

**Common Strategy for Sustainable  
Territorial Development of the cross-border  
area Romania-Bulgaria - MIS-ETC 171**

Common resources for a territorial planning  
analysis and strategy

FIRST VALIDATION OF THE LAND COVER DATA

## Project SPATIAL: First Validation Report

### 1. Stratified random sampling of the polygons for validation

LC_Class_Code	LC_Class_Name	Polygon_count	Sample size
1	Arable land	60349	200
2	Managed grassland	120	18
3	Paddy rice field		
4	Natural grassland	40339	200
5	Tree crop	3022	50
6	Tree plantation	255	20
7	Broadleaf deciduous forest	46451	200
8	Broadleaf evergreen forest		
9	Coniferous forest	10471	125
10	Mixed broadleaf and coniferous forest	12450	125
11	Waterlogged forest	37	15
12	Woodland	69639	200
13	Urban vegetated areas	3382	80
14	Association of herbaceous and woody crops	680	32
15	Association of crops and natural trees	4182	80
16	Shrub crop	2933	50
17	Scrubland	3112	50
18	Waterlogged vegetation	3878	80
19	Artificial non-build up surface	2487	50
20	Continuous mosaic urban fabric	579	32
21	Discontinuous urban fabric	13082	125
22	Fragmentary urban fabric	531	32
23	Artificial build up surface	9786	80
24	Artificial build up network	2869	50
25	Consolidated bare surface	322	32
26	Unconsolidated bare surface	442	32
27	Rivers	129	18
28	Channels	7	7
29	Reservoirs	902	32
30	Lakes and impoundments	2064	50
31	Greenhouses	207	20
		<b>294707</b>	<b>2085</b>

**Based on:** ISO 2859-2  
**Considering:** Lot in isolation  
**Accepting:** Limiting Quality (LQ) of 12.5%  
**Following:** Sampling procedures for inspection by attributes

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### 2. Structure of the validation data

A specific feature dataset **LC\_Validation.gdb**, is created out of the reference geodatabase. It contains the dataset (layer) **BG\_LC\_LandCover**, which represents the whole reference layer for the Bulgarian part of the CBC area.

The structure of the attribute table is as follows:

- **LC\_ID** – unique identified of the polygon in the layer. This field is non-editable.
- **IsValidation** – records which polygons are to be validated (code 1), and which not (code 2).
- **MixValidation** – records whether given feature represented by the polygon is classified as “pure” land cover (code 1) or represents cartographic mix (code 2). This field is editable. The following combinations are possible during the validation:
  - **11** – pure LC type, found to be correct during the validation
  - **12** – pure LC type, found to be incorrect during the validation
  - **21** – cartographic mix, found to be correct during the validation
  - **22** – cartographic mix, found to be incorrect during the validation
- **Operator** – Name of the operator that performed the validation of the given feature
- **LCCS\_MapLegend\_Validation** – this field records which is the dominant land cover types found during the validation by the operator.
- **Comment\_Validation** – comment field, where the operator can introduce valuable information, for example presence of defected polygon (virtual boundaries not following any particular land features). Such polygons are marked with “D”.

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### 3. First round of the accuracy assessment of the land cover classes found on the CBC area expressed in percentage (%)

Class Code	LCCS Class EN	User's Accuracy	Count
		<b>&lt;50%</b>	
Class 30	Lakes and impoundments	30.00%	50
Class 2	Managed grassland	44.44%	18
		<b>51% - 70%</b>	
Class 10	Mixed broadleaf and coniferous forest	50.40%	125
Class 18	Waterlogged vegetation	51.25%	80
Class 11	Waterlogged forest	66.67%	15
Class 26	Unconsolidated bare surface	68.75%	32
Class 4	Natural grassland	69.50%	200
Class 7	Broadleaf deciduous forest	70.00%	200
		<b>71% - 85%</b>	
Class 12	Woodland	70.50%	200
Class 17	Scrubland	74.00%	50
Class 19	Artificial non-build up surface	74.00%	50
Class 25	Consolidated bare surface	78.13%	32
Class 6	Tree plantation	80.00%	20
Class 14	Association of herbaceous and woody crops	81.25%	32
		<b>&gt;86%</b>	
Class 22	Fragmentary urban fabric	90.63%	32
Class 9	Coniferous forest	91.20%	125
Class 16	Shrub crop	92.00%	50
Class 13	Urban vegetated areas	92.50%	80
Class 1	Arable land	93.00%	200
Class 15	Association of crops and natural trees	95.00%	80
Class 24	Artificial build up network	96.00%	50
Class 5	Tree crop	98.00%	50
Class 21	Discontinuous urban fabric	99.20%	125
Class 20	Continuous urban fabric	100.00%	32
Class 23	Artificial build up surface	100.00%	80
Class 27	Rivers	100.00%	18
Class 28	Channels	100.00%	7
Class 29	Reservoirs	100.00%	32
Class 31	Covered agriculture land (Greenhouse)	100.00%	20
Class 3	Paddy rice field	N/A	0
Class 8	Broadleaf evergreen forest	N/A	0

**Result:** For some land cover types the thematic accuracy is below 80%. A second validation will be performed, after a correction of the classification approach for these land cover types.

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**Examples of misclassified land features:**

**Class30 to Class1**



**Class2 to Class4**



**Class2 to Class4**



**Class2 to Class15**



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**Class2 to Class15**



**Class30 to Class4**



**Class30 to Class4**



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**Class30 to Class4**



**Class30 to Class12**



**Class30 to Class12**



**Project SPATIAL: First Validation Report**

**Class4 to Class1**



**Class4 to Class7**



**Class7 to Class4**



**Class7 to Class9**





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**Class7 to Class9**



**Class7 to Class12**



**Class12 to Class4**



**Class12 to Class4**

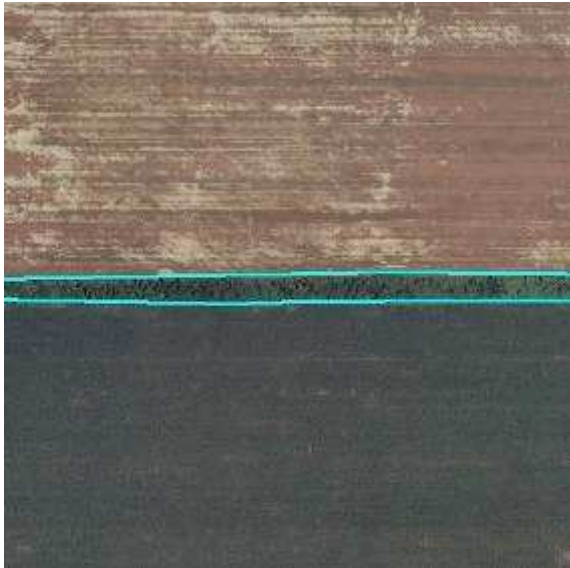


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**Class18 to Class12**



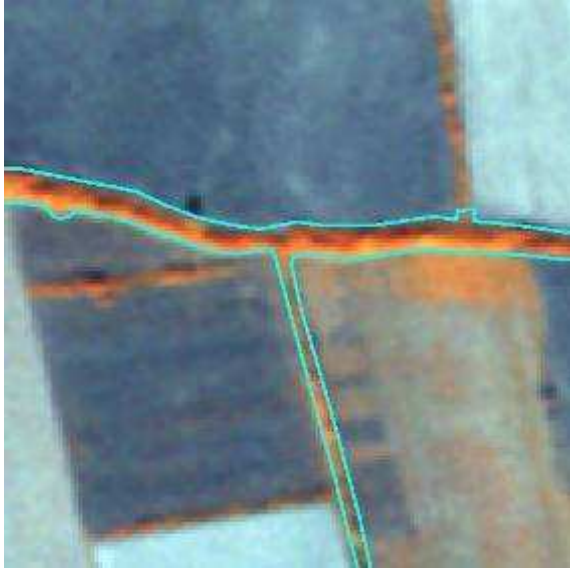
**Class18 to Class12**



**Class18 to Class12**



**Class18 to Class12**



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**Class18 to Class12**



**Class24 to Class12\_D**



**Class30 to Class12**

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**Polygons with incorrect geometry:**



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