Progetto Corine Land Cover
CLC2000

Guida Tecnica per la Validazione in campagna

CLC2000 National Technical Team

Maggio 2003

Scopo della guida

Obiettivo di questa Guida tecnica è fornire le informazioni necessarie alla validazione della cartografia CLC2000 tramite la verifica a terra di 500 punti di controllo.

Dati richiesti
Per ogni punto di controllo in campagna devono essere acquisite le seguenti informazioni:

1. Indicazione dell'uso del suolo prevalente sulla base del sistema di nomenclatura CLC2000 di quarto livello in un intorno circolare di 5000 m^2 (0.5 ha - raggio di 40 m) del punto di controllo .
2. Validazione della fotointerpretazione di controllo realizzata in un intorno circolare di 500.000 m^2 (50 ha - raggio 400 m) dal punto di controllo .

   A questo fine, alle squadre di controllo a terra verrà fornito il risultato della fotointerpretazione realizzato sulla base della copertura ortofotografica digitale IT2000 dal National Technical Team (NTT) del progetto I&CLC2000.

   Per ciascuna unità fotointerpretata (poligono) nell'intorno di 50 ha, la squadra di controllo a terra dovrà indicare l'uso del suolo prevalente sulla base del sistema di nomenclatura CLC2000 di quarto livello.

   Si sottolinea che trattasi di *validazione tematica*: solo la codifica dell'uso prevalente all'interno dei poligoni fotointerpretati nell'intorno di 50 ha è oggetto di validazione, e non la correttezza geometrica dei confini dei poligoni stessi. Eventuali macroscopiche difformità tra fotointerpretazione e realtà a terra potranno essere segnalate al NTT in forma di note.
3. Acquisizione di 4 fotografie digitali da scattare dal punto di controllo nelle direzioni dei punti cardinali.

   I file (in formato .jpg di dimensione massima di circa 1.5 Mb e minima di 150 Kb) dovranno essere nominati secondo una dicitura comune che identifichi i punti cardinali stessi ("numero punto di controllo_orientamento", esempio: "321_nord.jpg").

Se il punto di controllo a terra non è raggiungibile, le informazioni potranno essere acquisite anche da un punto di vista prossimo al punto. Se il punto di controllo non è visibile né raggiungibile verrà classificato come "*inaccessibile*".

Le informazioni sulla copertura di uso del suolo devono essere acquisite sulla base della situazione riscontrata effettivamente al momento del rilievo e sulla base delle definizioni delle classi di uso del suolo del sistema di nomenclatura CLC2000.

Il risultato finale fornito al NTT dalle squadre di controllo a terra deve essere esclusivamente sotto forma digitale, in formato shapefile ESRI.

Per ogni punto di controllo dovrà in oltre essere indicata la data del rilievo e il nominativo del capo-squadra responsabile. Per ogni punto di controllo possono essere fornite note esplicative.

Classificazione tematica CLC2000

Il programma CORINE (*Coordinated Information on the European Environment*) è stato istituito, a livello comunitario, nel 1985 allo scopo di raccogliere, coordinare e garantire l'uniformità dei dati sullo stato dell'ambiente nell'intera Europa. Il programma ha realizzato un riferimento cartografico comune (*Land Cover Map*) basato sull'interpretazione di immagini da satellite Landsat.

Il criterio gerarchico che caratterizza il sistema di nomenclatura CLC2000 è quello più utilizzato nelle classificazione dei tipi di copertura e d'uso del suolo: esso consente infatti di dettagliare progressivamente le categorie sfruttando il diverso grado di risoluzione a terra delle fonti d'informazione. Al contempo, questo approccio classificatorio si presta bene ad essere utilizzato ai diversi livelli della pianificazione.

In Italia, dal 3° livello CLC per le categorie delle superfici agricole utilizzate, territori boscati e ambienti semi-naturali è stato esploso un 4° livello in grado di restituire una lettura di maggior dettaglio di queste categorie di uso e copertura del suolo. Come tale, l'impianto generale della classificazione tematica proposta è dunque quello gerarchico a disaggregazione crescente del sistema CLC, del quale vengono mantenuti integralmente i primi tre livelli.

Il sistema di nomenclatura CLC2000 utilizzato in Italia è il seguente:

1. SUPERFICI ARTIFICIALI
    - 1.1. Zone urbanizzate di tipo residenziale
        - 1.1.1. Zone residenziali a tessuto continuo
        - 1.1.2. Zone residenziali a tessuto discontinuo e rado
    - 1.2. Zone industriali, commerciali ed infrastrutturali
        - 1.2.1. Aree industriali, commerciali e dei servizi pubblici e privati
        - 1.2.2. Reti stradali, ferroviarie e infrastrutture tecniche
        - 1.2.3. Aree portuali
        - 1.2.4. Aeroporti
    - 1.3. Zone estrattive, cantieri, discariche e terreni artefatti e abbandonati
        - 1.3.1. Aree estrattive
        - 1.3.2. Discariche
        - 1.3.3. Cantieri
    - 1.4. Zone verdi artificiali non agricole
        - 1.4.1. Aree verdi urbane
        - 1.4.2. Aree ricreative e sportive

2. SUPERFICI AGRICOLE UTILIZZATE
    - 2.1. Seminativi
        - 2.1.1. Seminativi in aree non irrigue
            - 2.1.1.1. Colture intensive
            - 2.1.1.2. Colture estensive
        - 2.1.2. Seminativi in aree irrigue
        - 2.1.3. Risaie
    - 2.2. Colture permanenti
        - 2.2.1. Vigneti
        - 2.2.2. Frutteti e frutti minori
        - 2.2.3. Oliveti
    - 2.3. Prati stabili (foraggere permanenti)
        - 2.3.1. Prati stabili (foraggere permanenti)
    - 2.4. Zone agricole eterogenee
        - 2.4.1. Colture temporanee associate a colture permanenti
        - 2.4.2. Sistemi colturali e particellari complessi
        - 2.4.3. Aree prevalentemente occupate da colture agrarie con presenza di spazi naturali importanti
        - 2.4.4. Aree agroforestali

3. TERRITORI BOSCATI E AMBIENTI SEMI-NATURALI
- 3.1. Zone boscate
  - 3.1.1. Boschi di latifoglie
    - 3.1.1.1 Boschi a prevalenza di leccio e/o sughera
    - 3.1.1.2 Boschi a prevalenza di querce caducifoglie (cerro e/o roverella e/o farnetto e/o rovere e/o farnia)
    - 3.1.1.3. Boschi misti a prevalenza di latifoglie mesofile e mesotermofile (acero-frassino, carpino nero-orniello)
    - 3.1.1.4 Boschi a prevalenza di castagno
    - 3.1.1.5 Boschi a prevalenza di faggio
    - 3.1.1.6. Boschi a prevalenza di specie igrofile (boschi a prevalenza di salici e/o pioppi e/o ontani, ecc.)
    - 3.1.1.7. Boschi e piantagioni a prevalenza di latifoglie non native (robinia, eucalitti, ailanto, ...)
  - 3.1.2. Boschi di conifere
    - 3.1.2.1 Boschi a prevalenza di pini mediterranei (pino domestico, pino marittimo) e cipressete
    - 3.1.2.2 Boschi a prevalenza di pini montani e oromediterranei (pino nero e laricio, pino silvestre, pino loricato)
    - 3.1.2.3 Boschi a prevalenza di abete bianco e/o abete rosso
    - 3.1.2.4 Boschi a prevalenza di larice e/o pino cembro
    - 3.1.2.5 Boschi e piantagioni a prevalenza di conifere non native (douglasia, pino insigne, pino strobo, …)
  - 3.1.3. Boschi misti di conifere e latifoglie
    - 3.1.3.1.1. Boschi misti di conifere e latifoglie a prevalenza di leccio e/o sughera
    - 3.1.3.1.2. Boschi misti di conifere e latifoglie a prevalenza di querce caducifoglie
    - 3.1.3.1.3. Boschi misti di conifere e latifoglie a prevalenza di latifoglie mesofile e mesotermofile
    - 3.1.3.1.4. Boschi misti di conifere e latifoglie a prevalenza di castagno
    - 3.1.3.1.5. Boschi misti di conifere e latifoglie a prevalenza di faggio
    - 3.1.3.1.6. Boschi misti di conifere e latifoglie a prevalenza di specie igrofile
    - 3.1.3.2.1. Boschi misti di conifere e latifoglie a prevalenza di pini mediterranei
    - 3.1.3.2.2. Boschi misti di conifere e latifoglie a prevalenza di pini montani e oromediterranei
    - 3.1.3.2.3. Boschi misti di conifere e latifoglie a prevalenza di abete bianco e/o abete rosso
    - 3.1.3.2.4. Boschi misti di conifere e latifoglie a prevalenza di larice e/o pino cembro
    - 3.1.3.2.5. Boschi misti di conifere e latifoglie a prevalenza di conifere non native
- 3.2. Zone caratterizzate da vegetazione arbustiva e/o erbacea
  - 3.2.1. Aree a pascolo naturale e praterie
    - 3.2.1.1 Praterie continue
    - 3.2.1.2 Praterie discontinue
  - 3.2.2. Brughiere e cespuglieti
  - 3.2.3. Aree a vegetazione sclerofilla
    - 3.2.3.1 Macchia alta
    - 3.2.3.2 Macchia bassa e garighe
  - 3.2.4. Aree a vegetazione boschiva ed arbustiva in evoluzione
- 3.3. Zone aperte con vegetazione rada o assente
  - 3.3.1. Spiagge, dune e sabbie
  - 3.3.2. Rocce nude, falesie, rupi, affioramenti
  - 3.3.3. Aree con vegetazione rada
  - 3.3.4. Aree percorse da incendi
  - 3.3.5. Ghiacciai e nevi perenni

4. ZONE UMIDE
- 4.1. Zone umide interne
  - 4.1.1. Paludi interne
  - 4.1.2. Torbiere
- 4.2. Zone umide marittime

4.2.1. Paludi salmastre
4.2.2. Saline
4.2.3. Zone intertidali

5. CORPI IDRICI
5.1. Acque continentali
5.1.1. Corsi d'acqua, canali e idrovie
5.1.2. Bacini d'acqua
5.2. Acque marittime
5.2.1. Lagune
5.2.2. Estuari
5.2.3. Mari e oceani

Per le zone boscate, la classificazione di 4° livello avviene in funzione di un criterio di prevalenza, sulla base dei valori di copertura delle varie specie o gruppi di specie prevalenti.

Si noti bene che le classi miste sono sottocategorie della classe di 3° livello 313 “Boschi misti di latifoglie e conifere” e devono quindi essere applicate solo per i boschi nei quali si riscontri la contemporanea presenza di conifere e di latifoglie. Se la copertura delle conifere raggiunge il valore soglia del 75%, il bosco è appartenente alla classe 311 e deve essere classificato con la classe di 4° livello sulla base della specie arborea o del gruppo di specie arboree con copertura prevalente. Analogamente, se la copertura delle latifoglie raggiunge il valore soglia del 75%, il bosco è appartenente alla classe 312 e deve essere classificato con la classe di 4° livello sulla base della specie arborea o del gruppo di specie arboree con copertura prevalente.

Solo nel caso in cui nè la componente di latifoglie, nè la componente di conifere raggiunga da sola la copertura del 75%, allora il bosco appartiene alla classe mista 313 e deve essere classificato con la classe di 4° livello sulla base della specie o del gruppo di specie con copertura prevalente.

Per quanto riguarda la tipologia delle superfici agricole utilizzate il IV livello prevede la riclassificazione delle aree agricole non irrigue (codice 211, in cui ricadono tutte le aee a seminativo tipo cereali, leguminose in pieno campo, erbai e colture foraggere avvicendate, coltivazioni industriali, ecc.); in due classi: la 2111 seminativi asciutti in coltura intensiva e la 2112 seminativi asciutti in coltura estensiva, intendendo nel primo caso i seminativi asciutti delle zone di pianura più facilmente meccanizzabili ed a maggior reddito e quindi su terreni a pendenza inferiore al 15% e nel secondo caso i seminativi collinari su terreni più acclivi (pendenza maggiore al 15%) e quindi con maggiori difficoltà di meccanizzazione e meno redditizi. Tale attribuzione è stata applicata non al singola unità ma più con carattere geografico relativamente ad un determinato comprensorio o tipo di paesaggio.

Le aree a copertura vegetale erbacea trovano nella classificazione CORINE diversa collocazione a seconda delle forme d’uso. Gli erbai ed i prati monofiti o oligofiti avvicendati sono attribuiti alla classe 211 quella dei seminativi; i prati polifiti permanenti (il cui esempio più noto è quello dei parti stabili dei fondovalle alpini), utilizzati con lo sfalcio o con il pascolamento e soggetti a pratiche agronomiche come la concimazione, il decespugliamento, ecc.., ricadono nella classe 231; i pascoli d’alta quota e gli incolti erbacei dei pendii asciutti e scoscesi a suolo superficiale sono invece da attribuire alla classe 321 ovvero alle praterie ed ai pascoli naturali.

Per le altre classi fanno strettamente riferimento le descrizioni sotto riportate estratte dal documento “CORINE land cover technical guide – Addendum 2000” (Technical report No 40, May 2000, European Environmental Agency).

Characteristics of the CORINE land cover classes

Class **1**: Artificial areas

Class 1.1 Urban fabric
Areas mainly occupied by dwellings and buildings used by administrative/public utilities or collectivities, including their connected areas (associated lands, approach road network, parking-lots).
Class 1.2 Industrial, commercial and transport units
Areas mainly occupied by industrial activities of transformation and manufacturing, trade, financial activities and services, transport infrastructures for road traffic and rail networks, airport installations, river and sea port installations, including their associated lands and access infrastructures. Includes industrial livestock rearing facilities.
Class 1.3 Mine, dump and construction sites
Artificial areas mainly occupied by extractive activities, construction sites, man-made waste dump sites and their associated lands.
Class 1.4 Artificial non-agricultural vegetated areas
Areas voluntarily created for recreational use. Includes green or recreational and leisure urban parks, sport and leisure facilities.

111 Continuous urban fabric

Most of the land is covered by structures and the transport network.
Building, roads and artificially surfaced areas cover more than 80 % of the total surface. Non-linear areas of vegetation and bare soil are exceptional.
Extension:
80 % of the total surface at least should be impermeable.
This heading includes:
•= urban centre types and dense ancient suburbs where buildings form a continuous and homogeneous fabric;
•= public services or local governments and commercial/industrial activities with their connected areas inside continuous urban fabric when their surface is less than 25 ha;
•= interstices of mineral areas;
•= parking lots, concrete or asphalt surfaces;
•= transport network;
•= small squares, pedestrian zones, yards;
•= urban greenery (parks and grass areas) amounting to 20 % of the polygon area;
•= unvegetated and vegetated cemeteries less than 25 ha located inside continuous urban fabric.

112 Discontinuous urban fabric

Most of the land is covered by structures. Building, roads and artificially surfaced areas associated with vegetated areas and bare soil, which occupy discontinuous but significant surfaces.
Extension:
Between 30 to 80 % of the total surface should be impermeable.
This heading includes:

•= private housing estates, residential suburbs made of individual houses with private gardens and/or small squares;
•= scattered blocks of residential flats, hamlets, small villages where numerous unmineralised interstitial spaces (gardens, lawns) can be distinguished;
•= large blocks of flats where green spaces, parking areas and adventure playgrounds cover significant surface area;
•= transport network;
•= sport area smaller than 25 ha included within discontinuous urban fabric;
•= buildings with educational, health care and production functions and market places smaller than 25 ha included within this class;
•= unvegetated and vegetated cemeteries smaller than 25 ha included within discontinuous urban fabric;
•= public utilities/communities surfaced areas less than 25 ha;
•= holiday cottage houses are included in 112 if infrastructures like houses, road network are visible in the satellite image; they must also be connected to built-up areas;
•= troglodyte villages along streets and subterranean housings visible from the satellite image.

This heading excludes:

•= holiday cottage areas, which are only used for recreational purposes and defined as a specific unit in the satellite image should be classified as 142;
•= installations structured with a view to summer settlement with bungalows and a specific organisation (road, facilities) which must be classified as 142;
•= scattered main and secondary residences implanted in natural or agricultural areas when their coverage is less than 30 % of the total surface; they are classified as 242 or 243;
•= greenhouses; they are classified as 211.

121 Industrial or commercial units

Artificially surfaced areas (with concrete, asphalt, tarmacadam, or stabilised, e.g. beaten earth) without vegetation occupy most of the area, which also contains buildings and/or vegetation.

This heading includes:

•= research and development establishments;
•= security and law and order services (fire stations, penal establishments);
•= company benefit schemes (old people's home, convalescent homes, orphanages, etc.);
•= stud farms, agricultural facilities (co-operatives, state farm centres, livestock farms, living and exploitation buildings);
•= exposition sites, fair sites;
•= nuclear power plants, military barracks, testing pistes, test fields, biological waste water treatment plants, water houses, transformers;
•= large shopping and exposition centres;
•= hospitals, spas,;
•= universities, schools;
•= parking lots;
•= abandoned industrial sites and by-products of industrial activities where buildings are still present;
•= water retention dam and hydroelectric dam in total >25 ha;
•= telecommunication networks (relay stations for T.V., telescopes, radar stations).

This heading excludes:

•= extractive industry (class 131);
•= oil terminals inside port activities (class 123);
•= dumps, decanting basin structures (class 132);
•= dockyards (class 123);
•= merchant departments belonging to private or public services (class 11x);
•= places of worship: convents, monasteries, etc. (class 142).

122 Road and rail networks and associated land

Motorways and railways, including associated installations (stations, platforms, embankments). Minimum width for inclusion: 100 m.

This heading includes:

•= transport networks – roads, railways, funiculars, minimum width 100 m;
•= motorway rest areas, service stations, parking areas haulage depots connected on motorway networks, services and maintenance activities for roads, tollbooths;
•= marshalling yards, perimeter of stations, services and maintenance activities for trains;
•= compounds of large crossroads with minimum area 25 ha;
•= tramways networks;
•= cableway networks.

This heading excludes:

•= motorways and high-speed train under construction (133);
•= closed-down transport network (classified under the real appropriate land cover class).

123 Port areas

Infrastructure of port areas, including quays, dockyards and marinas.

This heading includes:

•= commercial and military ports;
•= shipyards;
•= fishing ports;
•= yachts ports, sport and recreation ports;
•= shipping and infrastructure port facilities;
•= sea, river and lake ports;
•= harbour stations, dock houses;
•= oil terminals;
•= roads, railways and parking lots within the port area;
•= adjacent water areas shirted by quays if the area of infrastructure of the port (firm land part) is smaller than 25 ha

This heading excludes:

•= industrial and commercial units larger than 25 ha associated with port activities (class 121).

124 Airports

Airports installations: runways, buildings and associated land.

Extension:

This class includes associated lands (mainly grassland).

This heading includes:

•= take-off and landing runways (concrete, grass surfaced) of civil, military and sport airports with non concreted or asphalted runways and with installations;
•= terminals, hangars, service and storing buildings and in-door spaces;
•= flying schools used for pilot’s training programme of civil aviation;

•= parking lots and lay-by areas;
•= adjacent grass areas, or dispersed trees and shrubs within the buffer zone of airport;
•= small sport airports with non-concreted or asphalted runways used for agriculture and forestry (e.g. spreading of fertilizers and chemical materials).
This heading excludes:
•= small sport airports with non-concreted or asphalted runways;
•= disused airport or airfield should be classified as 321.

131 Mineral extraction sites
Areas with open-pit extraction of construction material (sandpits, quarries) or other minerals (open-cast mines). Includes flooded gravel pits, except for river-bed extraction.
Extension:
This class includes flooded gravel pits surface of which is less than 25 ha and temporary mining pools.
This heading includes:
•= open-pit extraction often associated with heaps of extracted building material (gravel, sand, stone or clays) or ore and non-ore mineral material (iron, manganese ores, magnesite, lignite, brown coal, kaolin, etc.);
•= infrastructure of buildings and installations providing for extraction, or primary processing of the quoted material and minerals;
•= transport networks associated with areas of open-pit extraction;
•= lay-by areas;
•= water bodies (smaller than 25 ha), often associated with open pit extraction of gravel, sand, etc.;
•= rock salt pits;
•= sand extraction site inside coastal dune areas;
•= inland Salinas;
•= oil fields with wells;
•= petroleum, gas and liquid petroleum gas, shale oil extraction site.
This heading excludes:
•= exploited peat bogs (class 412);
•= associated land of mines where barren materials are dumped (coal tips, slag dumps) (class 132);
•= coastal saline (class 422);
•= scree covered areas (class 332);
•= extraction sites abandoned and reconverted to leisure areas (class 142).

132 Dump sites
Public, industrial or mine dump sites.
Extension:
This class includes dump sites of raw materials or liquid wastes.
This heading includes:
•= dump sites of public, communal waste (landfills);
•= dump sites of industrial waste - waste rock after processing of various raw materials;
•= dump sites of waste material from stations cleaning the communal waste water;
•= pools of waste water/liquid waste, products of various chemical processes;
•= protecting dikes;
•= line vegetation belts, part of buffering/protective zones around the dump sites;
•= buildings, transport networks with parking lot associated with dump site;

•= slag heaps which are unvegetated.
This heading excludes:
•= decanting basins of biological water treatment plants by means of lagoonage processing (class 121);
•= dump sites abandoned and reconverted to leisure areas (class 142);
•= vegetated slag heaps (class 3xx).

133 Construction sites
Spaces under construction development, soil or bedrock excavations, earthworks.
This heading includes:
•= public and industrial fabric structures, road and rail networks, water dams/reservoirs, etc. under construction.
This heading excludes:
•= completed parts of transport networks under construction when they are larger than 25 ha.

141 Green urban areas
Areas with vegetation within urban fabric, includes parks and cemeteries with vegetation, and mansions and their grounds.
Extension:
This class includes cemeteries with important vegetation coverage.
This heading includes:
•= parks, park basins, lawns, flower beds in settlements;
•= ornamental gardens;
•= botanical and zoological gardens situated in settlement (urban fabric - 112) or in contact-peripheral zone of settlement;
•= city squares;
•= inner spaces of city blocks;
•= cemeteries with vegetation in settlements;
•= vegetated areas which can be used for recreational purpose even if it is not their main utilisation such as woods in urban fabric.
This heading excludes:
•= city gardens (class 242);
•= vegetated cemeteries outside urban fabric (class 142);
•= unvegetated cemeteries inside urban fabric (class 11x).

142 Sport and leisure facilities
Camping grounds, sports grounds, leisure parks, golf courses, racecourses, etc. Includes formal parks not surrounded by urban areas.
This heading includes:
•= areas of sport compounds (football stadiums with the corresponding infrastructure, hockey halls, swimming pools and tennis courts, cycling stadiums, athletic halls and stadiums, etc.) within settlements and out of them;
•= sport shooting-ranges;
•= cemeteries with vegetation situated out of the settlements;
•= camping sites;
•= cottage (tourist) communities used for recreation and leisure activities outside the settlements only for temporary residence;
•= zoological and botanical gardens out of settlements;

•= compounds of disclosed/open archaeological sites;
•= golf courses;
•= racecourses;
•= ski resorts (except ski pistes);
•= motor – racing circuit;
•= forest-parks in the periphery of settlements;
•= small sport airports with non concreted or asphalted runways.

This heading excludes:

•= motor-racing circuits inside industrial unit areas used for test purposes (class 121);
•= caravaning parking used for commercial activities (class 121);
•= beaches (class 331);
•= camping areas within forests that are not specially prepared for the purpose (class 31x);
•= stud farms (class 121).

Class **2**: Agricultural areas

Class 2.1 Arable land
Lands under a rotation system used for annually harvested plants and fallow lands, which are permanently or not irrigated. Includes flooded crops such as rice fields and other inundated croplands.

Class 2.2 Permanent crops
All surfaces occupied by permanent crops, not under a rotation system. Includes ligneous crops of standards cultures for fruit production such as extensive fruit orchards, olive groves, chestnut groves, walnut groves shrub orchards such as vineyards and some specific low-system orchard plantation, espaliers and climbers.

Class 2.3 Pastures
Lands, which are permanently used (at least 5 years) for fodder production. Includes natural or sown herbaceous species, unimproved or lightly improved meadows and grazed or mechanically harvested meadows.

Class 2.4 Heterogeneous agricultural areas
Areas of annual crops associated with permanent crops on the same parcel, annual crops cultivated under forest trees, areas of annual crops, meadows and/or permanent crops which are juxtaposed, landscapes in which crops and pastures are intimately mixed with natural vegetation or natural areas.

211 Non-irrigated arable land

Cereals, legumes, fodder crops, root crops and fallow land. Includes flowers and fruit trees (nurseries cultivation) and vegetables, whether open field, under plastic or glass (includes market gardening). Includes aromatic, medicinal and culinary plants. Does not include permanent pastures.

Extension:

This class includes flower, fruit trees (nurseries) and vegetable cultivation. Includes other annually harvested plants with more than 75 % of the area under a rotation system. Part of this class are the plots of arable land with area of several hectares reaching tens (hundreds) of ha.

This heading includes:

- = multi–year plants as asparagus and chicory;
- = flooded crops as water cross beds;
- = semi-permanent crops as strawberries;
- = temporary fallow lands (lands under three yearly rotation system);
- = drained arable land should be mapped as 211 instead of 212;
- = fragmented agricultural land use resulting in juxtaposition of different annual crops;
- = weeded crops;
- = non-permanent industrial crops as textile plants, oleaginous plants;
- = tobacco;
- = condiment plants;
- = sugar cane;
- = flowers under a rotation system;
- = industrial flower crops as lavender species;
- = nurseries-garden (seedlings of fruit trees and shrubs);
- = dispersed, mostly line vegetation;
- = abandoned irrigated arable land even the irrigation channel network is still visible in the satellite image.

This heading excludes:
•= city gardens (class 242);
•= lands which lie fallow for at least three years (class 231 or 32x);
•= hop plantations (class 222);
•= rice field (class 213);
•= forest tree nurseries with non-commercial purposes located in forest areas (31);
•= fruit trees and berry plantation under glass greenhouses (class 222);
•= osier trees for wicker production (class 222);
•= permanent plantations of roses (class 222);
•= wine-growing nurseries (class 221).

212 Permanently irrigated land
Crops irrigated permanently or periodically, using a permanent infrastructure (irrigation channels, drainage network). Most of these crops cannot be cultivated without an artificial water supply. Does not include sporadically irrigated land.
Extension:
This class excludes drainage network areas, which are assigned to 211, 231 or 242, applied for pumping infrastructure and irrigation systems from superficial water supplies.
This heading includes:
•= recently abandoned irrigation systems; decision must be taken based on the satellite image spectral reflectance showing if soils are still wet and the infrastructure;
•= sown grassland (as part of crop rotation) if the irrigation infrastructure is permanently present.

This heading excludes:
•= drainage network intended to clean up wet soils (classes 211, 231 or 242);
•= crops under greenhouses (classes 211 or 222);
•= underground irrigation pipes and above ground pipes and furrows (other cultivation classes);
•= spray sprinkler line (other cultivation classes);
•= rotary sprinkler (other cultivation classes);
•= rice fields (class 213).

213 Rice fields
Land prepared for rice cultivation. Flat surfaces with irrigation channels. Surfaces periodically flooded.
Extension:
Abandoned rice fields are not included. One or two yearly rotation is applied for rice fields, therefore the land cover is mapped according to the presence at the time of satellite data acquisition.
This heading includes:
•= rice fields;
•= irrigation channels.
This heading excludes:
•= ancient rice fields with irrigation channels should be mapped according to their actual land cover (mainly classes 211 or 231);

221 Vineyards
Areas planted with vines.

Extension:
Vineyard areas are classified as 221 if the vineyard parcels exceed 50 % of the area and/or they determine the land use of the area.
This heading includes:
•= vine-growing nurseries inside vineyard areas;
•= vineyards for wine production;
•= vineyards for consumer grapes and raisins;
•= complex cultivation pattern areas where vineyards parcels cover at least 50 % of the area.
This heading excludes:
•= vines mixed with arable land and/or meadows within a single parcel (class 241);
•= vines (single parcels (25 ha)) mixed with arable land and/or meadows interspersed with significant natural vineyard parcels covering less than 40 % of the area (class 243).

222 Fruit trees and berry plantations

Parcels planted with fruit trees or shrubs: single or mixed fruit species, fruit trees associated with permanently grassed surfaces. Includes chestnut and walnut groves.
Extension:
This class includes ligneous crops and chestnut and walnut tree orchards intended for fruit production.
This heading includes:
•= hop plantations;
•= plantations of berry shrubs, black and/or red currants, raspberries, gooseberries, blackberry crops;
•= willow plantation for wicker production;
•= fruit trees under greenhouses;
•= abandoned orchards which still preserve characteristic alignments;
•= fruit, orchards of apples, pears, plums, apricots, peaches, cherries, figs, quinces and other rosaceae;
•= ligneous crops : chestnut, walnut, almond, hazel, pistachio groves;
•= permanent florist plantations of roses;
•= plantation of vines associated to fruit trees within the same parcel where vines cover at least 40 % of the surface;
•= tropical fruit trees : avocados, bananas, guavas, mango, kiwis, passion fruits, papayas, pineapples, pomegranates, brazil nuts, cashew nuts, coconuts, nutmegs;
•= citrus fruit trees : oranges, lemons, mandarins, tangerines, grape fruits, pomelos;
•= fruit tree greeneries inside fruit tree plantations;
•= permanent industrial plants : coffee, cacao, mulberry, tea;
•= recently abandoned orchards where characteristic plantation structures (espaliers and climbers) are still visible;
•= scattered greenery.
This heading excludes:
•= strawberries (class 211);
•= olive groves (class 223);
•= vineyard (class 221);
•= fruit trees nurseries (class 211);
•= carob trees (class 311);
•= chestnut and walnut grove forests intended for wood production (class 311);

•= abandoned orchards where plantation structures have disappeared (class 324);
•= orchards located in permanently irrigated lands (class 212);
•= multi–year plants as asparagus (class 211).

223 Olive groves

Areas planted with olive trees, including mixed occurrence of olive trees and vines on the same parcel.

Extension:

This class includes Mediterranean plantations of Olea europaea ssp. europaea.

This heading includes:

•= olive groves shading herbaceous layer.

This heading excludes:

•= olive trees (Olea europaea ssp. sylvestris) as part of evergreen forest areas (class 311);
•= wild olive trees (Oleaster spp.) as part of sclerophyllous vegetation areas (class 323);
•= abandoned olive groves (class 323).

231 Pastures

Dense grass cover, of floral composition, dominated by graminacea, not under a rotation system. Mainly for grazing, but the fodder may be harvested mechanically. Includes areas with hedges (bocage).

Extension:

Grazing used by cattle.

Pastures can be described as extensively used grasslands with presence of farm structure such as: fences, shelters, enclosures, watering places, drinking trough, or regular agricultural works: mowing, drainage, hay making, agricultural practices, manuring.

This heading includes:

•= temporary and artificial pastures not under a rotation system which become permanent grasslands five years after ploughing. Significant number of natural vegetation species are present (as Taraxacum officinale, Ranunculus spp., Chrisanthemum leucantemum, Knautia arvensis, Achillea millefolium, Salvia spp., etc.);
•= abandoned arable land not under a rotation system used as pastures (after 3 years);
•= pastures may include patches of arable land which do not cover 25 % of the total surface;
•= humid meadows with dominating grass cover. Sedges, rushes, thistles, nettles, cover less than 25 % of the parcel surface;
•= scattered trees and shrubs (10–20% of surface).

This heading excludes:

•= military exercising grass fields (without grazing) (class 321);
•= salt meadow located in intertidal flat areas (class 423);
•= lawns inside sport and leisure facility areas (class 142);
•= high-productive natural alpine meadows far from houses and/or crops (class 321);
•= fodder crops (class 211);

241 Annual crops associated with permanent crops

Non-permanent crops (arable land or pasture) associated with permanent crops on the same parcel.

Extension:

Permanent crops are either in juxtaposition with arable land/pastures or located along the border of the parcels. The occupation rate of non-permanent crops is more than 50 %.

This heading includes:
•= non-permanent crop areas in which they are shaded by a fairly closed canopy of fruit trees or olive trees or vines;
•= non-permanent crop areas which are bordered by a reticulated structure of fruit tree lines, vine lines;
•= some parcels of permanent crops more or less irregular with annual crops/pastures less than 25 ha and inserted into a dominating non-permanent crop whole where none of these crops represents more than 75 %.
This heading excludes:
•= permanent crops associated with fruit trees (classes 22x);
•= non-permanent crops associated with forest trees (class 244);
•= natural grasslands shaded by permanent crops (class 324);
•= pastures planted with trees (class 231).

242 Complex cultivation patterns

Juxtaposition of small parcels of diverse annual crops, pasture and/or permanent crops.
Extension:
This class includes juxtaposition of small parcels of annual crops, city garden pastures, fallow land and/or permanent crops eventually with scattered houses or gardens.
This heading includes:
•= mixed parcels of permanent crops (fruit trees, berry plantations, vineyards and olive groves);
•= interstices of non-mineralised free spaces in discontinuous urban fabric < 25 ha;
•= complex cultivation pattern areas with scattered houses inserted within a patchwork structure when built-up parcels cover less than 30 % of the patchwork area;
•= summer settlement areas if infrastructure/road network is not visible;
•= hobby/city gardens;
•= parcels of grassland.
This heading excludes:
•= market gardening (class 211);
•= nurseries cultivation (class 211);
•= in spite of strong fragmentation, the areas with more than 75 % of area under rotation system (class 211);
•= complex cultivation patterns areas with scattered houses when they occupy more than 30 % of the patchwork area (class 112).

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

Areas principally occupied by agriculture, interspersed with significant natural areas.
Extension:
This class includes land occupied by agriculture with areas of natural or semi-natural origin (including wetlands and water bodies, out crops).
This heading includes:
•= parcels of arable land (smaller than 25 ha);
•= parcels of orchards, vineyards and berry plantations (smaller than 25 ha);
•= parcels of the rests of natural forests, groups of trees and shrubs (smaller than 25 ha);
•= small areas of water bodies;
•= sporadically occurring houses of rural settlement, or farm buildings

•= linear structures of trees organised for truffle production;
•= hortillonage (vegetable crops and canals);
•= agriculture and scattered heaps of stones.

This heading excludes:

•= agricultural land associated with small plots of fruit trees/olive groves without natural vegetation (class 242);
•= small islands of 243 made by mapping the forest units < 25 ha with a buffer of agricultural land to reach units > 25 ha;
•= areas in which the share of agricultural areas is above 75 % (classes 21x, 22x or 23x);
•= areas in which semi-natural areas predominate (more than 75 %) (classes 3xx).

244 Agro-forestry areas

Annual crops or grazing land under the wooded cover of forestry species.

Extension:

This class includes annual crops or grazing land and fallow land covering less than 50 % of the surface.

This heading includes:

•= areas of forest trees imbricated with fruit trees/olive trees while neither of the two kinds of trees dominates;
•= carob trees shading agricultural lands;
•= agricultural land shaded by palm trees in Mediterranean context.

Class **3**: Forest and semi-natural areas

Class 3.1 Forests

Areas occupied by forests and woodlands with a vegetation pattern composed of native or exotic coniferous and/or deciduous trees and which can be used for the production of timber or other forest products. The forest trees are under normal climatic conditions higher than 5 m with a canopy closure of 30 % at least. In case of young plantation, the minimum cut-off-point is 500 subjects by ha.

The 30 % minimum threshold to be considered can be illustrated by the three following figures.

Class 3.2 Shrubs and/or herbaceous vegetation associations

•= Temperate shrubby areas with Atlantic and alpine heaths, sub Alpine bush and tall herb communities, deciduous forest re-colonisation, hedgerows, dwarf conifers.

•= Mediterranean and sub-Mediterranean evergreen sclerophyllous bush and scrub (maquis, garrigue, mattoral, phrygana sensu lato), re-colonisation and degradation stages of broad-leaved evergreen forests.

•= Dry thermophilous grasslands of the lowlands, hills and mountain zone. Poor Atlantic a sub-Atlantic mat-grasslands of acid soils; grasslands of decalcified sands; Alpine and sub Alpine grasslands. Humid grasslands and tall herb communities; lowland and mountain mesophile pastures and hay meadows.

Class 3.3 Open spaces with little or no vegetation

Natural areas covered with little or no vegetation, including open thermophile formations of sandy or rocky grounds distributed on calcareous or siliceous soils frequently disturbed by erosion, steppic grasslands, perennial steppe-like grasslands, meso- and thermo-Mediterranean xerophile, mostly open, short-grass perennial grasslands, alpha steppes, vegetated or sparsely vegetated areas of stones on steep slopes, screes, cliffs, rock fares, limestone pavements with plant communities colonising their tracks, perpetual snow and ice, in land sand-dune, coastal sand-dunes and burnt areas.

311 Broad-leaved forest

Vegetation formation composed principally of trees, including shrub and bush understoreys, where broad-leaved species predominate.

Extension:

This class includes areas with a crown cover of more than 30 % or a 500 subjects/ha density for plantation structure, broad-leaved trees represent more than 75 % of the planting pattern. In case of young plants or seedlings the proportion of broad-leaved plants to be considered is at least 75 % of the total amount of plants.

This heading includes:

•= plantations of eucalyptus;

•= young plantations of deciduous trees;

•= walnut trees and chestnut trees used for wood production included into forest area context;

•= sparse broad-leaved forests with a 30 - 60 % bracket of crown cover;

•= evergreen broad-leaved woodlands composed of sclerophyllous trees (mainly *Quercus Ilex*, *Quercus Suber*, *Quercus Rotondifolia*);

•= arborescent mattoral with sclerophyllous species;

•= olive-carob forests dominated by *Olea europaea sp. sylvestris*, *Ceratonia siliqua*;

•= palm groves woodlands (one single case found in Greece);

•= holly woods dominated by *Ilex aquifolium*;

•= tamarix woodlands;
•= broad-leaved wooded dunes;
•= transitional woodland areas when the canopy closure of the trees cover more than 50 % of the area and if their average breast diameter is at least 10 cm;
•= denuded spots and grassland;
•= clear–cuts (applied for European Union countries)**.

This heading excludes:
•= burnt areas inside forest areas (classes 32x or 334);
•= non-evergreen coniferous trees dominated by larix species (class 312);
•= woodland areas composed of broad-leaved trees smaller than 5 m high (class 322);
•= vegetated areas where the crown cover of the broad-leaved trees is less than 25 % (class 324);
•= forest nurseries specialised in reproduction situated inside broad-leaved wooded areas (class 324);**
•= clear-cuts (class 324, applied for Phare countries)**;
•= forest nurseries outside forests for commercial purpose (class 211);
•= wooded parks (class 141).

312 Coniferous forest

Vegetation formation composed principaly of trees, including shrub and bush understoreys, where coniferous species predominate.

Extension:

Coniferous trees represent more than 75 % of the formation. In case of young plants or seedlings, the proportion of coniferous plants to be considered is at least 75 % of the total amount of plants and their texture is very similar to a surrounding coniferous forest texture.

This heading includes:
•= non-evergreen coniferous trees woodland composed of larch trees (*Larix spp.*);
•= young plantations of coniferous trees;
•= coniferous wooded dunes;
•= arborescent mattoral with dominating *Juniperus oxycedrus/phoenica*;
•= coniferous wooded land;
•= Christmas tree plantations;
•= denuded spots and grassland;
•= clear-cuts (applied for European Union countries)**.

This heading excludes:
•= dwarf coniferous trees as *Pinus mugo* (class 322);
•= sclerophyllous trees (class 311);
•= vegetated areas where the crown cover of coniferous trees is less than 30 % (class 324, 231, 321);
•= forest nurseries specialised in reproduction situated inside coniferous wooded areas (class 324);**
•= clear-cuts (class 324, applied for Phare countries).**
** See the general remarks concerning heading 31x.

313 Mixed forest

Vegetation formation composed principally of trees, including shrub and bush understoreys, where neither broad-leaved nor coniferous species predominate.

Extension:

Mixed forests with a crown cover of more than 30 % or a 500 subjects/ha density for plantation structure. The share of coniferous or broad-leaved species does not exceed 25 % in the canopy closure.

This heading includes:

•= mixed-forest wooded dunes;

•= denuded spots and grassland;

•= sporadically occurying shrub formations;

•= clear–cuts (applied for European Union countries)**.

This heading excludes:

•= young plantations (class 324)**;

•= forest nurseries specialised in reproduction situated inside mixed-forest areas (class 324)**;

•= clear-cuts (class 324, applied for Phare countries)**;

•= burnt areas inside mixed-forest areas (class 3.3.4);

•= woodlands with mixed species trees smaller than 5 m high (class 3.2.2);

•= vegetated areas where the crown cover of mixed species trees is less than 30 % (class 3.2.4, 231, 321).

** See the general remarks concerning heading 31x.

321 Natural grassland

Low productivity grassland. Often situated in areas of rough, uneven ground. Frequently includes rocky areas, briars and heathland.

Extension:

Natural grasslands are areas with herbaceous vegetation (maximum height is 150 cm and gramineous species are prevailing) which cover at least 75 % of the surface covered by vegetation which developed under a minimum human interference (not mowed, fertilized or stimulated by chemicals which might influence production of biomass); here belong for instance grass formations of protected areas, karstic areas, military training fields, etc. (even though the human interference cannot be altogether discarded in quoted areas, it does not suppress the natural development or species composition of the meadows), areas of shrub formations of scattered trees.

This heading includes:

•= saline grasslands grown on temporary wet areas of saline soils;

•= humid meadows where sedges, rushes, thistles, nettles cover more than 25 % of the parcel;

•= natural grasslands with trees and shrubs if they do not cover more than 25 % of the surface to be considered;

•= high-productive Alpine grasslands far from houses, crops and farming activities;

•= herbaceous military training areas;

•= grasslands which can be grazed, never sown and not otherwise managed by way of application of fertilizers, pesticides, drainage or reseeding except by burning;

•= grasslands with a yearly productivity less than 1.500 units of fodder/ha;

•= herbaceous grass covered composed of non-palatable gramineous species such as *Molinia spp.*and *Brachypodium spp.*;

•= derelict natural grassland where ligneous vegetation cover less than 75 % of the area;

•= grasslands found on calcareous soils with a high proportion of calcicole species of limestone, chalk Machair or Karst;

•= grasslands dotted with bare rock areas which represent less than 25 % of the surface.

This heading excludes:

•= grey dunes (class 331);

•= swampy grassland (class 411);
•= fallow land (class 211).

322 Moors and heathland

Vegetation with low and closed cover, dominated by bushes, shrubs and herbaceous plants (heather, briars, broom, gorse, laburnum, etc.).

Extension:

This class includes temperate shrubby area vegetation (climax stage of development): includes dwarf forest trees with a 3 m maximum height in climax stage.

This heading includes:

•= wet heath distributed on humid or semi-peaty soils (peat depth < 30 cm) with *Erica tetralix/ciliaris, Sphagnum spp.* and *Molinia spp.*;
•= *Pinus mugo* coverage above the upper tree limit in the Alpine zone or in the bottom of large depressions with temperature inversion;
•= maritime, prostrate, wind-swept and cushiony heaths with maritime ecotypes;
•= heath and scrub formation in Atlantic, sub-Atlantic and sub-continental areas with gorse (*Ulex spp.*), vaccinium heaths (*Calluna vulgaris, Vaccinium spp.*), heather (*Erica spp.*), bracken or gorse (*Genista spp.*), bilberry heaths (*Vaccinium myrtillus*), briar patch (*Rubus spp.*);
•= moors in supra-Mediterranean area with box trees and gorse, hedgehog-heaths (*Buxus spp., Astragalus spp., Bupleurum spp.*, etc.);
•= sub Alpine tall herbs with dominating bushy facies (*Calluna spp., Vaccinium spp., Rubus spp., Juniperus nana*, etc.);
•= arctic moors areas with moss, lichen, gramineous coverage and small dwarf or prostrate shrub formations (*Betula nana, Salix lapponum, Salix glauca, Juniperus alpina, Dryas spp.*);
•= thickets and brush woods in temperate climate areas (box, bramble thickets, broom fields, gorse thickets, braken fields, common juniper-scrubs);
•= brush woods and bush-like forest in Alpine area with dwarf mountain pine scrub or green alder scrub (*Pinus mugo ssp. mughus* and *Alnus spp.*) Alpine willow brush, etc., accompanied by *Rhododendron spp.*;

•= thickets and bush-like forest in arctic area with *Betula nana* and *Salix lapponum/glauca spp.*;
•= abandoned crops where ligneous/semi-ligneous species cover more of 25 % of the surface;
•= coastal dunes (so-called brown dunes) covered and fixed with shrubs (*Hippophae spp., Empetrum spp., Salix spp.*);
•= herbaceous coverage formations mainly composed of non-palatable gramineous species such as *Molinia spp., Brachypodium spp.*, etc.

This heading excludes:

•= low maquis/mattoral vegetation (class 323);
•= heathland under recolonizing process where tree-like species cover more than 30 % of the surface (class 324).

323 Sclerophylous vegetation

Bushy sclerophyllous vegetation, includes maquis and garrigue. In case of shrub vegetation areas composed of sclerophyllous species such as Juniperus oxycedrus and heathland species such as Buxus spp. or Ostrya carpinifolia with no visible dominance (each species occupy about 50% of

the area), priority will be given to sclerophyllous vegetation and the whole area will be assigned class 323.

Extension:

This class includes evergreen sclerophyllous bushes and scrubs which compose maquis, garrigue, mattoral and phrygana.

This heading includes:

•= mattoral of arid zone with pre-desert brushes and tall *Ziziphus lotus*;

•= laurrel mattoral with *Laurus nobilis*;

•= cypress mattoral with native or planted cypressus;

•= tree-spurge formation with dense stands of *Euphorbia dendroides* in thermo-Mediterranean area;

•= palmetto brush formations with dominating *Chamaerops humilis*;

•= pre-desert scrub with halo-nitrophyllous scrubs and gypsum scrubs: jujube brush (*Ziziphus lotus*), shrubes of African affinities (spiny brush formation of accacia);

•= abandoned olive groves.

This heading excludes:

•= arborescent mattorals which are a pre- or post-broad-leaved evergreen forest formation with more or less dense arborescent cover with a usually thick high evergreen shrub stratum organised around evergreen oaks (*Quercus suber/ilex/rotundifolia*) olive trees or pines the crown cover of which is more than 30 % (class 3.1.1). If the crown cover is less than 30 %, it is assigned 3.2.4.

324 Transitional woodland/shrub

Bushy or herbaceous vegetation with scattered trees. Can represent either woodland degradation or forest regeneration/recolonisation.

Extension:

Areas of natural developmental forest formations (young broad–leaved and coniferous wood species with herbaceous vegetation and dispersed solitary trees) for instance; in abandoned meadows and pastures or after calamities of various origin, part of this class may be also various degenerative stages of forest caused by industrial pollution, etc.

This heading includes:

•= arborescent mattorals which are pre- or post-formation of broad-leaved evergreen forest with a usually thick evergreen shrub stratum composed of evergreen oaks (*Quercus suber/ilex/ rotundifolia*), olive trees, carob trees or pines the crown cover density of which is less than 30 % of the surface;

•= agricultural lands (classes 2xx) under recolonizing process with occurrence of forest trees which cover more than 30 % of the surface (scattered trees or small plots of forests);

•= abandoned fruit tree plantations and orchards;

•= clear cuts in forest areas;

•= young plantations;

•= forest nurseries inside forests areas;

•= natural grassland areas with small forests < 25 ha and/or with trees intermixed which cover more than 30 % of the surface;

•= open clear-felled or regeneration areas with regrowing during transition stage which last for maximum 5-8 years;

•= forest burning areas which do not show black tones any more in the satellite image but are still visible;

•= heavily damaged forests by wind, snow-brake or acid rains and other pollution with more than 50 % dead trees;

•= marginal zones of bogs with a vegetation composed of shrubs and pine bogs which

cover more than 50 % of the surface;
•= bare rocks with scattered trees that cover more than 10 % of the surface.
This heading excludes:
•= transitional woodland areas when the area has been overgrown with forest vegetation. The canopy closure which is at least 50 % and if the average breast diameter of trees is at least 10 cm (class 311);
•= abandoned olive groves (class 323);
•= agricultural lands (classes 2xx) with occurrence of forest vegetation with an overgrowing rate less than 50 % (class 243);
•= stable/climax tree-like forest formations with a tree height less than 4 m and *Pinus mugo* forests (class 322);
•= arborescent mattoral with trees of which the crown cover is more than 30 % (class 311).

331 Beaches, dunes, and sand plains

Beaches, dunes and expanses of sand or pebbles in coastal or continental locations, including beds of stream channels with torrential regime.
Extension:
This class includes supra-littoral beaches and dunes developed at the back of the beach from high water mark towards land.
This heading includes:
•= river dune formation in the immediate vicinity of great rivers;
•= inland and lacustrine dunes;
•= shifting dunes with mobile, unvegetated or open grasslands (white dune);
•= grey dunes fixed, stabilised or colonised by more or less closed perennial grasslands;
•= machair formations (nature coastal sand-plain with more or less surface and grassland vegetation);
•= ergs (continental dune field located in desert);
•= accumulation of gravels along lower section of Alpine rivers.
This heading excludes:
•= inland dune heaths (crowberry and heather brown dunes) (class 322);
•= inland dunes thickets occupied by dense formations of shrubs including seabuckthorn, privet, elder, willow, gorse or broom often festooned with creepers (class 322);
•= dune juniper thickets and woods (class 32x);
•= dune sclerophyllous scrubs (class 323);
•= wooded dune (class 31x);
•= humid dune-slacks (class 411);
•= unvegetated gravels on steep Alpine mountain side (class 332);
•= vegetated islands inside stream beds (class 3xx).

332 Bare rock

Scree, cliffs, rock outcrops, incuding active erosion, rocks and reef flats situated above the high-water mark.
This heading includes:
•= unvegetated abandoned extraction sites;
•= sparsely vegetated areas where 75 % of the land surface is covered by rocks;
•= stable rocks with limestone pavements, block litter and mountain-top-debris;

•= unvegetated lapiaz;
•= sites and products of recent volcanic activities, volcanic ash and lapilli fields, barren lava fields;
•= unvegetated supra-littoral rocky zones.
This heading excludes:
•= white dunes (class 331);
•= mediolittoral rocky sea beds (class 423);
•= bare rocks with scattered trees that cover more than 10 % of the surface (class 324).

333 Sparsely vegetated areas

Includes steppes, tundra and badlands. Scattered high-altitude vegetation.
Extension:
Scattered vegetation is composed of gramineous and/or ligneous and semi-ligneous species for determining the ground cover percentage, excluding cryptograms.
This heading includes:
•= sparsely vegetated and unstable areas of stones, boulders, or rubble on steep slopes where the vegetation layer covers between 15 % and 50 % of the surface;
•= sub-desertic steppes with gramineous species (*Artemisia spp.*) mixed with alfa (*Stipa spp.*) when they cover between 15 % and 50 % of the surface;
•= vegetation of 'lapie' areas or limestone paving;
•= bare soils inside military training areas;
•= karstic areas of gramineous, ligneous and semi-ligneous vegetation.
This heading excludes:
•= windblown part of dune areas (class 331);
•= areas where ground cover more than 85 % of the surface (class 332);
•= areas where the vegetation layer covers more than 50 % of the surface (class 321);
•= dense alfa (*Stipa ssp.*) coverage (class 321).

334 Burnt areas

Areas affected by recent fires, still mainly black.
Extension:
This class includes burnt forest areas, moors and heathlands, transitory forest-shrub formations, areas with sparse vegetation.
This heading includes:
•= burns which are younger than three years and still visible in the satellite images;
•= all natural and semi-natural vegetated areas.
This heading excludes:
•= human farming management by burning arable lands (class 211).

335 Glaciers and perpetual snow

Land covered by glaciers or permanent snowfields.
This heading includes:
•= glaciers and perpetual snow;
•= bare rocks.

Class **4**: Wetlands

Class 4.1 Inland wetlands
Areas flooded or liable to flooding during the great part of the year by fresh, brackish or standing water with specific vegetation coverage made of low shrub, semi-ligneous or herbaceous species. Includes water-fringe vegetation of lakes, rivers, and brooks and of fens and eutrophic marshes, vegetation of transition mires and quaking bogs and springs, highly oligotrophic and strongly acidic communities composed mainly of sphagnum growing on peat and deriving moistures of raised bogs and blanket bogs.

Class 4.2 Coastal wetland
Areas which are submerged by high tides at some stage of the annual tidal cycle. Includes salt meadows, facies of saltmarsh grass meadows, transitional or not to other communities, vegetation occupying zones of varying salinity and humidity, sands and muds submerged for part of every tide devoid of vascular plants, active or recently abandoned salt-extraction evaporation basins.

411 Inland marshes

Low-lying land usually flooded in winter, and more or less saturated by water all year round.

Extension:
This class includes non-forested areas of low-lying land flooded or liable to flooding by fresh, stagnant or circulating water. Covered by specific low ligneous, semi-ligneous or herbaceous vegetation.

This heading includes:
- = fens and transitional bogs without peat deposition or on peaty ground (peat layer is less than 30 cm thick) with specific vegetation composed of reeds, bulrushes, rushes, willows, sedges and tall herbs, sphagnum hummocks, often with alder or willows and other water plants;
- = marsh vegetation located in margin zones of raised bogs;
- = water-fringe vegetation of reed beds, sedge communities, fen-sedge beds, tall rush swamps, riparian cane formations;
- = high floating vegetation;
- = inland saline (alkali) marshes (prevailing arheic).

This heading excludes:
- = humid meadows (water logging of between 10 and 30 cm depth) (class 231);
- = rice fields (class 213);
- = free water space in wetlands (class 512);
- = salt marshes (class 421);
- = salt meadows in intertidal zone (class 421);
- = polders with reticulated channels bordered by hydrophilic vegetation (class 2xx);
- = humid forests with a crown cover more than 30 % (class 31x);
- = low floating aquatic vegetation (class 512).

412 Peatbogs

Peatland consisting mainly of decomposed moss and vegetable matter. May or may not be exploited.

This heading includes:
- = minerotrophic peat bogs fed by ground water or streams with mosses (*Drepanocladus spp.*) and *Carex spp.* or schoenus in alcaline bogs with occurrence of *Calix spp.*, *Betula*

spp. and *Alnus spp.*;
•= ombrotrophic peat bogs fed only by direct precipitation with sphagnum species which are abundant and dominant with other acidophilous plants such as *Eriophorum vaginatum, Scirpus spp., Carex spp., Vaccinium oxicoccos, Andromeda spp., Drosera spp.* and lichens;
•= blanket bogs with sphagnum species and *Narthecium spp., Molinia spp., Scirpus spp., Shoenus spp., Erophiorum spp.*;
•= boreal peat bogs with reticulated structure (aapa) with *Sphagnum spp., Empetrum spp., Vaccinium spp., Betula nana, Salix nana, Carex spp., Eriophorium spp., Utriculara spp., Drosera spp.*;
•= peat extracting areas;
•= fossil arctic peat bogs (palsa) with *Vaccinium spp., Betula nana, Salix lapponum* and *Salix glauca*, lichens and *Carex spp.*
This heading excludes:
•= bog eye > 25 ha : large pool or lake occurring near the centre of raised bogs (class 512);
•= transitional bogs on peaty soils (< 30 cm thick peat) (class 324);
•= wooded peat bogs (class 31x);
•= drained peat bogs (class 411);
•= abandoned peat milling areas (class 32x);
•= upland areas of blanket peat bogs where peat does not accumulate dominated by nardus or other deciduous grasses (class 321).

421 Salt marshes
Vegetated low-lying areas, above the high-tide line, susceptible to flooding by seawater. Often in the process of filling in, gradually being colonized by halophilic plants.
This heading includes:
•= intertidal sand, silt or mud-based habitats colonized by halophytic grasses such as: *Puccinelia spp., Spartina spp.*, rushes such as *Juncus spp.* and *Blismus rufus* and herbs such as *Limonium spp., Aster tripolium, Slicornia spp.* Includes all flowering plant communities which are submerged by high tides at some stage of the annual cycle;
•= salt meadow shep areas.
This heading excludes:
•= inland salt marshes with halophile and gypsophile communities (classes 333 or 411);
•= humid meadows of low vegetation dominated by *Juncus gerardis, Carex divisa, Hordeum marinum* or *Trifolium spp.* and *Lotus spp.* of the edge of brackish lagoons (class 411).

422 Salines
Salt-pans, active or in process of abandonment. Sections of salt marsh exploited for the production of salt by evaporation. They are clearly distinguishable from the rest of the marsh by their parcellation and embankment systems.
This heading includes:
•= salinas organised for breeding shellfish, fishes;
•= salt pans;
•= sea water.
This heading excludes:
•= inland salinas (class 131).

423 Intertidal flats

Generally unvegetated expanses of mud, sand or rock lying between high and low water marks. 0 m contour on maps.

Extension:

Warning: 0 m marine contour on maps is not always based on the same reference system and might differ up to 2 m between European countries.

This heading includes:

- = intertidal seaweed-covered boulders, unvegetated shores, covered by shattered rocks or boulders, cliffs and outcropping base-rocks.

This heading excludes:

- = salt marshes (class 421);
- = broadening of rivers entering the sea (class 522);
- = part of lagoon area directly connected to the sea which is artificially separated (class 521).

Class **5**: Water bodies

Class 5.1 Inland waters
Lakes, ponds and pools of natural origin containing fresh (i.e non-saline) water and running waters made of all rivers and streams. Man-made fresh water bodies including reservoirs and canals.

Class 5.2 Marine waters
Oceanic and continental shelf waters, bays and narrow channels including sea lochs or loughs, fiords or fjords, rya straits and estuaries. Saline or brackish coastal waters often formed from sea inlets by sitting and cut-off from the sea by sand or mud banks.

511 Water courses

Natural or artificial water-courses serving as water drainage channels.
Includes canals. Minimum width for inclusion: 100 m.
This heading includes:
•= sand or gravel accumulations along streams < 25 ha,
•= rivers which have been canalised.
This heading excludes:
•= water bodies areas connected to watercourses (class 512),
•= hydroelectric plant located on watercourses > 25 ha (class 121).

512 Water bodies

Natural or artificial stretches of water.
This heading includes:
•= low floating aquatic vegetation with species such as *Nuphar spp.*, *Nymphaea spp.*, *Potamageton spp.* and *Lemna spp.*;
•= archipelago of lakes inside land areas;
•= water surfaces used for fresh-water fish-breeding activities.
This heading excludes:
•= surface plant species characteristic for standing water (e.g. *Typha latifolia*, *Carex riparia*, *Glyceria maxima*, *Sparganium erectum* and *Phragmites communis* (class 411);
•= liquid waste (class 132).

521 Coastal lagoons

Stretches of salt or brackish water in coastal areas which are separated from the sea by a tongue of land or other similar topography. These water bodies can be connected to the sea at limited points, either permanently or for parts of the year only.
Extension:
This class includes
This heading includes:
•= only water surface, vegetation fringe should be separated;
•= estuarine lagoon;
•= salt or brackish water surface remaining at low tide;
•= lagoons organised for breeding shellfish.
This heading excludes:
•= salt marshes (class 421);
•= water courses (class 511);
•= beaches (class 331);

●= fresh water bodies along shoreline (class 512).

522 Estuaries

The mouth of a river within which the tide ebbs and flows.

This heading includes:

●= the water and the channel bed with the fringing vegetation zone < 25 ha.

This heading excludes:

●= bays and narrow channel (class 523);

●= fjords or fiards, ryas and straits (class 523);

●= fringing vegetation along the estuary channel bed > 25 ha (class 421).