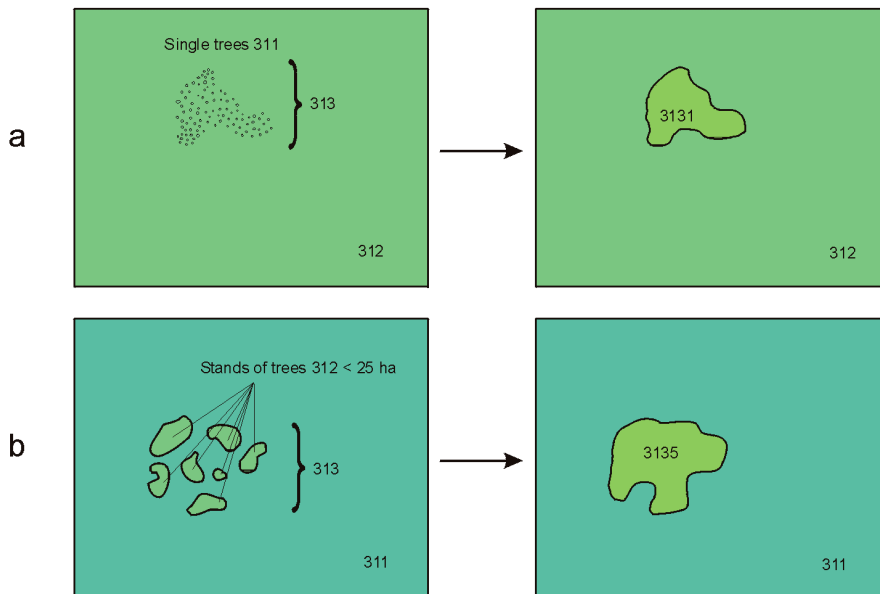
Heterogeneity of many CLC classes at scale 1:100 000 was caused by the fact that they contain objects smaller and larger than 25 ha. If we use a new criterion "the minimum size of identified polygon 4 ha" it will be possible to formulate new classes in terms of proposed definitions of CLC nomenclature 1:50 000 which will be relatively more homogeneous from the viewpoint of the contents.



*Fig. 1 Sample of class 243 (Land principally occupied by agriculture with significant areas of natural vegetation) from which using the characteristic "the minimum size of identified polygon 4 ha" new class 2111 can be delimited.*

➤ *Morphostructural and physiognomic characteristics of land cover objects*

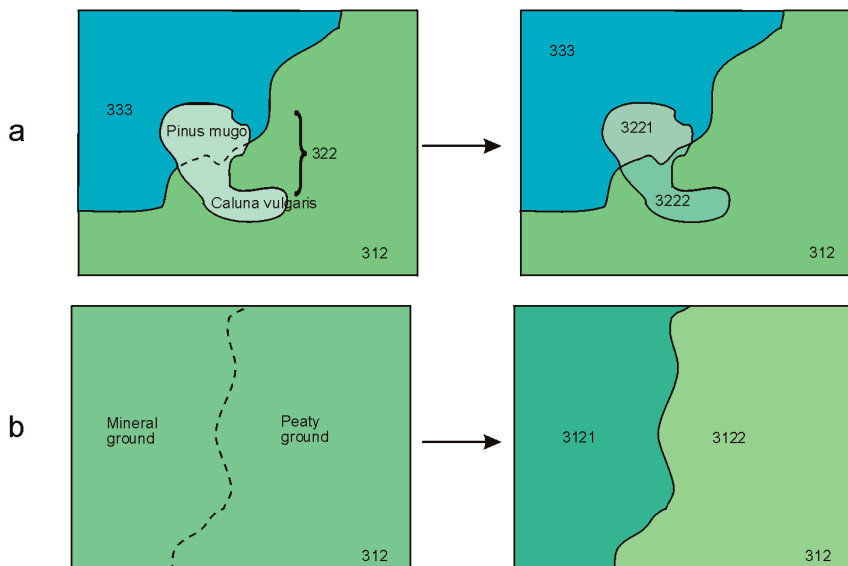
Inner heterogeneity of land cover classes at scale 1:100 000 manifested in satellite images by means of physiognomic characteristics (for instance alternation of single trees or stands of trees – broad-leaved or coniferous, crown coverage within class 313) allows for more detailed itemisation of this class at scale 1:50 000.



*Fig. 2 Mixed forest (class 313) where the distinguishing characteristic is whether it is **a** – alternation of dispersed single trees (broad-leaved – coniferous) or **b** – stands of trees (broad-leaved – coniferous).*

➤ *Territorial (national) peculiarities of the land cover objects*

Acceptance of territorial (national) peculiarities will facilitate delimitation of new land cover classes at scale 1:50 000 characteristic for various geographic areas of PHARE countries.



*Fig. 3 Demonstration of division of class 322: **a** – (Moors and heathland) to 3221 (Areas of dwarf mountain pine and to 3222 (Heathlands and moorlands) and 312: **b** – class (Coniferous forests) to 3121 (Coniferous forests with continuous canopy not on mire) and to 3122 (Coniferous forests with continuous canopy on mire).*

## Characteristics used for the delimitation of CLC classes of the fourth level:

- ⇒ the size limit (4 ha) at the smallest unit (polygon),
- ⇒ morphostructural and physiognomic characteristics distinguishing the inner heterogeneity of the 3rd level classes:
  - 111: Density of urban fabric, size and shape of the buildings, share of supplementing parts of the class (square, width of the streets, parking lots)
  - 112: Size and shape of the buildings, arrangement and character of supplementing parts of the class (gardens, urban greenery)
  - 121: Share of buildings and areas of special infrastructure in urban fabric
  - 122: Character of transport network
  - 123: Size and character of neighbouring water areas, arrangement of infrastructure, size of quays
  - 124: Character of the runway surfaces
  - 131: Situation and character of sites
  - 132: State of the dumps
  - 141: Arrangement and share of anthropogenic parts of the class
  - 142: Arrangement and share of playgrounds and sport halls
  - 211: Share of dispersed greenery
  - 222: Arrangement and share of areas of permanent crops
  - 231: Share of dispersed greenery
  - 242: Occurrence of dispersed houses (cottages)
  - 243: Arrangement and share of single objects of the class
  - 321: Share of dispersed greenery
  - 324: Character (developmental stage) and arrangement of vegetation
  - 331: Character of the neighbouring classes
  - 333: Character of substrate
  - 411: Character of substrate, water and vegetation
  - 412: Character and share of vegetation or water
  - 421: Character and share of vegetation
  - 511: Character (origin) of flowing waters
  - 512: Character (origin) of standing water
- ⇒ territorial (national) peculiarities as well as morphostructural and physiognomic characteristics, distinguishing the inner heterogeneity of the 3rd level classes:
  - 311: Character of substrate, canopy, special plantation of vegetation
  - 312: Character of substrate, canopy, special plantation of vegetation
  - 313: Character of substrate, character of alternation (mixture), canopy
  - 322: Character (composition) of vegetation

### 3. The new nomenclature proposal

The Smolenice version of the CORINE land cover nomenclature at scale 1:50 000 (Feranec et al. 1995) was prepared by J. Feranec and J. O'ahel', completed and approved by the team of the following experts: M. Baranowski, M. Bossard, G. Büttner, A. Ciolkocz, J. Kolář and Ch. Steenmans (during meeting in Smolenice, Slovak Republic, January 1995). It was used for elaboration of new version of nomenclature. Following, all national CORINE land cover teams – from Bulgaria (D. Kontardjiev), the Czech Republic (D. Zdenková), Estonia (K. Aaviksoo), Hungary (G. Büttner), Latvia (H. Baranovs), Lithuania (R. Kaulakys et al.), Slovenia (A. Kobler, B. Vrščaj), Poland (M. Baranowski), Romania (V. Vajdea), and the Slovak Republic (J. Feranec, J. O'ahel') – participated on preparation of proposal for names and definitions of the 4th level nomenclature.

# 1 ARTIFICIAL SURFACES

## 1.1 Urban fabric

### 1.1.1 Continuous urban fabric

#### 1.1.1.1 Areas of urban centres

*Areas of urban centres with public, administrative and commercial buildings, roads, parking lots and artificial surfaces (e.g. cemeteries without vegetation) cover more than 80% of the total surface. Urban greenery is exceptional.*

#### 1.1.1.2 Areas of ancient cores

*Dense ancient cores (mainly residential buildings) with roads, parking lots, etc. Urban greenery is exceptional.*

### 1.1.2 Discontinuous urban fabric

#### 1.1.2.1 Discontinuous built-up areas with multiflat houses prevailing without gardens

*Areas, substantial part of which are formed mainly by houses without more distinct representation of gardens. Also lawns and tree and shrub urban greenery, communications, parking lots, in lesser extent service buildings, cemeteries without vegetation, private family houses can be part of them. They are represented mainly by urban settlement with multistoreyed houses.*

#### 1.1.2.2 Discontinuous built-up areas with family houses with gardens

*Areas, substantial part of which are formed mainly by family houses connected with gardens and lawns. There are fruit trees, vegetable, eventually agricultural crops. Other elements of the class are communications, various service buildings, parking lots, small squares reaching the area of approx. 20-50% of the pattern area, cemeteries without vegetation. They are represented mainly by rural settlements and parts of urban settlements.*

#### 1.1.2.3 Discontinuous built-up areas with greenery

*Areas mostly consisting of houses in forestland (dispersed houses in forest environment, e.g. Tapiola "Garden city").*

## 1.2 Industrial, commercial and transport units

### 1.2.1 Industrial or commercial units

#### 1.2.1.1 Industrial and commercial units

*Areas of industrial enterprises, store houses, shops, agricultural farms (e.g. cattle-, pig-, poultry-, etc.), fair sites, exposition sites, power plants and unbuilt areas associated to industrial units, hospitals, university or school campus, etc.*

#### 1.2.1.2 Areas of special installations

*Areas of technical infrastructure e.g. sewage plants, transformers, test fields of civil and military production industry, military base houses, etc.*

### 1.2.2 Road and rail networks and associated land

#### 1.2.2.1 Road network and associated land

*Road network and associated areas. Lines of roads of minimum width 50 m with associated transport facilities (parking lots along the motorways, maintenance activities for roads, trenches, etc.).*

#### 1.2.2.2 Rail network and associated land

*Rail network and associated areas. Lines of rail roads of minimum width 50 m with associated transport facilities (station buildings, maintenance activities for trains, trenches, etc.).*

### 1.2.3 Port areas

#### 1.2.3.1 Sea commercial, fishing and naval ports

*Areas of commercial, fishery and naval ports with piers and associated infrastructure.*

#### 1.2.3.2 River and lake ports

*Areas of ports situated on the lake shores or river banks with associated infrastructure of buildings and communications.*

#### 1.2.3.3 Shipyards

*Areas formed by infrastructure of production and assembly halls with the associated water surface and communications.*

#### 1.2.3.4 Sport and recreation ports

*Areas of sport and recreation ports with piers and associated infrastructure.*

#### 1.2.4 Airports

##### **1.2.4.1 Airports with artificial surfaces of runways**

*Areas of airports with artificial surface of runways with associated grass areas and infrastructure of airport buildings.*

##### **1.2.4.2 Airports with grass surfaces of runways**

*Areas of airports with grass surface of runways with associated airport buildings.*

#### 1.3 Mine, dump and constructions sites

##### 1.3.1 Mineral extraction sites

###### **1.3.1.1 Open cast mines**

*Areas of open cast coal mines, oil-shale mines, gravel, sand, and clay pits.*

###### **1.3.1.2 Quarries**

*Areas of quarries.*

##### 1.3.2 Dump sites

###### **1.3.2.1 Solid waste dump sites**

*Areas of public and industrial waste and dump sites of raw materials.*

###### **1.3.2.2 Liquid waste dumps**

*Areas of dump sites of liquid waste originating in mainly chemical industry.*

##### 1.3.3 Construction sites

###### **1.3.3.1 Construction sites**

*Areas under construction development for which earthworks and different stages of building constructions are typical.*

#### 1.4 Artificial, non agricultural vegetated areas

##### 1.4.1 Green urban areas

###### **1.4.1.1 Parks**

*Areas of parks occurring within the settlements and formed mainly by lawns, tree and shrub greenery, strips of lanes and paths.*

###### **1.4.1.2 Cemeteries**

*Areas of cemeteries with vegetation.*

##### 1.4.2 Sport and leisure facilities

###### **1.4.2.1 Sport facilities**

*Areas of playgrounds within or outside the urban fabric, running tracks, race-courses, ski resorts, golf grounds, etc.*

###### **1.4.2.2 Leisure areas**

*Areas of leisure and recreation with cottages, spa buildings with parks, castle parks, zoo-gardens, forest-parks not surrounded by urban areas, historical open-air museums, skanzens, open-air theatres, etc.*

## **2 AGRICULTURAL AREAS**

### 2.1 Arable land

#### 2.1.1 Non-irrigated arable land

##### **2.1.1.1 Arable land prevailingly without dispersed (line and point) vegetation**

*Plots of arable land (where cereals, legumes, industrial crops, root crops and fodder crops, semi-permanent crops as strawberries, market gardens, kitchen gardens, flowers and trees nursery-gardens - non-forestry nurseries, are cultivated), with rare occurrence of scattered (line and point) greenery. This class includes also fallow lands (3-4 years abandoned). They can be seasonally irrigated.*

##### **2.1.1.2 Arable land with scattered (line and point) vegetation**

*Plots of arable land (where cereals, legumes, industrial crops, root crops and fodder crops, semi-permanent crops as strawberries, market gardens, kitchen gardens, flowers and trees nursery-gardens - non-forestry nurseries, are cultivated), with sporadic occurrence of scattered (line and point) greenery - less than 15%. This class includes also fallow lands (3-4 years abandoned). They can be seasonally irrigated.*

##### **2.1.1.3 Greenhouses**

*Areas of glass and plastic greenhouses.*

2.1.2 Permanently irrigated land

**2.1.2.1 Permanently irrigated land**

*The same definition than for the 3rd level.*

2.1.3 Rice fields

**2.1.3.1 Rice fields**

*Areas of rice fields.*

2.2 Permanent crops

2.2.1 Vineyards

**2.2.1.1 Vineyards**

*Areas of vineyards (single vineyard plots with area of 4 ha and more; if single vineyard plots smaller than 4 ha each, in total exceeding 60% of the area are mixed with e.g. fruit trees, arable land, meadows, priority will be given to 2211).*

2.2.2 Fruit trees and berry plantations

**2.2.2.1 Orchards**

*Areas of fruit orchards (apples, plums, pears, cherries, peaches, apricots, etc.) and ligneous crops (walnut, chestnut, hazel, almond, etc.).*

**2.2.2.2 Berry fruit plantations**

*Areas of plantations of berry fruits (black and red currants, raspberries, gooseberries, etc.).*

**2.2.2.3 Hop plantations**

*Areas of hop plantations.*

**2.2.2.4 Kiwi plantations**

*Plots planted with kiwi.*

**2.2.2.5 Oil-bearing rose plantations**

*Parcels planted with oil-bearing rose.*

**2.2.2.6 Wild willow plantations**

*Areas of wild willow plantations.*

2.2.3 Olive groves

**2.2.3.1 Olive groves**

*Areas of olive groves.*

2.3 Pastures

2.3.1 Pastures

**2.3.1.1 Grassland (pastures and meadows) prevailingly without trees and shrubs**

*Areas of grassland prevailingly without trees and shrubs (less than 15%).*

**2.3.1.2 Grassland (pastures and meadows) with trees and shrubs**

*Areas of grassland with trees and shrubs (between 15-40%).*

2.4 Heterogeneous agricultural areas

2.4.1 Annual crops associated with permanent crops

**2.4.1.1 Annual crops associated with permanent crops**

*The same definition as for the 3rd level.*

2.4.2 Complex cultivation patterns

**2.4.2.1 Complex cultivation patterns without scattered houses**

*Juxtaposition of small plots of diverse annual crops, pastures and/or permanent crops (fruit trees, vineyards and berry plantations) without scattered houses (settlements).*

**2.4.2.2 Complex cultivation patterns with scattered houses**

*Juxtaposition of small plots of diverse annual crops, pastures and/or permanent crops (fruit trees, vineyards and berry plantations) with scattered houses (settlements).*

2.4.3 Land principally occupied by agriculture, with significant areas of natural vegetation

**2.4.3.1 Agricultural areas with significant share of natural vegetation, and with prevalence of arable land**

*Agriculturally cultivated areas with prevalence of arable land (over 50%) with a pronounced representation of natural vegetation, especially strips and patches of forest, grasslands and sporadic occurrence of water areas (artificial and natural).*

#### **2.4.3.2 Agricultural areas with significant share of natural vegetation, and with prevalence of grasslands**

*Agriculturally cultivated areas with prevalence of grasslands (over 50%) with representation of arable land, strips and patches of forest, grass communities and water areas (artificial and natural).*

#### **2.4.3.3 Agricultural areas with significant share of natural vegetation, and with prevalence of scattered vegetation**

*Agriculturally cultivated areas with prevalence of scattered greenery (woodland patches and bushes over 50%) with representation of arable land, grasslands and water areas.*

#### **2.4.3.4 Agricultural areas with significant share of ponds, and with presence of scattered vegetation**

*Agriculturally cultivated areas with prevalence of ponds (over 50%) with representation of arable land, grassland, strips and patches of forests.*

#### **2.4.3.5 Agricultural areas with significant share of permanent crops, and with presence of scattered vegetation**

*Agricultural areas with vineyards and orchards (to 50%) with representation of grasslands and strips of forests.*

#### **2.4.4 Agro-forestry areas**

##### **2.4.4.1 Agro-forestry areas**

*Areas of annual crops or grazing land under the wooded cover of forestry species.*

### **3 FOREST AND SEMI-NATURAL AREAS**

#### **3.1 Forests**

##### **3.1.1 Broad-leaved forests**

###### **3.1.1.1 Broad-leaved forests with continuous canopy, not on mire**

*Areas of broad-leaved woods forming continuous canopy (crown of trees overlap one another - continuous canopy is more than 80%).*

###### **3.1.1.2 Broad-leaved forests with continuous canopy on mire**

*Areas of broad-leaved woods forming continuous canopy (crown of trees overlap one another - continuous canopy is more than 80%).*

###### **3.1.1.3 Broad-leaved forests with discontinuous canopy, not on mire**

*Areas of broad-leaved woods forming discontinuous canopy (crown of trees do not overlap one another - continuous canopy is less than 80%).*

###### **3.1.1.4 Broad-leaved forests with discontinuous canopy on mire**

*Areas of broad-leaved woods forming discontinuous canopy (crown of trees do not overlap one another - continuous canopy is less than 80%).*

###### **3.1.1.5 Plantation of broad-leaved forests**

*Artificially planted areas of the same species of broad-leaved wood, e.g. poplar, etc. These plantations are cleared and replanted in regular intervals.*

##### **3.1.2 Coniferous forests**

###### **3.1.2.1 Coniferous forests with continuous canopy, not on mire**

*Areas of coniferous woods forming continuous canopy (crown of trees overlap one another - continuous canopy is more than 80%).*

###### **3.1.2.2 Coniferous forests with continuous canopy on mire**

*Areas of coniferous woods forming continuous canopy (crown of trees overlap one another - continuous canopy is more than 80%).*

###### **3.1.2.3 Coniferous forests with discontinuous canopy, not on mire**

*Areas of coniferous woods forming discontinuous canopy (crown of trees do not overlap one another - continuous canopy is less than 80%).*

###### **3.1.2.4 Coniferous forests with discontinuous canopy on mire**

*Areas of coniferous woods forming discontinuous canopy (crown of trees do not overlap one another - continuous canopy is less than 80%).*

#### **3.1.2.5 Plantation of coniferous forests**

*Artificially planted areas of the same species of coniferous woods, e.g. pine, larch, spruce, etc. These plantations are cleared and replanted in regular intervals.*

#### **3.1.3 Mixed forests**

##### **3.1.3.1 Mixed forests created by alternation of single trees with continuous canopy, not on mire**

*Areas of forest formed by alternation of the broad-leaved and coniferous woods (crown of trees overlap one another - continuous canopy is more than 80%).*

##### **3.1.3.2 Mixed forests created by alternation of single trees with continuous canopy on mire**

*Areas of forest formed by alternation of the broad-leaved and coniferous woods (crown of trees overlap one another - continuous canopy is more than 80%).*

##### **3.1.3.3 Mixed forest created by alternation of single trees with discontinuous canopy, not on mire**

*Areas of forest formed by alternation of the broad-leaved and coniferous woods (crown of trees do not overlap one another - continuous canopy is less than 80%).*

##### **3.1.3.4 Mixed forest created by alternation of single trees with discontinuous canopy on mire**

*Areas of forest formed by alternation of the broad-leaved and coniferous woods (crown of trees do not overlap one another - continuous canopy is less than 80%).*

##### **3.1.3.5 Mixed forests created by alternation of stands of trees with continuous canopy, not on mire**

*Areas of forest formed by alternation of the groups of broad-leaved and coniferous woods (crown of trees overlap one another - continuous canopy is more than 80%).*

##### **3.1.3.6 Mixed forests created by alternation of stands of trees with continuous canopy on mire**

*Areas of forest formed by alternation of the groups of broad-leaved and coniferous woods (crown of trees overlap one another - continuous canopy is more than 80%).*

##### **3.1.3.7 Mixed forests created by alternation of stands of trees with discontinuous canopy, not on mire**

*Areas of forest formed by alternation of the groups of broad-leaved and coniferous woods (crown of trees do not overlap one another - continuous canopy is less than 80%).*

##### **3.1.3.8 Mixed forests created by alternation of stands of trees with discontinuous canopy on mire**

*Areas of forest formed by alternation of the groups of broad-leaved and coniferous woods (crown of trees do not overlap one another - continuous canopy is less than 80%).*

#### **3.2 Scrub and/or herbaceous vegetation associations**

##### **3.2.1 Natural grasslands**

###### **3.2.1.1 Natural grassland prevailingly without trees and shrubs**

*Areas of natural grasslands without trees and shrubs (less than 15%). They are formed by grasslands of protected areas, alpine grasslands, military training area and abandoned low productivity grassland (e.g. karstic poljes meadows, etc.).*

###### **3.2.1.2 Natural grassland with trees and shrubs**

*Areas of natural grassland with trees and shrubs (between 15-40%). They are formed by grasslands of protected areas, military training areas, alpine grasslands and abandoned low productivity grassland with trees and shrubs.*

##### **3.2.2 Moors and heathland**

###### **3.2.2.1 Heathlands and moorlands**

*Areas of heathlands, moorlands and transitory peat-bogs represented mainly by dense shrubs and herbaceous plants (*Calluna vulgaris*, *Erica* sp., *Vaccinium* sp., *Genista* sp., *Rubus* sp., *Juniperus* sp., etc.).*

###### **3.2.2.2 Dwarf pine**

*Areas of mountain dwarf pine (*Pinus mugo* ssp. *mughus*) or dwarf pine planted on dunes and mires (*Pinus mugo* ssp. *uncinata*).*

##### **3.2.3 Sclerophyllous vegetation**

###### **3.2.3.1 Sclerophyllous vegetation**

*Bushy sclerophyllous vegetation, including maquis and garrigue.*

##### **3.2.4 Transitional woodland-scrub**



#### **3.2.4.1 Young stands after cutting (and/or clear cuts)**

*Areas of young stands planted by man after cutting, fire or natural disaster without vegetation.*

#### **3.2.4.2 Natural young stands**

*Areas of natural forest regeneration/recolonization.*

#### **3.2.4.3 Bushy woodlands**

*Areas formed by shrubs (Juniperus, Crataegus, Rosa, etc.) along with dispersed trees and grassland. Crowns of shrubs and trees do not form a continuous canopy.*

#### **3.2.4.4 Forest nurseries**

*Areas of forest nurseries (production areas of young forest trees).*

#### **3.2.4.5 Damaged forests**

*Areas of forests strongly affected by air pollution, biotical injurious agents or natural disasters.*

### **3.3 Open spaces with little or no vegetation**

#### **3.3.1 Beaches, dunes, sands**

##### **3.3.1.1 Beaches**

*Areas of bank sand plains prevailingly without vegetation. They are adjacent to 5.2.3.*

##### **3.3.1.2 Dunes**

*Areas of dunes almost without vegetation or with sporadic occurrence of mainly thin grasses (occur in coastal zone as well as in inland).*

##### **3.3.1.3 River banks**

*Belts of river banks formed mainly by deposits of sands and gravel prevailingly without vegetation.*

#### **3.3.2 Bare rocks**

##### **3.3.2.1 Bare rocks**

*Areas of different rock outcrops, e.g. cliffs, screes, rock-face surfaces, etc.*

##### **3.3.2.2. Products of recent volcanism**

*Areas of recent lava streams and mud without vegetation*

#### **3.3.3 Sparsely vegetated areas**

##### **3.3.3.1 Sparse vegetation on sands**

*Areas of sand plains (dunes, glaciofluvial terraces) covered by sparse vegetation.*

##### **3.3.3.2 Sparse vegetation on rocks**

*Areas of xerothermic grasses and shrubs of karstic terrain, or areas of discontinuous alpine grasslands and partially dwarf mountain pine.*

##### **3.3.3.3 Sparse vegetation on salines**

*Areas of salines covered by sparse halophilic vegetation.*

#### **3.3.4 Burnt areas**

##### **3.3.4.1 Burnt areas**

*Areas (mainly forest and heathlands and moorlands) after recent fires.*

#### **3.3.5 Glaciers and perpetual snow**

##### **3.3.5.1 Glaciers and perpetual snow**

*Areas covered by glaciers or permanent snow.*

## **4 WETLANDS**

### **4.1 Inland wetlands**

#### **4.1.1 Inland marshes**

##### **4.1.1.1 Fresh-water marshes with reeds**

*Areas of swamps with reed beds (more than 80%) and other water plants without peat deposition (peat layer is less than 30 cm thick) seasonally or permanently waterlogged with low mineral content.*

##### **4.1.1.2 Fresh-water marshes without reeds**

*Areas of swamps without reed beds (to 20%) and with other water plants without peat deposition (peat layer is less than 30 cm thick) seasonally or permanently waterlogged with low mineral content.*

##### **4.1.1.3 Saline (alkali) inland marshes with reeds**

*Areas of swamps with reed beds (more than 80%) and other water plants without peat deposition (peat layer is less than 30 cm thick) seasonally or permanently waterlogged (prevailing arheic) with higher mineral content.*

#### **4.1.1.4 Saline (alkali) inland marshes without reeds**

*Areas of swamps without reed beds (to 20%) and with other water plants without peat deposition (peat layer is less than 30 cm thick) seasonally or permanently waterlogged (prevailing arheic) with higher mineral content.*

#### **4.1.2 Peat bogs**

##### **4.1.2.1 Explored peat bogs**

*Areas of peat-bogs with extraction.*

##### **4.1.2.2 Natural peat bogs with scattered trees and shrubs, without pools**

*Characteristic for higher stage of bog development where conditions for pool formation are created (peat deposit more than 30 cm thick).*

##### **4.1.2.3 Natural peat bogs with pools communities**

*Areas of convex (raised) bog where zones of pools are perpendicular to water movement (peat deposit more than 30 cm thick).*

##### **4.1.2.4 Natural dwarf shrub bogs**

*Vegetation composed of shrubs (*Calluna vulgaris*, *Ledum palustre*, *Empetrum nigrum*, *Andromeda polifolia*, *Oxycoccus* sp.) and scattered pines and birches. Situated mainly in the margin zones of bogs (peat deposit more than 30 cm thick).*

#### **4.2 Maritime wetlands**

##### **4.2.1 Salt marshes**

###### **4.2.1.1 Salt marshes without reeds**

*Areas of coastal plains seasonally or permanently waterlogged covered by sparse halophilic vegetation.*

###### **4.2.1.2 Salt marshes with reeds**

*Areas flooded by sea water and colonized by *Phragmites communis*.*

##### **4.2.2 Salines**

###### **4.2.2.1 Salines**

*The same definition as for 3rd level.*

##### **4.2.3 Intertidal flats**

###### **4.2.3.1 Intertidal flats**

*The same definition as for the 3rd level.*

## **5 WATER BODIES**

### **5.1 Inland waters**

#### **5.1.1 Water courses**

##### **5.1.1.1 Rivers**

*Natural water streams of minimum width of 50 m with meanders, usually without longer straight spells of banks which are often formed by deposits of gravel, sand or trees and shrubs.*

##### **5.1.1.2 Channels**

*Artificial water channels or regulated water streams of minimum width of 50 m, prevailing straight.*

#### **5.1.2 Water bodies**

##### **5.1.2.1 Natural water bodies**

*Water areas of natural origin.*

##### **5.1.2.2 Artificial reservoirs**

*Water areas created by man with prevailing regular shape.*

### **5.2 Marine waters**

#### **5.2.1 Coastal lagoons**

##### **5.2.1.1 Coastal lagoons**

*The same definition as for the 3rd level.*

## 5.2.2 Estuaries

### 5.2.2.1 Estuaries

*The same definition as for the 3rd level.*

## 5.2.3 Sea and ocean

### 5.2.3.1 Sea and ocean

*The same definition as for the 3rd level.*

## 4. Conclusions

- ⇒ The CLC nomenclature of the 4th level at scale 1:50 000 was elaborated on the basis of proposals of the national teams of Phare countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Slovak Republic).
- ⇒ The elaboration of nomenclature was based on the morphostructural and physiognomic characteristics of the land cover classes of the 3rd level. These characteristics differentiated also landscape-ecological and functional properties of land cover and pointed at the significance of real landscape structure. Characteristics of territorial peculiarities increased the importance of land cover at national scale. More detailed knowing of land cover at scale 1:50 000 represents a suitable data for future scientific and applied research. Pattern analysis of land cover accompanied by the analysis of natural conditions and function priorities facilitates solution of ecological conflicts and risks and proposition the optimal spatial organisation of landscape. In this sense land cover data represent one of the decisive source material for environmental planning.
- ⇒ The CLC nomenclature 1:50 000 will support the trend of more geometric and thematic details of land cover mapping by using satellite data for practical, as well as gnoseological aims mainly at regional and partly local level policies (it will be more suitable to the needs of national users).
- ⇒ Land cover classes at scale 1:50 000 will be much more appropriate for the cross-reference with e.g. EUNIS habitats, CORINE biotopes, different statistics, etc.
- ⇒ Proposed land cover classes can be used as basis of the uniform European 4th level CLC nomenclature.

## 5. References

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