

Proposal of a “first-cut” data product specification for the zone geographical component

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Overview

GeoZone: data product specifications for the geographic information related to the *zones* - Chapter 4.3 of the OIE Terrestrial Code

- To provide the rules for **collecting** the spatial information of *zones*
- To be used in GIS applications for the **inventory** of *zones* and for **visual explorative spatial analysis**
- To **share** geospatial data related to a *zone*

Data content and structure

A single spatial type of object has been defined to spatially represent the zone. This type of object contains the core properties that can be categorised into three sets of information:

1. Zone specific properties
2. Classification properties
3. Controlled activities

Zone specific properties

- 1.1 **geometry:** it represents the spatial extent of the spatial object.
The geometry of a *zone* shall be represented as polygon
- 1.2 **designation period:** it is the time when the zone was legally designated or became effective
- 1.3 **competent authority:** the Veterinary Authority responsible for delivering the zone to the OIE
- 1.4 **legal basis:** the reference to, or citation of, the legislative provision that establishes the zone

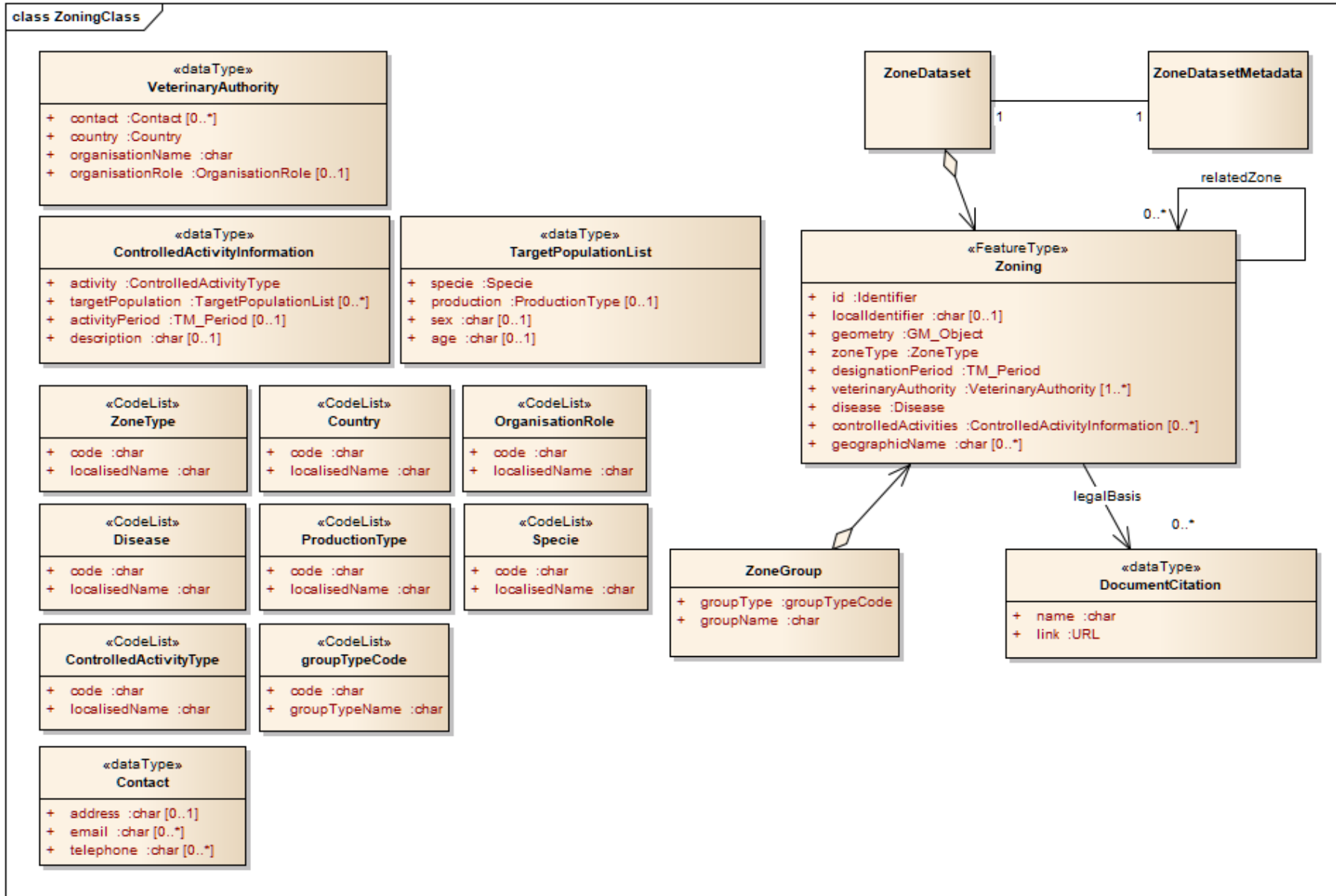
Classification properties

- 2.1 **zone type:** it provides the type of zone defined according to the OIE Terrestrial Code (e.g. containment zone, free zone)
- 2.2 **disease:** the disease whose outbreak/s that determined the establishment of the zone

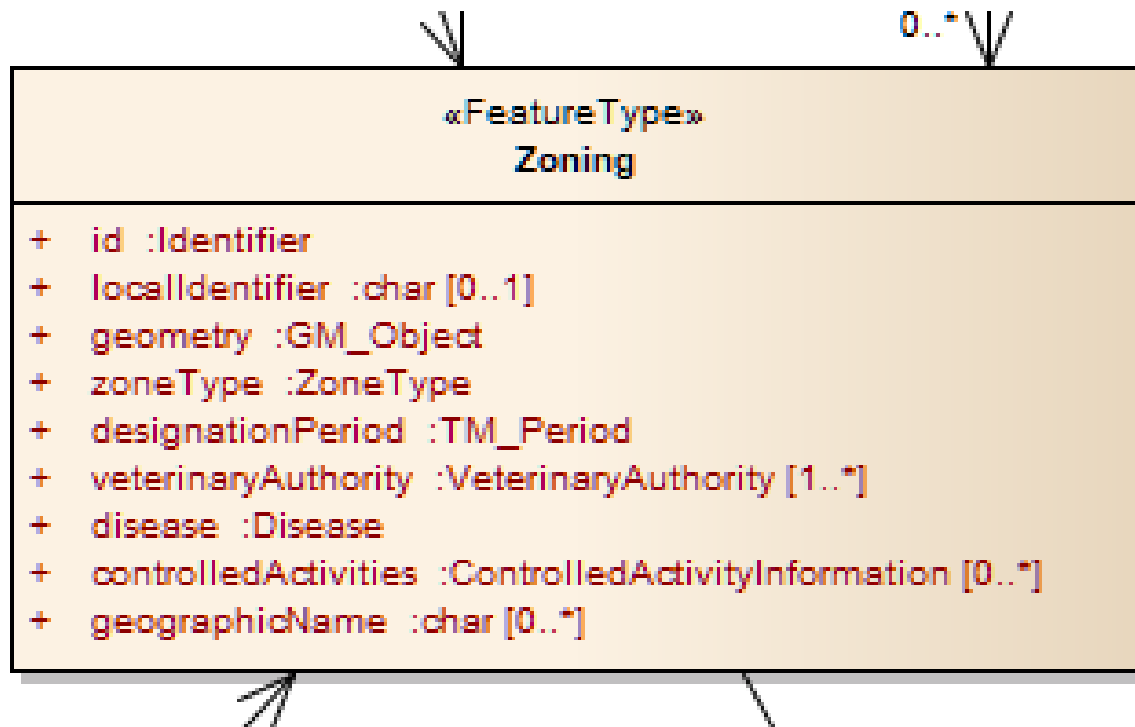
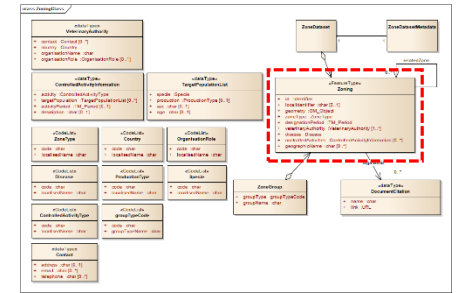
Zone specific properties

- 3.1 **activity:** the types of actions that are enforced within the zone to control the disease
- 3.2 **target population:** the animal population/s involved in the control measures
- 3.3 **activity period:** the time period during which the activities are enforced

UML overview

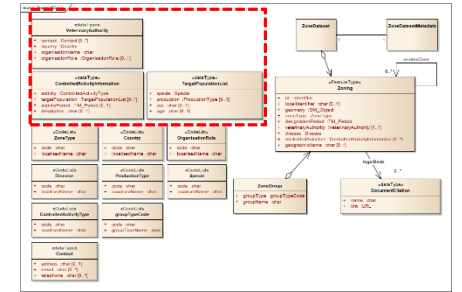


Zoning



Attribute	Description
id	Identifier (e.g. UUID)
localIdentifier	Code given by the data producer
geometry	Geometry representing the spatial extent of the zone
zoneType	Classification of zone (e.g. containment zone, free zone, infected zone)
designationPeriod	When the zone is legally designated or became effective
veterinaryAuthority	Veterinary Authority that is responsible for delivering the zone data
disease	Disease
controlledActivities	Activities or control measures put in place in the zone
geographicName	Geographical name that is used to identify a zone

dataType



«dataType» VeterinaryAuthority
+ contact :Contact [0..*] + country :Country + organisationName :char + organisationRole :OrganisationRole [0..1]

«dataType» ControlledActivityInformation
+ activity :ControlledActivityType + targetPopulation :TargetPopulationList [0..*] + activityPeriod :TM_Period [0..1] + description :char [0..1]

The code list related to the data types shall be compliant to I18N technologies

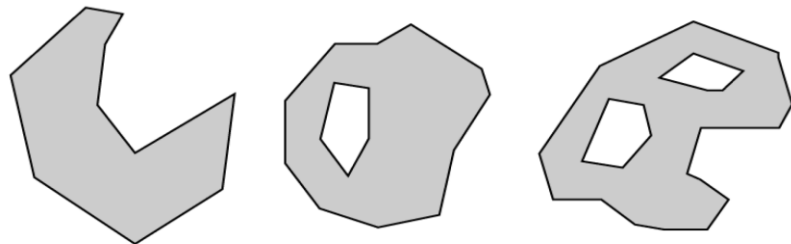
«dataType» TargetPopulationList
+ specie :Specie + production :ProductionType [0..1] + sex :char [0..1] + age :char [0..1]

Geometry representation

The geometry representation (indicated in the Zoning feature type as GM_Object) refers to the ISO standard **Simple feature spatial schema** (ISO19107)

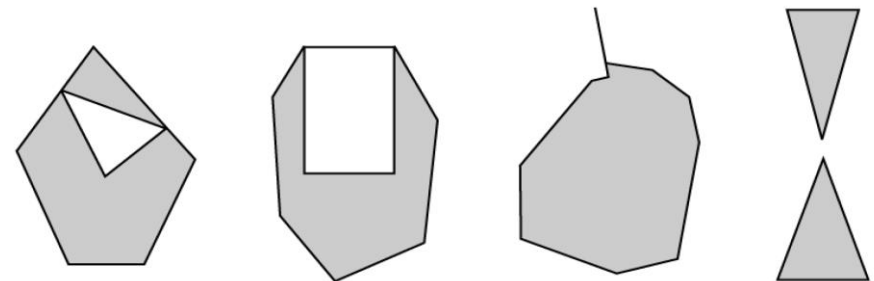
This specification restricts the spatial schema to polygons.

A polygon is a planar surface defined by 1 exterior boundary and 0 or more interior boundaries. Each interior boundary defines a hole in the polygon.



Examples of polygons with 1, 2 and 3 rings, respectively

Where a *zone* is comprised of multiple parts, the geometry of every single part should be provided



Examples of objects not representable as a single instance of Polygon

Temporality representation

The designationPeriod and the activityPeriod use the TM_Period property (ISO19108).

This property defines the “beginPosition” and the “endPosition”.

- beginPosition: the date at which the zone or the activity became valid
- endPosition: the date at which the zone or the activity is no longer valid

The data shall be organised in a way that the largest temporal term (the year) appears first in the data string and progresses to the smallest term (the second)

Example. 1968-06-27 shall be used to refer to 27th June 1968


Coordinate reference system

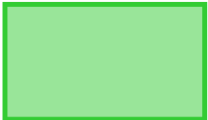
Spatial data set shall be made available using the **WGS84** coordinate reference system

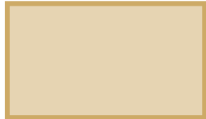
The data model proposes the use of the http URIs provided by the Open Geospatial Consortium as coordinate reference system identifiers. These are based on and redirect to the definition in the EPSG Geodetic Parameter Registry (<http://www.epsg-registry.org/>).


The WGS84 is coded in the EPSG registry with the code 4326.

Zone portrayal

Style name	Zoning.InfectedZone.Default
Spatial object type	zoneType = infectedZone
Abstract	The geometry is rendered using a red (#FF0000) fill with a transparency of 50% and a solid red (#FF0000) outline with a stroke width of 2 pixels
Example	

Style name	Zoning.FreeZone.Default
Spatial object type	zoneType = FreeZone
Abstract	The geometry is rendered using a light green (#33CC33) fill with a transparency of 50% and a solid light green line (#33CC33) outline with a stroke width of 2 pixels
Example	

Style name	Zoning.ContainmentZone.Default
Spatial object type	zoneType = ContainmentZone
Abstract	The geometry is rendered using a light brown (#CDAA66) fill with a transparency of 50% and a solid light brown (#CDAA66) outline with a stroke width of 2 pixels
Example	

Style name	Zoning.ProtectionZone.Default
Spatial object type	zoneType = ProtectionZone
Abstract	The geometry is rendered using a mango (#FFD37F) fill with a transparency of 50% and a solid mango (#FFD37F) outline with a stroke width of 2 pixels
Example	

Use cases - 1

Use Case Description	
Name	Draw Avian Influenza infected zones
Primary actor	Spatial planner in the Member Country
Goal	To draw the zone's boundary and to store the related characteristics of an Avian Influenza infected zones.
System under consideration	Animal disease control
Description	The spatial planner defines the extent of the zone and draw the boundary according to a protocol derived from the legislation of the Member Country. A set of zone's characteristics are stored in the attribute of the zone spatial object. Information about a set of appropriate control measures established by the Veterinary Authority within the zone can be stored in the attribute of the zone spatial object.
Pre-condition	Information about the Avian Influenza outbreaks are obtained/generated from local data sources. Ancillary spatial data (e.g. river branches, major roads, administrative boundaries, etc.) are available to the spatial planner. The spatial planner uses a GIS software and follow a protocol to draw the zone boundary and register the related characteristics of an Avian Influenza infected zones.
Flow of Events – Basic Path	
Step 1	The spatial planner verifies the quality and format of the spatial information about the Avian Influenza outbreak and if necessary, performs the spatial transformation of this data in order to overlay the spatial information with the ancillary spatial data.
Step 2	According to the protocol derived from the legislation of the Member Country, the spatial planner displays the spatial data (e.g. ancillary data, outbreaks data) in a GIS software and performs the spatial function to edit the zone boundary and the zone characteristics.
Step 3	The spatial planner activates the procedure for the validation of the zone borders and the related characteristics. If one or more information are not validated by the Veterinary Authority, the process envisages to perform again step 2.
Step 5	At the end of the validation process, the spatial planner activates the procedure for transferring the zone data to WHAIS+.

Use Case Description	
Name	Finding zones in a Member Country
Primary actor	Analyst
Goal	Identifying a list of zones and including the map in a report.
System U. C.	Risk analysis
Description	An analyst from a Veterinary Authority needs to perform a risk analysis for importing domestic animals from a given country. The analyst needs to acquire information about the spatial distribution of zones of a given disease in the interested area/region.
Pre-condition	WH AIS+ provides zone spatial data by means of a file transfer process or a web service. The analyst has the ancillary spatial data (e.g. administrative boundaries, major roads, etc.) for the interest area.
Post-condition	The maps derived from the analysis are included in a specific report.
Flow of Events – Basic Path	
Step 1	By using a GIS software, the analyst accesses the zone dataset provided by WH AIS+.
Step 2	The analyst queries the zones for a given set off criteria (e.g. disease, period of time).
Step 3	The analyst organises the layers for the analysis and develops the required maps from the queried data.
Step 4	The analyst activates the procedure for the validation of the output and for its inclusion in a specific report.

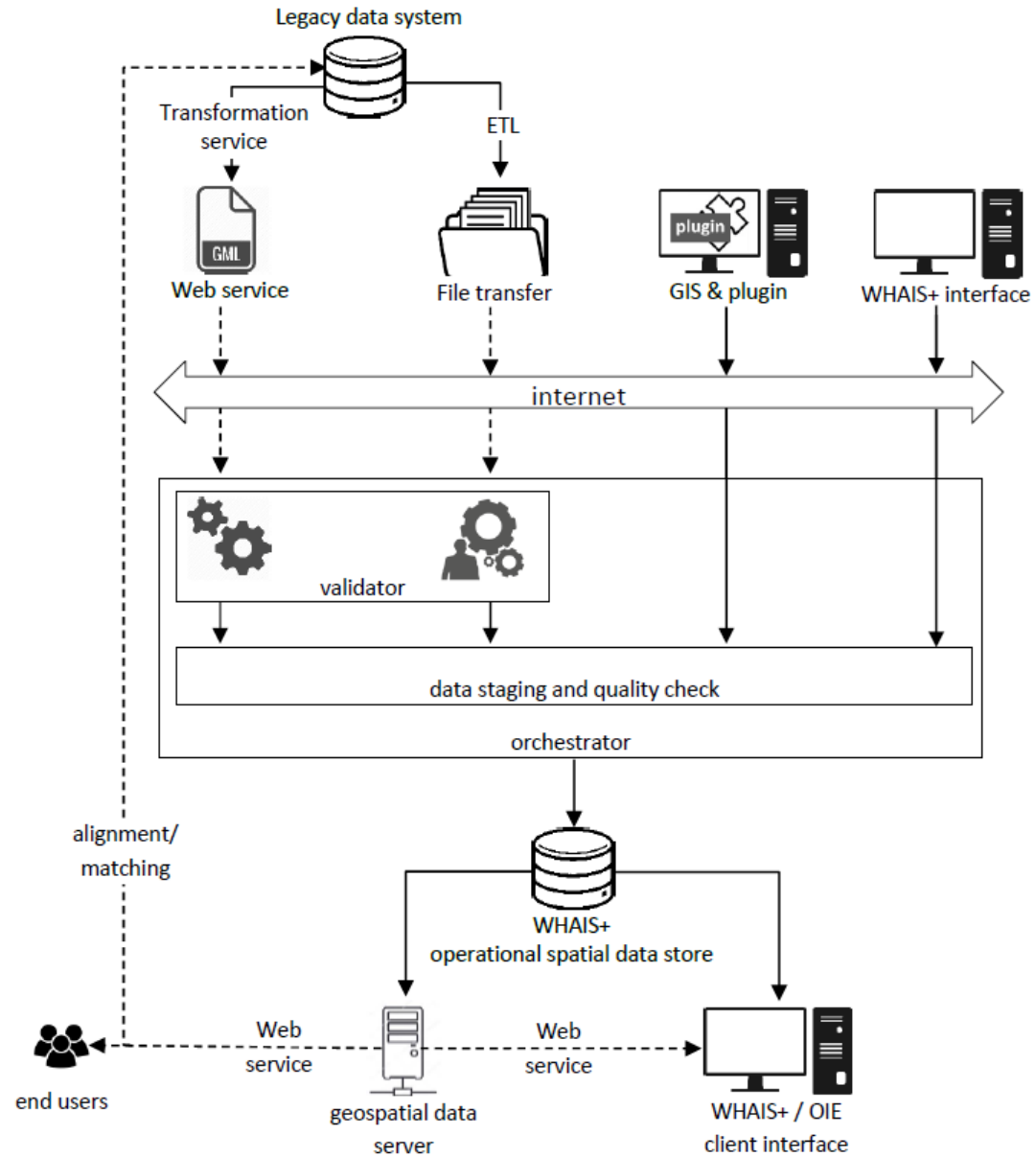
Use Case Description	
Name	Management of Avian Influenza infected zone validity period.
Primary actor	Spatial planner
Goal	To manage the date when an Avian Influenza infected zone is not in force any more.
System U. C.	Animal disease control
Description	According to the legislation, the spatial planner updates the value of the endPosition property of a specific Avian Influenza infected zone.
Pre-condition	The OIE zone has already been constituted and transmitted to the OIE.
Flow of Events – Basic Path	
Step 1	By using a GIS software, the analyst accesses the zone dataset provided by WH AIS+.
Step 2	The analyst queries the zones for a given identifier.
Step 3	The spatial planner updates the designation period value, in particular the endPosition property.
Step 4	The spatial planner activates the procedure for the validation of the updated value.
Step 5	At the end of the validation process, the spatial planner activates the procedure to send the zone with the updated values to WH AIS+.

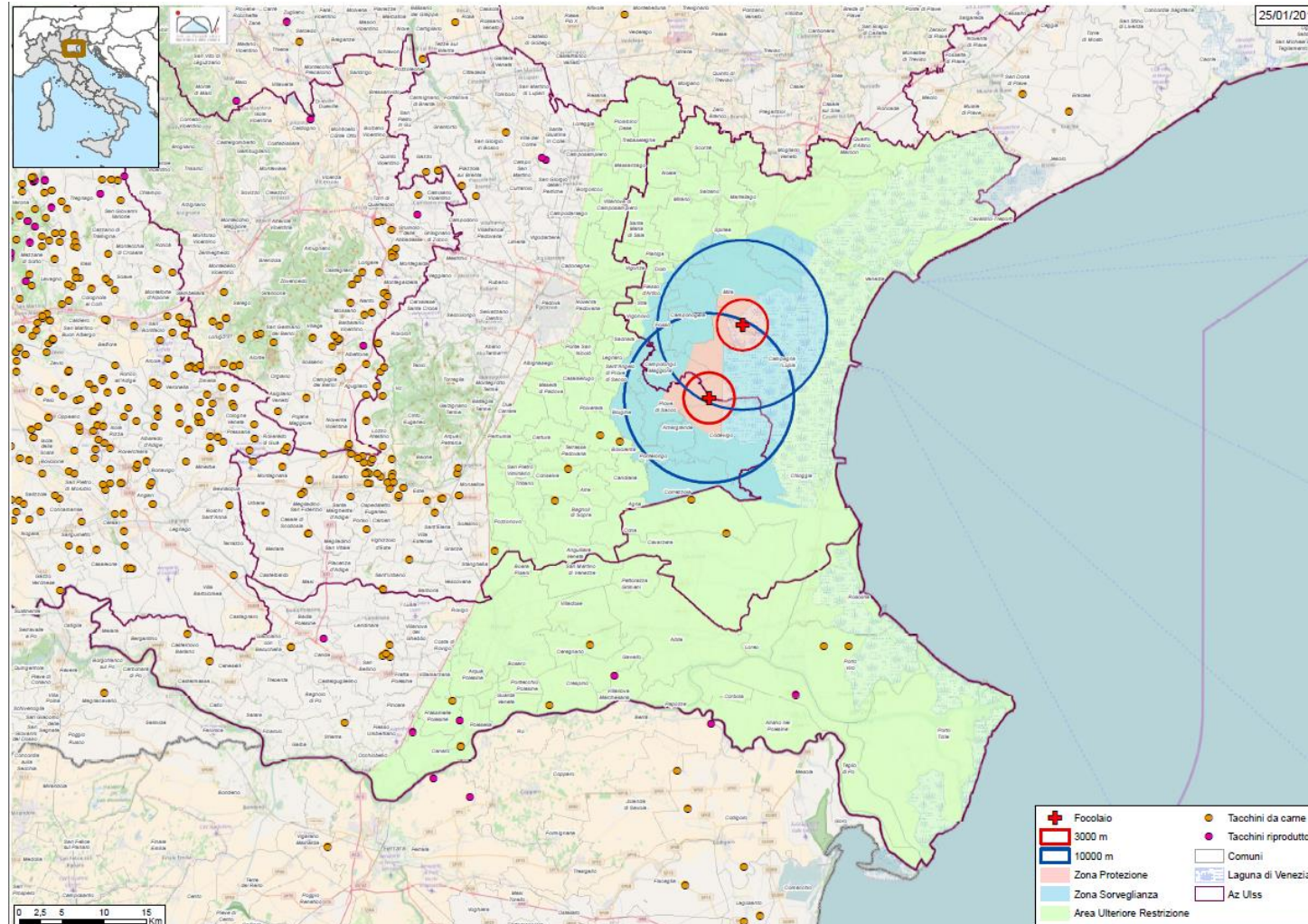
Use cases - 2

Use Case Description	
Name	Modify the spatial information of an Avian Influenza infected zones
Primary actor	Spatial planner
Goal	If the spatial information of a zone that has been already sent to WHAIS+ needed to be modified, a new spatial object must be uploaded in the WHAIS+. All the previous information of the zone shall be versioned (the management and storage of the changes applied to the zone, allowing the chronologic reconstruction of the zones spatial distribution) and the new version of the zone is stored.
System under consideration	Animal disease control
Description	The spatial planner, among the zones already sent to WHAIS+, identifies the zone with the not correct value (either geometry or attribute) and edit the end date of zone validity in order to create an old version of the zone. After this operation the spatial planner performs the activities of the "To draw Avian Influenza infected zones" use case
Pre-condition	The correct information about the zone is provided to the spatial planner. Information about already defined zones are available in WHAIS+.
Flow of Events – Basic Path	
Step 1	By using a GIS software, the analyst accesses the zone dataset provided by WHAIS+
Step 2	The analyst queries the zones for a given identifier.
Step 3	The analyst verifies the zone information of the identified zone.
Step 4	The spatial planner modifies the end of validity of the identified zone (to create an old version of the identified zone) and save the edit.
Step 5	The analyst activates the procedure for the validation of the update value and, subsequently, activates the procedure for sending the zone data to WHAIS+.
Step 6	The spatial planner starts the process described in the "To draw Avian Influenza infected zones" use case

Use Case Description	
Name	Group of zones by epidemic
Primary actor	Epidemiologist and Analyst
Goal	To define a logical list of zones which are grouped or related together by a single characteristic.
System under consideration	Animal disease control
Description	The epidemiologist identifies a list of zones according to a given characteristic. It is not mandatory for a zone to be part of a group.
Pre-condition	Two or more zones for a given disease have been already defined in WHAIS+. The epidemiologist defines the characteristic/ criteria for grouping the zones.
Flow of Events – Basic Path	
Step 1	By using a GIS software, the analyst accesses the zone dataset provided by WHAIS+ and identifies the zones that should be grouped together.
Step 2	The analyst verifies if a group with the same characteristic is already stored in the acquired dataset in order to avoid duplications.
Step 3	The analyst queries the zones for the specific characteristic provided by the epidemiologist.
Step 4	The analyst, for each queried spatial object, assigns the group code in order to include them in the group. The group code is stored in the attribute of the zone spatial object.
Step 5	The epidemiologist validates the data modified by the analyst.
Step 6	At the end of the validation process, the spatial planner activates the procedure for transferring each zone with the updated values to WHAIS+.

Data supply chain





Thank you for your attention