

Annex B

(informative)

Use cases

As mentioned in Annex E of the "'Data Specifications" Methodology for the development of data specifications", the TWG-AF identified several use cases that are hereunder referenced.

B.1 Use case: "Safe Plant and Animal Production"

B.1.1 Introduction

A safe agricultural production, of both plant production and animal production is a basic requirement for a safe human food supply in the EU and the Members States., Also the export of agricultural products relies on a safe production and the absence of pest, diseases and contamination of these commodities.

The control and the measurements in case of an outbreak of an infectious animal disease, or pests in plant production is regulated by several EU regulations and national implementations.

In case of an accident which caused air, water or soil pollution, in the contaminated area or the potential contaminated area measurements will be taken to prevent contaminated products to be used for human food, animal feed or other products which can have risks for human health.

E.g Fukushima nuclear incident.

Fukushima nuclear plant and information related (based on Inspire requirements) would be under the PF TWG. AF should provide information to evaluate the impact on agricultural production (food).

- Farms affected by different levels of radiation.
- Traceability of agricultural products. Trucking.

A delegation from Japan will visit JRC and one of the experts will try to recover information from them about the analysis and cartographical information they are dealing with. Even about the lacks of information they found.

"Agricultural monitoring and possible interventions surrounding the site" was one of the conclusions proposed after the accident.

Information about Agricultural Facilities could be classified by different levels of detail and urgency:

- Identify which Agricultural/Aquaculture facilities are inside the different level of radiation (e.g buffers or dispersion model plume).
- Classify with kind of activities are taking place in order to classify actions and responses to be taken.
- Each item produce depending on its nature has different levels of restriction.
- Radiation can vary from air to soil and the persistence of each different medium is different. E.g Water sources can influence on the restrictions.
- Other kind of information (not confirmed if databases about exists already) could be relevant to define areas of indirect influence. (e.g straw or manure commercialized for other purposes by farms that are under the restriction area). Probably waste legislation or the water framework directive could be requesting information related with this purposes.
- About the difference between Site and Holding, is relevant to have access to the distribution of plots (sites) under the control of certain Holdings or companies in order to avoid mixture of material from contaminated areas with other free of radiation effects.

During a crisis process there are different actions on time. Since minute "0" to "years later" period. Each different period require different information. Each step could define new sources and formats from which information is required.

- Alarm system.
- Restrictions.
- Historical Control.

In all these cases it is important to have geographical information available about the agricultural and aquaculture production facilities and production, to support the decisions about the measurements to be taken by the authorities.

In the present situation the geographical information about facilities and production is available but it is divided over many separate databases. In the databases the geographical content is heterogeneous.

To perform a spatial analysis of the threat or the impact of an incident, information of different sources has to be combined. A harmonized geo component and basic information about elements like holdings, sites and installations, buildings and plots is required.

For monitoring various pest and diseases the EU uses model. The quality of the model results can be improved when harmonized detailed information about facilities is made available to these models. Models are also used to predict the distribution of infectious diseases and the severity of the outbreak.

Some examples:

Animal diseases:

The outbreak of avian influenza, classical swine fever, foot and mouth disease and Bluetongue

Plant pests:

Bacterial wilt (potatoes), plant seeds infection with harmful insects and / or viruses

Incidents:

Contamination with PCBs, metals, dioxine due to a fire incident (zone with air deposition or hydrostructures infected by firefighting water)

Nuclear Contamination

Contamination of water infrastructure due to industrial failure or failure of networks

(wastewater installation and -network failure, industrial process failure, emergency emission)

Structural:

Continuous contamination due to emissions into air, surface or groundwater from (previous) production facilities (mining, industry)

(*) It depends on the type of incident.

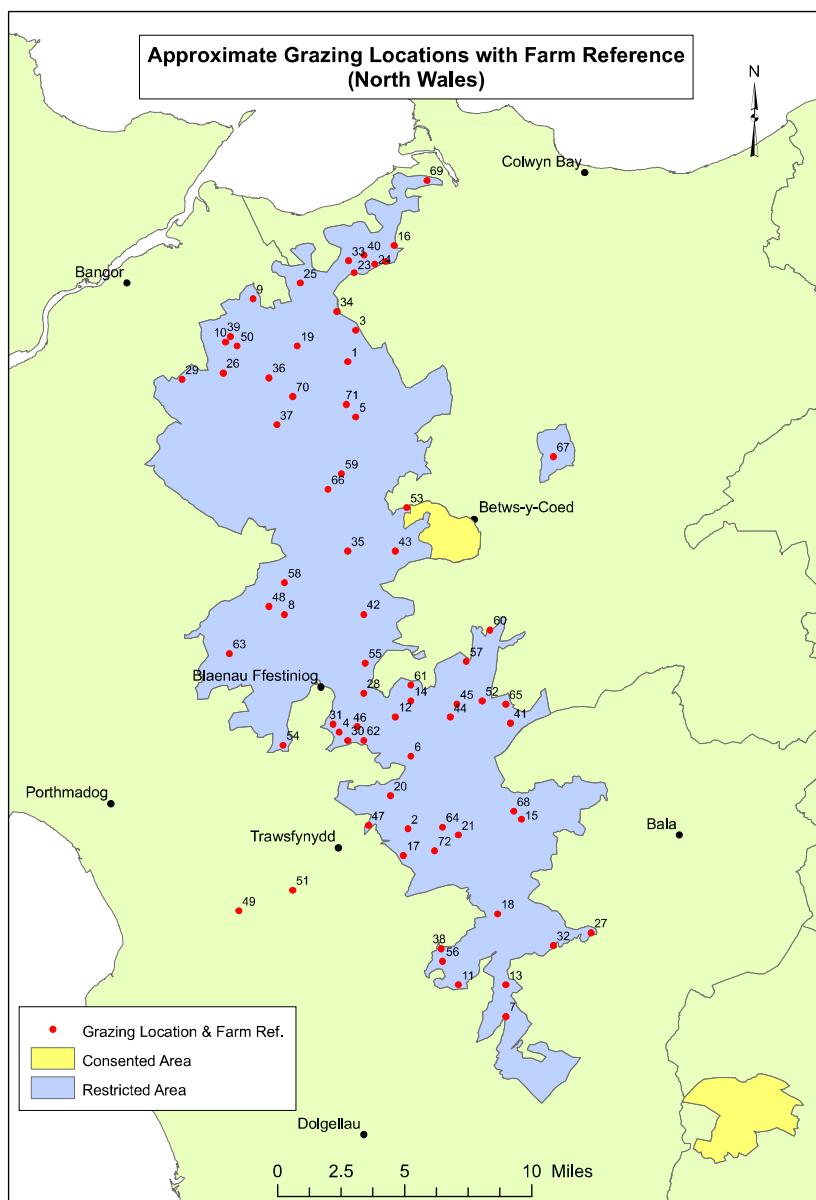


Figure 9 – An Assessment of Radiocaesium Activity Concentrations in Sheep in Restricted Areas of England and Wales and Potential Consumer Doses (Food Standard Agency)
(<http://www.food.gov.uk/multimedia/pdfs/chernobylassessment.pdf>)

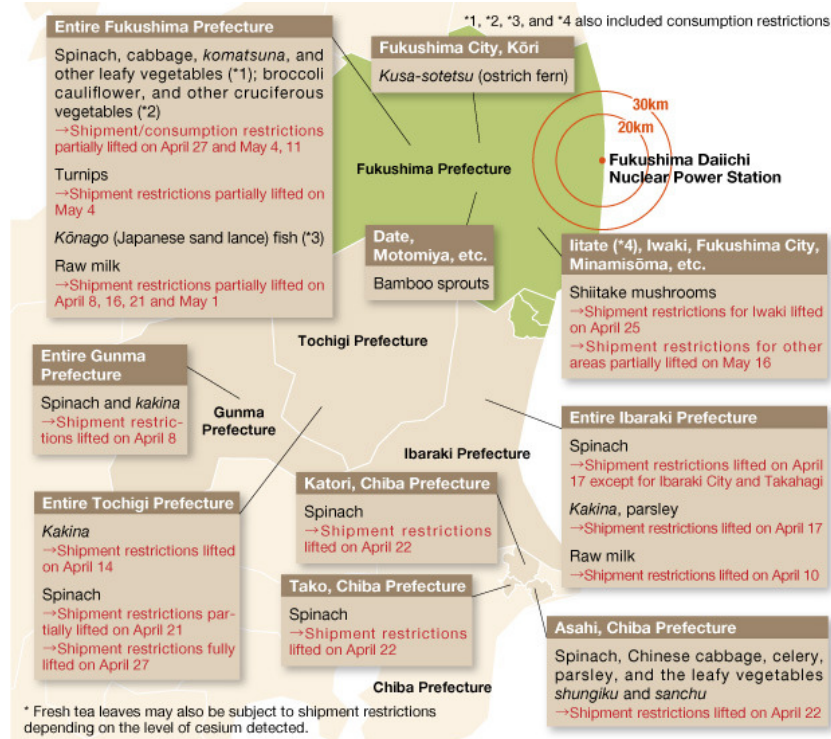


Figure 10 – Predicting Radioactivity Diffusion and its Impact on Food (<http://japanecho.net/311-data/1022/>)



Figure 11 – The Fire on a chemical storage and packing plant Moerdijk.



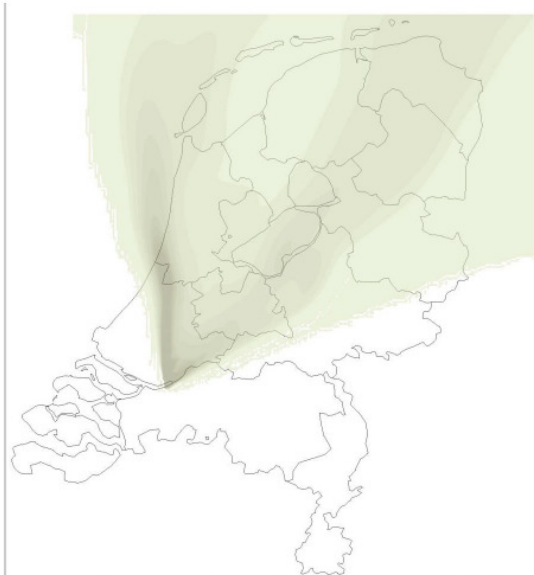
Figure 12 – The Fire on a chemical storage and packing plant Moerdijk.



Figure 13 – The investigation report Moerdijk

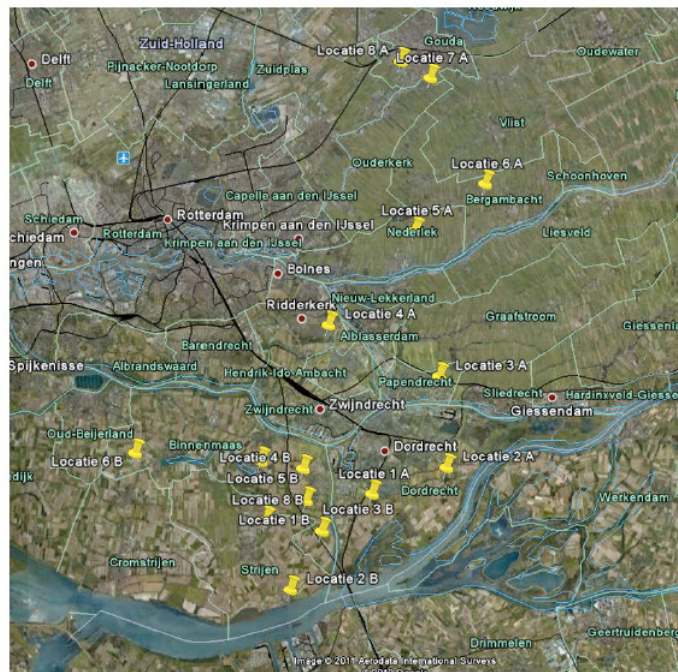


Figure 14 – Overview of the 10km zone affected by the plume of the fire and the location of the sample points of the RIVM.



Figuur 1 Relatieve, over de brandperiode gesommeerde luchtconcentraties op leefniveau (relatieve eenheden)

Figure 15 – Relative air concentration, accumulated over the fire period, and measured over the living level.



Figuur 3 Monsternamelocaties voor gras- en veegmonsters

Figure 16 –Locations of grass and brush samples.

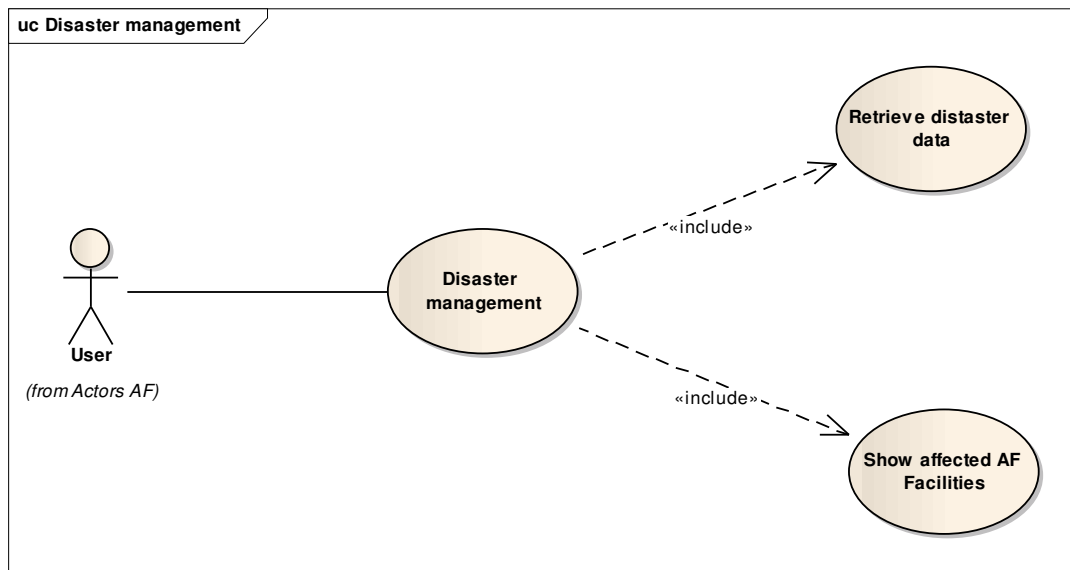
BIJLAGE 1, BEHOORT BIJ ARTIKEL 1, EERSTE LID, ONDERDEEL A



Figure 17 – The temporary restriction zone of the fire Moerdijk. where the crop plants can be contaminated and not suitable for consumption.

B.1.2 Use case description: Safe Plant and Animal Production

Part 1: UML use case diagram



Part 2: Legislative Background

The background legislations are numerous, in the different aspects of food production and food safety, animal health, plant protection and the environment.

The EU regulation for registration of bovine animals

The EU regulation for registration of sheep and goat animals

The EU regulation for the transport of farm animals

The EU regulations on animal feed production

The general food law

The Seveso directive (only for large agriculture piggery and poultry facilities)

The EU Water Framework Directive

The EU regulation 1200/2009 (annual agriculture survey)

The key issue is the integration of all the data sources based on this broad set of specialized legislations. This key issue is not covered by a single or dedicated (set) of regulation(s)

Part 3: Detailed, structured description of the use case

Use Case Description	
Name	Safe Plant and Animal Production.
Priority	Medium

Use Case Description	
Description	<p>In case of an major accident which caused air, water or soil pollution (temporal or continuous), in the exposed area or the potential contaminated area, measurements will be taken to prevent contaminated products to be used for human food, animal feed or other products which can have risks for human health. Anyway information and uses along a contamination crisis, pass across different stages in which information require can vary.</p> <p>In all these cases it is important to have geographical information available about the agricultural and aquaculture production facilities and production, to support the decisions about the measurements to be taken by the authorities in each of the different stages of the crisis.</p>
Pre-condition	The data about AF is available and updated and can be analyzed based on the geographical context.
Flow of Events – Basic Path	
Step 1.	<p>Outbreak:</p> <p>In case of some disaster the user (Governmental Authorities, Civil Protection,...), collects and process all the relevant data available on the web. The use case deals with disasters like: Pollution of the natural environment, distributed in natural way by water, air and soil, or artificial by transport vessels, cars, trains, airplanes. In addition it could be extended to: Outbreak of dangerous plant disease Outbreak of dangerous animal disease</p>
Step 2	<p>Take Measures:</p> <p>The data about the emission sources (amounts and categorization) as the geographical location of physical sources could be collected from others or the same dataset.</p> <p>Also information to evaluate, make calculations or define areas of restriction or under control could be obtained from different thematic areas (INSPIRE themes) or other sources.</p> <p>AF facilities provide information to define those <i>Agricultural and Aquaculture Facilities</i> that are affected or included under the delimited areas, helping to categorize them against the impact received and the actions to be taken as result of the events.</p> <p>Information can be also applied to define temporal control and monitoring of those facilities affected.</p> <p>.</p>

Use Case Description	
Step 3	<p>Monitor and evaluate:</p> <p>The relevant AF datasets will be made available to the responsible authorities who need to support their decisions over information (basically geographical).</p> <p>The problems and measurements to be taken after the event are no part of the use case but a tool to do it.</p> <p>They are covered by the veterinarian expert, plant health experts, or any other responsible authority, by example the National Food Authority.</p> <p>Based on inputs from experts and the analysis and monitoring operations as result of previous steps, information could evolve in different ways to more restrictions and actions or to next steps as the closure of the event.</p>
Post-condition	The relevant data about AF is available for the authorities and can be used for analyses of the threat, and the provide arguments for measurements be taken to fight the threat.
End-users	<p>Authorities → EU-level --. JRC; national Min of Agriculture, Water, Environment; regional water authorities, National Food Authority, Nat. Animal Health organisation, Nat. Plant protection organisation</p> <p>Farmers</p> <p>Processors of agri and aqua products</p> <p>Agri service providers and advisors</p> <p>Citizens and other stakeholders.</p>
Data source: Thematic information for example relating to environmental aspects	
Description	<p>Registrations of livestock (cattle registration, sheep and goat, pigs, poultry) including movements and holdings.</p> <p>Registrations managed by animal health organizations.</p> <p>The building register (subset agri or aquaculture functions)</p> <p>The Licensing authority (environmental license to run an AF facility)</p>
Data provider	<p>Public, Water Authorities, Animal registration authority, Municipalities</p> <p>Private and public→ data collection agencies and companies, , consultancy companies, farm animal organizations (breeding society) farm products processors (dairy industry, agri cooperations...)</p>

Part 4: Cross-Thematic Data Requirements

TWG	Affected?	Datasets affected
Administrative Units (AU)	Yes	
Addresses (AD)	Yes	

TWG	Affected?	Datasets affected
<i>Agricultural and Aquaculture Facilities (AF)</i>	Yes	
Area management/restriction/regulation zones and reporting units (AM)	Yes (*)	
Atmospheric conditions+Meteorological geographical features (AC-MF)	No	
Bio-geographical regions + Habitats and biotopes + Species distribution (BR-HB-SD)	No	
Buildings	No (*)	
Cadastral Parcels (CP)	No	
Coordinate reference systems	No	
Energy Resources	No	
Environmental Monitoring Facilities (EMF)	Yes	
Geographical grid systems	No	
Geographical names (GN)	Yes (*)	
Geology + Mineral resources (GE-MR)	No	
Human Health and Safety (HH)	Yes (*)	
Hydrography (HY)	Yes (*)	
LandCover (LC)	Yes (*)	
LandUse (LU)	Yes (*)	
Natural Risk Zones	Yes (*)	
Production and industrial facilities (PF)	Yes	
Protected Sites (PS)	Yes (*)	
Soil (SO)	Yes (*)	
Statistical Units + Population distribution, demography (SU-PD)	Yes (*)	
TransportNetwork (TN)	Yes (*)	
Utility and governmental services (US)	No (*)	

B.2 Use case: “Animal Diseases in Aquaculture”

B.2.1 Introduction

In order to contain and control the spread of animal diseases veterinary authorities rely to a system of registration of holdings and traceability of animal movements established for the major farmed species.

In case of an outbreak of a listed disease, veterinary authorities take a series of measures prescribed by the EU legislation to control spread of the disease. These measures are normally applied to a defined geographical area around the outbreak site and to all farms falling within this area. The availability of spatial information for the delineation of the area subjected to restriction measures and for the identification of affected farms is of great importance for the planning, management and reporting of the control measures prescribed by EU legislation.

The use case considered as example in this document is related to Infectious Salmon Anemia (ISA) which is an important infectious viral disease affecting Atlantic Salmon.

The disease was first reported in Norway in 1984, and has since been reported in Canada, Faroe Islands, the USA, Ireland and Scotland. The annual cost of infectious salmon anemia outbreaks among farmed fish was estimated to be \$11million (U.S. dollars) in Norway in 1999, \$14 million in

Canada, and \$32 million in Scotland in 1998 – 1999. Recent outbreaks were reported in Shetland (Scotland) in 2008-2009.

B.2.2 Description

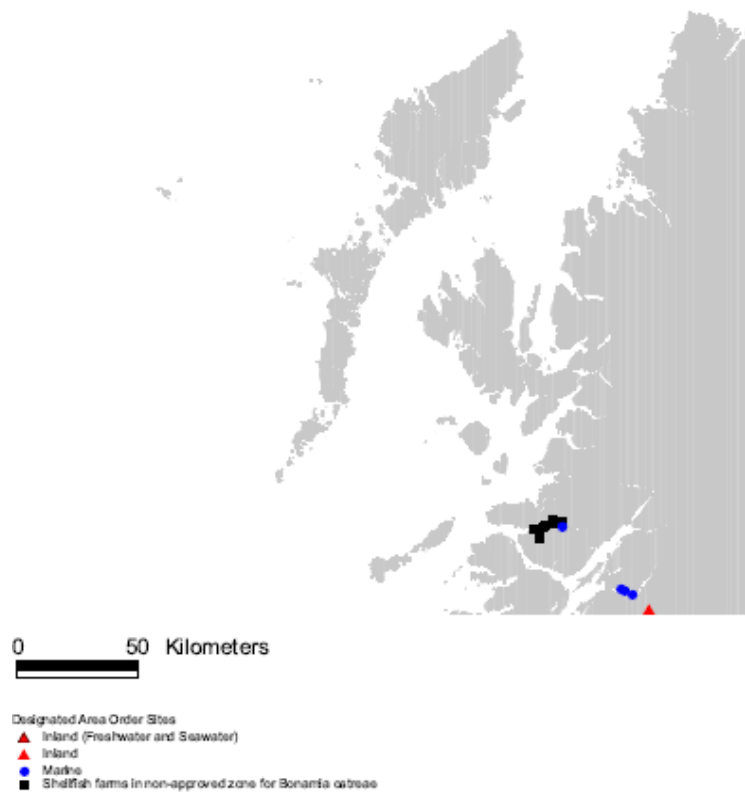
In order to deal with outbreaks of Infectious Salmon Anaemia (ISA) the Central Veterinary Administration establishes containment areas subjected to movement restriction measures at a certain radius from an affected farm.

An ordinance is issued establishing that in these areas movement restrictions measures on persons, aquatic animals, equipment and means of transport are applied.

Local veterinary authorities control the implementation of these restriction measures.

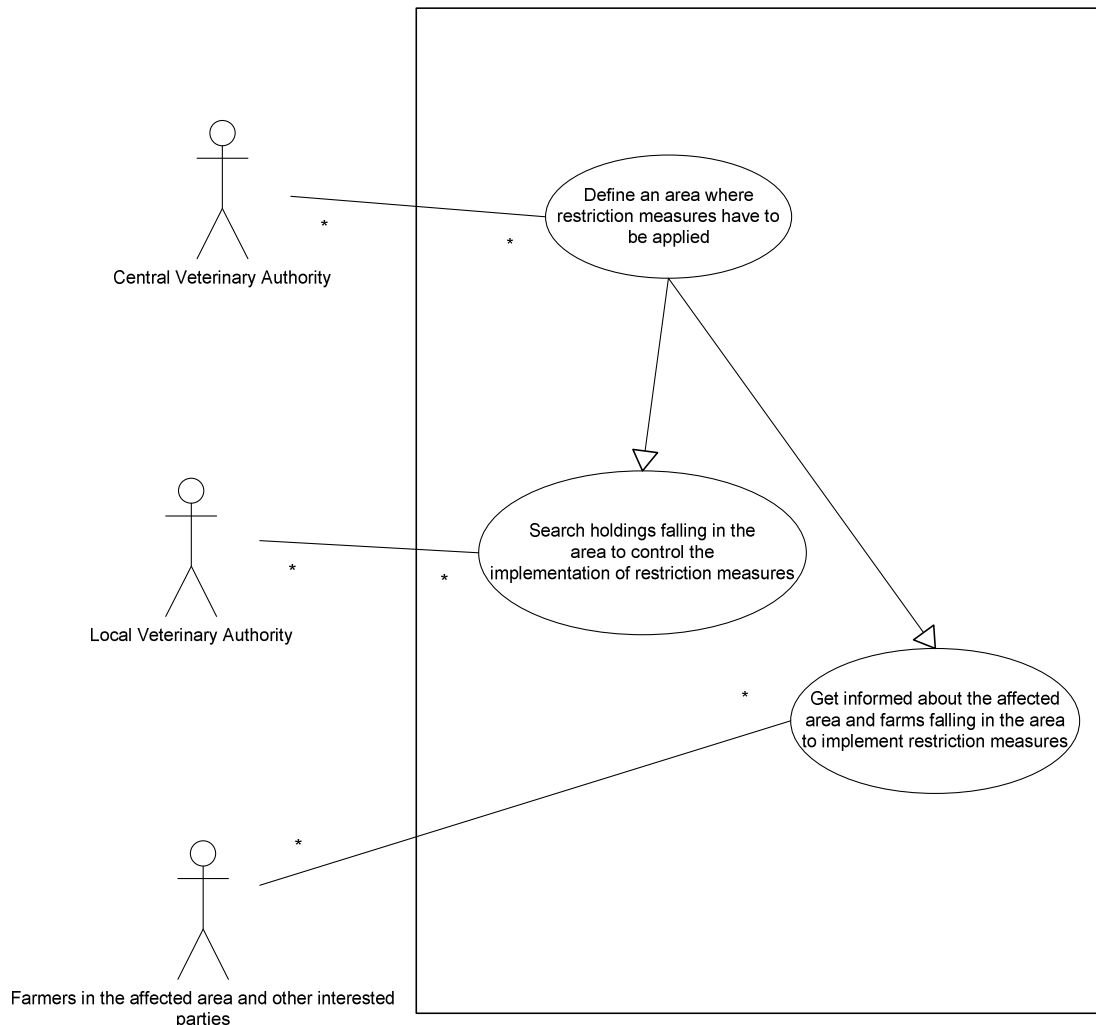
Relevant stakeholders of the aquaculture industry and the public are informed about the application of these measures.

The following map shows an example of areas with active movement restriction measures in the Western Isles following various outbreaks of disease in fish and shellfish farms.



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Part 1: UML use case diagram



Part 2: Legislative Background

In the case of aquaculture Council Directive 2006/88/EC prescribes the following measure to be taken in case of suspicion of outbreak of a listed disease:

- farms or molluscs production areas are placed under official surveillance,
- movement to and from the affected farm or area are not allowed and,
- epizootic investigation are initiated.

After the epidemiological investigation if the outbreak of the disease is confirmed:

- the farm or mollusc farming area is declared infected,
- a containment area including protection zone and surveillance zone is established and,
- according to the type of disease a series of control measures including movements' restrictions, compulsory slaughter and disinfection of infected farms are implemented to reduce and prevent the spread of the disease.

In order to allow the identification of aquaculture facilities the Directive 2006/88/EC prescribes that the competent authorities should keep registers of authorized aquaculture production businesses. For each aquaculture production business the register should contain in addition to address and contact details, information on the production type, health status and the geographical position of the farm. In addition, Commission Decision 2008/392/EC, in order to facilitate the interoperability of information between Member States, prescribes that national registers of aquaculture production businesses should be made available through an internet-based information page.

In relation to ISA, Commission Decision 2003/466/EC prescribes that control zones should be drawn in a circle with a radius at least 5 km or of at least one tidal excursion, centered on the infected farm and surveillance zones or an equivalent area determined according to appropriate hydrodynamic or epidemiological data.

Definitions used in the legislation:

'production area' (*) means any freshwater, sea, estuarine, continental or lagoon area containing natural beds of molluscs or sites used for the cultivation of molluscs, and from which molluscs are taken;

'farm' means any premises, enclosed area, or installation operated by an aquaculture production business (AF holding) in which aquaculture animals are reared with a view to their being placed on the market, with the exception of those where wild aquatic animals harvested or caught for the purpose of human consumption are temporarily kept awaiting slaughter without being fed; It would be related with the Site as is described on the AF Data Model.

'epidemiological unit' (*) means a group of aquatic animals that share approximately the same risk of exposure to a disease agent within a defined location. This risk may be because they share a common aquatic environment, or because management practices make it likely that a disease agent in one group of animals would quickly spread to another group of animals;

'containment area' means an area around an infected farm or mollusc farming area where disease control measures are applied with the purpose of preventing the spread of the disease;

'zone' means a precise geographical area (*) with a homogeneous hydrological system comprising part of a water catchment area from the source(s) to a natural or artificial barrier that prevents the upward migration of aquatic animals from lower stretches of the water catchment area, an entire water catchment area from its source(s) to its estuary, or more than one water catchment area, including their estuaries, due to the epidemiological link between the catchment areas through the estuary.

(*) AF Model doesn't refer to "areas" but includes all the information related at a Holding - Site level.

Part 3: Detailed, structured description of the use case

Use Case Description	
Name	Animal disease in aquaculture
Priority	Medium
Description	Control of the spread of a disease in an aquaculture holdings through the application of restriction measures in a defined area
Pre-condition	An outbreak of a disease listed is confirmed. Following the confirmation of an outbreak the Central Veterinary Authority issues an administrative notice indicating the boundaries of the area where restriction measures will be applied.
Flow of Events – Basic Path	
Step 1	The Central Veterinary Authority Spatial publishes spatial information on the affected area using a web map portal.
Step 2	The local veterinary authorities extract from the web map portal a list of aquaculture sites falling within the affected area to enforce control measures. They extract information on holding addresses, type of production, species kept to plan inspections for each site within the affected area.
Post-condition	--

Use Case Description	
Flow of Events – Alternative Paths	
Step 2	An aquaculture business verifies if movement of live fish with a given are permitted by looking in the web map portal. They enter information about name and address of the trading partner (holding) and the web portal will show all the sites owned by the given holding and if present the areas with active restriction movement restriction measures.
Data set: Aquaculture sites	
Description	Public register of aquaculture sites established under Directive 2006/88/EC
Data provider	National Veterinary Authorities
Geographic scope	National
Thematic scope	<i>Agricultural and Aquaculture Facilities (AF),</i>
Scale, resolution	Scale relevant to the application
Delivery	Local Veterinary Authorities, Public, Aquaculture enterprises
Data set: Restricted areas	
Description	Areas subjected to disease control measures established in an administrative notice.
Data provider	National Veterinary Authorities
Geographic scope	National
Thematic scope	Area management/restriction/regulation zones and reporting units (AM)
Scale, resolution	Scale relevant to the application
Delivery	Local Veterinary Authorities, Public, Aquaculture enterprises

Part 4: Cross-Thematic Data Requirements

TWG	Affected?	Datasets affected
Addresses (AD)	No	
Agricultural and aquacultural facilities (AF)	Yes	
Area management/restriction/regulation zones and reporting units (AM)	Yes	
Atmospheric conditions+Meteorological geographical features (AC-MF)	No	

Bio-geographical regions + Habitats and biotopes + Species distribution (BR-HB-SD)	No	
Buildings	No	
Cadastral Parcels (CP)	No	
Coordinate reference systems	Yes	
Energy Resources	No	
Environmental Monitoring Facilities (EMF)	Yes (*)	
Geographical grid systems	Yes	
Geographical names (GN)	Yes	
Geology + Mineral resources (GE-MR)	No	
Human Health and Safety (HH)	No	
Hydrography (HY)	Yes	
LandCover (LC)	No	
LandUse (LU)	No	
Natural Risk Zones	No	
Production and industrial facilities (PF)	Yes	
Protected Sites (PS)	No	
Soil (SO)	No	
Statistical Units + Population distribution, demography (SU-PD)	No	
TransportNetwork (TN)	No	
Utility and governmental services (US)	No	

B.3 Use case: “Official controls in mollusk production areas”

B.3.1 Introduction

The production of molluscs is subject official controls to ensure food safety and prevent contamination from water pollution and from the accumulation of toxins linked to Harmful Algal Blooms (HAB).

The use of spatial information is needed for the classification of production areas, for the planning of controls, for the monitoring and implementation of the controls and for the communication to producers and other interested parties of the results of the controls and of possible restriction measures.

B.3.2 Description

The CA has to fix the location, boundaries and classification of the mollusc production areas. In order to classify an area the CA:

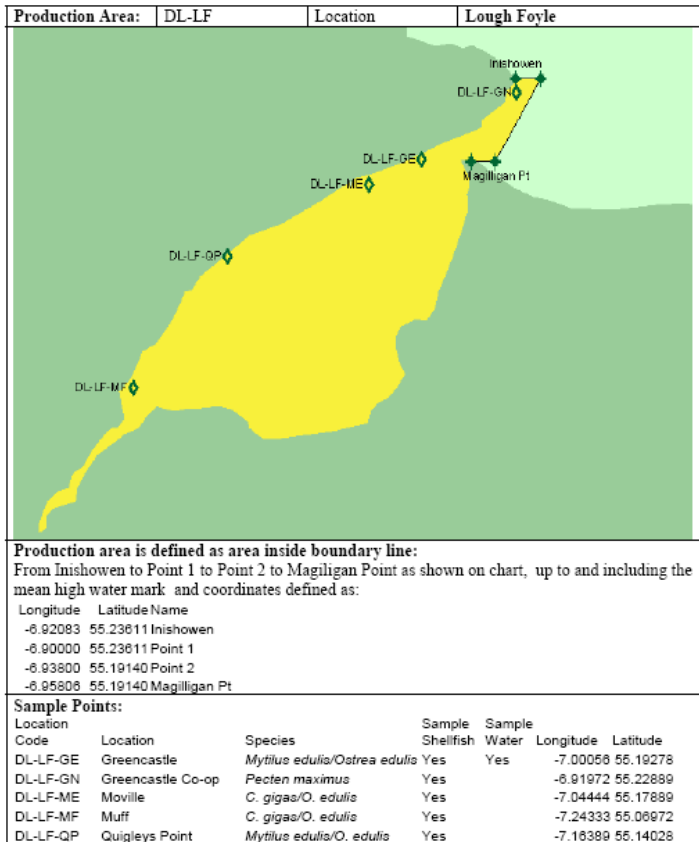
- makes an inventory of the sources of pollution of human or animal origin likely to be a source of contamination for the production area;
- examines the quantities of organic pollutants which are released during the different periods of the year, according to the seasonal variations of both human and animal populations in the catchment area, rainfall readings, waste water treatment, etc.;
- determines the characteristics of the circulation of pollutants by virtue of current patterns, bathymetry and the tidal cycle in the production area.

Similar sets of spatial information are used on yearly basis to evaluate the risk of contamination for existing mollusc farms and to determine the sampling frequencies and sampling sites.

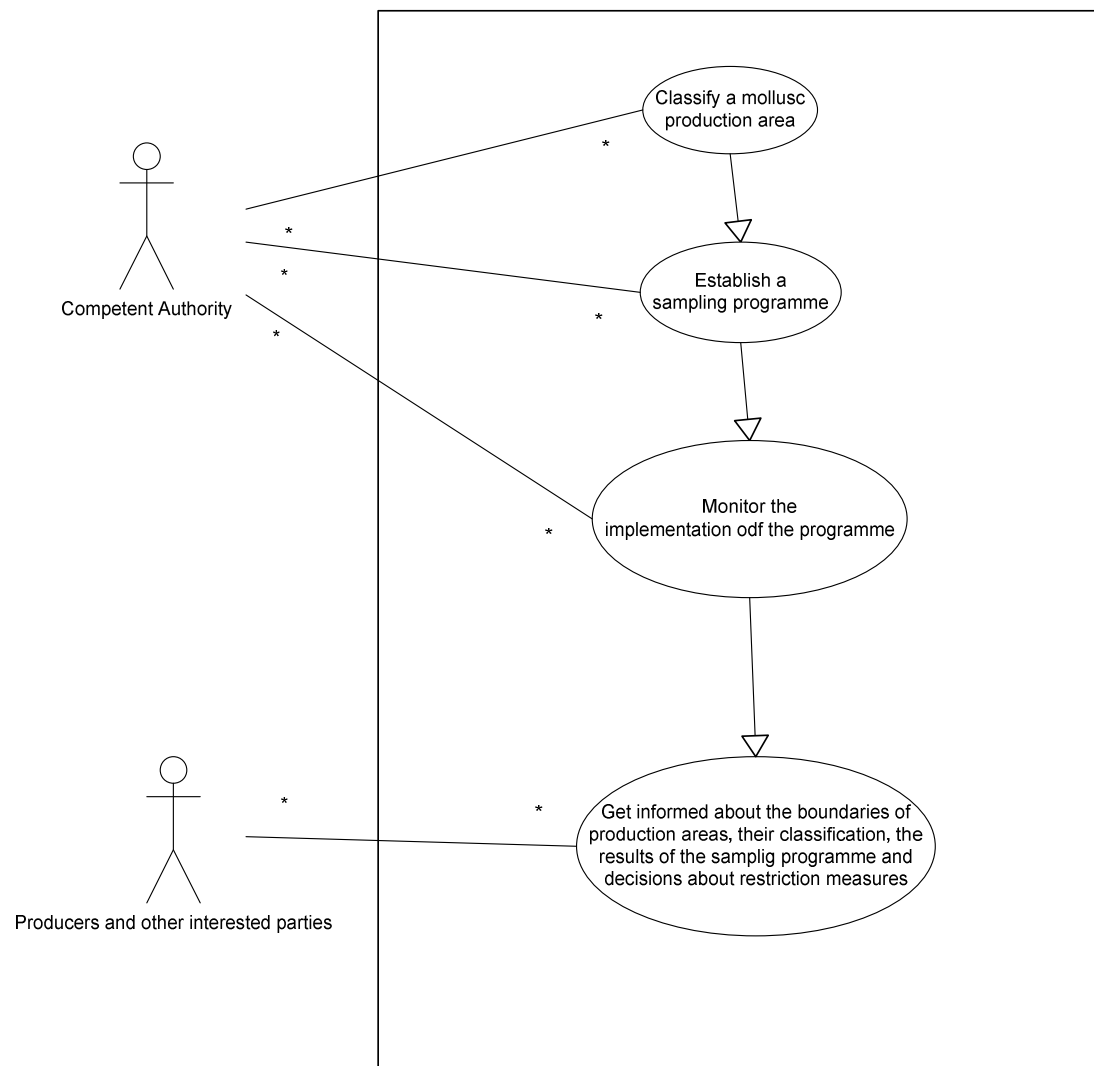
The CA monitors the implementation of the programme to take appropriate decisions on the production area if the results of the analysis are negative.

To inform producers about the results of the monitoring programme the CA regularly publishes maps and information showing for each production area the list of authorised sites, the sampling site with the results of the latest analysis and the administrative decisions about the classification and closures of the area.

In the example below the Irish Marine Institute through the Irish Spatial Data Exchange provides datasets and maps for locations along the Irish coastline where commercial shellfish harvesting takes place. The figure shows an example of authorized shellfish production area, with sample points for bio-toxin and phytoplankton samples.



Part 1: UML Case Diagram



Part 2: Legislative Background

Regulation 854/2004 on official controls on products of animal origin requires that bivalve mollusc are taken from classified production areas.

The areas are classified in one of the following categories according to the level of faecal contamination:

- Class A areas from which live bivalve molluscs may be collected for direct human consumption.
- Class B areas from which live bivalve molluscs may be collected, but placed on the market for human consumption only after treatment in a purification centre or after relaying so as to meet the health standards
- Class C areas from which live bivalve molluscs may be collected but placed on the market only after relaying over a long period so as to meet the health standards

Classified areas should be periodically monitored according to sampling programme to check for:

- the microbiological quality of live bivalve mollusc in relation to the production and relaying areas;
- the presence of toxin-producing plankton in production and relaying waters and biotoxins in live bivalve mollusc; and
- the presence of chemical contaminants in live bivalve molluscs.

The geographical distribution of the sampling points and the sampling frequency must ensure that the results of the analysis are as representative as possible for the area considered.

The sampling plan should take into account possible variations in the presence of plankton containing marine biotoxins and likely variation in faecal contamination.

If the results of the sampling programme show that health standards are exceeded or if there is a risk for human health, the production area is closed or re-classified.

The competent authorities must establish and keep up to date and communicate to interested parties a list of approved production and relaying areas, with details of their location, boundaries, classification and possible closures.

Definitions in the legislation (see Council Directive 2006/88/EC):

'mollusc farming area' means a production area or relaying area in which all aquaculture production businesses operate under a common biosecurity system;

'production area' means any freshwater, sea, estuarine, continental or lagoon area containing natural beds of molluscs or sites used for the cultivation of molluscs, and from which molluscs are taken;

Part.3: Detailed Structured description of the Use Case

Use Case Description	
Name	Official controls in mollusc production areas
Priority	Medium
Description	The CA monitors the implementation of the sampling program on the quality of mollusc and water and informs the public and stakeholders of the results.
Pre-condition	The CA has established mollusc production area and a sampling program.
Flow of Events – Basic Path	
Step 1.	Select from the geo portal an authorised mollusc production area.
Step 2	Show sampling points and aquaculture sites in the mollusc production area.
Step 3	Extract for the sampling points the list of samples taken for shellfish and water and the results of analyses for given temporal interval.
Flow of Events – Alternative Paths	
Step 3	Show active management restriction measures for the given production area
Post-condition	
Data set: Aquaculture sites	
Description	Public register of aquaculture sites established under Directive 2006/88/EC
Data provider	National Veterinary Authorities
Geographic scope	National
Thematic scope	Agricultural and aquacultural facilities (AF)
Scale, resolution	Scale relevant to the application
Delivery	Local Veterinary Authorities, Public, Aquaculture enterprises

Use Case Description	
Data set: Restricted areas	
Description	Authorised areas for mollusc production and their classification (Regulation 854/2004)
Data provider	National Veterinary Authorities
Geographic scope	National
Thematic scope	Area management/restriction/regulation zones and reporting units (AM)
Scale, resolution	Scale relevant to the application
Delivery	Local Veterinary Authorities, Public, Aquaculture enterprises
Data set: Water quality and food safety sampling	
Description	The sites where samples under official water quality monitoring and shellfish programme are taken
Data provider	Environmental laboratories (water quality) and food safety laboratories (shellfish)
Geographic scope	National
Thematic scope	Food safety, Environmental Monitoring Facilities (Water quality)
Scale, resolution	Scale relevant to the application
Delivery	Local Veterinary Authorities, Public, Aquaculture enterprises

Part.4: Cross-Thematic Data Requirements

TWG	Affected?	Datasets affected
Addresses (AD)	Yes	
Agricultural and aquacultural facilities (AF)	Yes	
Area management/restriction/regulation zones and reporting units (AM)	Yes	
Atmospheric conditions+Meteorological geographical features (AC-MF)	Yes	
Bio-geographical regions + Habitats and biotopes + Species distribution (BR-HB-SD)	No	
Buildings	No	
Cadastral Parcels (CP)	No	
Coordinate reference systems	Yes	
Energy Resources	No	
Environmental Monitoring Facilities (EMF)	Yes	
Geographical grid systems	Yes	
Geographical names (GN)	Yes	

Geology + Mineral resources (GE-MR)	No	
Human Health and Safety (HH)	No	
Hydrography (HY)	Yes	
LandCover (LC)	No	
LandUse (LU)	No	
Natural Risk Zones	No	
Production and industrial facilities (PF)	Yes	
Protected Sites (PS)	No	
Soil (SO)	No	
Statistical Units + Population distribution, demography (SU-PD)	No	
TransportNetwork (TN)	No	
Utility and governmental services (US)	No	