UN-GGIM EUROPE

UNITED NATIONS COMMITEE OF EXPERTS ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT

Core Spatial Data Theme "Regulated or Managed Zones" Recommendation for Content

Working Group A - Deliverable of Task 1.b

Version 1.0- 2019-05-24

Version History

Version number	Date	Modified by	Comments
1.0	2019-05-24	WG A	Consolidated draft, for review by geographical and statistical community

Warning: in the following parts of this document, the paragraphs written in grey e.g. "This document has annexes containing more detailed explanations " are common to all core spatial data themes; they aim to provide context and objectives of core data. The paragraphs written in black are specific to core spatial data theme "Regulated or Managed Zones".

Content

1 Executive Summary

In September 2015 the countries of the United Nations adopted the 2030 Agenda for Sustainable Development; a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda. Each goal has specific targets to be achieved over the next 15 years. The 17 Sustainable Development Goals (SDGs) of the 2030 Agenda are supported by 169 targets and 230 indicators.

Geospatial data supports the measuring, achieving and monitoring of many of the goals and targets set by the 2030 Agenda. The 2030 Agenda demands new data acquisition and integration approaches to improve the availability, quality, timeliness and disaggregation of data. Goal 17 explicitly emphasizes the need for developing capacities and partnerships. In this context the success of the 2030 Agenda depends on senior administrators owning and leading the geospatial efforts in their respective countries.

In Europe, building on the INSPIRE Directive redirecting the focus on a cohesive spatial data infrastructure without gaps in content and discrepancies in quality, stakeholders are working on geospatial standardization and increasing richness of data through Core Data Recommendations for Content that correspond to the first phase of WGA work program. Core data is primarily meant for fulfilling the common user requirements related to SDGs in Member States and European institutions.

"Regulated or Managed Zones" are a key tool to achieve the SDGs. Therefore, geographic data on this core theme is necessary to ensure that every interested stakeholder is aware of the regulations applying to a given territory; it is a key tool of good governance.

The recommended data content is based on the common approach of related INSPIRE themes or sub-themes: 'Area Management, Restriction and Regulation Zones', 'Protected Sites' and 'Planned Land Use'. In other words, the attributes of a regulated or managed area should include a geometry, a unique identifier, a name (if any), a classification, a link to the legal text establishing it and temporal attributes. In addition, it is advised to document the legal value of the geographic representation.

There may be a wide range of regulated or managed areas and therefore difficulties to capture the related geographic representation for all of them. In order to decide on priorities, some general principles are proposed, for instance, regarding regulated areas, priority should be given to the areas aiming to control a specific place of interest. However, most of the standardisation work will have to be done at national level.

The quality of the geographic representation consists in consistency with legal text and choice of relevant geometric definition (e.g. list of points with their coordinates or relevant background data). Good quality should be ensured at least for the new regulated or managed areas.

2 Foreword

2.1 Document purpose and structure

2.1.1 Purpose

This document provides the main characteristics of core data for theme Regulated or Managed Zones with focus on the recommendation for content. This document aims to help decision makers (from governments, data producers, national coordination bodies, etc.) to define their policy regarding the improvement of existing data and production of new geospatial data. It addresses digital data.

This document has Annexes containing more detailed explanations targeting the technical people who will be in charge of implementing or adapting core data recommendations (e.g. for production purpose, as source of other standards, etc.).

2.1.2 Structure

The executive summary synthesizes the main conclusions of the Working Group A (WG A) process and results to develop the recommendation for content. It is meant mainly for high level decision makers.

The foreword reminds the general context of core data, the first step achieved by WG A (i.e. selecting core data themes), and it explains the general principles set by WG A to develop the recommendations for content of core data specifications for all selected themes.

The 'recommendation for content' document itself includes four chapters:

- Overview: it provides the general scope of the theme and describes the main use cases addressed;
- Data content: it provides the main characteristics of the recommended content, such as the list of core features and attributes (for vector data), as well as data capture and quality rules;
- Other recommendations: e.g. Coordinate Reference System, Metadata, Delivery;
- Considerations for future: this chapter addresses some key trends or significant user requirements that cannot be considered as core today but that might be considered in future.

The 'recommendation for content' document is meant for medium level decision makers. It is written in natural and not too technical language.

The technical explanations included in annexes describe the relationship between the recommendation for content and the corresponding INSPIRE specification, and contain any other appropriate information useful for this theme.

2.2 Core data context

2.2.1 Rationale for core data

The following background of harmonised pan-European data was identified.[1]

Authoritative geospatial data are used to support both the implementation of public policies and the development of downstream services. Moreover, geospatial data are required to be homogenous to enable the implementation of public policies in a coherent and coordinated way among countries and at regional or global level. Likewise, significant opportunities exist if services developed by industry can be exploited without requiring country specific adaptation.

The INSPIRE Directive has set up the legal and technical framework for harmonisation of the existing data related to the themes in annexes I, II and III. INSPIRE specifications provide common data models that ensure a first step towards interoperability, however ensuring homogeneous content is outside their scope, as they contain no indication about levels of detail, very few recommendations about quality, and as most features and attributes are "voidable", i.e. to be supplied if available or derivable at reasonable cost.

This background led the UN-GGIM: Europe Regional Committee to setup in 2014 the Working Group A on Core Data to deal with core data content and quality, production issues, funding and data availability.

Recommendations for content of core data will complement INSPIRE data specifications by defining the priorities on the core content that is encouraged to be made available in Europe in order to fulfil the main user requirements that are common to many countries, with focus on the SDG related ones.

Core data availability may be ensured either through upgrading of existing data when feasible or through production of new data when necessary.

2.2.2 Core data scope

In its first phase, WG A selected core data themes according to the following criteria: core data is the geospatial data that is the most useful, either directly or indirectly, to analyse, to achieve and to monitor the Sustainable Development Goals.

Among the 34 INSPIRE data themes, 14 have been considered as core including theme Regulated or Managed Zones.

More information about the selection process and results may be found in document 'Core Data Scope - Working Group A - First Deliverable of Task 1.a - Version 1.2' on http://un-ggim-europe.org/content/wg-a-core-data

[1] Extract from the Report by the Preparatory Committee on the establishment of the UN-GGIM: Europe Regional Committee, European Commission Ref. Ares(2014)1491140 - 09/05/2014.

2.3 Document objectives and principles

2.3.1 Encouraging content availability

This deliverable provides recommendations for national governments and data producers, aiming to help them to define their priorities for enriching existing data or producing new data. This deliverable is meant mainly for data producers, however it defines the recommended result and target but not the production process.

2.3.2 Complementing INSPIRE

Core data specifications are built upon INSPIRE data specifications. On one hand, they often simplify INSPIRE by selecting core feature types and attributes and by restricting or clarifying the scope; On the other hand, they enrich INSPIRE by recommending specific levels of detail, quality rules and sometimes data model extensions. Besides, the INSPIRE common terminology is thoroughly used for naming core features and attributes.

Regarding the levels of detail, the ELF (European Location Framework) project terminology has been used. The ELF levels of detail are the following: Global, Regional, Master level 2, Master level 1, Master level 0. These terms are defined in the glossary.

Regarding delivery, core data may be supplied according to several ways. It is expected that, very often, the core data recommendations will be used to enrich and upgrade existing products. In this case, core data will be available through these improved products. Core data may also be delivered through INSPIRE conditions (specifications and services).

2.3.3 Status of core data recommendations

This document contains recommendations that are not legally binding. However, some recommendations are more important than others. This order is indicated as follow:

Core Recommendation X

It is first priority recommendation, considered as both necessary and achievable in principle. Ideally, it should encourage involved stakeholders to launch short-term actions (typically within a couple of years).

Core recommendations are usually addressing only technical aspects and are meant for the organisations in charge of producing this theme. The set of core recommendations defines the basic expectations on core data.

Good Practice X
It is second priority recommendation; if adopted, it will provide significant added value to core data; it indicates a relevant trend to be adopted as much as possible. It encourages involved stakeholders to take these recommendations into account in long term, if not possible in short term.

NOTE: some of these good practices may be quite easy to achieve and are already effective in some countries whereas some others may be more difficult to achieve. This is typically the case when these good practice recommendations involve other stakeholders in addition to the organisations in charge of producing this theme, and when they address not only technical aspects but also legal or organisational ones.

A “core data set” should contain the minimum data defined by the core recommendations (and ideally also by the good practices) of this deliverable but may of course contain more and/or better information.

2.4 Abbreviations

AM	INSPIRE Theme Area Management/Restriction/Regulation Zones and Reporting Units
CAD	Computer Aided Design
CRS	Coordinate Reference System
ELF	European Location Framework
EU	European Union
GIS	Geographic Information System
GPS	Global Positioning System
LU	INSPIRE theme Land Use
PS	INSPIRE theme Protected Sites
SDG	Sustainable Development Goal
UN-GGIM	United Nations initiative on Global Geospatial Information Management
US	INSPIRE Theme Utility and Government Services
WG A	(UN-GGIM: Europe) Working Group on Core data

2.5 Glossary

2.5.1 Levels of detail

Global	Level of detail defined by ELF: data to be used generally at scales between 1: 500 000 and 1: 1 000 000, i.e. mainly at international level
Regional	Level of detail defined by ELF: data to be used generally at scales between 1: 100 000 and 1: 500 000; data mainly for national or regional (European or cross-border) actions.
Master level 2	Level of detail defined by ELF: data to be used generally at scales between 1: 25 000 and 1: 100 000); data mainly for regional (sub-national) actions.
Master level 1	Level of detail defined by ELF: data to be used generally at scales between 1: 5 000 and 1: 25 000; data mainly for local level actions.
Master level 0	Level of detail defined by ELF: data to be used generally at scales larger than 1: 5 000; typically, data at cadastral map level, mainly for local level actions.

NOTE: the above definitions are indicative; in practice, detailed data (Master levels) may also be required also by national, European or international users.

2.6 Reference documents

INSPIRE Data Specification on Area Management/Restriction/Regulation Zones and Reporting Units – Technical Guidelines 3.1: http://inspire.ec.europa.eu/id/document/tg/am

INSPIRE Data Specification on Protected sites – Technical Guidelines 3.1: http://inspire.ec.europa.eu/id/document/tg/ps

INSPIRE Data Specification on Land Use– Technical Guidelines 3.1: http://inspire.ec.europa.eu/id/document/tg/lu

Core spatial data theme ‚Geographical Names' – Recommendation for content – Final version 1.1 https://un-ggim-europe.org/wp-content/uploads/2018/11/UN-GGIM-Europe_WGA_Recommandation_Content-GN-v1.1.pdf

3 Overview

3.1 General scope

Definition: Areas regulated or managed in order to achieve sustainable development.

- **Manage**: zones are established to plan, perform, monitor and control activities to achieve specific legally defined sustainable development goal objectives. A goal may be continuous.
- **Regulate**: zones are established to monitor and control certain activities (to permit, promote, prohibit, or restrict) to achieve legally defined sustainable development goal objectives.

[This UN-GGIM: Europe WG A definition is adapted from INSPIRE AM].

Description: This theme focuses on the geographic description of areas submitted to any sustainable development related regulation or management plan, at any level of government, from local to international.

NOTE 1: Comparison with INSPIRE
The core theme "Regulated and managed areas" has overlaps and intersections with the following INSPIRE themes:

- Area Management/Restriction/Regulation Zones and Reporting Units
- Protected Sites
- Land Use
- Utility and Government Services

More detailed comparison with INSPIRE is available in annex A.

NOTE 2: Comparison with global fundamental data

At world level, UN-GGIM has selected a set of global fundamental data themes, including theme "Functional Areas" that is defined as follows: "Functional Areas are the geographical extent of administrative, legislative, regulatory, electoral, statistical, governance, service delivery and activity management areas." The scope of this UN-GGIM global fundamental theme is very similar to the scope of Un-GGIM: Europe core themes "Administrative Areas", "Statistical areas" and "Regulated and Managed Zones" .

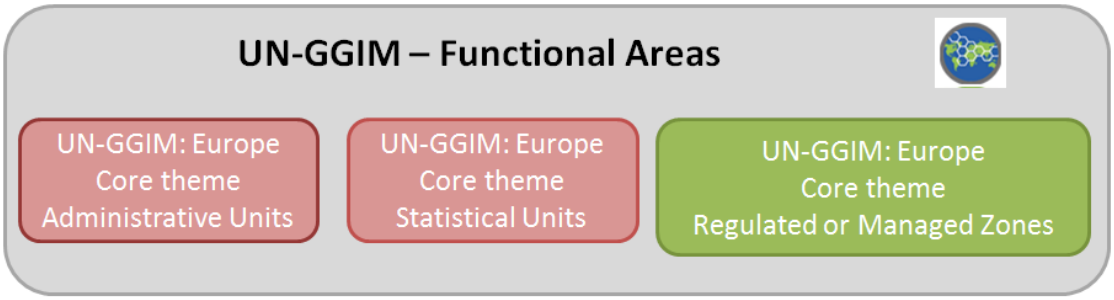

Figure 1 : Comparison between global fundamental theme « Functional Areas » and related core themes

NOTE 3 : Purpose of this document

Main objective of core data recommendation for content is to define priorities for capture of new data or enhancement of existing ones. Regarding theme « Regulated or Managed Zones », the recommendations are limited to the geographic representation of these zones , i .e. the decisions about which regulated or managed zones are necessary and relevant are of course out of scope of this document and under full responsibility of governments, from local to global.

3.2 Use cases

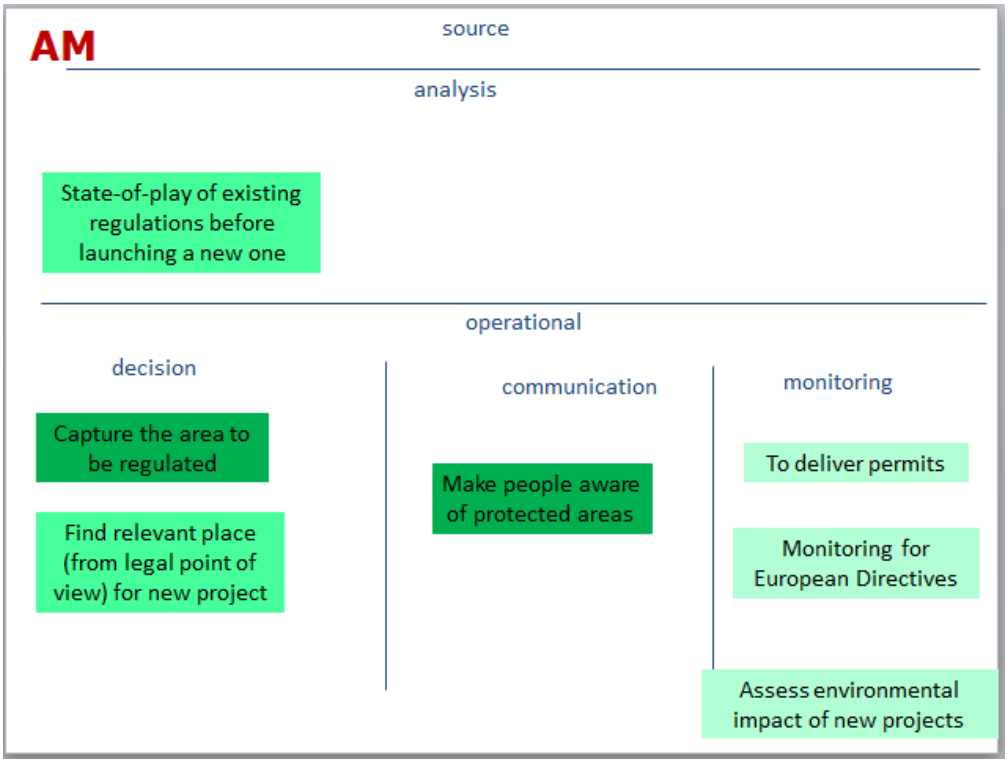

Figure 1: use case map for theme “Regulated or managed areas”

In INSPIRE, the exact name of this theme “Area management/restriction/regulation zones and reporting units”. For WG A, an overarching theme was defined as “Regulated or managed areas” which covers and extends the following INSPIRE themes: “Area management/restriction/regulation zones and reporting units”, ‘Protected Sites’ and the Supplementary Regulations of the INSPIRE Land use sub-theme ‘Planned Land Use’. All of these themes or sub-themes present specific cases of regulated and managed zones.

Regulating specific zones is a powerful mean to help achieving the SDGs. Such regulations may aim to protect a specific area by prohibiting or mandating some activities, to affect the most relevant land use to a given area, to ensure sustainable exploitation of forest or other natural resources, to allocate more funds to less favoured areas etc.

In the analysis phase, before introducing new rules, it is necessary to check that there is no conflict or useless redundancy with existing regulations. Then the location of the regulated area has to be properly captured as spatial data, enabling it to be combined with reference data, such as administrative units or cadastral parcels: to be applied, the regulations must be widely known by citizens and so easy to access and to understand. For instance, protected sites and restricted areas around contaminated sites or air quality management zones must be known by the public in order to

lower their exposure to the hazards involved. Knowledge of all public restrictions also brings security for investments and to the land market, ensuring that there are no hidden restrictions.

In the operational phase, governments and other actors have to take into account the existing regulated areas to find relevant locations for a new project, at least to check if this project conforms to the various regulations on land. The protected areas around watercourses may be integrated and taken into account by the GPS of tractors to prevent farmers from spreading pesticides etc.

Regulated zones have also to be known to deliver various kinds of permits (e.g. planned land use for building permits) and to assess the environmental impact of "big" projects. Protected sites are required for reporting to several European Directives (e.g. Natura 2000) and are involved in some SDG indicators. Theme 'Protected Sites' contributes to the depiction of cultural heritage and nature protection sites both in land and water.

4 Data content

4.1 Features types and attributes

Core Recommendation 1
Core data should include feature type RegulatedOrManagedZone with following attributes:
- geometry and its legal value
- unique and persistent identifier (s)
- name (if any), with the name itself, i.e. its spelling and with information on its language, status and (if relevant) source.
- classification
- validity period
- link to the legal text(s) establishing the regulated or managed area.

NOTE 1: The regulated or managed zone will generally be represented by a surface (GM_Surface or GM_MultiSurface) but in specific cases, it may be represented by a point (e.g. protected sites for bats may be very small – a cave – and so, just represented by a point) or by a line (e.g. a speed limit along a road link). In some cases, the geometry may even require a solid (3D data), such as for the regulated areas related to aerial navigation.

NOTE 2: The geospatial feature in digital format may define the regulated or managed zone (and in this case it has legal value) or it may just represent it (and in this case, it does not have legal value, the legal value being in the text).

NOTE 3: A regulated or managed zone should have at least a database identifier; in addition, if thematic identifiers are in current use to attach external information or for reporting, they should also be captured.

NOTE 4: In case a regulated or managed zone has one or several names, these names should be captured according to the recommendations of theme 'Geographical Names', i.e. with their language, status and source. These attributes describing the name should help users to decide on

which name(s) is (are) the most relevant to be displayed on a map. The information about "source" is relevant if some sources are considered as more reliable than others. See annex A for illustration.

NOTE 5: The classification should document the nature, the domain or the main purpose of the regulated or managed zone. Examples: health protection, bathing waters, forest management area, electoral zone.

NOTE 6: The validity period is the period when the regulation or management shall legally apply on the related zone.

4.1.1 Temporal aspects

Core Recommendation 2
Only valid features are considered as core data.

In other words, efforts to capture obsolete regulated or managed areas are not considered as a priority.

However, once features have been captured, it is recommended to keep them in the data base, even after their end in the real world.

Good Practice 1
It is recommended to manage the history of features, using the mechanism provided by the INSPIRE data specifications: versioning and life-cycle attributes.

NOTE 1: Versioning and life-cycle attributes enable change-only updates; they also enable to retrieve the status of geographic data about regulated or managed areas, at any time of the past (since the adoption of these mechanisms).

NOTE 1: The versioning and life-cycle attributes enable change-only updates; they also enable to retrieve the status of geographic data on Regulated and Managed Zones, at any time of the past (since the adoption of these mechanisms).

NOTE 2: The above Core recommendation and Good practice may look contradictory but in fact they are not. Let us imagine a data producer deciding to implement the core recommendations and good practices of this deliverable from 2020:

- In a first step, according to the above Core recommendation, first priority is to capture the features that are valid (in 2020), as they are both the most useful and the easiest to be captured. For instance, capturing features from the past would require significant efforts for limited benefits.
- In a second step, for instance in 2025, a given entity disappears in the real-world; the related feature – already captured in 2020 – should be kept in the database as "deprecated", which is documented by the life-cycle attributes of INSPIRE. This may be done quite easily just through proper database management.

4.2 Geographical extent

Core Recommendation 3
Core data for theme "Regulated or Managed Areas" should be available on whole territory, both on land and sea.

NOTE : Regulated or managed zones on land contribute obviously to achieve most of the SDGs; regulated or managed zones on sea are one of the main tools to achieve SDG 14 about “life under water”.

4.3 Data capture

4.3.1 Priority scope

In most countries, there is generally a wide range of regulated or managed zones. Capturing under digital data the geometry and other core attributes of all these regulated or managed zones may be difficult to achieve (or even not always relevant). It is why it may be of interest to define some priorities.

4.3.1.1 Priority scope for regulated areas

Core Recommendation 4
As general rule, priority is to capture the regulated areas related to a specific place of interest.

NOTE 1: Some regulations are generic as they apply only on some areas but under the same rule on whole territory; for instance, it may be forbidden to spread pesticides within a given distance from (all) buildings. Capturing such regulated areas is clearly not a priority; in addition, it would be very difficult to maintain up-to-date data on such regulated areas. In this case, the priority should be to ensure the completeness of the building data. In opposite, regulated areas related to the protection of historical monuments should be captured as they address protection of specific places of interest.

NOTE 2: Core recommendation 3 is a general principle but the definition of “specific place of interest” is subject to various interpretations and will not enable to decide, in all cases and without any doubt, about what is specific and what is generic. Ideally, there should be some coordination, at least at national level, to agree on these specific places of interest.

NOTE 3: In addition, capturing the geometry of some generic regulated areas may also be considered as a priority. For instance, in Spain, the public restrictions on or around rivers are considered as very important and are materialized in the real-world: it is obviously a priority to capture these related regulated areas as geographic data.

4.3.1.2 Priority scope for managed areas

Core Recommendation 5
Priority is to capture the categories of managed areas that apply at international, European or national levels.

EXAMPLES:

- Electoral zones, areas of responsibility of public services (schools, hospitals, tribunals …)
- Management zones required by the SDG indicators (e.g. forest management areas, cross-border drainage basins)
- For EU Member States, management zones required or defined by European Directives

NOTE 1: it may occur that, in some countries, there is a general rule stating that areas of responsibility of public services (or electoral zones) correspond to a given level of “Administrative Units”. In these cases, there is no strong need to duplicate capture of data.

NOTE 2: Local governments generally prepare and define urbanism plans that are very important for sustainable building and housing process. These plans are considered under core theme “Land Use” in sub-theme “Planned Land Use”

NOTE 3: Capturing the other managed zones (if any), that are defined only by local level governments, i.e. applying only on specific parts on the national territory is also of interest. It is not out of scope of core data but has less priority.

4.3.1.3 General consideration

The previous two core recommendations provide some general principles but they will not be enough to define clear priorities in all cases as it should be recognised that the situation may be quite heterogeneous between countries regarding both the legal situation (variety and number of regulated or managed areas) and the state-of-play of existing data. Therefore, it is up to each Member State to define its priorities, according to its national context.

Good Practice 2

Member States are encouraged to draw up a state-of-play of their regulated and managed areas and of the availability and quality of existing data, to assess the gaps and to prepare an action plan, with defined priorities.

4.3.2 Geometric delimitation

It is more user-friendly if **the geometric data has legal value** (no need to check text); of course, this should be mentioned in the regulation but a pre-condition is that the geometric representation is good enough.

However, this is not always the case as several cases may occur regarding the **geographic data** on regulated or managed zones:

- Data do not exist at all and has to be created from the descriptions in the regulation text; this may occur of course for new regulations but (unfortunately) also for some old texts.
- Data already exists; however, it may be of poor quality or available only in non-vector formats (e.g. CAD, .pdf or even just paper maps).

Therefore, this deliverable is proposing a step-wise approach.

Good Practice 3

For new regulations, Member States are encouraged to set up relevant procedures to ensure that geographic data is prepared together with the text and that it is of good quality; this is a pre-condition to give legal value to geographic data.

NOTE 1: For existing regulations, it is recommended to proceed as well as possible. Short-term solution may be to capture geometry, even with some uncertainties (without legal value): this would at least inform users about the existence of regulated or managed zones; geographic data might be used at least as warning.

NOTE 2: Good quality geographic data is defined in chapter 4.4.

4.3.3 Classification

There may be many kinds of regulated or managed zones. The INSPIRE code lists can supply a good starting point for the zones devoted to environmental issues. However, the classification should also include the zones devoted to the two other pillars of sustainable development, namely society and economy. This may include for instance priority areas for specific domains (education, agriculture …).

This classification may of course vary according to the national context.

Good Practice 4
Member States should agree on a national classification for regulated or managed zones.

NOTE 1: Regarding the regulated or managed zones aiming at environment, this national classification should be easily matchable with the INSPIRE code lists (at least for EU countries). Regarding the regulated or managed areas aiming at society or economy, this national classification should extend the INSPIRE code lists.

4.3.4 Link to legal text

There are lots of legal texts at different levels of government, some of them related to regulated or managed areas, some related to other topics. Ideally, all these texts should be easily available on Internet and managed in a national digital documentary database or set of data bases.

Good Practice 5
Member States are encouraged to set up documentary digital database(s) of all legal texts and to provide the link between the geographic data on regulated or managed zones and the legal text establishing it.

NOTE 1: The documentary database(s) should include not only the legal texts but also some metadata elements aiming to facilitate their search, such as validity dates.

NOTE 2: In practice, the link to the legal text may be provided, either as a URL to a single document in the documentary database or as a URL to this documentary database together with relevant information to retrieve the relevant document, such as title, publication date and possibly government level.

4.4 Quality

Main quality rule about regulated or managed areas is related to the geometric representation. Main principle is that this geometry representation should be consistent with the description in the legal text. The legal text may define the extent of a regulated or managed zone according to three main methods (that are not exclusive):

a) By delimiting this extent as a feature of a Geographic Information System and by referring to this (digital) feature in the legal text
b) By defining the zone boundaries by a list of points with their coordinates in a given Coordinate Reference System
c) By describing in the text this extent according to background data (e.g. as a set of parcels or of administrative units, by its boundaries provided through a list of streets or of topographic limits)

Whereas the two firs options enable to define the regulated or managed zone without any ambiguity, this is not always the case for the third option that is unfortunately the most common. Therefore, in the third option, the quality of geospatial data on "Regulated or managed zones" depend both on the quality of the legal text that should ideally describe without ambiguity the extent of the area (but this doesn't always occur) and on the availability of relevant background data.

4.4.1 Cross-theme consistency

Good Practice 6
When described in text according to background data, the geographic delimitation of regulated or managed zones should be based on relevant background data, i.e. in general on authoritative reference data, at best level of detail and of same reference date as the legal text establishing the area.

NOTE 1: Best level of detail should ideally be Master level 0 for addresses and Cadastral Parcels and Master level 1 for Administrative Units and topographic features.

NOTE 2: This Good practice applies in case of option c); it aims to ensure consistent use of regulated or managed zones with reference data; it also aims to ensure (as much as possible) an accurate and unambiguous definition of the zone extent. It should also apply if the extent of the regulated or managed zone is defined both by descriptive text and by a reference digital feature in GIS.

NOTE 3: Regarding cross-border regulated or managed zones, there may be interest for edge-matching at international boundaries. Until now, this is not yet fully achieved on large scale data. In these cases, geographic representation at smaller scale (e.g. Regional level) might be relevant in addition or in replacement to large scale representation. More generalised data may also be required for reporting (e.g. European Environmental Acquis).

4.4.2 Consistency with legal text

Core Recommendation 6
The geographic delimitation of regulated or managed areas should be as consistent as possible with the legal text establishing it.

NOTE 1: Difficulties may come in case of option c), from ambiguous legal text and/or from lack of relevant background data, typically in case of old texts referring to features that are no longer existing.

Good Practice 7
For new regulations, great care has to be taken to ensure that the regulation text describes without any ambiguity the geographic delimitation of the regulated or managed area.

For new regulated or managed areas, it is also recommended to ensure temporal consistency between legal text and regulated or managed area: geographic data should be published in same time as the legal text and the updates of geographic data should also follow the evolutions in texts.

4.4.3 Topologic consistency

There may be some topologic rules in real world related mainly to managed areas. Typically, some managed areas are supposed to provide a partition of national territory; this is for instance the case

of electoral zones or of areas of responsibility of public services. At least, most of managed areas of same category are not supposed to intersect one another.

Good Practice 8
Great care has to be taken to ensure that the topologic rules applying in the real world are respected in geographic data.

5 Other recommendations

5.1 Coordinate Reference System (CRS)

5.1.1 Case of 2D data

Good Practice 9
Core data should be stored and managed in a CRS based on datum ETRS89 in areas within its geographical scope, either using geographic or projected coordinates.

NOTE 1: Geographical scope of ETRS-89 excludes over-sea territories, such as Canary Islands or French Guyana or Madeira Islands and Azores Islands. In these cases, it is recommended to use a CRS based on ITRS (International Terrestrial Reference System).

NOTE 2: Storing and managing data in CRS based on international datum facilitates the import of measures from modern sensors, ensures that data is managed in a well-maintained geodetic framework and of course, facilitates the export of data into international CRS (e.g. those mandated by INSPIRE).

NOTE 3: If core data at regional and global levels has to be provided as a single data set on an area including over-sea territories, it is recommended to use as CRS geographic coordinates with any realisation of the International Terrestrial Reference System (ITRS), known as International Terrestrial Reference Frame (ITRF). At small or medium scales, all ITRS realisations can be considered as equivalent, as deviations between them are negligible compared to data accuracy.

5.1.2 Case of 2.5D or 3D data

Most of regulated or managed areas are expected to be produced as 2D data. However, some areas (e.g. pubic easements for aerial navigation) have to be produced as 3D data.

Good Practice 10
If regulated or managed areas are captured as 2.5D data or 3D data, it is recommended to use a gravity-related height for the Z coordinate, ideally given in EVRS as vertical component of the Coordinate Reference System.

NOTE 1: EVRS states for European Vertical Reference System.

5.2 Metadata

Good Practice 11
Core data should be documented by metadata for discovery and evaluation, as stated in the INSPIRE Technical Guidelines for metadata and for interoperability.

NOTE: This is an INSPIRE recommendation (only the INSPIRE Implementing Rules are legally binding for the Member States belonging to the European Union, but the Technical Guidelines are considered necessary to make the European Spatial Data Infrastructure work in practice). For the other countries, this is a way to make their data easily manageable by transnational users.

5.3 Delivery

It is expected that core data will be made available through improved existing products (or new products) or as INSPIRE data, and perhaps as specific core products (delivery issues still have to be investigated by the working group).

Good Practice 12
Core data corresponding to INSPIRE themes "Protected sites", "Area management/restriction/ regulation zones and reporting units" and "Land Use" should be made available according to the related INSPIRE Technical Guidelines for interoperability, for metadata and for services.

NOTE: This is an INSPIRE recommendation (only the INSPIRE Implementing Rules are legally binding for the Member states belonging to the European Union, but the Technical Guidelines are considered necessary to make the European Spatial Data Infrastructure work in practice). For the other countries, this is a way to make their data easily manageable by transnational users.

NOTE 2: The scope and model of this core data theme "Regulated or Managed Zones" are intersecting the scopes and models of several INSPIRE themes. It is advised to provide at least the common part under INSPIRE rules.

In most countries (if not all), data on regulated or managed zones is scattered between many public authorities and users have difficulties to know all the regulations applying on a given territory.

Good Practice 13
Member States are encouraged to set up efficient and user-friendly mechanisms to deliver geographic data on regulated or managed zones (with link to associated legal texts) to all potential users.

NOTE 1: Convenient mechanism would generally be a single access point for users (e.g. thematic Geoportal). Offering background topographic, cadastral or administrative base maps would be necessary to enable users to understand the location and impact of the regulated or managed zones.

NOTE 2: There is a wide range of potential users, including citizens, private companies, non-governmental organisations and public authorities themselves.

6 Considerations for future

6.1 Geometric delimitation

The core recommendation n° 5 encourages consistency between the geographic data representing regulated or managed areas and the legal text(s) establishing it. However, this deliverable also recognises the difficulties to ensure this consistency, especially for old legal texts: “difficulties may come from ambiguous legal text and/or from lack of relevant background data, typically in case of old texts referring to features that are no longer existing.”

Member States are encouraged to assess the gap between present situation and what is desirable (reliable geographic representation consistent with legal text), to investigate potential solutions (e.g. struggling to capture background data from the past or revising legal texts to remove ambiguities or references to past data) and to perform some cost-benefit analysis (i.e. to compare the costs of potential solutions with the costs of risks stemming from non-reliable geographic data).

In addition, research and knowledge exchange activities should also be encouraged regarding methods to enhance the geometric delimitation of regulated or managed areas; this may concern automation of text mining to extract background geographic features, methodologies for vectorisation and georeferencing of paper maps or CAD documents …

6.2 Information on responsible party

Many of the regulated or managed areas are managed by a responsible party, generally a public actor. The information about responsible party would be of interest for citizens and for e-government applications.

The most efficient way to provide this information would be to set up a data base of (public) actors and to establish a link from regulated or managed areas to the public actor in charge of it (if any). This dataset of competent authorities might possibly be included in a Business Register and it might also be used for many other applications.

However, in many countries, such information system of competent authorities does not exist yet. Member States are encouraged to envisage the constitution and maintenance of this very useful asset.

NOTE: In INSPIRE, the responsible party is modelled as an attribute. This modelling choice is suitable for delivery purposes (what is the aim of INSPIRE) but not for production purposes (what is the aim of core data) as it might imply lots of redundancy: a public actor may be responsible party for several areas or activities. This is why an association to a database of public actors is considered as more relevant.

6.3 Modelling content of legal text

This document recommends an attribute about the classification of regulated or managed areas. This attribute would facilitate the discovery and handling of data. However, in most cases, it is clearly not enough to understand what is controlled, forbidden, restricted, mandated or managed: typically, users will have to read carefully the legal text to understand what they are allowed to do in a

regulated area. Of course, this is not user-friendly at all and textual description may also be source of ambiguities and of legal uncertainty.

Research and knowledge exchange activities should also be encouraged regarding methods to model the content of the legal texts establishing regulated or managed areas. There has been some attempts to promote such approach in INSPIRE, through the extended model about Controlled Activities in theme AM and trough the attribute about dimensioning indication on feature type Supplementary Regulation in theme LU. The ISO 19152 standard (LADM) may also provide useful starting points for such activities; typically, the LADM (Land Administration Domain Model) is proposing the concept of RRR: rights – responsibilities – restrictions between spatial units and parties.

Likely, it will not be possible or even desirable to model the content of all concerned legal texts but some significant progress may be foreseen.

6.4 INSPIRE coming closer to core data

The current document is widely based on the common aspects of INSPIRE related themes, namely "Area management/restriction/regulation zones and reporting units", "Protected sites" and (part of) "Land Use". If data has been produced following the core recommendations and good practices of this deliverable, the part that is common to INSPIRE related themes should be easily transformed and derived into INSPIRE conformant data.

However, the current document is also recommending some extensions to INSPIRE, such as the information of legal value for the geographic representation (for more detail, see annex A).

If this additional information is deemed of interest for the European Spatial Data Infrastructure, it may be suggested to the European Commission to publish some official optional extended schema including the core data additions or even to envisage the inclusion of the core data additions in the mandatory INSPIRE data models.

7 Annex A: Relationship with INSPIRE

7.1 Data model

The UML models provided in this annex are only graphical illustrations of the core recommendations and of the good practices present in this document.

The recommendations for content are represented by highlighted the selected attributes in the following way:

Core recommendation 

Good practice 

7.1.1 Comparison between Core Data and INSPIRE content

7.1.1.1 Core data model

Core Recommendation 1

Core data should include feature type RegulatedOrManagedArea with following attributes:
- geometry and its legal value
- unique and persistent identifier (s)
- name (if any), with the name itself, i.e. its spelling and with information on its language, status and (if relevant) source.
- classification
- validity period
- link to the legal text(s) establishing the regulated or managed area.

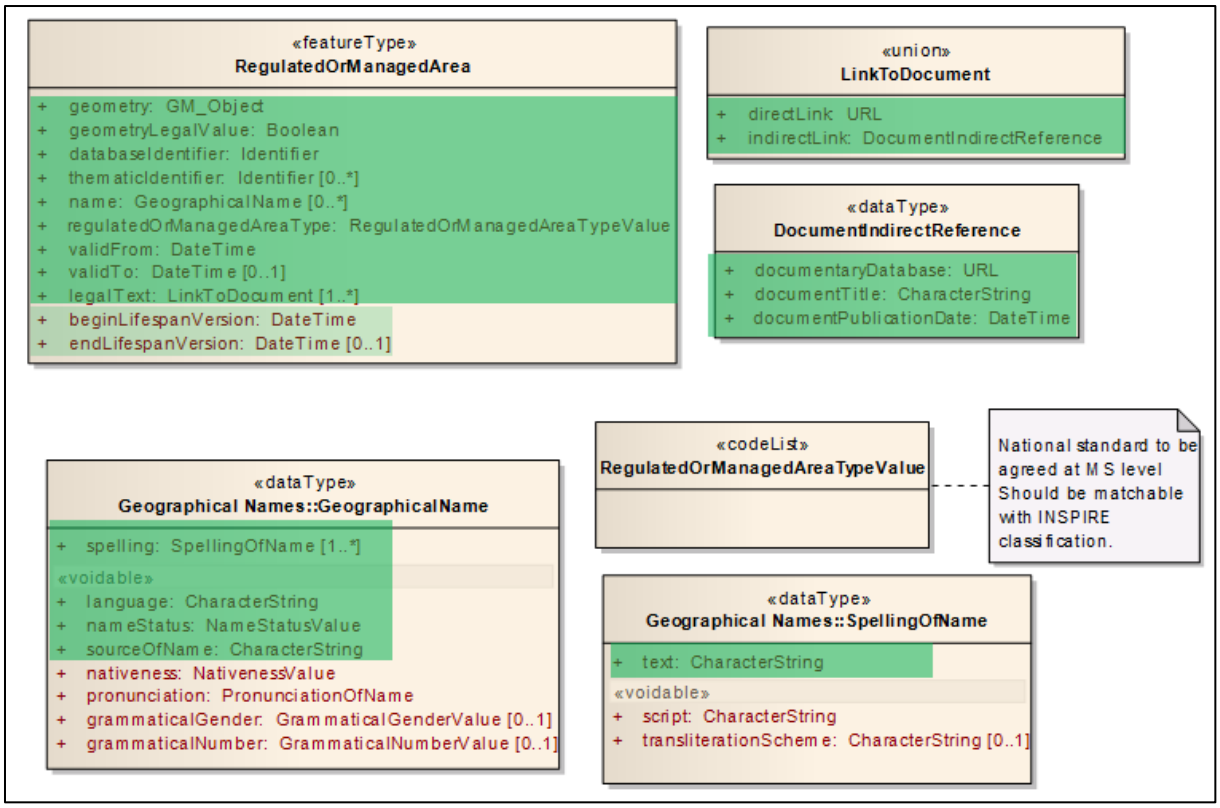

Figure 3: proposed core data model

NOTE 1: The proposed core data model is just an illustration of core recommendation 1 (and of good practice 1). However, it is expected that data producers will use their own data model, in national language and including possibly more content.

NOTE 2: This model is widely based on the common concepts of INSPIRE data models related to AM, PS and LU (feature type SupplementaryRegulation).

NOTE 3: In order to provide a simple overview, this model is proposing a single attribute with a single associated code list for the classification of all types of regulated or managed zones. However, it is a purely theoretical approach and in practice, it is very likely that several attributes and code lists will be required to deal with the wide variety of regulated or managed zones.

NOTE 4: The main differences in core data model (compared to the INSPIRE one) include the information about the legal value of the geographic data (geometryLegalValue), harmonises the information about the legal document (legalText) and extend code lists addressing economic and social domains. The association to the responsible authority is not included but might be considered in the future.

In the following paragraphs, there is a more detailed comparison showing the similarities and differences between core data model and related INSPIRE data models. In the illustrations below, the core feature type “RegulatedOrManagedArea” is shown as inheriting from some INSPIRE feature types. The purposes of the illustrations below are to make comparison, by highlighting the additional core attributes and to demonstrate how core data may be matched to INSPIRE data model.

7.1.2 Core data model and Protected Sites

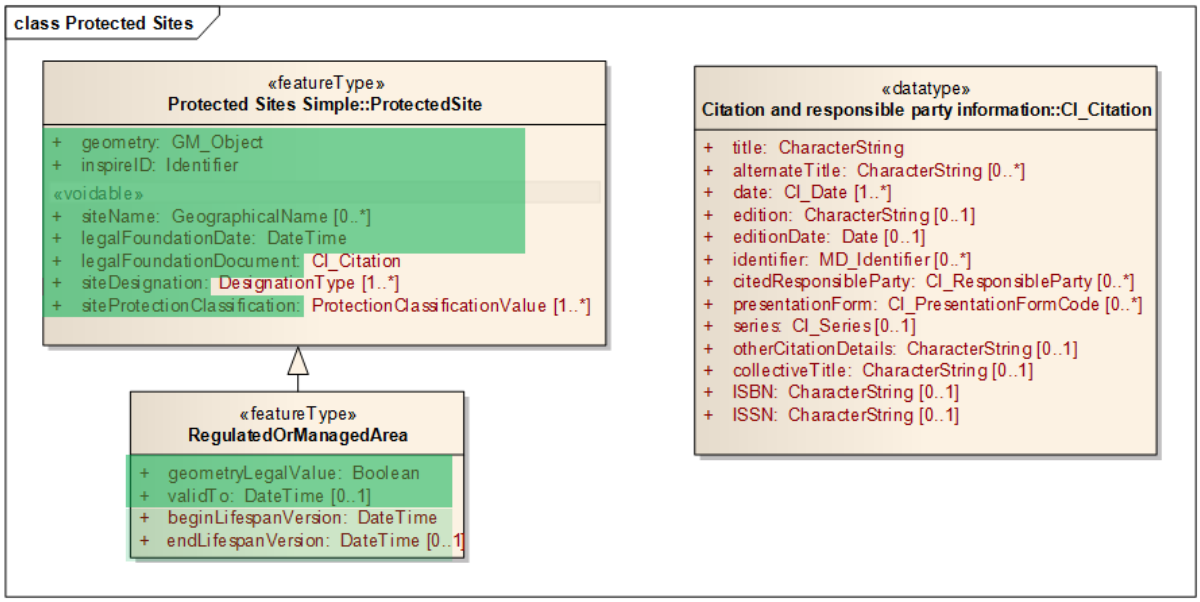

Figure 4: comparison between core data model and INSPIRE data model on Protected Sites

NOTE 1 : The core data model includes all the information of INSPIRE data model:

- The matching is obvious for the attributes geometry and siteName
- The INSPIRE attribute “inspireId” is equivalent to the core attribute “databaseIdentifier”
- The INSPIRE attribute “legalFoundationDate” is equivalent to the core attribute “validFrom”
- The INSPIRE attribute “legalFoundationDocument” corresponds to the core attribute “legalText”. However, INSPIRE defines it in a flexible way, as “a URL or text citation referencing the legal act that created the Protected Site » whereas core data recommends only the URL mechanism, considered as more user-friendly than a text citation
- The INSPIRE attributes “siteDesignation” and “siteProtectionClassification” correspond to the (theoric) core attribute “RegulatedOrManagedAreaType”. The related core data code list should be matchable to INSPIRE classification attributes.

NOTE 2: The core data model extends the INSPIRE PS data model with some temporal attributes (validTo and the life-cycle attributes begin/endLifespanVersion) and with the legal value of geometry.

NOTE 3: In INSPIRE, the reference to legal text is done using the (complex) data type CI_Citation. Core data recommends just either a direct link (by URL) to the legal text itself or a link to the documentary database hosting the legal text with the minimum metadata information necessary to retrieve the given legal text, namely its title and publication date.

7.1.3 Core data model and Area Management

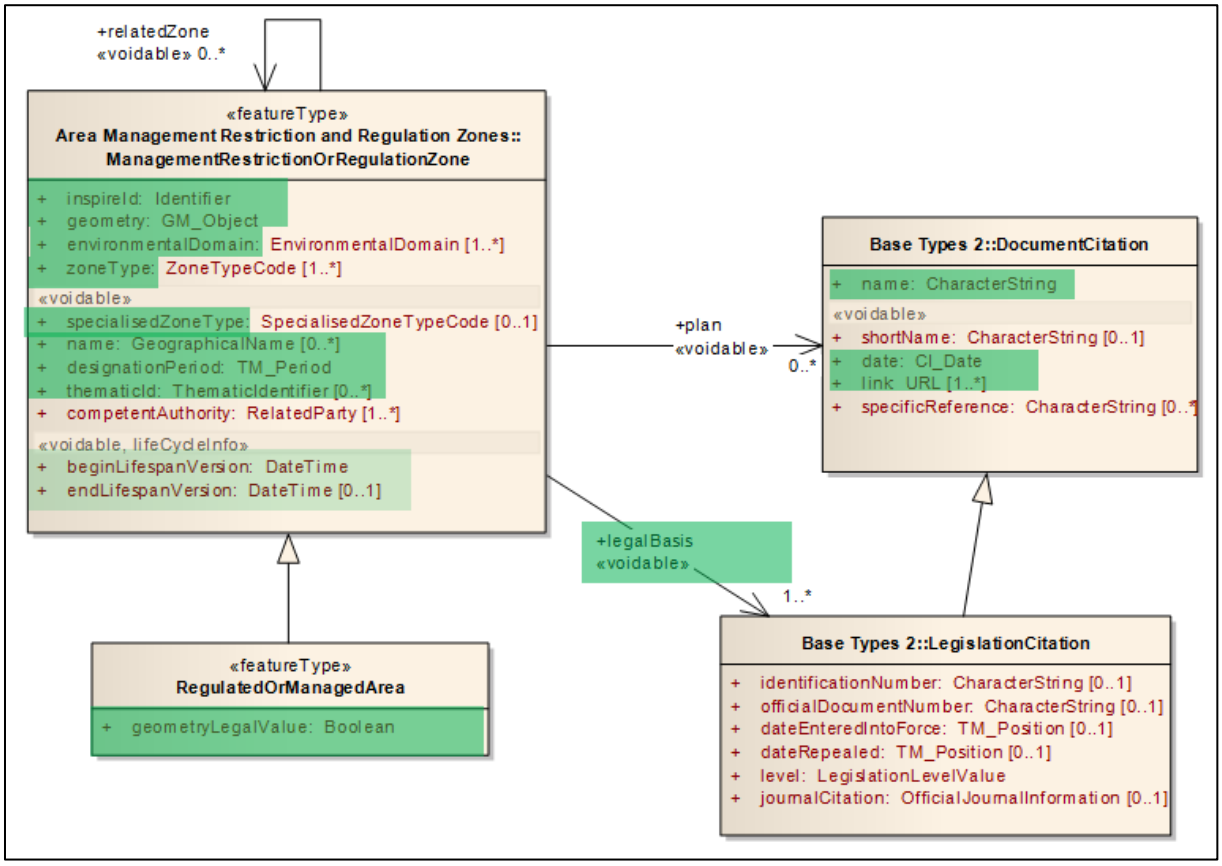

Figure 5: comparison between core data model and INSPIRE data model on Area Management

NOTE 1: the core data model includes most of the information of INSPIRE data model:

- The matching is obvious for the attributes geometry and name
- The INSPIRE attribute “inspireId” is equivalent to the core attribute “databaseIdentifier”
- The INSPIRE attribute “designationPeriod” is equivalent to the core attributes “validFrom” and “validTo”
- The INSPIRE association to data type DocumentCitation ” corresponds to the core attribute “legalText”. However, INSPIRE defines it in a flexible way, as it may be a URL or a specific reference whereas core data recommends only the URL mechanism, considered as more user-friendly than a text citation
- The INSPIRE attributes “environmentalDomain”, “zoneType” and “specialisedZonetype” correspond to the (theoric) core attribute “regulatedOrManagedAreaType”. The related core data code list should be matchable to INSPIRE classification attributes, regarding areas aiming to environmental issues and it should extend the INSPIRE code list in order to include the areas related to other components of sustainable development.

NOTE 2: The core data model extends the INSPIRE data model with the legal value of geometry.

NOTE 3: in INSPIRE, the reference to legal text is done using the data types DocumentCitation and LegislationCitation. Core data recommends just either a direct link (by URL) to the legal text itself or a link to the documentary database hosting the legal text with the minimum metadata information necessary to retrieve the given legal text, namely its title and publication date.

Core data recommends a documentary database registering all legal texts and documented by some metadata elements. The INSPIRE data types may provide a good starting point to investigate relevant metadata elements for legal texts (in addition to the document title and publication date). These data types fit for legal documents whereas the CI_Citation used by INSPIRE theme Protected Sites fit for other kinds of resources (such as datasets) and is more complex; therefore, the CI_Citation looks less adapted.

7.1.4 Core data model and feature class "SupplementaryRegulation" of INSPIRE theme Land Use (LU)

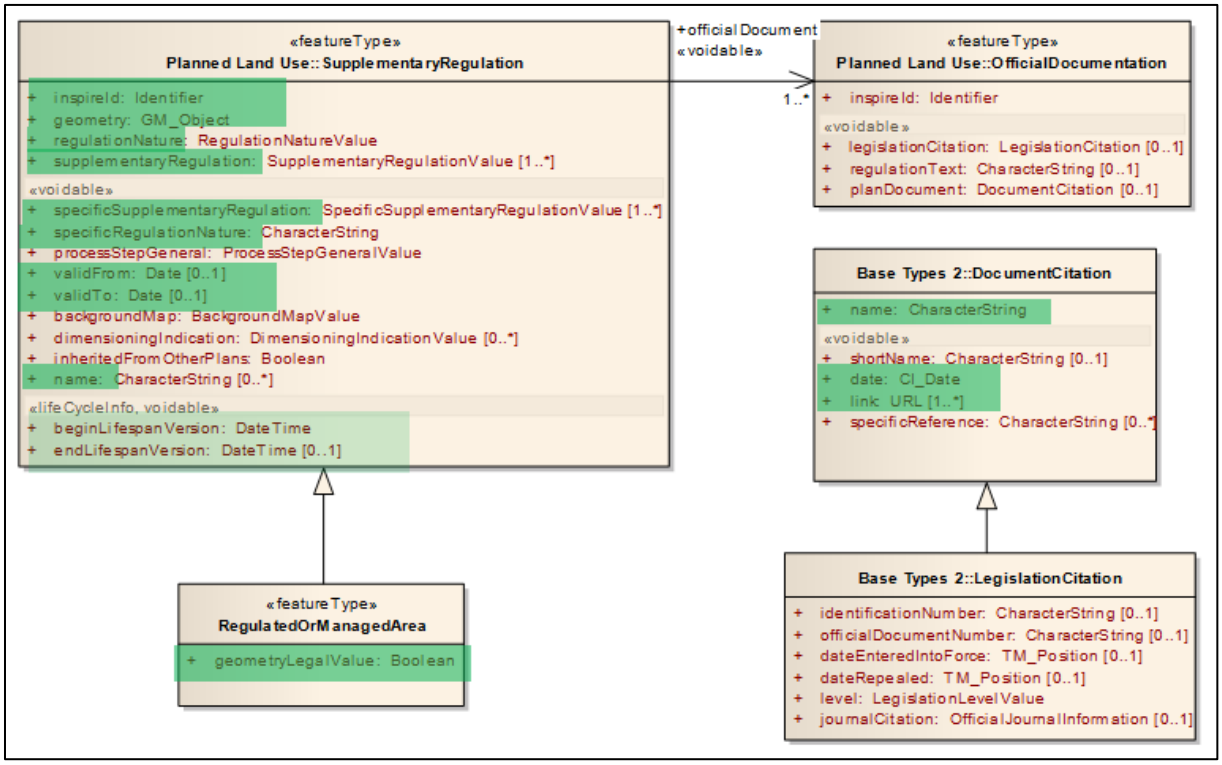

Figure 6: comparison between core data model and INSPIRE data model of theme "Land Use" (feature type "SupplementaryRegulation")

NOTE 1: the core data model includes most of the information of INSPIRE data model:

- The matching is obvious for the attributes geometry, validFrom and validTo
- The INSPIRE attribute "inspireId" is equivalent to the core attribute "databaseIdentifier"
- The INSPIRE association to feature type "OfficialDocumention " corresponds to the core attribute "legalText". However, INSPIRE defines it in a flexible way, as it may be a URL or a specific reference whereas core data recommends only the URL mechanism, considered as more user-friendly than a text citation
- The INSPIRE attributes "regulationNature", "supplementaryRegulation", "specialisedSupplementaryRegulation" and "specificRegulationNature" correspond to the (theoric) core attribute "RegulatedOrManagedAreaType". The related core data code list should be matchable to INSPIRE classification attributes.

NOTE 2: The core data model extends the INSPIRE data model with the legal value of geometry.

NOTE 3: In a similar way as for theme “Area Management”, most of the attributes of the INSPIRE feature type “OfficialDocumentation” are not considered as core information for geographic data (except the URL link and possibly title and date) but may be relevant as some metadata information for a documentary database registering legal texts.

7.1.5 Core data model and attribute “AreaOfResponsibility” of sub-theme “Governmental services” (US)

In the INSPIRE data model of sub-theme “Governmental Services”, a governmental service may have an attribute “areaOfResponsibility”.

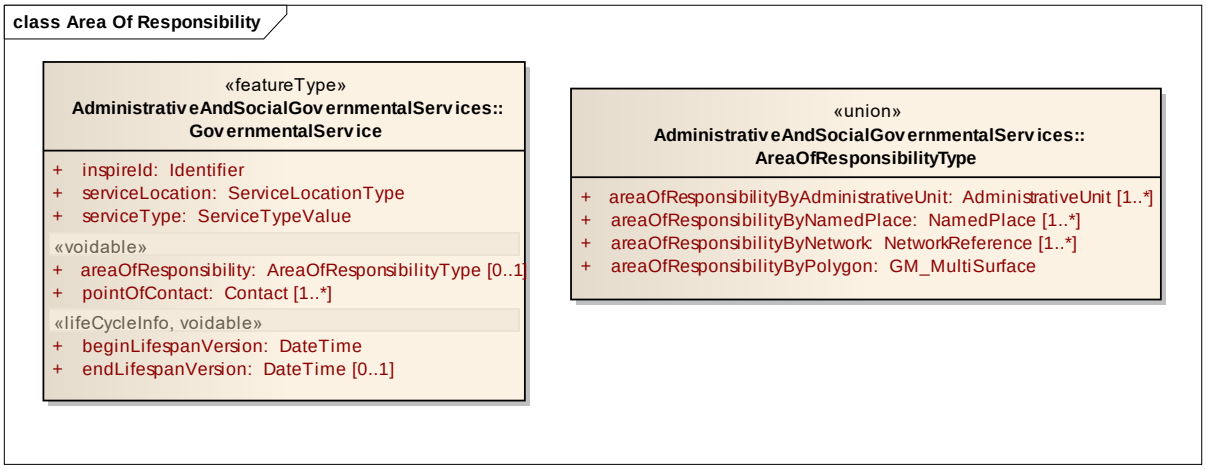

Figure 6: the INSPIRE data modelling of “area of responsibility”

The model proposed for the production of core data is based on an association between the feature type “BasicService” (that is an adaptation of INSPIRE feature type “GovernmentalService”) and the feature types “AdministrativeUnits” or “RegulatedOrManagedArea”.

The production core data model with association enables easy derivation to the INSPIRE delivery model and provides easier implementation.

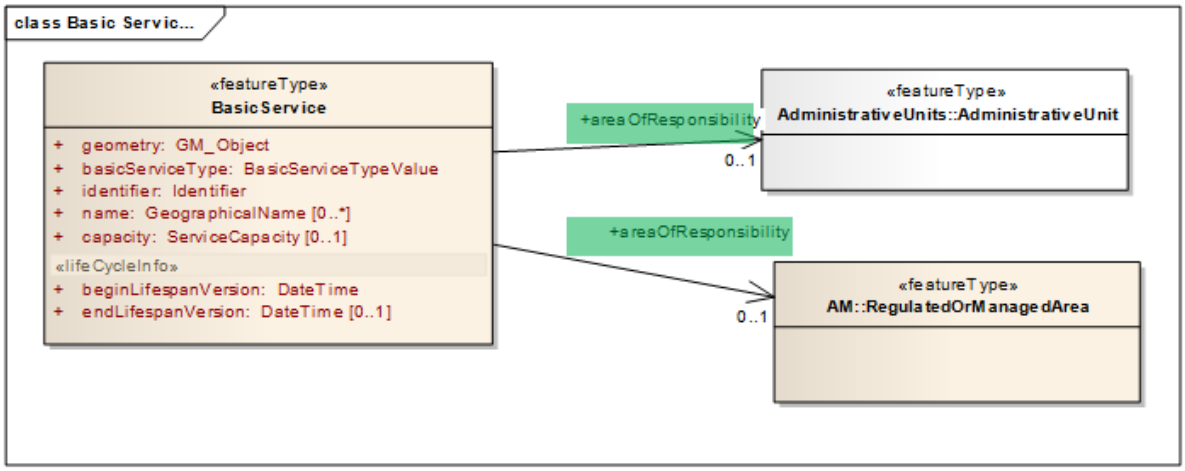

Figure 7: the core data modelling of “area of responsibility”

7.1.6 Alternative implementation data model

The proposed core data model is very basic, with a single feature type RegulatedOrManagedArea and a minimum set of attributes. As the scope of the theme is very wide, according to national context and requirements, it may be of interest to create children feature types, to facilitate data handling, especially if specific additional attributes are considered as necessary on some specific areas.

For instance, it might be of interest to create children feature types ProtectedSite, AreaManagement and SupplementaryRegulation in order to facilitate the matching with related INSPIRE themes.

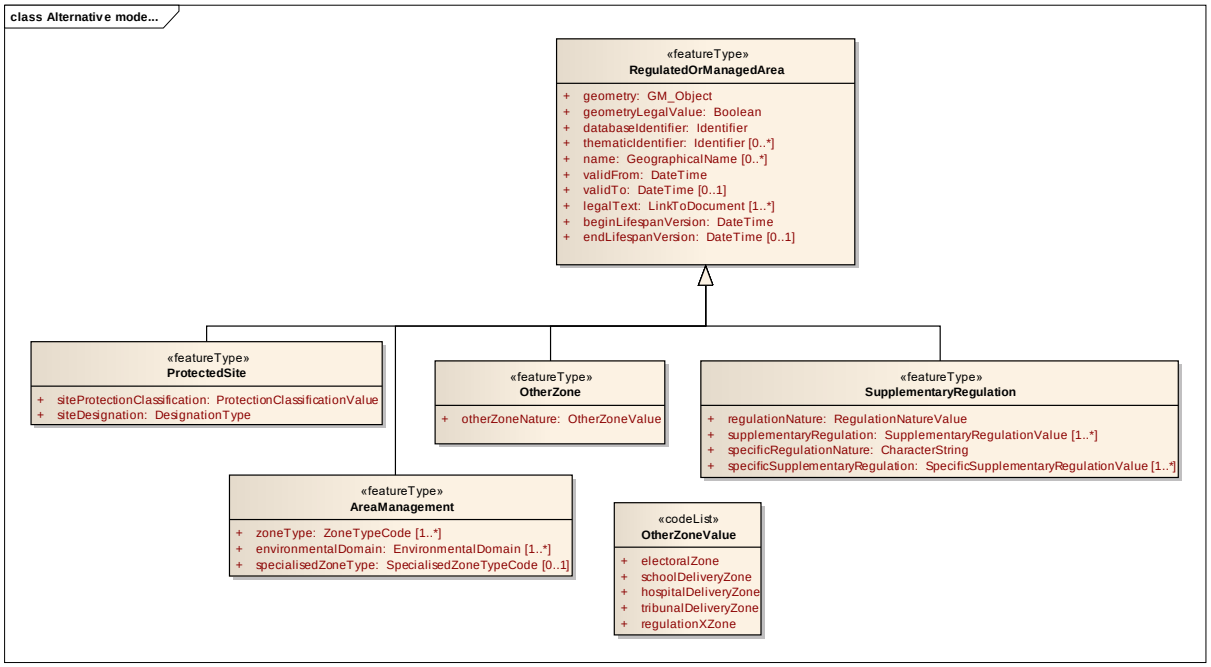

Figure 8: example of alternative model using the INSPIRE classification attributes

NOTE 1: The code list provided for OtherZoneNature is just an example providing some ideas about which might be these “other” regulated or managed zones, not included in INSPIRE themes scope.

Another option would consist in creating children feature types RegulatedAreas and ManagedAreas if they require different additional attributes or different quality rules.

7.2 Other

7.2.1 Scope

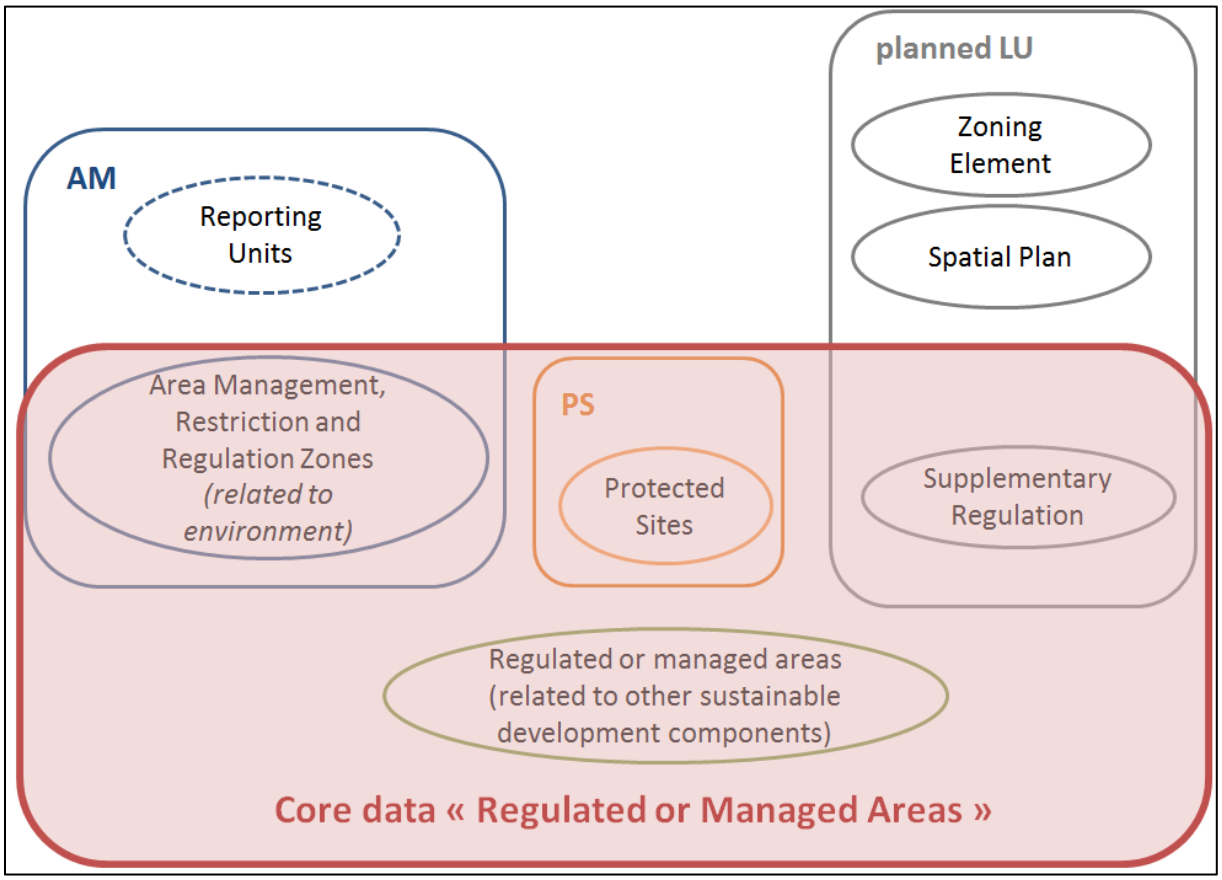

Figure 8: the core data scope compared to related INSPIRE themes

The figure above illustrates the comparison between scope of INSPIRE themes and scope of core data on theme "Regulated or Managed Areas":

- Theme AM

INSPIRE theme title is "Area Management, Restriction and Regulation Zones and Reporting Units". However, in practice, INSPIRE Data Specification includes only an application schema for Area Management, Restriction and Regulation Zones. Rationale is that Reporting units can be any spatial objects, this is why INSPIRE AM doesn't include a specific data model for reporting units.

In INSPIRE, the scope of sub-theme "Area Management, Restriction and Regulation Zones" is limited to the environmental topics. As core data aims to contribute to achieve the analysis, achievement and monitoring of SDG, the scope is extended to other components of sustainable development (namely, economy and society).

NOTE 1: The INSPIRE reporting units apply only to the European Union whereas the core data recommendations of UN-GGIM: Europe apply to whole geographic Europe and so, include only the common data required by all countries. This is why reporting units are not considered as core data.

NOTE 2: Core data includes the INSPIRE sub-theme named "Area Management, Restriction and Regulation Zones" and consequently, the feature type "ManagementRestrictionOrRegulationZone".

However, from the definitions provided in INSPIRE Technical Guidelines, it appears that “Restrictions” are a specific kind of “Regulations”. This is why the core theme and its unique feature type have been renamed “RegulatedOrManagedAreas”.

- Theme PS

For core data, Protected Sites are just considered as specific case of Regulated or Managed Areas. This is conformant with the INSPIRE definition of Protected Sites: “Protected Sites are established to manage, regulate and restrict activities to conserve nature, biodiversity and cultural heritage, only“ [INSPIRE Technical Guidelines on theme AM].

- Theme planned Land Use

The “SupplementaryRegulation” feature type is considered as core data under the scope of core data theme “Regulated or Manged Areas”. The other feature types (mainly “ZoningElement”) will be considered under the scope of core data theme “Land Use”.

7.2.2 Quality

There are no quality recommendations in INSPIRE theme AM, only a few recommendations regarding the geometry representation for theme PS (accuracy better than 100 m, polygon representation if PS more than 1 ha) and only a few recommendation regarding consistency and completeness in theme LU.

Regarding core data, the main focus is on the quality of geographic representation: consistency with legal text, based on relevant capture method (reference to digital geographic feature, list of points with their coordinates, description based on relevant background data).

8 Annex B: Methodology

Core data specifications have been elaborated based on one hand on user requirements (with focus on the ones related to SDG) and on the other hand on INSPIRE data specifications.

Core data specifications have been elaborated based on one hand on user requirements (with focus on the ones related to SDGs) and on the other hand on INSPIRE data specifications.

The methodology has been based mainly on a comparative analysis of INSPIRE related themes: AM, PS and planned LU that has been completed by interviews of experts. The three main investigated topics have been the scope, the data model and the quality.

8.1 Data model

The INSPIRE data models of themes AM, PS and planned LU may look different; however, the comparative analysis of these models has shown a common general approach. The aim of these models seems to answer five main questions: Where? What? Why? When? Who?

- Where is the regulated or managed area ? => need for attribute geometry
- What is the regulated or managed area about ? => need for some classification
- Why this regulated or managed area? => need for an association to the legal text establishing the area
- When does the regulation or management apply? => need for temporal attributes
- Who is in charge of applying regulated or managed area? => interest for a responsible party

The fifth question has been assessed as difficult to answer on short term; it is why it has been considered under “considerations for future”. The answers to the four other questions, completed by identifiers and a name constitute the main attributes of the core data model.

8.2 Data scope

In the first phase “selection of core data themes”, the investigation of user requirements showed that INSPIRE themes PS, AM and planned LU are providing data to similar use cases.

The first issue was to decide how the core data scope is related to INSPIRE themes AM, PS and planned LU. The results are explained in chapter 7.2.1.

NOTE: In a way, the whole scope of INSPIRE sub-theme “Planned Land Use” might also be considered as “regulated areas”. However, the decision has been to consider only the feature type “SupplementaryRegulation” as under scope of core theme “Regulated or Managed Areas” because its attributes correspond to the common approach described in 8.1. In opposite, the other main feature type of INSPIRE sub-theme “Planned Land Use”, namely “ZoningElement”, carries as main information the land use and therefore deserves to be kept under core data theme “Land Use”.

The second issue was based on following assumption: in most countries, there is a huge amount of regulated or managed areas; it might be not feasible to provide good geographic data on all of them in a short term delay; so it would be relevant to provide some priorities. From the discussions with experts and within WG A, some general principles have been proposed (see core recommendations 3 and 4).

8.3 Data quality

The discussions with experts have shown the issues related to the quality and reliability of the geographic representation of regulated or managed areas. In order to solve, at least partially these issues, the current document provides an attempt to define the quality of regulated or managed areas (consistency with legal text, relevant definition and capture method); it is also proposing to document the legal reliability of the geographic representation of the managed or regulated areas.