



European Union Reference Laboratory for Fish Diseases

National Institute of Aquatic Resources, Technical University of Denmark

Listing of fish diseases in EU legislation

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Animal Health Law - Status

- Publication – entering into force: 31 March 2016
- Transposition period: 5 years
 - Supplementary rules to be drafted and adopted: 36 months
 - Delegated acts
 - Implementing acts
 - Member States preparing period: 24 Months
- AHL will apply from : 1 April 2021


Delegated acts

- One Delegated act for the listing of diseases (both aquatic and terrestrial diseases)
- One delegated act for diagnostic methods (both aquatic and terrestrial diseases)
- One delegated act for all other issued – aquatic animals:
 - Requirements for registration and approval
 - Requirements for disease notification and control
 - Requirements for eradication programmes and disease free status
 - Requirements for intra Union movements incl. health certification
 - Requirements for entry into the Union of aquatic animals

Implementing acts

- **One implementing act for surveillance, eradication and disease control**
 - Detailed requirements for surveillance- and eradication programmes and applications for disease free status
 - Practical implementation of contingency plans
- **One implementing act for Intra Union movement and entry**
 - Derogations from obligations to approve or register establishments
 - Animal health certificates – models
 - List of third countries
- **One implementing act for approval of national measures**
 - List of diseases subject to national measures
 - Approval of eradication programmes and disease free areas

New AHL: From 2 to 5 categories of disease listing

- Exotic diseases 
 - Non-exotic diseases
- **Category a): Diseases not normally occurring in the Union**
 - Category b): Diseases which must be controlled in all MS
 - **Category c): Diseases subject to voluntary control in the MS**
 - Category d): Diseases for which movement restriction measures may apply.
 - **Category e): Diseases which shall be subject to surveillance**

Assessment of the listing of all existing listed diseases + candidate diseases

- In order to provide the necessary background for evaluation of diseases the EURL Fish was asked to provide updated information based on scientific studies.

ASSESSMENT CRITERIA – Fish diseases

Disease	Salmonid alphavirus (SAV)
Source	
DISEASE PROFILE	
Animal species	
Morbidity and Mortality rates in animal populations	
Zoonotic character	
Resistant to treatments, AMR	
Persistence in the animal population or environment	
Routes and speed of transmission animals-animals	
Routes and speed of transmission animals-humans	
Absence, presence and distribution of the disease in the EU	
Risks of its introduction into the EU if absent in EU	
Existence of diagnostic and disease control tools	
IMPACT OF THE DISEASE ON	
Agricultural production:	
- level of presence of the disease	
- loss of production	
- other losses	
Human health:	

- transmissibility	
- severity of human forms	
- effective prevention or medical treatments	
Animal welfare	
Biodiversity and the environment	
POTENTIAL TO GENERATE A CRISIS SITUATION AND ITS POTENTIAL USE IN BIOTERRORISM	
Bi terrorism	No data
FEASIBILITY, AVAILABILITY AND EFFECTIVENES OF THE DISEASE PREVENTION AND CONTROL MEASURES	
Diagnostic tools and capacities	
Vaccination	
Medical treatments	
Biosecurity measures	
Restrictions on the movement of animals and products	
Killing of animals	
Disposal of carcasses and other relevant animal by-products	
IMPACT OF DISEASE PREVENTION AND CONTROL MEASURES	
Direct and indirect cost for the affected sector and the economy as a whole	
Social acceptance	
Welfare of affected subpopulations of kept and wild animals	
Environment and biodiversity	

Assessment of VHS and IHN

Disease	Viral haemorrhagic septicaemia (VHS)		
Source	at 4°C (Frost and Wellhausen, 1974; Pietsch et al., 1977). VHSV is completely inactivated within hours at temperatures between 35 and 50 °C and within minutes at higher temperatures. For full survival estimates see FishEggTrade Work package 3 report: Pathogen survival outside the host, and susceptibility to disinfection . Some survivors of epizootics will become long-term carriers of the virus.		
Routes and speed of transmission animals-animals		update on the significance and the impact of the disease. Unfortunately exact data on the presence of VHS and losses due to VHS is almost impossible to achieve as the disease is endemic in large areas of EU and casualties are not reported. In Denmark 80 % of the farm were infected in 1965, in 2008 just before a final eradication only approximately 5 % (10-15 farms) were infected. An analysis of socio-economic benefits of a total eradication at that time was approx. 6.4 mill €/ year	
Routes and speed of transmission animals-humans			
Animal species	<p>Absence, presence and distribution of the disease in the EU</p> <p>Risks of its introduction into the EU if absence in EU</p> <p>Existence of diagnostic and disease control tools</p> <p>Zoonotic character</p> <p>Resistant to treatments, AMR</p> <p>Persistence in the animal population or environment</p>	<p>Human health:</p> <ul style="list-style-type: none"> - transmissibility - severity of human forms - effective prevention or medical treatments <p>Animal welfare</p> <p>Biodiversity and the environment</p> <p>POTENT</p> <p>FEASIBILITY, A</p> <p>Diagnostic tools and capacities</p> <p>Vaccination</p> <p>Medical treatments</p> <p>Biosecurity measures</p>	
Morbidity and Mortality rates in animal populations		and other birds access. Spillage of water from fish transport lorries into the farm should be avoided. Fresh fish should not be used as feed for farmed fish. Transfer of live fish from sea water to fresh water is likewise not recommendable. Depending on local conditions, it is possible to eradicate the disease among farmed fish. In Denmark, the majority of fish farms (>400) were infected with the pathogen in the 1960s. Based on a programmes agreed on between the fish farmers and the competent authorities the country succeeded in eradicating the disease with the last outbreak taking place in January 2009. One of the key points in the programmes has been stamping out, followed by drainage and disinfection of the ponds and restocking after following with certified free fish. Stamping out procedures have been performed both in case of specific new outbreaks but also in more controlled manners where all farms at the same system are stamped out after a pre-decided plan. (Olesen and Skall, 2014)	
Zoonotic character			
Resistant to treatments, AMR			
Persistence in the animal population or environment			
		Restrictions on the movement of animals and products	
		Killing of animals	
		Disposal of carcasses and other relevant animal by-products	
		IMPACT OF DISEASE PREVENTION AND CONTROL MEASURES	
		Direct and indirect cost for the affected sector and the economy as a whole	VHS have had a very significant impact on the economy of the aquaculture sector producing rainbow trout, olive flounder and turbot- especially in environments with water temperatures in the range of 5-15 C. A major reason for the international competitiveness of the Danish aquaculture sector is the eradication of VHS in 2009.
		Social acceptance	Well accepted
		Welfare of affected subpopulations of kept and wild animals	Fish welfare is not affected by preventative or control measures
		Environment and biodiversity	Outbreaks of some genotypes of VHS could cause serious impact on environment and +biodiversity.
		Medical treatments	
		Biosecurity measures	In order to prevent introduction and spreading of the disease into and between farms, a number of zoonotic measures can be used. Where possible, netting over the ponds and fencing the sides of the farms is strongly advisable in order to prevent herons

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Assessment of VHS, IHN, EHN, SAV, and VNN done

EFSA will be approached with regard to KHV

Listing of susceptible species

Proposal for fish species to be listed as susceptible to infection with listed diseases: **EHN**

Disease	Susceptible species	Vector species	Comment
Epizootic haematopoietic necrosis	Rainbow trout (<i>Oncorhynchus mykiss</i>), Redfin perch (<i>Perca Fluviatilis</i>) <i>Maquaria perch (Maquaria australasica)</i> , <i>Silver perch (Bidyanus bidyanus)</i> <i>Mountain galaxias (Galaxias olidus)</i> <i>Mosquito fish (Gambusia affinis)</i> <i>Black bullhead (Ameiurus melas)</i> <i>Northern Pike (Esox Lucius)</i> <i>Pike-perch (Sander lucioperca)</i>	<i>Bighead carp (Aristichthys nobilis)</i> , <i>goldfish (Carassius auratus)</i> , <i>crucian carp (C. carassius)</i> , <i>common carp and koi carp (Cyprinus carpio)</i> , <i>silver carp (Hypophtalmichthys molitrix)</i> , <i>Chub (Leuciscus spp)</i> , <i>Roach (Rutilus rutilus)</i> , <i>Rudd (Scardinius erythrophthalmus)</i> , <i>tench (Tinca tinca)</i> , <i>Australian smelt (Retropinna semoni)</i> , <i>Australian bass (Maquaria novemaculeata)</i> , <i>Golden perch (M. ambigua)</i> <i>Barramundi (Lates calcarifer)</i> , and <i>Sumatra barb (Capoeta</i>	Species in red are added

Listing of susceptible species

Proposal for fish species to be listed as susceptible to infection with listed diseases: VHS

<p>Viral haemorrhagic septicaemia</p>	<p>Rainbow trout (<i>Oncorhynchus mykiss</i>), Pacific salmon (<i>O. spp.</i>) Brown trout (<i>Salmo trutta</i>), Marble trout (<i>Salmo marmoratus</i>) Atlantic salmon (<i>Salmo salar</i>) Herring (<i>Clupea spp.</i>), Whitefish (<i>Coregonus sp.</i>), Pike (<i>Esox lucius and E. masquinongy</i>) Haddock (<i>Gadus aeglefinus</i>), Pacific Cod (<i>G. macrocephalus</i>), Atlantic cod (<i>G. morhua</i>), Rockling (<i>Onos mustelus</i>), Turbot (<i>Scophthalmus maximus</i>), Sprat (<i>Sprattus sprattus</i>), Grayling (<i>Thymallus thymallus</i>) Olive flounder (<i>Paralichthys olivaceus</i>), South American pilchard (<i>Sardinops sagax</i>), Poor cod (<i>Trisopterus minutus</i>), Whiting (<i>Merlangius merlangus</i>), Blue whiting (<i>Micromesistius poutassou</i>) Norway pout (<i>Trisopterus esmarkii</i>), Alaska pollock (<i>Theragra chalcogramma</i>), Fourbeard rockling (<i>Encheiopus cimbrius</i>), Pacific hake (<i>Merluccius productus</i>), Common dab (<i>Limanda limanda</i>), European flounder (<i>Platichthys flesus</i>), European plaice (<i>Pleuronectes platessa</i>) Greenland halibut (<i>Reinhardtius hippoglossoides</i>), Argentine (<i>Argentina sphyraena</i>), Surf smelt (<i>Hypomesus pretiosus</i>), Pacific sand lance (<i>Ammodytes hexapterus sp.</i>), Sand goby (<i>Pomatoschistus minutus</i>), Round goby (<i>Neogobius melanostomus</i>), Shiner perch (<i>Cymatogaster aggregate</i>), Freshwater drum (<i>Aplodinotus</i></p>	<p><i>tetrazona</i>), Brook trout (<i>Salvelinus fontinalis</i>), Arctic char (<i>S. alpinus</i>), Beluga (<i>Huso huso</i>), Danube sturgeon (<i>Acipenser gueldenstaedtii</i>), Sterlet sturgeon (<i>Acipenser ruthenus</i>), Starry sturgeon (<i>Acipenser stellatus</i>), Sturgeon (<i>Acipenser sturio</i>), Siberian Sturgeon (<i>Acipenser Baerii</i>) Bighead carp (<i>Aristichthys nobilis</i>), goldfish (<i>Carassius auratus</i>), Crucian carp (<i>C. carassius</i>), common carp and koi carp (<i>Cyprinus carpio</i>), silver carp (<i>Hypophthalmichthys molitrix</i>), Chub (<i>Leuciscus spp</i>), Roach (<i>Rutilus rutilus</i>), Rudd (<i>Scardinius erythrophthalmus</i>), tench (<i>Tinca tinca</i>) North African catfish (<i>Clarias gariepinus</i>), Northern pike (<i>Esox lucius</i>) Catfish (<i>Ictalurus spp.</i>), Black bullhead (<i>Ameiurus melas</i>), Channel catfish (<i>Ictalurus punctatus</i>), Pangas catfish (<i>Pangasius pangasius</i>), Pike perch (<i>Sander lucioperca</i>), Wels catfish (<i>Silurus glanis</i>) European seabass (<i>Dicentrarchus labrax</i>), Striped bass (<i>Morone chrysops x M. saxatilis</i>), Flathead grey mullet (<i>Mugil cephalus</i>), Red drum (<i>Sciaenops ocellatus</i>), Meagre (<i>Argyrosomus regius</i>), Shi drum (<i>Umbrina cirrosa</i>), True tunas (<i>Thunnus spp.</i>), Atlantic bluefin tuna (<i>Thunnus thynnus</i>), White Grouper</p>	<p>A large number of species is proposed to be added in order to be in line with the OIE. Most of interest and of possible conflict is:</p> <ol style="list-style-type: none"> 1. Atlantic salmon added to the list of susceptible species- this species was taken off the list in 2006. 2. Marble trout added. 3. Wrasse sp. and humpfish sp. used as cleaner fish in the salmon industry are now added to the list of susceptible species 4. The following hybrids are added to the list of susceptible: <i>O. mykiss x O. kisutch</i>, <i>O. mykiss x S. fontinalis</i> triploid, <i>O. mykiss x S. alpinus</i> triploid 5. The Arctic char and the brook trout is proposed inserted as vector species <p>The list is in fact very long and might be reduced by giving fish orders or families</p>
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	<p><i>grunniens</i>), Pacific chub mackerel (<i>Scomber japonicas</i>), Three-spined stickleback (<i>Gasterosteus aculeatus</i>), European river lamprey (<i>Lampetra fluviatilis</i>), European bass (<i>Dicentrarchus labrax</i>), Ayu (<i>Plecoglossus altivelis</i>), Lake trout (<i>Salvelinus namaycush</i>), <i>O. mykiss x O. kisutch</i>, <i>O. mykiss x S. fontinalis</i> triploid, <i>O. mykiss x S. alpinus</i> triploid Wrasse (<i>Labridae sp.</i>), and Lumpfish (<i>Cyclopteridae sp.</i>)</p>	<p>(<i>Epinephelus aeneus</i>), Dusky grouper (<i>Epinephelus marginatus</i>), Senegalese solea (<i>Solea senegalensis</i>), Common sole (<i>Solea solea</i>), Common pandora (<i>Pagellus erythrinus</i>), Common dentex (<i>Dentex dentex</i>), Gilthead seabream (<i>Sparus aurata</i>), White seabream (<i>Diplodus sargus</i>), Black spot seabream (<i>Pagellus bogaraveo</i>), Red Sea Bream (<i>Pagrus major</i>), Diplodus vulgaris, Sharop snout seabream (<i>Diplodus puntazzo</i>), Common two banded seabream (<i>Diplodus vulgaris</i>), Red porgy (<i>Pagrus pagrus</i>) Tilapia spp (<i>Oreochromis</i>)</p>
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VHS susceptible species

Proposed News:

- Atlantic salmon added to the list of susceptible species- this species was taken off the list in 2006.
- Marble trout added.
- Wrasse sp. and lumpfish sp. used as cleaner fish in the salmon industry are now added to the list of susceptible species
- The following hybrids are added to the list of susceptible: *O. mykiss* x *O. kisutch*, *O. mykiss* x *S. fontinalis* triploid, *O. mykiss* x *S. alpinus* triploid
- The Arctic char and the brook trout is proposed inserted as vector species
- For VHS: Proposal to group species in genera and families (salmonids for VHS)

Proposal for fish species to be listed as susceptible to infection IHN

Also for IHNV many additions are proposed of most interest is that:

- the Marble trout, the Arctic char and the Brook trout is proposed inserted as susceptible species
- The cod is moved from vector to susceptible species
- The white sturgeon proposed included as susceptible

<p>Infectious haematopoietic necrosis</p>	<p>Chum salmon (<i>Oncorhynchus keta</i>), coho salmon (<i>O. kisutch</i>), Masou salmon (<i>O. masou</i>), rainbow or steelhead trout (<i>O. mykiss</i>), sockeye salmon (<i>O. nerka</i>), pink salmon (<i>O. rhodurus</i>) chinook salmon (<i>O. tshawytscha</i>), Atlantic salmon (<i>Salmo salar</i>), Lake trout (<i>Salmo namaycush</i>), Marble trout (<i>Salmo marmoratus</i>) Brook trout (<i>Salvelinus fontinalis</i>), Arctic char (<i>S. alpinus</i>), Whitespotted char (<i>S. leucomaenis</i>), Pacific herring (<i>Clupea pallasii</i>), Shiner perch (<i>Cymatogaster aggregata</i>), Tube-snout (<i>Aulorhynchus flavidus</i>), Ayu (<i>Plecoglossus altivelis</i>), Atlantic cod (<i>Gadus morrhua</i>), White sturgeon (<i>Acipenser transmontanus</i>), and Northern pike (<i>Esox lucius</i>)</p>	<p>Beluga (<i>Huso huso</i>), Danube sturgeon (<i>Acipenser gueldenstaedtii</i>), Sterlet sturgeon (<i>Acipenser ruthenus</i>), Starry sturgeon (<i>Acipenser stellatus</i>), Sturgeon (<i>Acipenser sturio</i>), Siberian Sturgeon (<i>Acipenser Baerii</i>) Bighead carp (<i>Aristichthys nobilis</i>), goldfish (<i>Carassius auratus</i>), crucian carp (<i>C. carassius</i>), common carp and koi carp (<i>Cyprinus carpio</i>), silver carp (<i>Hypophthalmichthys molitrix</i>), Chub (<i>Leuciscus spp</i>), Roach (<i>Rutilus rutilus</i>), Rudd (<i>Scardinius erythrophthalmus</i>), Tench (<i>Tinca tinca</i>), North African catfish (<i>Clarias gariepinus</i>), Catfish (<i>Ictalurus spp.</i>), Black bullhead (<i>Ameiurus melas</i>), Channel catfish (<i>Ictalurus punctatus</i>), Pangas catfish (<i>Pangasius pangasius</i>), Pike perch (<i>Sander lucioperca</i>), Wels catfish (<i>Silurus glanis</i>) Atlantic halibut (<i>Hippoglossus hippoglossus</i>), Flounder (<i>Platichthys flesus</i>), Haddock (<i>Melanogrammus aeglefinus</i>) Atlantic cod (<i>Gadus morrhua</i>)</p>	<p>Also for IHNV additions are proposed of most interest is that:</p> <ol style="list-style-type: none"> 1. the Marble trout is proposed as susceptible species 2. The cod is moved from vector to susceptible species 3. The white sturgeon proposed included as susceptible
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Proposal for fish species to be listed as susceptible to infection ISA

- Since the last list was produced ISAV HPR0 is no longer listed- therefore it is suggested to transfer Rainbow trout to the list of vector species and not the susceptible species

Infection with HPR deleted infectious salmon anaemia virus	Atlantic salmon (<i>Salmo salar</i>) and brown and sea trout (<i>S. <u>trutta</u></i>).	Rainbow trout (<i>Oncorhynchus mykiss</i>), <u>Amago</u> trout(<i>Oncorhynchus masau</i>) Herring (<i><u>Clupea harengus</u></i>)
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Proposal for fish species to be listed as susceptible to infection with KHV

- It is proposed to include hybrids of *Cyprinus carpio* as susceptible whereas it is proposed to include grass carp and gold fish as vector species

Koi herpes virus disease	Common carp and koi carp (<u><i>Cyprinus carpio</i></u>) Common carp hybrids (<u><i>Cyprinus carpio</i></u> x <u><i>Carassius auratus</i></u>) (<i>crucian carp</i> x <i>koi carp</i> hybrids)	Gold fish (<u><i>Carassius auratus</i></u>) Grass carp (<u><i>Ctenopharyngodon idella</i></u>)
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This is a proposal for a preliminary list. The final list await the outcome of the OIE working group on assessment of the susceptible species of the 10 OIE listed fish diseases- to be finally adopted at the OIE General Assembly in 2019

The OIE working group

- *An ad hoc* Group on susceptibility of fish species to infection with OIE listed diseases will undertake assessments for the 10 OIE listed fish diseases.
- Develop a list of susceptible species for inclusion in the fish disease-specific chapters in the *Aquatic Code*.
- Develop a list of species with incomplete evidence for susceptibility for inclusion in *Aquatic Manual*

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Background

- A new Chapter 1.5. 'Criteria for listing species as susceptible to infection with a specific pathogen' was introduced into the 2014 edition of the *Aquatic Code*.
- The purpose of this chapter is to provide criteria for determining which host species are listed as susceptible of each disease specific chapter in the *Aquatic Code*.
- The criteria are to be applied progressively to each disease specific chapter in the *Aquatic Code*.

Chapter 1.5.

Criteria for listing species as susceptible to infection with a specific pathogen

- The purpose to provide criteria for determining which species are listed as susceptible of each disease-specific chapter in the Aquatic Code.
- **Scope**
- Susceptibility may include clinical or non-clinical infection but does not include species that may carry the pathogenic agent without replication.
- The decision to list a species as susceptible should be based on a finding that the **evidence is definite**. However, **possible susceptibility** of a species is also important information and this should also be included in «Susceptible host species» of the relevant disease-specific chapter of the Aquatic Manual.
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A 3-stage approach

1. criteria to determine whether the route of transmission is consistent with **natural pathways** for the *infection*
2. criteria to determine whether the *pathogenic agent* has been **adequately identified**
3. criteria to determine whether the evidence indicates that **presence of the *pathogenic agent* constitutes an *infection*.**

Stage 1: criteria to determine whether the route of transmission is consistent with natural pathways for the infection

- The evidence should be classified as transmission through:
 1. **natural occurrence**; includes situations where infection has occurred without experimental intervention e.g. infection in wild or farmed populations; or
 2. **non-invasive experimental** procedures; includes cohabitation with infected hosts, infection by immersion or ingestion.

Stage 2: criteria to determine whether the pathogenic agent has been adequately identified

- The pathogenic agent should be identified and confirmed in accordance with the methods described in the Aquatic Manual, or other methods that have been demonstrated to be equivalent.

Stage 3: criteria to determine whether the evidence indicates that presence of the pathogenic agent constitutes an infection

- A) the pathogenic agent is **multiplying in the host**, or developing stages of the pathogenic agent are present in or on the host;
- B) viable pathogenic agent is **isolated from the proposed susceptible species**, or infectivity is demonstrated by way of transmission to naive individuals;
- **C) clinical or pathological changes** are associated with the infection;
- D) the **specific location** of the pathogen corresponds with the expected target tissues.

Outcomes of the assessment

The decision to list a species as susceptible (Aquatic Code):

✓ Transmission has been obtained naturally or by experimental procedures that mimic natural pathways for the infection

AND

✓ the identity of the pathogenic agent has been confirmed

AND

✓ there is evidence of infection with the pathogenic agent in the suspect host species.

✓ To be included in the Aquatic Code

Species for which there is incomplete evidence for susceptibility (Aquatic Manual)

- The decision to list a species as should be based on a finding that the evidence is definite.
- However, where there is **insufficient evidence** to demonstrate susceptibility through the approach information will be included in the relevant disease-specific chapter in the Aquatic Manual.
- If there is insufficient evidence to demonstrate susceptibility of a species, the Competent Authority should assess the risk of spread of the pathogen under consideration prior to the implementation of import health measures.

For each disease list with fish species assessed for susceptibility created giving them status as 1 (Code) 2 (Manual) 3 Not applicable (Neither Code nor Manual) 4 Non-susceptible (Manual)

Genus	species	STAGE 1 - route of infection			STAGE 2 - path		STAGE 3 - Pathology. A: Agent replication. B: viable agent isolated from host. C: Disease signs. D: pathogen located in target tissues				Reference	Comments	OUTCO	OVERALL STATUS
		Route of transmissio	Natural	FR	Outbre	pathogen id.	Comments	A	B	C				
Perca	P fluviatilis	Natural/E (non-inva	Natural	Yes	incomplete	first report	Y	Y	Y	Y	Langdon et al 1986; Lan	PCR not available		1
Perca	P fluviatilis	E (non-invasive)	Natural	No	Yes	PCR only	Y	Y	Y	Y	Borzym et Maj-Paluch 2	PCR only - no post experimental sequencing, but isolate used for infec		1
Perca	P fluviatilis	E (non-invasive)	Natural	No	IFAT		Y	Y	Y	Y	Ariel et Bang Jensen 20	PCR not used, no post experimental sequencing, but isolate used for i		1
Oncorhynchus	O mykiss	E (non-invasive)	Natural	No	Yes	PCR only	Y	Y	Y	Y	Borzym et Maj-Paluch 2	PCR only - no sequencing, no post experimental sequencing, but isolat		1
Oncorhynchus	O mykiss	Natural/E (non-inva	Natural	Yes	incomplete	first report	Y	Y	Y	Y	Langdon et al 1988; Lan	PCR not available		1
Oncorhynchus	O mykiss	E (non-invasive)	Natural	No	IFAT		Y	Y	Y	Y	Ariel et Bang Jensen 20	PCR not used - no post experimental sequencing, but isolate used for i		1
Oncorhynchus	O mykiss	Natural	Natural	Yes	ELISA		N	Y	Y	Y	Whittington et al 1994	PCR not used		1
Sander	S lucioperca										Bang Jensen et al 2011			
Cyprinus	C carpio										Bang Jensen et al 2011			
Carassius	C auratus										Bang Jensen et al 2011			
Macquaria	M australasica	E (non-invasive)	Natural	No	incomplete	first report	Y	Y	Y	Y	Langdon 1989	PCR not available		2
Maccullachella	M peeli	E (invasive)	Natural	No	incomplete	first report	Y	Y	Y	Y	Langdon 1989	PCR not available		2
Bidayanus	B bidyanus	E (non-invasive)	Natural	No	incomplete	first report	Y	Y	Y	Y	Langdon 1989	PCR not available		2
Galaxias	G ollus	E (non-invasive)	Natural	No	incomplete	first report	Y	Y	Y	Y	Langdon 1989	PCR not available		2
Gambusia	G affinis	E (non-invasive)	Natural	No	incomplete	first report	Y	Y	Y	Y	Langdon 1989	PCR not available		2
Amelurus	A melas	E (non-invasive)	Natural	No	IFAT		N	Y	N	Y	macroscop Gobbo et al 2010	PCR not used		2
Esax	E lucius	E (non-invasive)	Natural	No	IHC		Y	Y	Y	Y	Jensen et al 2009	PCR used for inoculum characterisation, isolate used was the same as		1
Salmo salar	S salar	E (invasive)			incomplete	first report	nd	Y	Y	N	Langdon et al 1986		2b	2
Retrapinna	r semoni	E (non-invasive)					nd	nd	nd	nd	Langdon 1989			na
Carassius	c auratus	E (non-invasive)/E (i					nd	nd	nd	nd	Langdon 1989			na
Maquaria	m novemaculeata	E (non-invasive)/E (i					nd	nd	nd	nd	Langdon 1989			na
Maquaria	m ambigua	E (non-invasive)/E (i					nd	nd	nd	nd	Langdon 1989			na
Lates	l calcarifer	E (non-invasive)/E (i					nd	nd	nd	nd	Langdon 1989			na
Capoeta	c tetrazona	E (non-invasive)					nd	nd	nd	nd	Langdon 1989			na
Paratya	p australiensis	E (non-invasive)					nd	nd	nd	nd	Langdon 1989			na
Daphnia	d carinata	E (non-invasive)					nd	nd	nd	nd	Langdon 1989			na
Cherax	c destructor	E (non-invasive)					nd	nd	nd	nd	Langdon 1989			na
Aggraptoarixia	a sp.	E (non-invasive)					nd	nd	nd	nd	Langdon 1989			na
Bidayanus	b bidyanus										Becker et al 2013			
Craterocephalu	c stercusmuscaru										Becker et al 2013			
Gambusia	g halbrooki										Becker et al 2013			
Hypseleotris	h spp.										Becker et al 2013			
Maccullachella	m macquariensis										Becker et al 2013			
Maccullachella	m peeli peeli										Becker et al 2013			
Macquaria	m ambigua ambig										Becker et al 2013			

The OIE listed fish diseases assessed at present

- ✓ EHN
- EUS
- ✓ *Gyrodactylus.sal*
- ISA
- ✓ SAV
- ✓ IHN
- ✓ KHV
- ✓ RSBIV
- ✓ SVC
- VHS

Article 1.3.1.

The following *diseases* of fish are listed by the OIE:

- Epizootic haematopoietic necrosis disease
- Infection with *Aphanomyces invadans* (epizootic ulcerative syndrome)
- Infection with *Gyrodactylus salaris*
- Infection with HPR-deleted or HPR0 infectious salmon anaemia virus
- Infection with salmonid alphavirus
- Infectious haematopoietic necrosis
- Koi herpesvirus disease
- Red sea bream iridoviral disease
- Spring viraemia of carp
- Viral haemorrhagic septicaemia.

EFSA report on susceptible species



European Food Safety Authority

The EFSA Journal (2008) 808, 1-144

Aquatic species susceptible to diseases listed in Directive 2006/88/EC¹

Scientific Opinion of the Panel on Animal Health and Welfare (AHAW)

(Question No EFSA-Q-2008-074)

Adopted on the 11th of September 2008

In conclusion:

- A number of changes are proposed concerning listing of fish species susceptible to the EU listed fish diseases
- The assessments shall be made based on scientific studies and peer reviewed papers
- The EURL alone cannot comply with all diseases and will call for an expert group meeting at DTU or in Brussels in order to provide sufficient scientific strength of the proposals to the Commission
- Proposal for Members of this group/ volunteers? (big but interesting work)

Thank you for your attention