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LIPS QA 2011 workshop, Tallinn 22nd November 2011

LPIS QA Training 2011

Tallinn, 22nd November 2011

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GeoCAP Action - MARS Unit - JRC Ispra

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Agenda

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1. Essential ATS elements
- Implementation Conformance Statement
- Purpose and scope of the Eligibility Profile

2. Performing the ETS correctly 1/2
- Reading the guidance
- Setting the environment, preparing data and discarding zones
- Inspecting the LUI and establishing non-conformities

3. Performing the ETS correctly 2/2
- Inspection errors identified during the screening of the 2010 ETS package relevant for 2011
- Understanding the Support articles
- Templates, Schemas and Tools
- The LPISQA portal

4. Discussion + Q&A
- Recent MS questions
- Technical issues only!

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Implementation Conformance Statement

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Implementation conformance statement

- **Mandatory and structured part:**
  - Eligibility profile (XML)
  - List of applicable waivers for contamination (XML)
- **Informative, textual part:**
  - Payment scheme
  - Type of Reference Parcel
  - RP Identifier
  - Coordinate Reference System
  - Flowchart for operations
  - Findings of recent audit and mitigation actions

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Purpose and scope of the Eligibility Profile

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Outline

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- **Eligibility profile explained**
  - General Overview
  - Elements of the Eligibility Profile
  - Eligibility and land cover
- **Practical instructions for LPIS QA 2012**
  - Step-by-Step creation of the profile
  - The Pro-rata land cover
  - Landscape Features
- **Support in 2011 LPIS QA**
  - JRC follow-up in 2012
  - Questions from EU Member States
- **LCCS user manual**
  - General Overview
  - Example of pro-rata class creation with LCCS
- **Q&A**

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Eligibility Profile explained

General Overview

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What is the Eligibility Profile?

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A conversion table allowing raw ETS observations (mapped land cover features) to be expressed in eligibility terms (**direct aids only!!)**.

In other words, it converts the results of the land cover mapping into “eligible hectares or features found”.

It provides the correct quantitative determination within a single methodology

by joining the common pan-European qualitative aspect of the land cover features with the national rules for support schemes applied to the measured areas.

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Purpose of the Eligibility Profile

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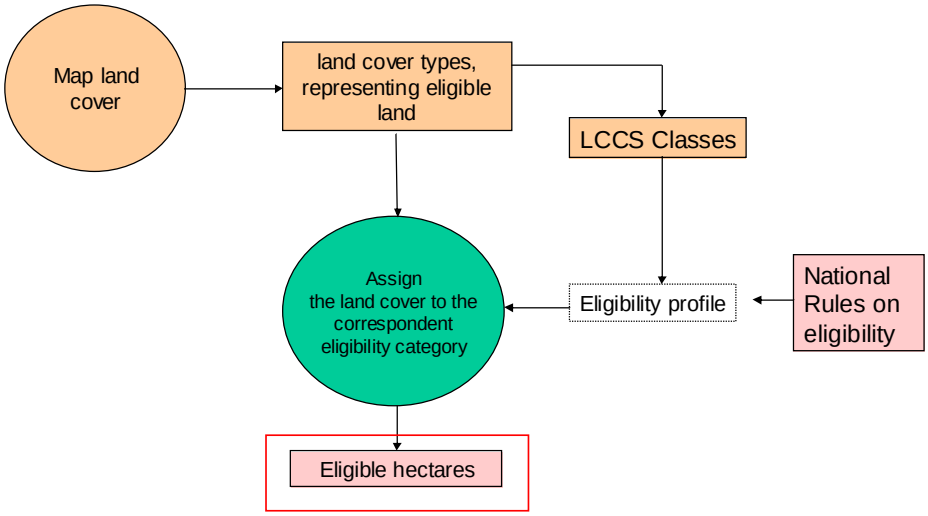

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Structure of the Eligibility Profile

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Land Cover Class	Land cover Class Definition	Minimum Mapping Legend	User-defined Legend Code	LCCCode	Representation of eligible land (direct aid) (Yes/Pro rata/Conditional)	Eligible Hectare factor (as percentage of the geometric area of the mapped feature)
Arable Land (general)	**Continuous Field(s) Of Herbaceous Crop(s).**	**Arable land**	**A**	**10099**	**YES**	**100%**
Arable Land (rainfed with fallow system)	Herbaceous Crop(s) ., With Fallow System	Arable land	A	10660	YES	100%
Arable Land (temporary resting)	Shifting Cultivation Of Herbaceous Crop(s)	Arable land	A	10224	YES	100%
Arable Land with Patches of Trees (up to 15% of the surface)	Herbaceous Crop(s) ., With Fallow System / Sparse Trees And Sparse Herbaceous	n/a	tbd	10660 / 20505	PRO RATA	Single value between 0% and 100%
Arable Land with Patches of Scattered Trees (up to 4% of the surface)*	Herbaceous Crop(s) ., With Fallow System / Scattered Trees And Sparse Herbaceous	Arable land	A	10660 / 20505-9032	PRO RATA	Single value between 0% and 100%
Agriculture with Cultivated Trees (intercropping)	Rainfed Herbaceous Crop(s) / Permanently Cropped Area With Rainfed Tree Crop(s)	n/a	tbd	10222 / 11492	YES	100%
Permanent pasture (self-seed or sown)	**Closed Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species // Permanently Cropped Area With Graminoids Crop(s) Dominant Crop: Fodder - Fodder grasses**	**Grassland**	**G**	**20439-12763-T2 // 11512-S0701**	**YES**	**100%**

Structure of the Eligibility Profile (2)

	Landscape Elements					
Field margins (sparsely vegetated)	Bare Soil And/Or Other Unconsolidated Material(s) Scattered Vegetation: Scattered Vegetation Present	n/a	tbd	6005-U1(3)[Z7]	CONDITIONAL	0% or 100%
Stone Walls	Linear Built Up Area(s) Built-up object: Other – Stone wall	n/a	tbd	5002--A44Zp1	CONDITIONAL	0% or 100%
Hedgerows	Permanently Cropped Area With Small Sized Field(s) Of Rainfed Tree Crop(s) // Permanently Cropped Area With Small Sized Field(s) Of Rainfed Shrub Crop(s)	n/a	tbd	10176(3)[Z1] // 1021110285	CONDITIONAL	0% or 100%
Ponds	Artificial Waterbodies (Standing) Scattered Vegetation: Scattered Vegetation Present	n/a	tbd	7001-5-U1(3)[Z2]	CONDITIONAL	0% or 100%
Ditches	Artificial Waterbodies (Flowing) Scattered Vegetation: Scattered Vegetation Present	n/a	tbd	7001-1-U1(3)[Z3]	CONDITIONAL	0% or 100%
Row of trees	Row of trees Floristic Aspect: Groups of Plant Species	n/a	tbd	20282-T2(3)[Z4]	CONDITIONAL	0% or 100%

The values of the "Eligible Hectare Factor" for the classes assigned as "pro-rata" or "conditional", have to be in line with the Reg. eligibility conditions.

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Eligibility Profile explained

Elements of the Eligibility Profile

Structure of the Eligibility Profile (3)

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Column Name	Description	Data Type
Land Cover Class	User-defined name of the land cover class	TEXT
Land Cover Class Definition	Brief Semantic Description of the land cover class, according to LCCS methodology	TEXT
Minimum Mapping Legend	Minimum level of detail of the land cover interpretation, that needs to be achieved by the operator for each class.	TEXT
User-Defined Legend code	User-defined legend entry, which is used by the operator to code the delineated land cover	TEXT
LCCCode	Code of the land cover class, generated by the LCCS	TEXT
Representation of eligible land (direct aid)	Classifies the land cover type, according to its "ability" to represent the eligible land	TEXT (multiple choice)
Eligible Hectare factor	Determines how the eligible area is calculated for a mapped land cover feature, described by the given land cover (LCCS) class:	NUMBER (%)

Elements of the Eligibility Profile (1)

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"Land cover class" shows the name of the LC class, as defined in the nation-specific nomenclature, preferably (but not compulsory) translated in English

- For example "broussailles" for a specific landscape feature in LU; or "dehesas" for a specific land cover type in Spain

"Land cover class Definition" shows a short semantic description of the land cover class, as derived from the LCCS codification

- JRC uses the FAO/UN Land Cover Classification System (LCCS), which is the base for the draft ISO 19144-2 Geographic information – Classification Systems Part 2

"LCCCode" shows the unique code generated by the FAO software for LCCS codification

- It is a short version of the Boolean formula holding the combination of the classifiers
- For example "Arable Land with Patches of Trees" has a Boolean formula "A3XXB5C2D1 // A3A14B2XXXXXXF2F4F10G4-A15", and LCCcode "10656 // 20505-6022"

Elements of the Eligibility Profile (2)

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"Representation of eligible land" shows the "ability" for each land cover class, to represent the eligible land:

•YES: the given class represents a "single" land cover and its semantic description is sufficient to unambiguously represent "pure" eligible land

•PRO RATA: the given class represents "mixed" land cover and its semantic description could be sufficient to unambiguously represent those cases of "contaminated" eligible land, where reduction coefficient need to be applied to calculate the maximum eligible area

•CONDITIONAL: the given class represents "single" or "mixed" land cover and its semantic description is not-sufficient to unambiguously describe eligible land, without supplementary information from the national legislation and local context.

Elements of the Eligibility Profile (3)

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"**Eligible Hectare factor"** determines how the eligible area is calculated for a mapped land cover feature, described by the given land cover (LCCS) class:

•100%: the eligible area equals to the geometric area of the digitized (mapped) land cover feature

•Between 0% and 100%: the eligible area is a pre-defined percentage from the geometric area of the digitized (mapped) land cover feature.

- the value depends on the nature of the mixed land cover class (its semantic description), national rules for the supporting schemes and specific agriculture practices.

•0% or 100%: the eligible area is either 0% or 100% from the physical area of the digitized (mapped) land cover feature,

- depending on the rules in the national legislation and the country (or region)-specific agriculture practices, as well as the particular spatial context of the individual feature.

Elements of the Eligibility Profile (4)

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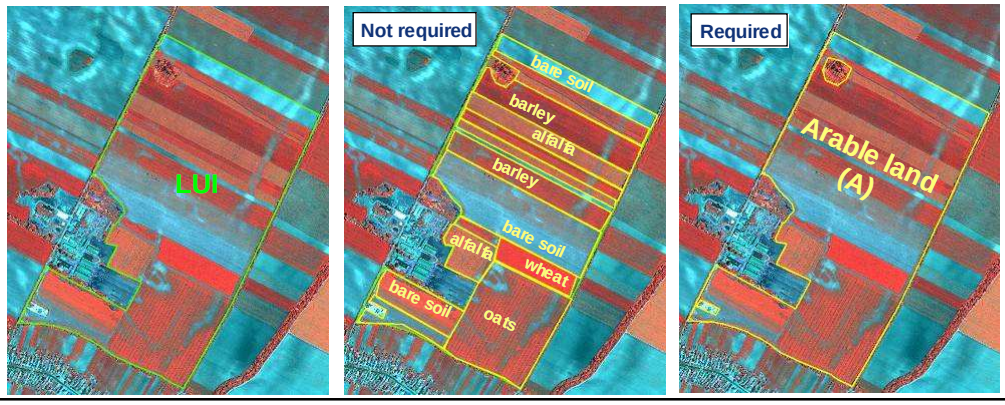
"Minimum Mapping Legend" shows the so-called "Aggregated LC classes"

- **representing the land cover identified in the regulations (R 1120/2009 and R 73/2009)**
- **for SAPS and SPS (no coupled payments)**
- independent **of the time of observation**

Detail of the land cover interpretation - minimum at the level of the aggregated classes



Elements of the Eligibility Profile (5)

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"User-Defined Legend Code" is a unique Land cover class" shows the name of the LC class with 2 capital letter abbreviation for easier class assignment during LC mapping.

Land Cover Class	Land cover Class Definition	Minimum Mapping Legend	User-defined Legend Code	LCCCode	Representation of eligible land (direct aid) (Yes/Pro rata/Conditional)	Eligible Hectare factor (as percentage of the geometric area of the mapped feature)
Arable Land (general)	Continuous Field(s) Of Herbaceous Crop(s).	Arable land	A	10099	YES	100%
Arable Land (rainfed with fallow system)	Herbaceous Crop(s) ., With Fallow System	Arable land	A	10660	YES	100%
Arable Land (temporary resting)	Shifting Cultivation Of Herbaceous Crop(s)	Arable land	A	10224	YES	100%
Arable Land with Patches of Trees (up to 15% of the surface)	Herbaceous Crop(s) ., With Fallow System / Sparse Trees And Sparse Herbaceous	n/a	tbd	10660 / 20505	PRO RATA	between 0% and 100%
Arable Land with Patches of Scattered Trees (up to 4% of the surface)*	Herbaceous Crop(s) ., With Fallow System / Scattered Trees And Sparse Herbaceous	Arable land	A	10660 / 20505-9032	PRO RATA	between 0% and 100%
Agriculture with Cultivated Trees (intercropping)	Rainfed Herbaceous Crop(s) / Permanently Cropped Area With Rainfed Tree Crop(s)	n/a	tbd	10222 / 11492	YES	100%
Permanent pasture (self-seed or sown)	Closed Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species // Permanently Cropped Area With Graminoids Crop(s) Dominant Crop: Fodder - Fodder grasses	Grassland	G	20439-12763-T2 // 11512-S0701	YES	100%

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Example

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Table 2 from Annex III Land Cover Class	Land cover Class Definition	LCCCode	Representation of eligible land (direct aid) (Yes/Pro rata/Conditional)	Eligible Hectare factor (as percentage of the geometric area of the mapped feature)
Arable Land (general)	Continuous Field(s) Of Herbaceous Crop(s) .	10099	YES	100%
Arable Land (rainfed with fallow system)	Herbaceous Crop(s) . With Fallow System	10660	YES	100%
Arable Land (temporary resting)	Shifting Cultivation Of Herbaceous Crop(s)	10224	YES	100%
Arable Land with Patches of Trees (v1)	Herbaceous Crop(s) . With Fallow System / Sparse Trees And Sparse Herbaceous	10660 / 20505	PRO RATA	between 0% and 100%
Arable Land with Patches of Scattered Trees (v2)	Herbaceous Crop(s) . With Fallow System / Scattered Trees And Sparse Herbaceous	10660 / 20505-9032	PRO RATA	between 0% and 100%
Permanent pasture (sown)	Permanently Cropped Area Graminoid Crop(s) Dominant Crop: Fodder - Fodder grasses	10822-S0701	YES	100%
Permanent pasture (self-seed)	Closed Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species	20439-12763-T2	YES	100%
Permanent pasture (self-seed with shrubs)	Open Medium Tall Grassland With Medium High Shrubs Floristic Aspect: Groups of Plant Species	20488-12292-T2	PRO RATA	between 0% and 100%
Permanent crops (family gardens)	Permanently Cropped Area With Small Sized Field(s) Of Irrigated Non-Graminoid Crop(s)	11135	YES (SAPS only)	100%
Permanent crops (orchards)	Permanently Cropped Area With Rainfed Tree Crop(s)	10153	YES	100%

Two agriculture classes found:

Arable Land

Corresponds to Class "Arable Land (general)" – LCCSCode 10099

Eligible Hectare Factor is 100%

Eligible area is equal the geometry area of the digitized polygon

Grassland

Corresponds to Class "Perm pasture (sown) – LCCSCode 10822-S0701

Eligible Hectare Factor is 100%

Eligible area is equal the geometry area of the digitized polygon

ftp://mars.jrc.ec.europa.eu/LPIS/Documents/v51_Oct2011/APPENDIX_from_Annex_II_ver_5_1.pdf

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Eligibility Profile explained

Eligibility and land cover

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Eligibility and crosschecks

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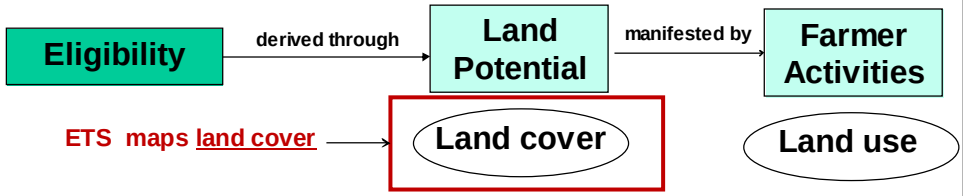
Article 20 of 73/2009 - Verification of eligibility conditions

Member States shall carry out administrative controls on the aid applications to verify the eligibility conditions for the aid.

Article 23 of 73/2003 - Verification of eligibility conditions

Member States shall carry out administrative checks on the aid applications including a verification of the eligible area and the corresponding payment entitlements.



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Land use/ land cover concepts (INSPIRE 2007)

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Land cover: Physical and biological cover of the earth's surface including artificial surfaces, agriculture areas, forests, (semi-) natural areas, wetlands, water bodies.

Land Use: Territory characterised according to its current and future planned functional or socio-economic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational)

The CAP regulation uses both concepts

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Description vs. Classification

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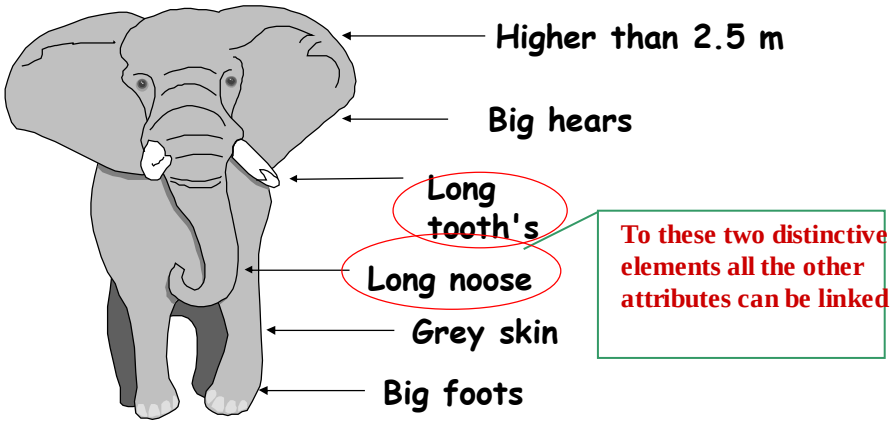
If a classification must be done, only few elements will be used, only the ones that allow a distinct identification.



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Concept for Classifying Land cover

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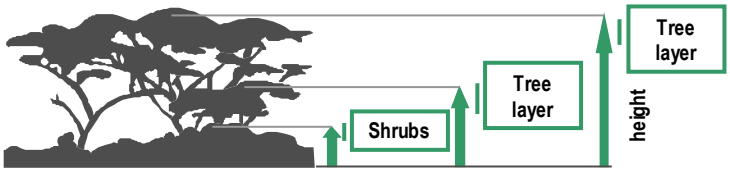
Primarily Vegetated Areas

When observing plant communities and considering their growth forms, two factors are fundamental:

- **Physiognomy, the overall appearance of the vegetation; and**
- **Vegetation Structure, which is defined as "*the spatial distribution pattern of growth forms in a plant community*"** (Küchler and Zonneveld, 1988).
  - **The structure describes the individual layers, usually characterized by height and density of the respective growth forms.**



Concepts for Complex Agriculture Areas

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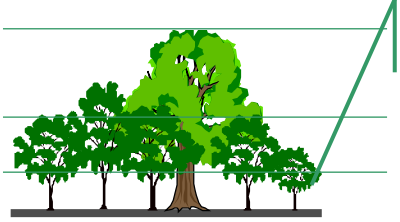
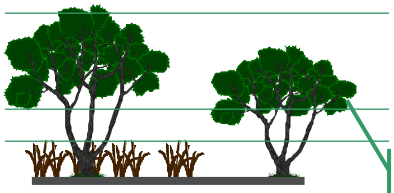


The dominant Life Form in this example is Closed Cultivated Trees.

The *Life Form* of a plant is defined by its physiognomic aspect (e.g. Trees, Shrubs, Herbaceous, etc.).

Two criteria need to be considered to determine *Dominance*:

the main criteria is (1) the uppermost canopy layer on (2) the condition that the dominant Life Form has a Cover either *Closed* or *Open*.



The dominant Life Form in this example is Open Natural Trees. *There is a grassland beneath*

How to define Land Cover class?

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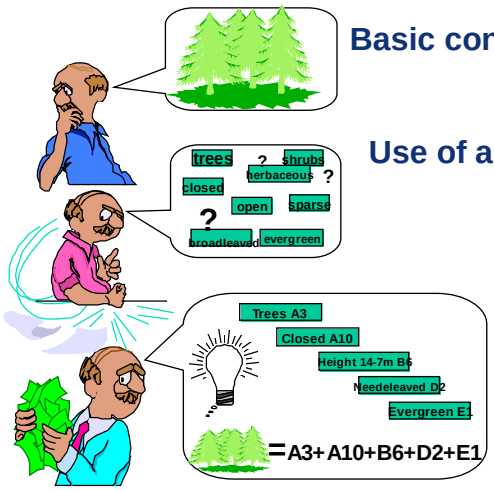

Basic concept of a land cover class *(the idea)*

Use of appropriate semantics *(the language)*

Elaboration of the concept in the "codified" language *(the concept expression)*

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Need for concise LC language

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Land cover types needs to be expressed in concise language, that uses the minimum set of classifiers to characterise a land cover feature.

WHY? For three main reasons:

- **a difference exist between the process of classify or describe a feature.**

- **the use of the minimum set of classifiers necessary reduce the interpretative errors and facilitate the homogenisation of the interpretation.**

- **the characterisation of a land cover feature with the a minimum set of classifiers will reduce and simplify the field checks.**

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Different grassland – same definition?

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While it is not possible to develop standard legends because they are specific to use (or region and scale), it is possible to adopt standard classification systems



The legend will be the expression of the classification system applied at a specific place and defined scale

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Practical Instructions for LPIS QA 2012

Step-by-Step creation of the profile

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Practical Instructions (1)

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1. Identify what land cover criteria are relevant for your region/country
2. Identify what kind of “pure”, “pro rata” and “conditional” land cover classes you need to define and codify
3. Use, where possible, the pre-defined classes from Table 2 (Annex III of ETS) and remove all unnecessary classes
4. In case Table 2 is not holding all your agriculture land cover classes, representing eligible land:
   - Provide:
     - the description of the land cover classes (together with the user-defined legend code) and
     - motivation/justification for their eligibility in a separate document.
   - ask JRC to provide the correct LCCS description and LCCODE

Practical Instructions (2)

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5. Assign to each of the land cover classes defined in the previous step, the relevant principle (formula) for the calculation of the eligible area,
   - according to the national legislation, country-related agriculture practices and supporting schemes applied
   - agreed in advance with EC!!
6. Document the resulting classes so that an unambiguous CAPI delineation can be made.
   - Develop as well interpretation keys for the ETS operator
7. Any polygons delineated during the inspection can only be coded with an LCCODE attribute value from the customised legend.
8. Level of land cover classification should at minimum represent the aggregated level of land cover identified in the regulations (R 1120/2009 and R 73/2009).

Practical Instructions (3)

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Aggregated level of land cover (minimum mapping legend-MMU):

A - arable land
G - grassland
N - natural grassland
H - greenhouse
T - permanent tree crop
S - permanent scrub crop
C - permanent herbaceous crop
P - short rotation coppice (plantation)
R - (irrigated) rice
K - kitchen gardens (SAPS only)

In some MS, LC types related to Art 34 (2) of regulation 73/2009 should be defined

- High nature value natural or semi-natural vegetation developed on former agriculture land
- Afforested former agriculture land

Practical Instructions (4)

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Useful tips:

- **List all your land cover types in the eligibility profile, regardless their detection ability on the orthoimage**
  - The taxonomic description of the land cover type is independent from the limits and specification of the observation method used
  - Rapid field visit are always an option, if a final decision cannot be made on the orthoimage
- **Do not include non-agriculture land cover types in the profile**
- **User-defined legend entries should not conflict with any of the pre-defined codes of MMU**
  - should be expressed with maximum 2 capital letter abbreviation

References:

ANNEX III, The Concept of land cover and "eligible hectares" version 5.1 -
ftp://mars.jrc.ec.europa.eu/LPIS/Documents/v51_Oct2011/Annex_III_LC_concept_eligibility_ver5_1.pdf
Eligibility Profile Template
ftp://mars.jrc.ec.europa.eu/lpis/schemas/5_1_EligibilityProfile_20111027.xsd
FAO LCCS, version 2.4.5
http://www.glcn.org/downs/pub/docs/manuals/lccs/LCCS2-manual_en.pdf

Practical Instructions (5)

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The most important for the ETS operator:

- **Use the standard LCC definition and classifiers to build your interpretation keys!**
  - Should provide sufficient information for distinct identification of the LC feature type
  - Should be valid and applicable regardless the observation method used (CAPI or GPS) and time-related ground conditions
  - During ETS: Do not limit yourself with the spectral, shape or textural properties of the land feature itself
    - Observe and take into account the surrounding context

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Practical Instructions (6)

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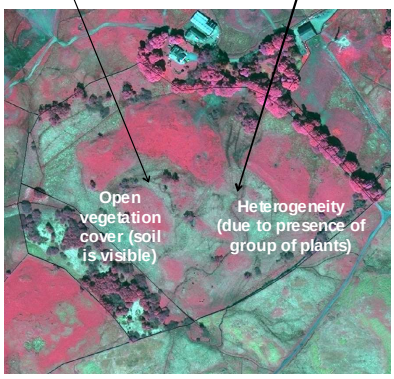
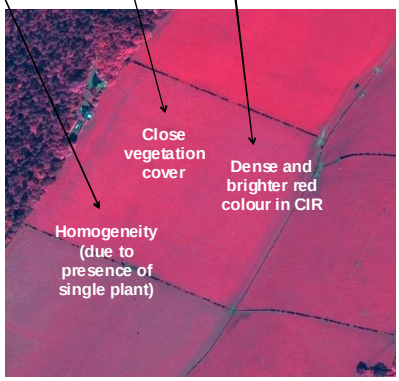
Permanent pasture (self-seed)

Land cover Class Definition
Open Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species



Permanent pasture (sown)

Land cover Class Definition
Permanently Cropped Area Graminoid Crop(s) Dominant Crop: Fodder - Fodder grasses



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LC mapping with CAPI and GPS – Real case study

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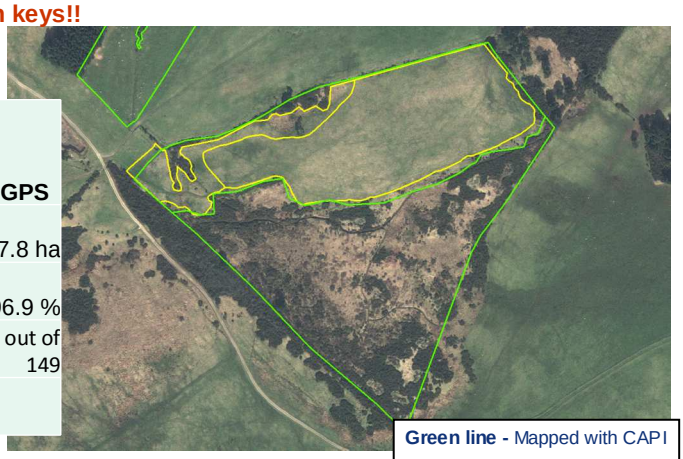
- **160 reference parcels inspected both using CAPI and GPS on the field**
- **Sometimes operators map different land cover features, due to the lack of proper interpretation keys!!**

Quality measures and elements	with CAPI	with GPS
Area obs	899.8 ha	877.8 ha
QE1	99.3 %	96.9 %
QE2	33 out of 149	35 out of 149
Area Recorded in LPIS	906.2 ha	



Green line - Mapped with CAPI

Yellow line - Mapped with GPS

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Practical Instructions for LPIS QA 2012

The Pro-rata land cover

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Intro

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1. **A proportional approach to eligible hectares**
2. **Why: to address area measurement issues**
3. **Challenge for LPIS: what to delineate?**
   1. In a systematic (nationwide) manner
   2. Exclusive from all "purely" eligible and ineligible areas
   3. Exhaustive for all areas of that "type" (no choice from the farmer)
   4. How to motivate why it cannot be precisely mapped, e.g.
      1. spatially interwoven mix of land covers within the MMU
      2. temporal fluctuation of the internal boundaries
4. **Goal: remove the "fuzziness" or arbitrary outcome**

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In practice (1)

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For LPIS, map land cover not land use

1. **A pro-rata class is by definition a mixture of eligible and ineligible components.**
   Not merely a mix of the default area types but **typically** a well described land form/habitat with an intrinsic land cover mix.
   1. Defined and (typically) named
   2. Easily identifiable and distinguishable
      1. By its characteristic (physiognomic-structural) components
      2. In a specific local context
   3. Well known and stable proportions of the mixture components
   4. Often the result of a typical agricultural practice

2. **Appropriate mapping instructions needed, separating:**
   1. (delineable) patches >0.1 ha of homogenous components
   2. Any non mixture components (e.g. roads)

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In practice (2)

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3. **Demonstrate how you arrived to the rate applied for the pro-rata class. e.g.**
   - Results of past OTSC checks
   - Analysis of historic images
   - Specific studies
   - …
4. **Adapt your OTSC procedures appropriately:**
   1. LPIS update feedback
      1. Parcel (internal) boundary level
      2. Evaluate and re-confirm the rate applied
   2. NOTE: exclude non-mix features larger than 0.01 ha!

EXAMPLES on following pages are theoretical cases ONLY

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example 1: polderweide

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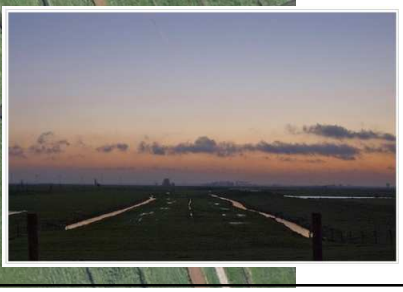
- Mixture of grass and water – within a polder
- Possible motive: seasonal fluctuation of water level

3619-8-L11L5P1(1)[Z001]
Medium Sized Field(s) Of Graminoid Crops On Waterlogged Soil
Major Landclass: Level Land, Plain, Slope
Class: Flat To Almost Flat
Altitude: < 50 - 300 m



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example 2: kwelder/schorre

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- **Mixture of grass and water – on intertidal flats**
- **Possible motive: daily fluctuation of water level**
- **complication: "grass" is in fact a mixture**
  + *Spartina anglica* , *Puccinellia, Festuca rubra, ….*
  - Salicornia europaea, *Limonium vulgare*, *Juncus gerardii, Chenopodium glaucum*,…

30008-L11L5P5(1)[Z002]
Graminoid Crops Water level With Daily Variations
Major Landclass: Level Land, Plain, Slope
Class: Flat To Almost Flat

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example 3: dehesas

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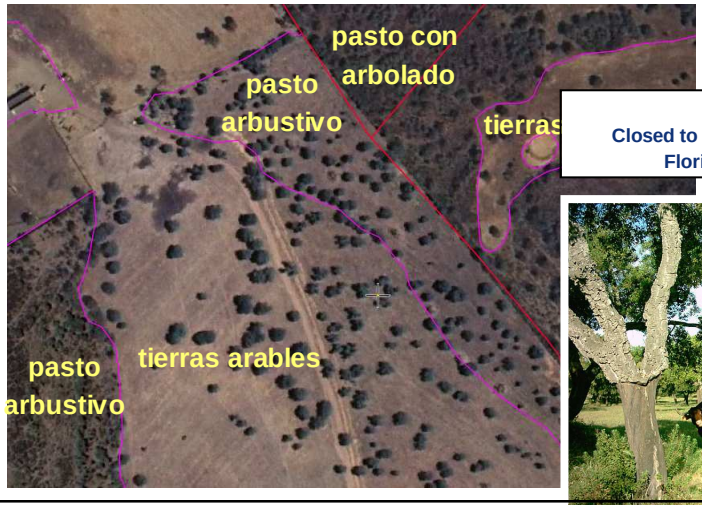
- Mixture of grass and oak trees – on communal property
- Possible motive: spatial distribution



21670-Zt001
Closed to Open Grassland with Trees
Floristic Aspect: Oak tree

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a “negative” example

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Coastal strip

- Delineable components
- No temporal fluctuation

Calculation of Pro-Rata

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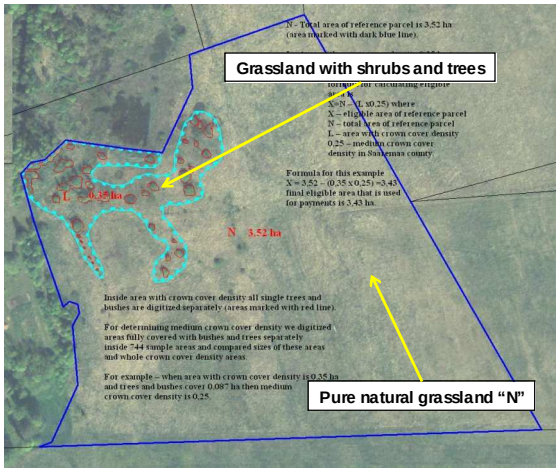

Maximum eligible area is calculated as follows:

X = N + (L x C)

X- maximum eligible area of reference parcel
N- geometric area of the pure natural grassland "N"
L- geometric area of the polygon enclosing the mixed class (grassland with trees/shrubs
C- pro-rata coefficient calculated on the base of the medium level of crown cover density

Conclusion

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1. **Fairly complicated operation**
   1. Increases LPIS complexity: Black&White mask → grayscale map
   2. Requires specialist operators
   3. Review LPIS-OTSC interaction
2. **So, implement with caution**
   1. Only consider when all principles are clearly met
   2. Only consider when substantial areas are involved
3. **Not a solution to accommodate "dynamics of land use"**

Pro-rata is applied at the level on the particular LC feature, and on at the whole RP level!

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Individual parcel eligibility reductions

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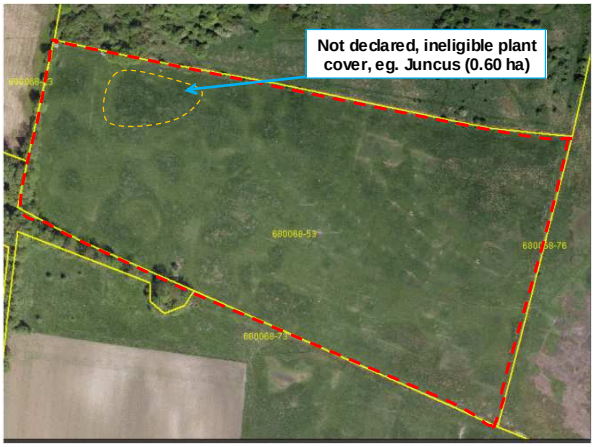

Area partly covered with Juncus:

- **Is not easily identifiable and distinguishable**
- **Proportions of the mixture components are unknown and unstable**
- **Reduction is based of individual assessment on the entire RP area**
  - **cannot it be reproduce with ETS**

Pro-rata Approach for the area covered with Juncus is not possible.

RP is out of scope for QE2 measure – areas not comparable

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Practical Instructions for LPIS QA 2012

Landscape Features

Landscape features in the Eligibility profile

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Scope: Only those subject to 2009R1122 art (34)3)

- Should be subject to explicit GAEC legislation of the individual Member States and their spatial context in which the feature is found

Graphical representation: not only as polygons!

hedges	--> linear
ponds	--> polygon
ditches	--> linear
trees in line,	--> linear
trees in group	--> polygon
isolated tree	--> point
field margins	--> linear

Representation of eligible land: Always conditional!

Landscape features in the Eligibility profile

LIPS QA 2011 workshop, Tallinn 22nd November 2011

Eligibility profile entries for Landscape Features:

- **Check your GAEC legislation**
- **Check/Define your own mapping specifications**
- **Provide to JRC with detailed description and examples (imagettes, photos from the ground, reference publications and documentation)**

Field copses:
foremostly areas overgrown with woody plants, not used for agricultural production, with a minimum size of 100 to a maximum size of 2000 square metres. Areas for which an afforestration aid or premium is granted, are not considered as field copses.

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Eligibility Profile Checklist

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Before using your eligibility profile you must ensure that you have the following elements:

- The complete list of all you LC classes representing eligible land
- The complete list of your eligible landscape features according to your GAEC rules
- Correct codification of all LC (and LF) types in LCCS (ask JRC for help if needed)
- Correct correspondence between the land cover type and the quantification of its eligibility (LFs are always CONDITIONAL!)
- Values in "Representation of eligible land (direct aid)" and "Eligible Hectare factor" are following the conceptual logic (Pro rata cannot be 100% eligible!)
- Availability of entries in the "Minimum Mapping Legend", when aggregated classes are used in the ETS mapping
- Availability of the two capital letter abbreviations for each land cover class entry
- The Eligibility profile is valid with respect to the official JRC XML schema

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Support in 2011 LPIS QA

JRC follow-up in 2012

Questions from EU Member States

Support in 2012

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JRC will continue to provide support to the EU MS with respect to the formal conformity of their eligibility profile in 2012

- **EU MS could:**
  - Send their eligibility profile for formal check
  - Ask questions and technical support with respect to the formal definition and codification of the land cover types (incl. landscape features)
- **JRC will:**
  - Respond to the requests and support the preparation of the eligibility profile
  - Post all relevant bilateral discussions on WikiCAP
    - FAQ 2011: http://marswiki.jrc.ec.europa.eu/wikicap/index.php/LPISQA2011_3.d
    - Member State feedback and Q&A: http://marswiki.jrc.ec.europa.eu/wikicap/index.php/LPISQA2011_4.a
    - Errata 2011: http://marswiki.jrc.ec.europa.eu/wikicap/index.php/LPISQA2011_5.e

Some Questions from EU MS

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- Q: How to process agricultural areas with trees?
  - When do we need to map single trees in the ETS? How to proceed if we have 50 trees per hectare on agriculture land? What LCCS code do we use?

  A: See our FAQ 2011 in WikiCAP
- Q: Are the list of non-agricultural land cover types to be included in the eligibility profile (XML)?
- A: No. Non-agriculture land cover types are not part of the eligibility profile. No LCC-codes are needed.
- We have kitchen gardens (an agriculture land cover), which are not eligible under SPS. Should we include it as an entry in the eligibility profile?
- A: Yes, you will put in the profile with “Eligible Hectare Factor” of zero
- Q: Some non-agricultural areas are eligible for aid under the SPS according to the Article 34 (2) (b) of Regulation 73/2009 under certain conditions. How should we treat them in the eligibility profile.
- Q: Specific LC entries, having conditional eligibility have been created by JRC. They will be listed in the Errata Wiki-page of LPIS QA 2011

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LCCS 2.4.5 user manual

General Overview

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The initial Dichotomous Phase of LCCS 2

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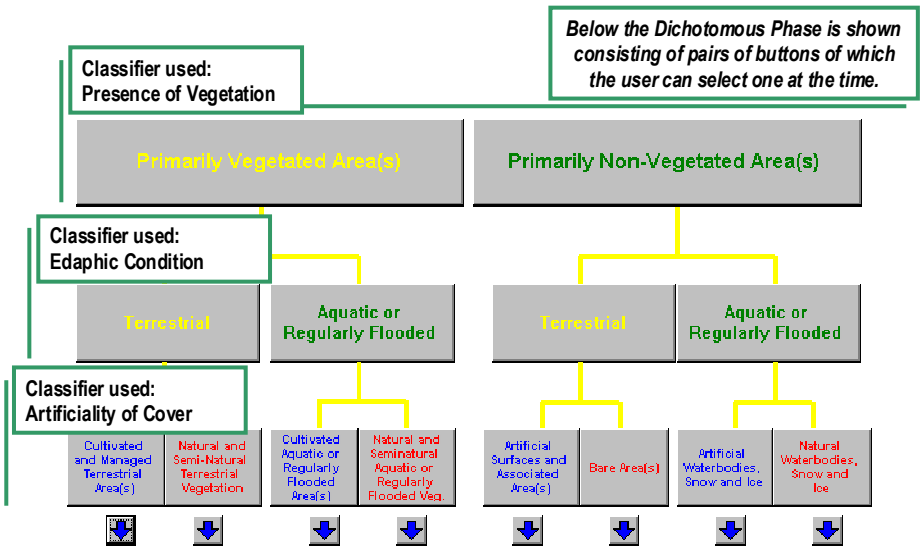

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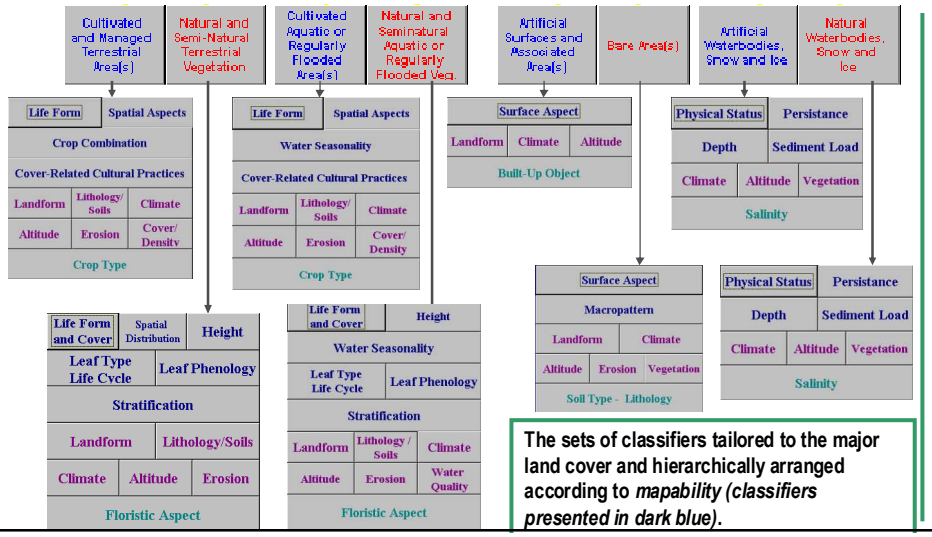
The subsequent Modular-Hierarchical Phase of LCCS



The sets of classifiers tailored to the major land cover and hierarchically arranged according to *mapability (classifiers presented in dark blue)*.

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Concept for creation of a land cover class

With each classifier option selected, the string of codes grows, the class name changes and so does the code.

Example "Natural and Semi-Natural Terrestrial Vegetation (A12)" :

Classifiers Used:	Boolean Formula:	Standard Class Name:	Code:
Life Form & Cover	A3A10	Closed Forest	20005
Height	A3A10B2	High Closed Forest	20006
Spatial Distribution	A3A10B2C1	Continuous Closed Forest	20007
Leaf Type	A3A10B2C1D1	Broadleaved Closed Forest	20095
Leaf Phenology	A3A10B2C1D1E2	Broadleaved Deciduous Forest	20097
2nd Layer: LF, C, H	A3A10B2C1D1E2F2F5F7G2	Multi-Layered Broadleaved Deciduous Forest	20628
3rd Layer: LF, C, H	A3A10B2C1D1E2F2F5F7G2 F2F5F10G2	Multi-Layered Broadleaved Deciduous Forest With Emergents	20630

LCCS is a concise language, it uses the minimum set of classifiers to characterise a land cover feature.

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Classification of LPIS land cover using LCCS

Arable land

Basic classifier: Cultivated and Managed Terrestrial Areas

Life Form: Herbaceous

Spatial Aspect – Field size: N/A

Spatial Aspect – Distribution: N/A

Spatial Aspect – Crop Combination: Multiple Crops

Cover-related Cultural Practices - Water Supply: Rainfed

Cover-related Cultural Practices – Cultivation Time Factor: Fallow

Classified used	Boolean Formula	Standard Class Name	Code
Herbaceous Crops	A3XXB5C2D1D8	Herbaceous Crop(s), with Fallow System	10660

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Classification of LPIS land cover using LCCS

Family gardens

Basic classifier: Cultivated and Managed Terrestrial Areas

Life Form: Herbaceous (non-graminoids)

Spatial Aspect – Field size: Small

Spatial Aspect – Distribution: Continuous

Spatial Aspect – Crop Combination: Multiple Crops

Cover-related Cultural Practices - Water Supply: Irrigated

Cover-related Cultural Practices – Cultivation Time Factor: Permanent

Classified used	Boolean Formula	Standard Class Name	Code
Herbaceous Crops	A5B2B5C2D3D9	Permanently Cropped Area With Small Sized Field(s) Of Irrigated Non-Graminoid Crop(s)	11135

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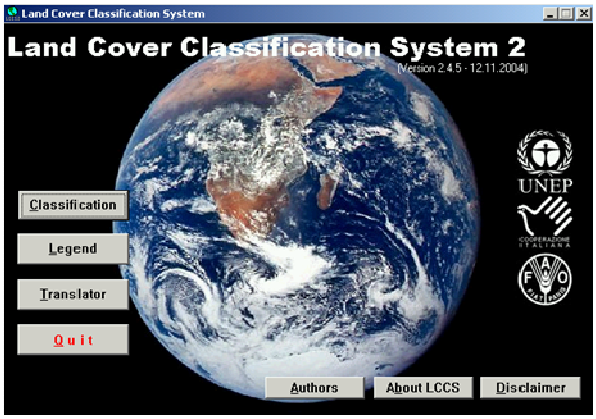
Example of a design of user - specific land cover class, using LCCS 2.4.5

http://www.glcn.org/sof_1_en.jsp



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LCCS design of user-specific LC class

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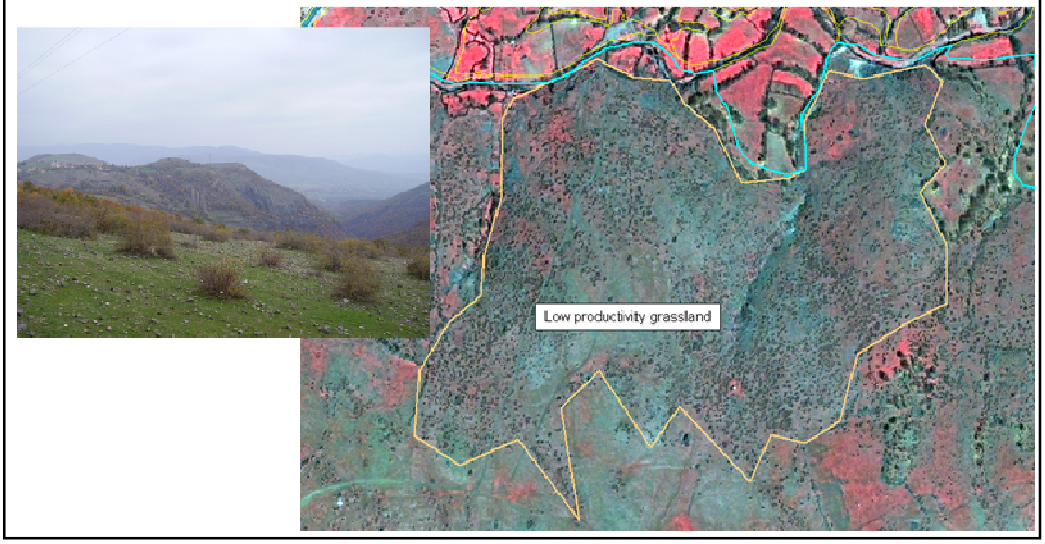
A given EU MS, has specific land cover class entry in their Eligibility Profile: "Low productivity grassland in the mountain regions"



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Analysis of the available information

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User definition

Intricate mixture of semi-natural open herbaceous vegetation and low shrubs, developed on rocky soil at relatively higher altitudes (above 500 meters).

LC elements (keywords)

Land cover properties

- vegetation
- natural
- herbaceous
- low shrubs
- open

Environmental attributes

- high
- above 500 meters
- altitudes
- rocky soil

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Dichotomous Phase

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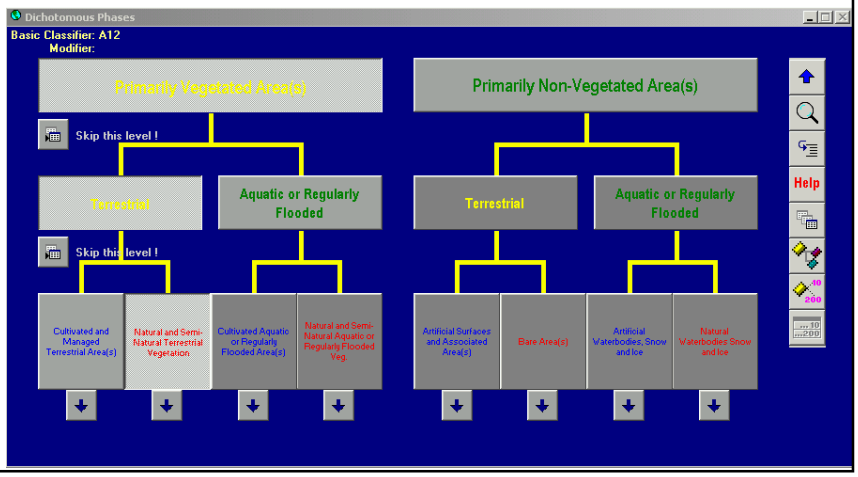
In the Dichotomous Phase of LCCS, based on the initial analysis, we select the category

"Natural and Semi-Natural Terrestrial Vegetation"



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LCCS Classifiers

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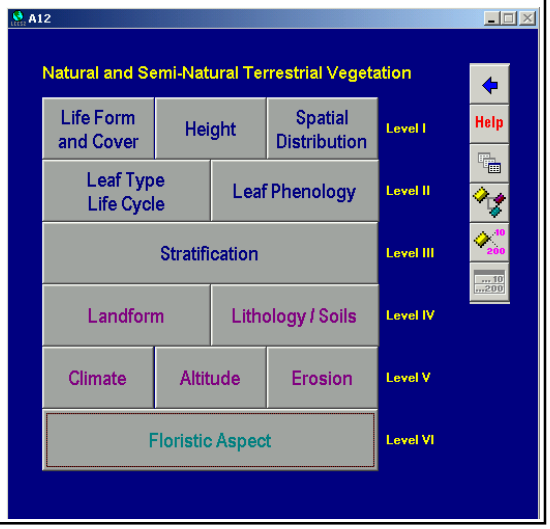
We "map" the identified LC elements, to the classifiers, available for that LC category:

Related to land cover properties
– grass/ bare soil (1st strata), and shrubs (2nd strata)
Related to environment attributes
– soil type, altitude
Related to some technical aspects
– N/A



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Main LC classifiers

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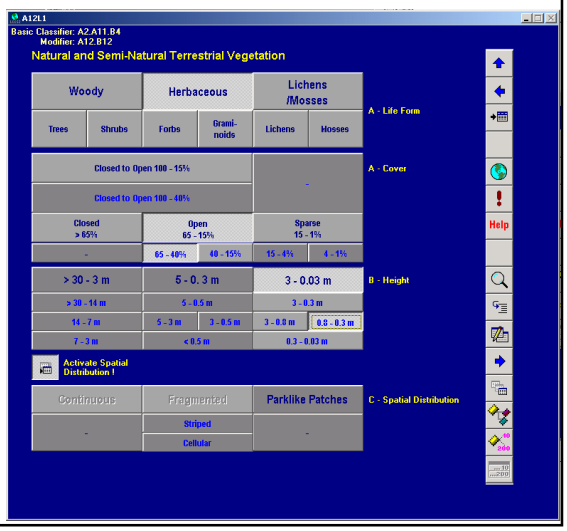
To account the presence of open grassland, we select:

Life form: Herbaceous
Cover: Open (65%-40%)
Height: 0.8 – 0.3 meters
Spatial Distribution: N/A
Leaf Type: N/A
Leaf Phenology: N/A



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Main LC classifiers

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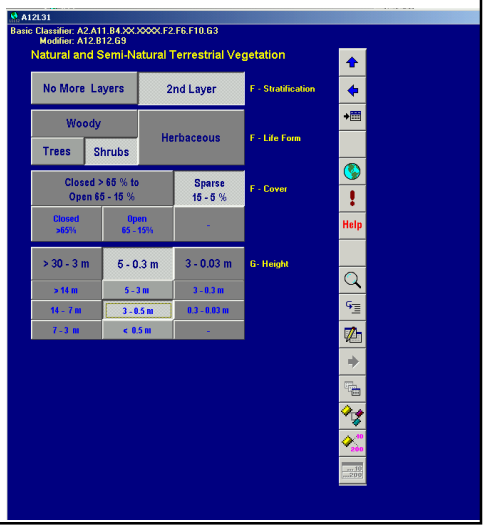
To account the presence of sparse shrubs, we select:

Stratification: 2nd Layer
Life form: Shrubs
Cover: Sparse (15% - 5%)
Height: 3 – 0.5 meters
Spatial Distribution: N/A



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Environmental Attributes

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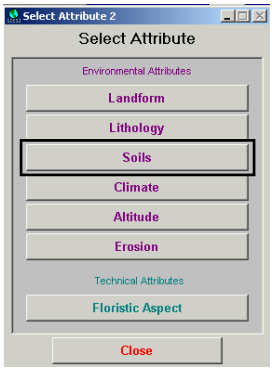
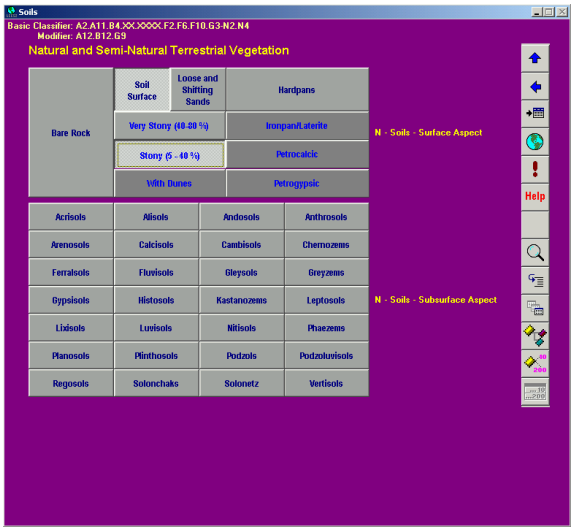
For the “Soil” classifier, we select:

Surface Aspect:
Soil Surface – Stony (5-40%)
Subsurface aspect: N/A





Environmental Attributes

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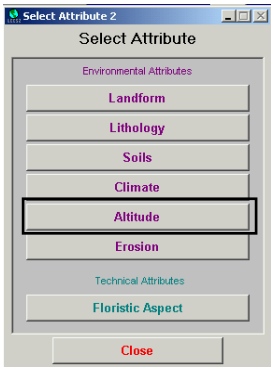
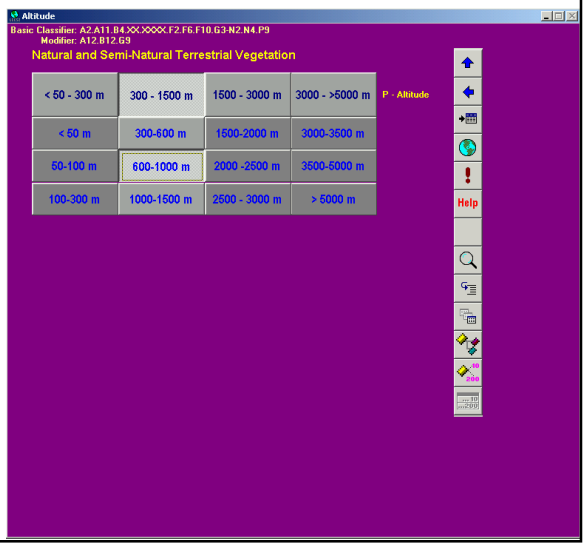
For the “Altitude” classifier, we select:

Altitude: 600 – 1000 meters





LCCS Description of the LC class

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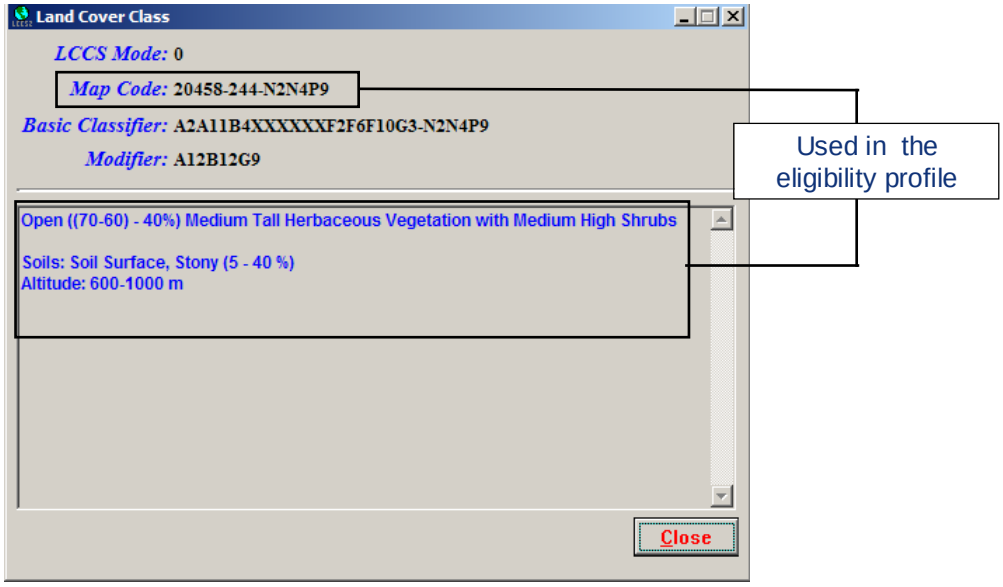

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LCCS Description of the LC class

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Class User Name	**Low productivity grassland**
Classifiers Used	**A2A11B4XXXXXXF2F6F10G3-A12B12G9-N2N4P9**
Land Cover Class Code	**20458-244-N2N4P9**
Standard Description	**Open ((70-60) - 40%) Medium Tall Herbaceous Vegetation with Medium High Shrubs Soils: Soil Surface, Stony (5 - 40 %) Altitude: 600-1000 m**
Structural Domain	**Grasslands**
User Description	**The main layer consists of open herbaceous vegetation. The crown cover is between (70-60) and (20-10)%. The height is in the range of 3 - 0.03m. The second layer consists of sparse shrubs with a height in the range of 0.5 to 3 meters. The surface not occupied by vegetation consists of bare rock and/or coarse fragments, such as gravels, stones and/or boulders. This class is mostly presented at altitude above 500-600 meters.**

Proper LCCS description depends on how comprehensive is the information provided by the EU Member State

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What we have learned

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- **The technical background of the Eligibility profile**
- **The conceptual basis for land cover mapping in the ETS**
- **The reason to introduce "Pro-rata" land cover**
- **What to do in practice for LPIS QA 2012**
- **What support to expect in JRC for 2012**
- **How to codify our own classes in LCCS**

References:

- **Land Cover Classification System, User Guide, © FAO 1998**
- **Louisa J.M. Jansen - Antonio Di Gregorio, Land Cover Classification System LCCS, A guide to utilization of concepts and software application, © FAO 1999**