European Environment Agency
European Topic Centre on Water

GIS Reference Layers on UWWT Directive Sensitive Areas

Technical Report

Version: 1.0

ETC/Water task: 1.4.1.3

Prepared by / compiled by: Jiri Kvapil, ETC/W
Organisation: CENIA
EEA Project Manager: Bo Jacobsen

Version History

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Contents

1. Introduction

The creation of the GIS reference layers on UWWT Directive Sensitive Areas is based on the GIS data reported by countries under the 2007 UWWTD reporting and 2009 updates. Member states were given a GIS guidance document which was developed by UBA Vienna, consultant of the European Commission, and made available for their 2007 reporting. The GIS data submitted by countries were collected by the UBA Vienna, but huge inconsistency of the data prevented UBA Vienna from making a EU GIS reference layer on the sensitive areas.

ETC/W has taken over this task and has undertaken with the member states the quality assurance of the shape files and attributes reported in 2007 during summer 2008.

To facilitate the 2009 reporting of UWWTD GIS data, ETC/W has updated the UWWTD GIS reporting guidance originally developed by UBA Vienna and prepared templates for all GIS layers on sensitive areas, which were made available for the member states together with the boundaries of each country. Boundaries were extracted from EuroRegionalMap, scaled 1:250 000, which was also decided to be the reporting scale. Member states were kindly asked to use the templates for their reporting and to fit the data inside the boundaries. This has improved the comparability of GIS data reported in 2009 and facilitated the updating of the GIS reference layer on UWWTD sensitive areas.

2. Overview of data reported

Each member state was given a set of templates for all sensitive area GIS layers which may be collected under UWWTD. Not all the layers are reported by all of the countries, therefore the countries were asked to use only layers which are relevant for them. Under UWWTD the following sensitive area GIS layers are collected:

Sensitive area – catchments
Sensitive area – rivers
Sensitive area – lakes
Sensitive area – transitional water
Sensitive area – coastline
Sensitive area – coast area
Less sensitive area – transitional water
Less sensitive area – coastline

Some member states have decided to declare the entire area of their country as a sensitive area or they have applied Article 5(8) of the UWWT Directive. In that case no GIS layer needs to be reported by these countries as the entire country area is used for the resulting EU-wide GIS layer. The following tables give an overview of GIS data reported by countries during the 2007 and 2009 UWWTD reporting.

Table 1: Country GIS data availability overview for 2007 data reporting

	Application of Article (no need to report GIS data)	Entire country sensitive area (no need to report GIS data)	LSA – coastline	LSA – transitional waters	SA – coast area	SA – coastline	SA – lakes	SA – rivers	SA - transitional waters	SA - catchments
AT	x									
BE		X								
BG						x		x		X
CY					x		x			X
CZ										
DE	x									
DK	x									
EE	x									
ES										x
FI	x									
FR					x		x	x	x	x
GR										
HU										x
IE					x		x	x	x	x
IT					x		x	x	x	x
LT	x									
LU	x									
LV	x									
MT					x					x
NL	x									
PL	x									
PT		X					x	x	x	x
RO	x									
SE					x		x			x
SI					x	x	x	x		x
SK		X								
UK					x	x	x	x	x	x

LSA: Less sensitive areas

SA: Sensitive areas

No member state declared transitional waters as a less sensitive area. The resulting EU layer for LSA transitional waters will therefore stay empty. The data for the Czech Republic and for Greece were not delivered in the required format.

Table 2: Country GIS data – 2009 UWWTD reporting updates and new delivery

	Application of Article (no need to report GIS data)	Entire country sensitive area (no need to report GIS data)	LSA – coastline	LSA – transitional waters	SA – coast area	SA – coastline	SA – lakes	SA – rivers	SA - transitional waters	SA – catchments
AT										
BE										
BG						xx		xx		xx
CY										
CZ	x									
DE										
DK										
EE										
ES					xx		xx	xx		xx
FI										
FR										
GR					x	x	x	x	x	x
HU										
IE					xx		xx	xx	xx	xx
IT					xx		xx	xx	xx	xx
LT										
LU										
LV										
MT										
NL										
NO			x		x	x	x	x		x
PL										
PT										
RO										
SE										
SI					xx	xx	xx	xx	xx	xx
SK										
UK					xx	xx	xx	xx	xx	xx

LSA: Less sensitive areas

SA: Sensitive areas

x – Newly reported in 2009 (layer not reported in 2007)

xx – Updated in 2009 (layer also reported in 2007)

There were first time reports by Greece, Norway and the Czech Republic, updates were delivered by Bulgaria, Spain, Ireland, Italy, Slovenia and the United Kingdom.

No member state declared transitional waters as a less sensitive area in 2009. The resulting EU layer for LSA transitional waters will therefore stay empty as it was for the 2007 reporting.
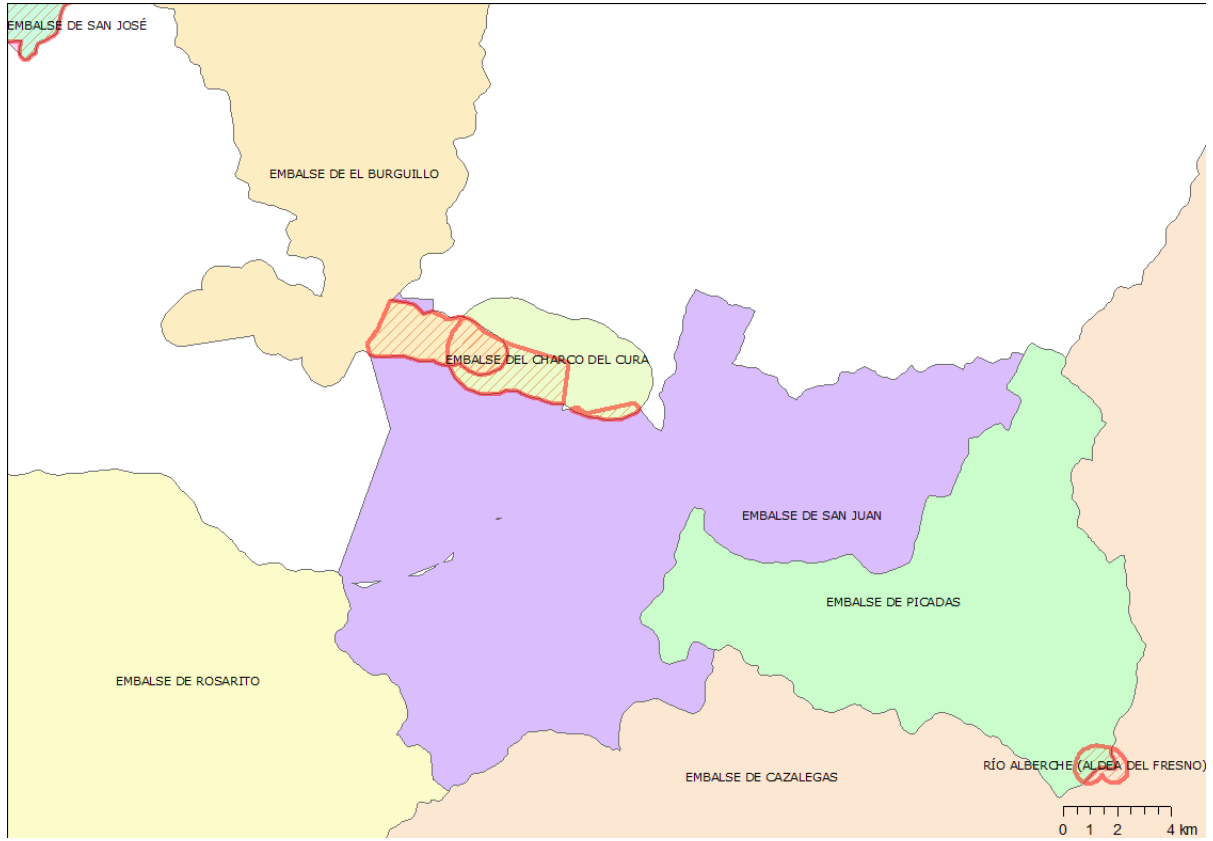
3. Errors introduced in the 2007 data

Several types of errors were appearing in the national data. Most of the errors were common to several countries. The following table gives a general overview of the violations of rules defined by the UWWTD GIS reporting guidance, inconsistencies and logical errors.

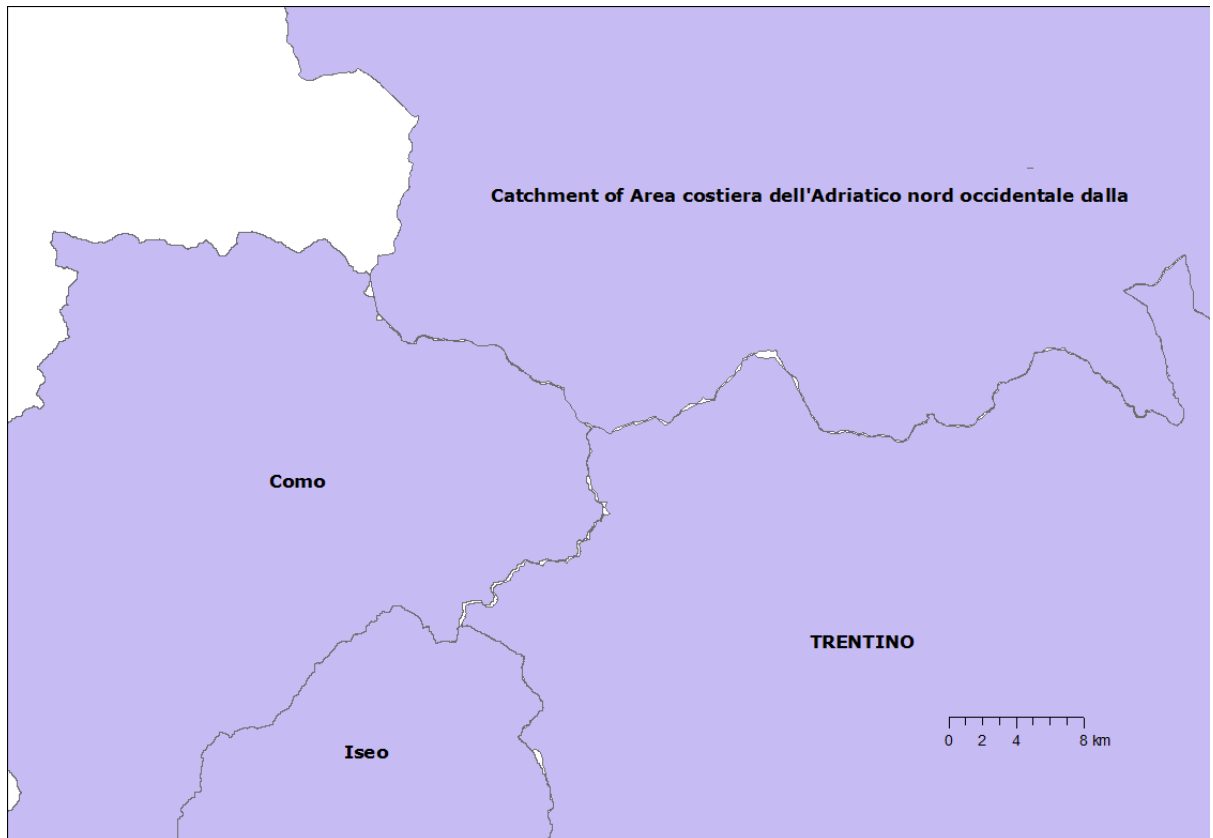**Table 3: 2007 UWWTD GIS data error overview table**

Error	Appearance
Features inside one layer are overlapping	Many countries
Features among several layers are overlapping	Almost all countries
Coordinate system different form ETRS89	ES (CGS1950), HU (ETRF)
Data too detailed for 1:250 000 scale	Almost all countries
Wrong declaration of coordinate system	UK (Northern Ireland – data is projected in Irish Grid, but ETRS89 is declared)
Non 7 bit ASCII characters in the names of features	FR, SI, ES
Broken national characters in names of features	FR
Code too long for the given column	SI (MSCD), FR (Name), PT (Name)
Different names of columns	FR
Features shifted	SI (ca. X by 360 m, Y by 60 m)
All data in one layer	CY
Wrong names of data files	Many countries
Wrong data format	FR (Mapinfo)
Wrong calculations of feature areas	Several countries

Examples of errors are shown in the following maps:

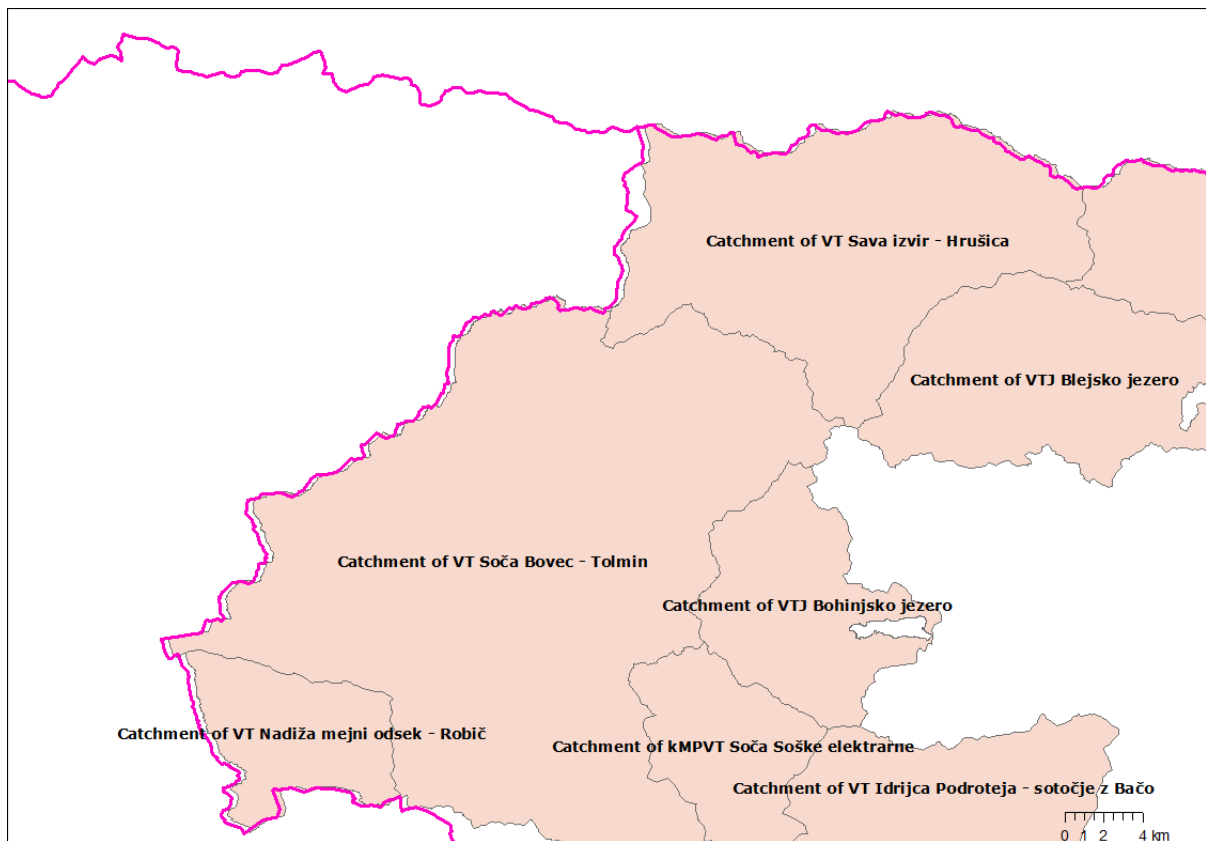## Fig 1: Overlapping features

Fig 2: Holes between polygons

Fig 3: Shifted polygons, national characters

4. Errors introduced in 2009 data

There were only some minor errors in the data reported. Data format, coordinate system and structure of attributes were mostly delivered according to the requirements. Exceptions were easily resolved and changed to the required format. Obviously the member states have already familiarized themselves with the UWWTD GIS data reporting procedure and requirements and finalized their deliveries in much higher quality.

5. Compilation of EU reference layers

For all works, ArcGIS Desktop 9.3.1 software was used.

The procedure of creating and updating a GIS reference layer on catchments of sensitive areas was the following for each type of sensitive area:

1/ Investigating the data format used and transformation to shape file (where needed)
2/ Investigating the coordinate system used and projecting the data to ETRS89 coordinate system (where needed)
3/ Overlaying the data with the ERM 1:250 000 boundaries using the *update* function
4/ Fitting of SA catchments inside ERM boundaries using the *dissolve* and *eliminate* functions
5/ Creating of normal areas inside the countries as a supplement to sensitive areas
6/ Harmonization of attributes – re-naming of columns, changing column types

7/ Loading the cleaned MS layer into the resulting EU layer. If the newly loaded member state layer is an update of an existing layer in the EU dataset, the old data for the country being updated is completely removed first

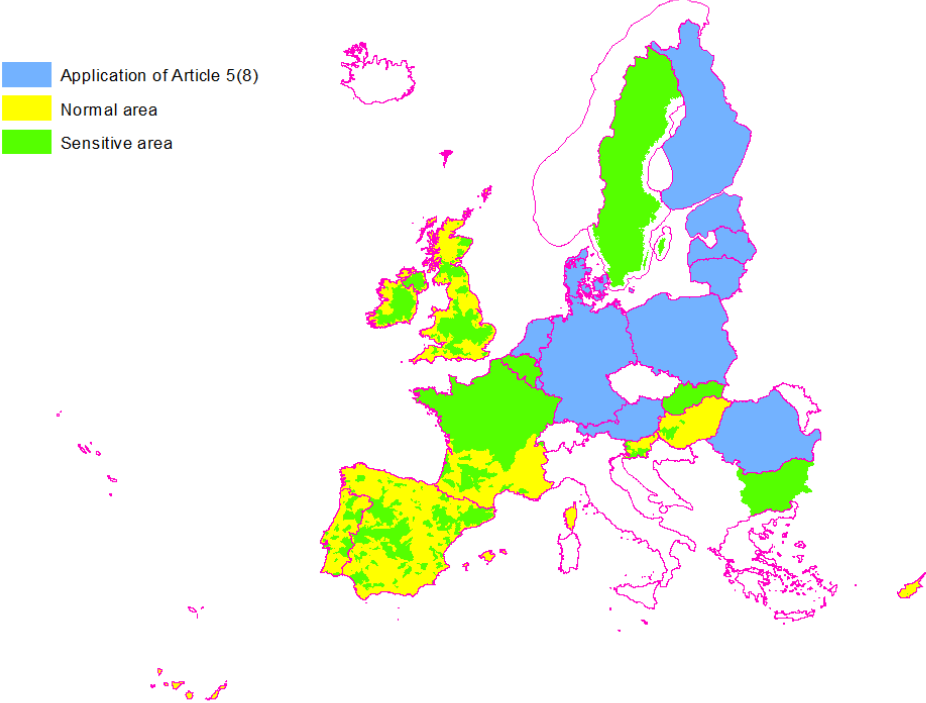8/ Cleaning of the resulting EU layer using editing tools and the *repair geometry* function

The most important work was the trans-boundary harmonization and harmonization of attributes. There were huge numbers of inconsistencies in the 2007 datasets. Most of the topology requirements had to be neglected and reference layers were created, even though not being topologically clean. For the working scale of 1:250 000, most of the inconsistencies are not visible at all, especially for small polygons or lines. The rules on overlapping different layers had to be completely neglected. The biggest effort was put on the reference layer of catchments of sensitive areas, where the trans-boundary harmonization is crucial, as it is covering the whole of the EU area. The other layers are not covering the EU area continuously and they don't require such a level of harmonization. For these layers only the harmonization of attributes was done, any further work would require updates of the datasets by the member states.

All data reported in 2009 was included in the resulting reference layers. There was no need to remove any datasets due to them not meeting the required quality standard as defined in the UWWTD GIS reporting guidance as what happened to the 2007 data from Italy.
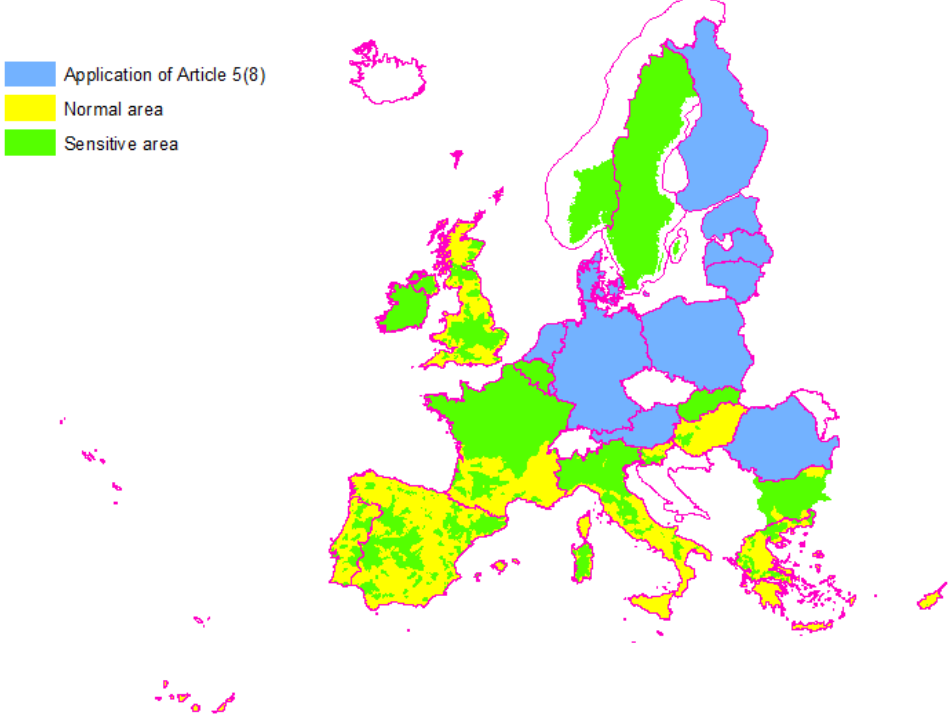
The finalized GIS reference layer doesn't include the latest data updates from the UK reported in October 2010 yet, due to inconsistencies between tabular and GIS data which is still being resolved.

The following two illustrations demonstrate the UWWTD GIS data situation after the 2007 data delivery (Fig. 4) and 2009 update (Fig 5). Due to scale constraints only catchments of sensitive areas are shown.

Fig 4: GIS reference layer on catchments of sensitive areas – 2007 data only

Fig 5: Finalized GIS reference layer on catchments of sensitive areas – 2007 and 2009 data

6. Finalisation with member states' input

During October 2010 member states were asked to send their comments to newly compiled GIS reference layers v 2.0 based on the 2007 data and 2009 updates. Comments from several countries arrived and were explained or accepted (LT, NL, GR, UK), which was reflected in the updated GIS dataset v 2.1.

7. Conclusion

Compilation of EU-wide GIS reference layers on UWWTD sensitive areas was possible based on 2007 data, however many compromises had to be accepted. The overall outcome was acceptable as a result of the first GIS data reporting exercise under UWWTD, but there was certainly a lot of space for further improvements during the next round of reporting.

Data collected under the 2009 UWWTD reporting finally enabled the possession of the complete EU coverage of catchments of sensitive areas together with Norway. Missing GIS data were added, some layers were updated.