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**PANDA**

Permanent network to strengthen expertise on infectious diseases of  
aquaculture species and scientific advice to EU policy

Coordination Action

Scientific support to policies

**Work Package 2**

**Risk analysis of exotic, emerging and re-emerging disease hazards**

**Annex 7: Examples of data extraction**

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<b>PU</b>	Public	PU
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	

## **Table of Contents**

<b>Annex 7 - Examples of data extraction .....</b>	<b>1</b>
<b>7.1 Species and reported diseases by country.....</b>	<b>1</b>
<b>7.2 A possible country disease profile .....</b>	<b>2</b>

## Annex 7 - Examples of data extraction

### 7.1 Species and reported diseases by country (for *Dicentrarchus labrax* and *Ostrea edulis*)

Species	Disease	Country
<i>Dicentrarchus labrax</i>	<i>Ceratothoa</i> spp., <i>Mothocya</i> spp. and <i>Nerocila</i> spp.	Unknown exactly
	<i>Sphaerospora</i> spp.	Possibly widespread
	<i>Photobacterium piscicida</i>	Mediterranean region
	<i>Pseudomonas anguilliseptica</i>	Mediterranean region
	Viral Encephalopathy and Retinopathy	France, Martinique (French Overseas Department), Greece, Italy, Malta, Portugal, Singapore, Spain
	Viral Haemorrhagic Septicaemia	Experimental demonstration
<i>Ostrea edulis</i>	Bonamiosis	Denmark, France, Ireland, Italy, Kuwait, Netherlands, Spain, UK (excl. Scotland) and USA (California, Maine and Washington)
	Gill necrosis virus disease	France, Portugal, Spain and the UK
	<i>Haplosporidium amoricenum</i> (European oyster minchiniasis)	France and the Netherlands
	<i>Herpesviridae</i> (Herpesvirosis – Oyster herpes-like virus disease)	Unknown exactly
	<i>Herpesviridae</i> (Herpes virus infection of larval <i>Crassostrea gigas</i> )	Australia, Europe (France, ?Spain and ?UK), New Zealand and possibly Mexico and USA
	Hinge ligament disease – Cytophaga-like bacteria	Possibly ubiquitous
	Marteiliosis	France, Greece, Italy, Morocco, Netherlands, Portugal, Spain and ?UK (Southern England)
	Mikrocytosis	Canada
	<i>Myticola intestinalis</i>	Europe (Denmark, Ireland, Italy and UK)
	<i>Ostracoblabe implexa</i> – Shell disease	Canada, Europe (Ireland and UK) and India
<i>Vibrio lentus</i>	Spain (Valencia)	

## 7.2 A possible country disease profile

Reported aquatic animal diseases	Susceptible aquatic species (natural in bold)
<i>Aeromonas hydrophila</i>	<b>Many</b>
<i>Anguillicola crassus</i>	<i>Anguilla anguilla</i> and <i>Anguilla japonicus</i>
<i>Anisakis</i> spp.	Many
? <i>Argulus</i> spp.	<b>Cyprinus carpio</b> , <b>Cyprinidae</b> and <b>Salmonidae</b>
Bacterial kidney disease ( <i>Renibacterium salmoninarum</i> )	<b>Oncorhynchus spp.</b> , <b>Salmo salar</b> and <b>Salmonidae</b>
? <i>Benedenia</i> spp.	Many
Bonamiosis ( <i>Bonamia ostreae</i> )	<b>Ostrea edulis</b> , <b>O. conchaphila</b> , <b>O. puelchana</b> , <b>O. angasi</b> , <b>O. chilensis</b> , <b>Ostrea spp.</b> <b>Tiostrea spp.</b> and <b>Crassostrea rivularis</b>
? <i>Bothriocephalus achellognathi</i>	<b>Cyprinus carpio</b> , <b>Carassius auratus</b> , <b>Ctenopharyngodon idellus</b> , and plankton eating fish
Brown ring disease ( <i>Vibrio tapetis</i> )	<b>Tapes philippinarum</b> , <b>Venerupis aurea</b> and <b>Cerastoderma edule</b>
? <i>Camallanus</i> spp.	Many
? <i>Chilodonella</i> spp.	<b>Salmonidae</b> and <b>Cyprinidae</b>
<i>Citrobacter freundii</i>	<b>Oncorhynchus mykiss</b> , <b>Salmo salar</b> , <b>Carassius auratus</b> and <b>Mola mola</b>
Crayfish plague	<b>Astacus astacus</b> , <b>Austropotamobius pallipes</b> , <b>Austropotamobius torrentium</b> , <b>Astacus leptodactylus</b> , <b>Pacifasticus leniusculus</b> , <b>Procambarus clarkii</b> and <b>Eriocheir sinensis</b>
<i>Cryptobia</i> spp.	Many
<i>Cryptocaryon irritans</i>	Many
? <i>Dactylogyrus</i> spp.	<b>Cyprinidae</b> and other freshwater ornamental species
? <i>Dermocystidium</i> spp.	Many
Edwardsiellosis ( <i>Edwardsiella tarda</i> )	<b>Ictalurus spp.</b> , <b>Anguilla spp.</b> , <b>Oreochromis spp.</b> and <b>Salmonidae</b>
Enteric redmouth ( <i>Yersinia ruckeri</i> )	<b>Oncorhynchus mykiss</b> , <b>O. kisutch</b> , <b>O. tshawytscha</b> , <b>O. masou</b> , <b>O. clarki</b> , <b>Salmo salar</b> , <b>Salmo trutta</b> , <b>Scophthalmus maximus</b> , <b>Anguilla anguilla</b> , <b>Solea solea</b>
? <i>Epitheliocystis</i> (? <i>Chlamydia</i> spp.)	Many
? <i>Ergasilus</i> spp.	<b>Tinca tinca</b> and many other freshwater and brackish species
<i>Erythrocytic necrosis virus</i> (Viral erythrocytic necrosis)	<b>Gadus morhua</b> , <b>Clupea harengus</b> , <b>C. pallasii</b> , <b>Oncorhynchus spp.</b>
? <i>Eubothrium</i> spp.	<b>Oncorhynchus spp.</b> , <b>Salmonidae</b> , <b>Salmo salar</b> , <b>Lota lota</b> , <b>Morone americanus</b> , <b>Myxocephalus quadricornis</b> , <b>Micropterus salmonoides</b> and <b>Mylocheilus saurinae</b>

<i>?Exophiala</i> spp.	<i>Sillaginodes punctata, Xanthichthys ringens, Gadus morhua, Salmo clarkii, Salmo salar</i>
Extracellular giant “rickettsiae”	<i>Crassostrea gigas</i>
Flavobacteriosis (Flexibacteriosis)	Many
Gill necrosis virus disease	<i>Crassostrea gigas</i> and <i>?Ostrea edulis</i>
Gyrodactylosis ( <i>G. salaris</i> )	<i>Salmo salar, Oncorhynchus mykiss, Salvelinus alpinus, S. fontinalis, Thymallus thymallus, Salvelinus namaycush</i> and <i>Salmo trutta</i>
<i>?Gyrodactylus</i> spp.	Many
Haemocytic infection virus disease	<i>Crassostrea angulata</i> and <i>Crassostrea gigas</i>
Haplosporidiosis of carpet clams	<i>Ruditapes decussatus</i> and <i>Ruditapes philippinarum</i>
<i>?Herpes</i> viral infection of larval <i>Crassostrea gigas</i>	<i>Crassostrea gigas</i>
<i>Ichthyophthirius multifiliis</i>	Many
Icosahedral virus-like disease of carpet-shell clams	<i>Ruditapes decussatus, Crassostrea gigas</i> and <i>Ruditapes pullastra</i>
Infectious haematopoietic necrosis	<i>Oncorhynchus mykiss, O. nerka, O. tshawytscha, O. keta, O. masou, O. rhodurus, O. kisutch, Salmo salar, Esox lucius, Sparus aurata</i> and <i>Scophthalmus maximus</i>
Infectious pancreatic necrosis	<i>Oncorhynchus mykiss, Salvelinus fontinalis, Salmo trutta, Salmo salar, Oncorhynchus</i> spp., <i>Seriola quinqueradiata, Scophthalmus maximus, Hippoglossus hippoglossus, Gadus morhua, Misgurnus anguillicaudatus, Esox lucius, Astacus astacus, Anguillidae, Atherinidae, Bothidae, Carangidae, Cotostomidae, Cichlidae, Clupeidae, Cobitidae, Coregonidae, Cyprinidae, Esocidae, Moronidae, Paralichthyidae, Percidae, Poeciliidae, Sciaenidae, Soleidae</i> and <i>Thymallidae</i>
<i>Iridoviridae</i> -Lymphocystis Disease virus (Lymphocystis)	<b>Clupeidae, Osmeridae, Serranidae, Paralichthidae, Lutjanidae, Percidae, Sciaenidae, Chaetodontidae, Cichlidae, Gobiidae and Soleidae</b>
<i>Lactococcus</i> spp. ( <i>L. garviae</i> )	<i>Oncorhynchus mykiss</i> and <i>Seriola quinqueradiata</i>
<i>?Lernaea</i> spp.	<i>Cyprinus carpio, Carassius auratus, Carassius</i> spp., <i>Cyprinidae, Oncorhynchus mykiss, Rana rana</i> and <i>Rana</i> spp.
Marteiliosis (more than one species)	<i>Ostrea edulis, Ostrea</i> spp., <i>Cerastoderma edule, Crassostrea gigas, Crassostrea virginica, Mytilus edulis</i> and <i>Mytilus galloprovincialis</i> and others
<i>Mycobacterium</i> spp.	Many
Pancreas disease	<i>Salmo salar</i>
Pasteurellosis ( <i>Photobacterium piscicida</i> )	<i>Anguilla reinhardtii, Chromis punctipinnis, Dicentrarchus labrax, Scophthalmus maximus, Seriola quinqueradiata, Solea senegalensis</i> and <i>Sparus aurata</i>
<i>Photobacterium</i> ( <i>Vibrio</i> ) <i>damselae</i>	Many
Perkinsosis	<i>Haliotis rubber, H. cyclobates, H. scalaris, H. laevigata, Anadara trapezia, Ruditapes</i>

	<i>laevigata</i> , <i>Anadara trapezia</i> , <i>Ruditapes philippinarum</i> and <i>Austrovenus stutchburyi</i> / <b><i>Ruditapes decussates</i> and others</b>
<i>Pseudomonas anguilliseptica</i>	<b><i>Acanthopagrus schlegeli</i>, <i>Anguilla anguilla</i>, <i>Carassius auratus</i>, <i>Clupea harengus</i>, <i>Coregonus</i> sp., <i>Dicentrarchus labrax</i>, <i>Epinephelus coioides</i>, <i>Oncorhynchus mykiss</i>, <i>Pagellus bogarave</i>, <i>Plecoglossus altivelis</i>, <i>Pseudocaranx dentex</i>, <i>Salmo salar</i>, <i>S. trutta</i>, <i>Scophthalmus maximus</i> and <i>Sparus aurata</i></b>
<i>Saprolegnia</i> spp.	Many
Spring viraemia of carp	<b><i>Cyprinus carpio</i>, <i>Ctenopharyngodon idellus</i>, <i>Hypophthalmichthys molitrix</i>, <i>Aristichthys nobilis</i>, <i>Carassius carassius</i>, <i>C. auratus</i>, <i>Rutilus rutilus</i>, <i>Cyprinus carpio</i>, <i>Leuciscus idus</i>, <i>Tinca tinca</i>, <i>Silurus glanis</i>, <i>Esox lucius</i>, <i>Argulus foliaceus</i> and <i>Piscicola piscicola</i></b>
<i>Streptococcus</i> spp. ( <i>S. iniae</i> )	<b><i>Oncorhynchus mykiss</i>, <i>Paralichthys olivaceus</i>, <i>Sardinops melanostictus</i>, <i>Brevoortia patronus</i>, <i>Morone saxatilis</i>, <i>Cichlidae</i> and <i>Lates calcarifer</i></b>
? <i>Trichodina</i> spp.	Many
? <i>Trichodinella</i> spp.	Many
Vibriosis (various <i>Vibrio</i> spp. in different aquatic animal species)	Many
Viral encephalopathy and retinopathy	<b><i>Lates calcarifer</i>, <i>Dicentrarchus labrax</i>, <i>Scophthalmus maximus</i>, <i>Hippoglossus hippoglossus</i>, <i>Oplegnathus fasciatus</i>, <i>Epinephelus akaara</i>, <i>E. fuscogutatus</i>, <i>E. malabaricus</i>, <i>E. moara</i>, <i>E. septemfasciatus</i>, <i>E. tauvina</i>, <i>E. coioides</i>, <i>Cromileptes altivelis</i>, <i>Takifugu rubripes</i>, <i>Verasper moseri</i>, <i>Paralichthys olivaceus</i> and <i>Pseudocaranx dentex</i></b>
Viral haemorrhagic septicaemia	<b><i>Oncorhynchus mykiss</i>, <i>Salmo trutta</i>, <i>Thymallus thymallus</i>, <i>Coregonus</i> spp., <i>Esox lucius</i>, <i>Micropterus salmoides</i>, <i>Paralichthys olivaceus</i>, <i>Scophthalmus maximus</i>, <i>Oncorhynchus</i> spp., <i>Gadus macrocephalus</i>, <i>Clupea pallasii</i>, <i>Gadus morua</i>, <i>Dicentrarchus labrax</i>, <i>Melanogrammus aeglefinus</i>, <i>Rhinonemus cimbrius</i>, <i>Sprattus sprattus</i>, <i>Clupea harengus</i>, <i>Trisopterus esmarkii</i>, <i>Micromesistius poutassou</i>, <i>Merlangius merlangius</i> and <i>Argentina sphyraena</i></b>
<i>Zeuxapta seriola</i>	<b><i>Seriola dumerili</i>, <i>Seriola</i> spp.</b>