



Epizootic Ulcerative Syndrome

Scientific Opinion adopted 15/9/11

<http://www.efsa.europa.eu/en/scdocs/scdoc/2387.htm>

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- Background
 - EUS
 - Legislation
- EUS epidemiology: pathogen, hosts, transmission, distribution, prevalence
- Ornamental fish trade
- Risk of entry
- Risk of spread
- Possible Impact

- EUS is an epizootic disease in wild and farmed freshwater and estuarine fish.
- The disease has never been reported in Europe.
- The fish species susceptible to EUS include many **ornamental fish**.

- **Ornamental aquatic animal (OF)**
- **Closed ornamental facilities (COF):** pet shops, garden centres, garden ponds, commercial aquaria or wholesalers keeping ornamental aquatic animals
- **Open ornamental facility (OOF)**

Derogations to ornamentals in COF

- Requirements on authorization, record keeping, traceability, risk-based surveillance and good hygiene practices do not apply.
- EUS susceptible species:
 - May be imported from all third countries being members of the OIE.
 - Currently no EUS specific requirements apply.

HOWEVER

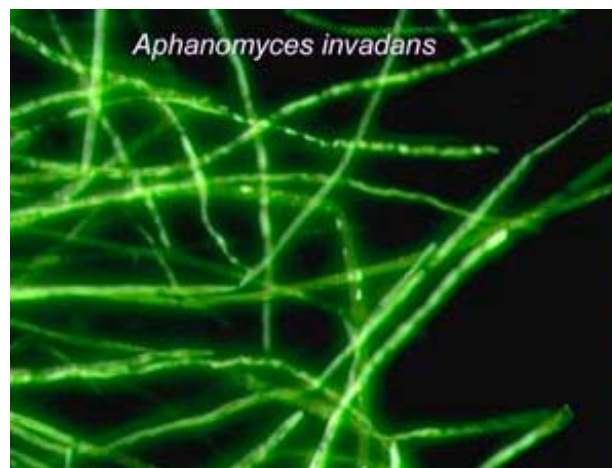
- Notification and minimum measures for control of diseases in aquatic animals do apply.

So.....

The Commission is aiming to re-assess the current regulatory regime as regards EUS.

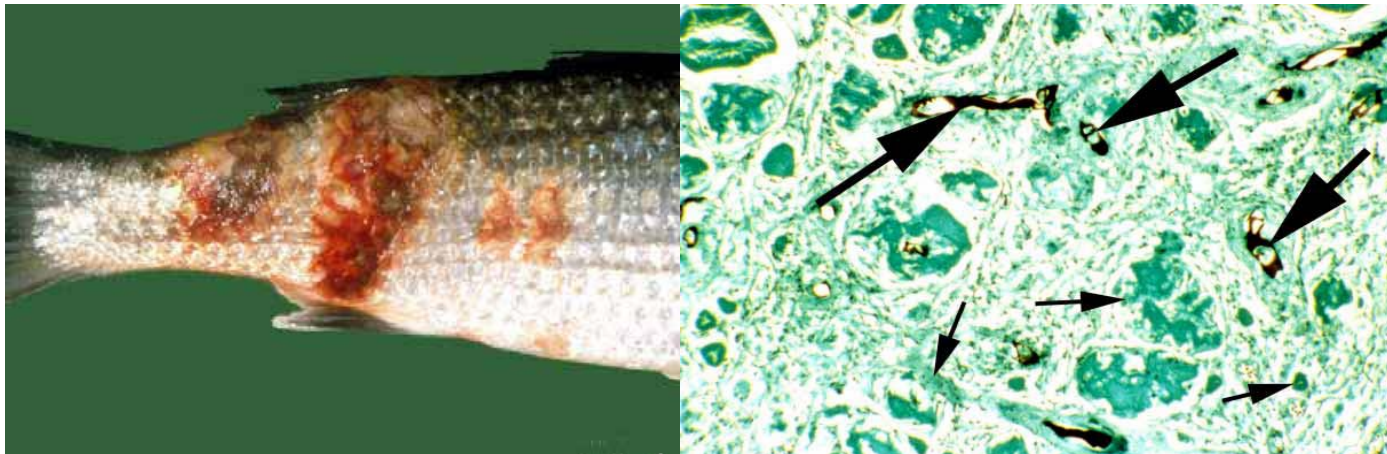
It is therefore appropriate and necessary to assess the risks posed by EUS for the EU aquaculture industry.

- EUS is caused by the oomycete known as *Aphanomyces invadans*.



- Large number of fresh water and estuarine species.
- European species:
 - naturally susceptible : crucian carp (*Carassius carassius*) and grey mullet (*Mugil cephalus*)
 - susceptible by experimental challenge: rudd, (*Scardinius erythrophthalmus*) European catfish (*Silurus glanis*), common carp (*Cyprinus carpio*), and roach (*Rutilus rutilus*).
 - Introduced fish species known to be susceptible: goldfish (*Carassius auratus auratus*) bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), rainbow trout (*Oncorhynchus mykiss*), rosy barb (*Puntius schwanenfeldi*) and rosy bitterling (*Rhodeus ocellatus*).

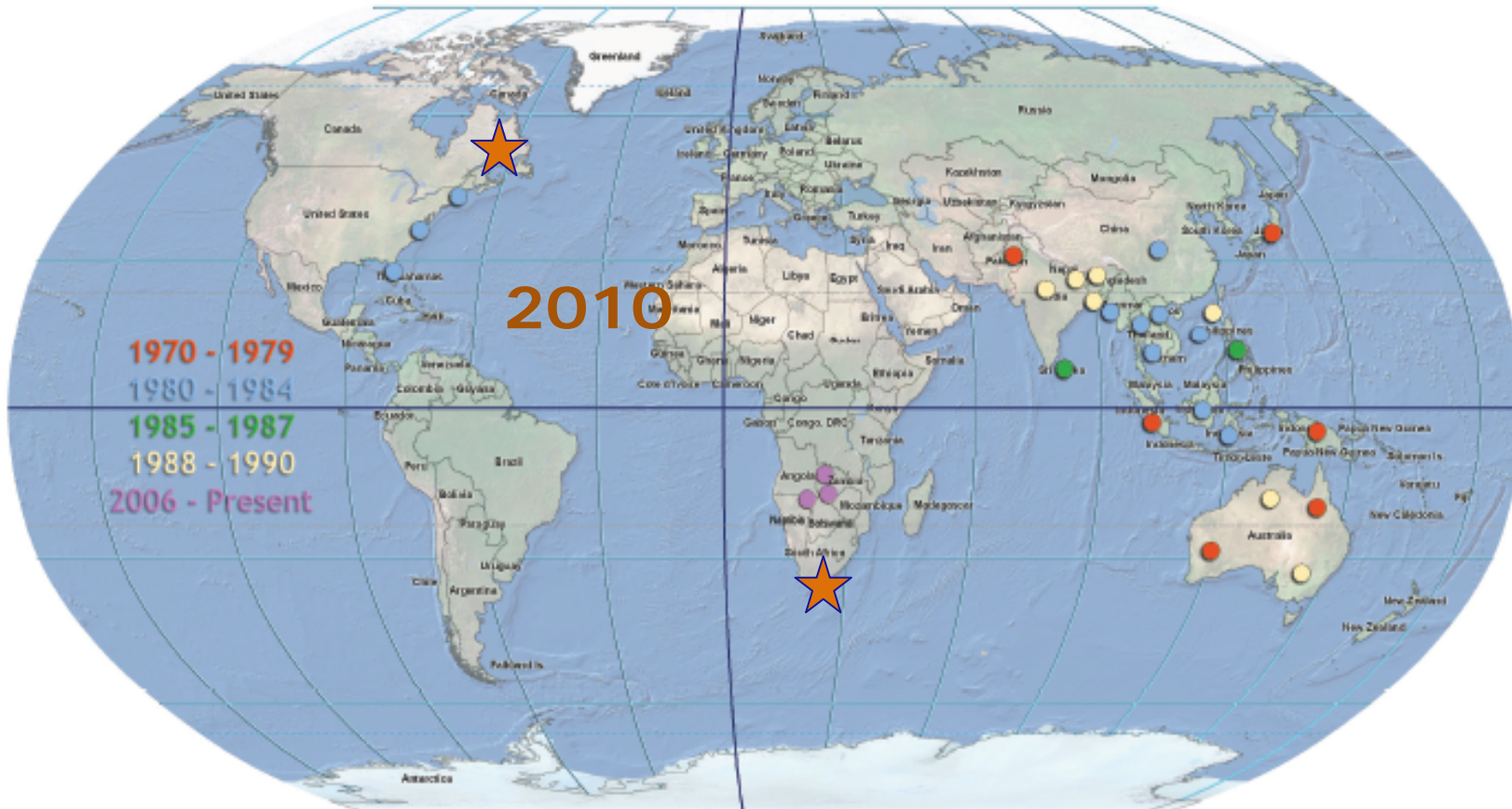
Signs



- Horizontal transmission (there is no published evidence demonstrating that zoosporangia form on the surface of infected fish and release zoospores)?
- Very small MID (demonstrated experimentally)?
- Predisposing factors: skin damage, low water temperature, water quality changes or other infections.
-
- Persistence between outbreaks

Distribution of EUS world wide

Map showing the current global distribution of epizootic ulcerative syndrome
(prepared by Jeff Jenness and José Aguilar-Manjarrez, FAO-FIMA; source: African Water Resource Database)



(FAO –2009)

Trade volumes of live fish

Top exporting countries to the EU (Eurostat 2009 data)

Partner/product	030110 - live ornamental fish(a)	03019 - live fish (excl. Ornamental fish) ¹ (a)	EUS Detection
SINGAPORE	12666		?
MALAYSIA*	1350		YES
UNITED STATES	1822	2326	YES
SRI LANKA*	1915		YES
JAPAN	1924		YES
THAILAND	1979		YES
INDONESIA	4501		YES
KENYA*	458		
MALDIVES*	601		
BRAZIL	620		
ISRAEL	6789	66	
CHINA (PEOPLE'S REPUBLIC OF)*	750		
COLOMBIA	810		
HONG KONG	816		
PHILIPPINES	861		YES

Handwritten annotations: A red bracket groups SINGAPORE, MALAYSIA*, UNITED STATES, SRI LANKA*, JAPAN, THAILAND, and INDONESIA. A blue number '27018' is written next to this bracket. A red circle highlights the value '2326' in the '03019' column for the UNITED STATES. A red ratio '11 : 1' is written between the '030110' and '03019' columns. A red circle highlights the 'EUS Detection' column for SINGAPORE, MALAYSIA*, UNITED STATES, SRI LANKA*, JAPAN, THAILAND, and INDONESIA. A red circle highlights the 'EUS Detection' cell for PHILIPPINES.

- Quantities in 100 kg
- The main exporters of ornamental fish to EU are countries considered not free of EUS.

- Total imports of ornamental (2010) :
210 058 725
- Total value of the industry in UK: 400 millions £
- 85% of EU imports arrive at UK and 47% through Heathrow BIP.

Table 1: Live aquatic animals imported through the Heathrow BIP in 2010.

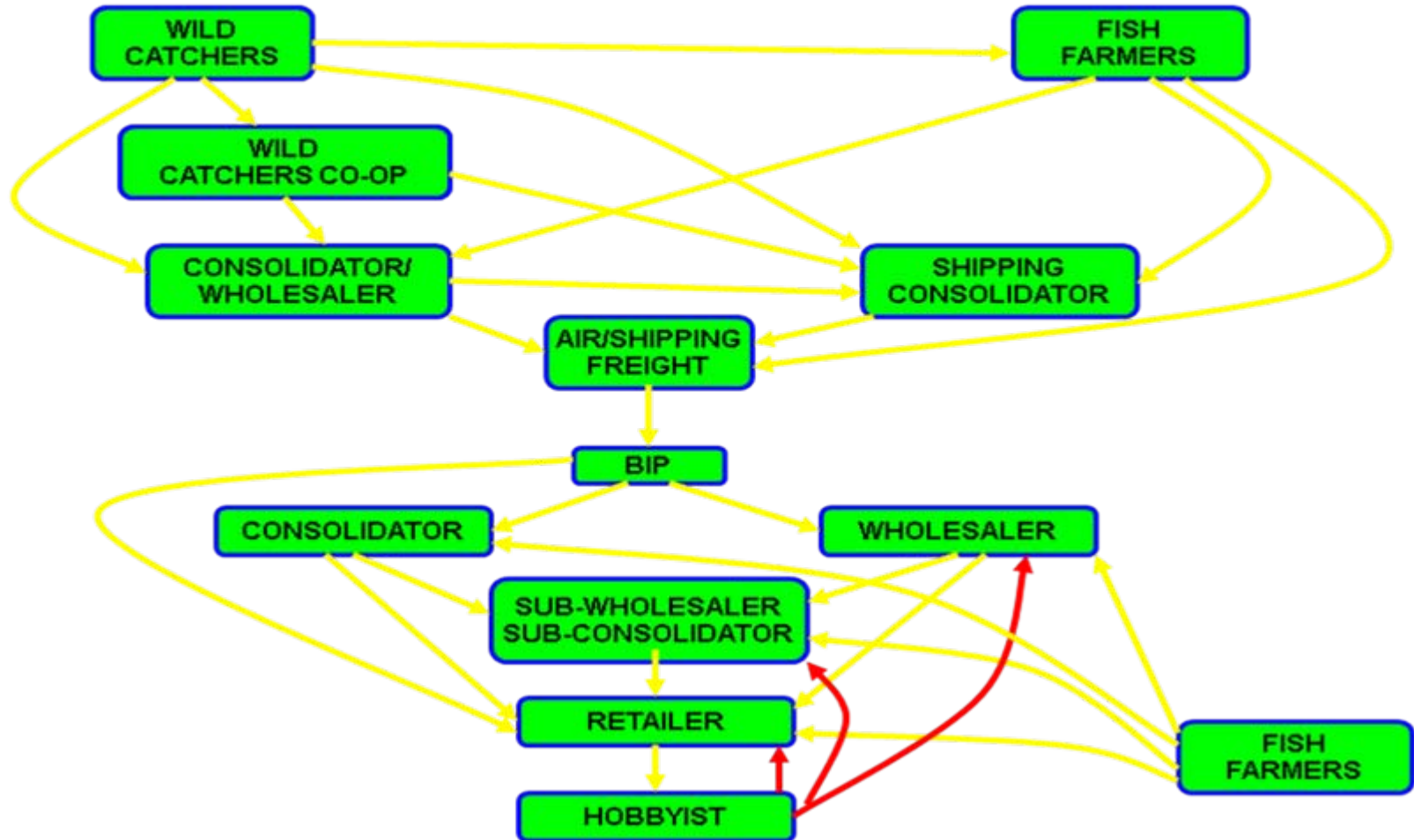
	No. consignments	%	No. fish/eggs	%	No. boxes	%
Non-ornamental fish*	40	0.8	20,430,700	42.1	87	0.1
Ornamental fish	4,864	94.0	27,941,784	57.6	110,371	92.4
Others**	271	5.2	136,674	0.3	8,936	7.5
Total	5,175		48,509,158		119,394	

*Trout eggs and one consignment of halibut

**Molluscs, crustaceans, corals, etc.

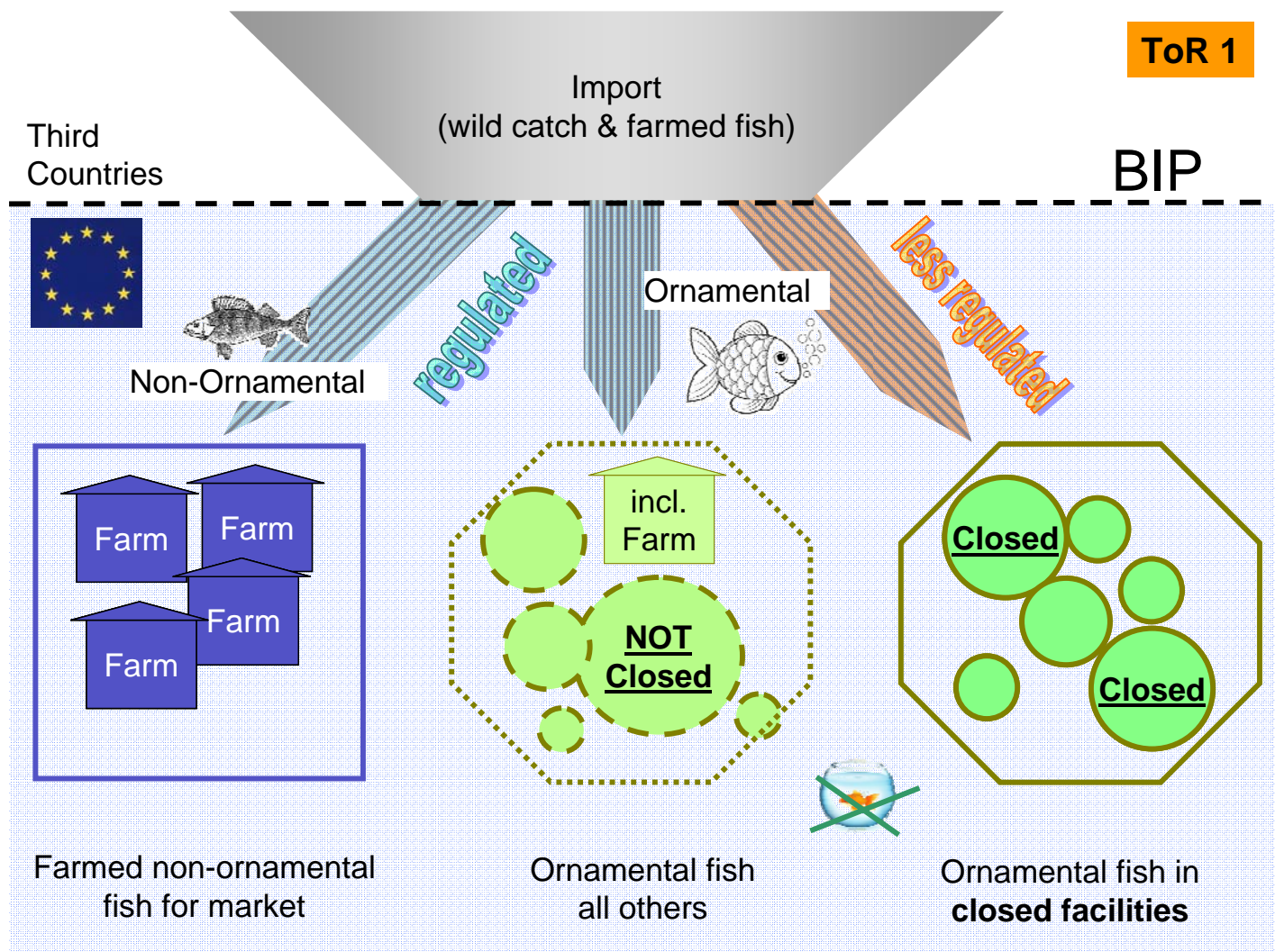
Trade routes of Ornamental fish

TRADE LINKS



- To assess the risk of introduction of EUS into EU aquaculture, by means of import of live fish from third countries:
 - into closed ornamental facilities, and
 - into aquaculture facilities other than closed ornamental facilities.

Risk of entry



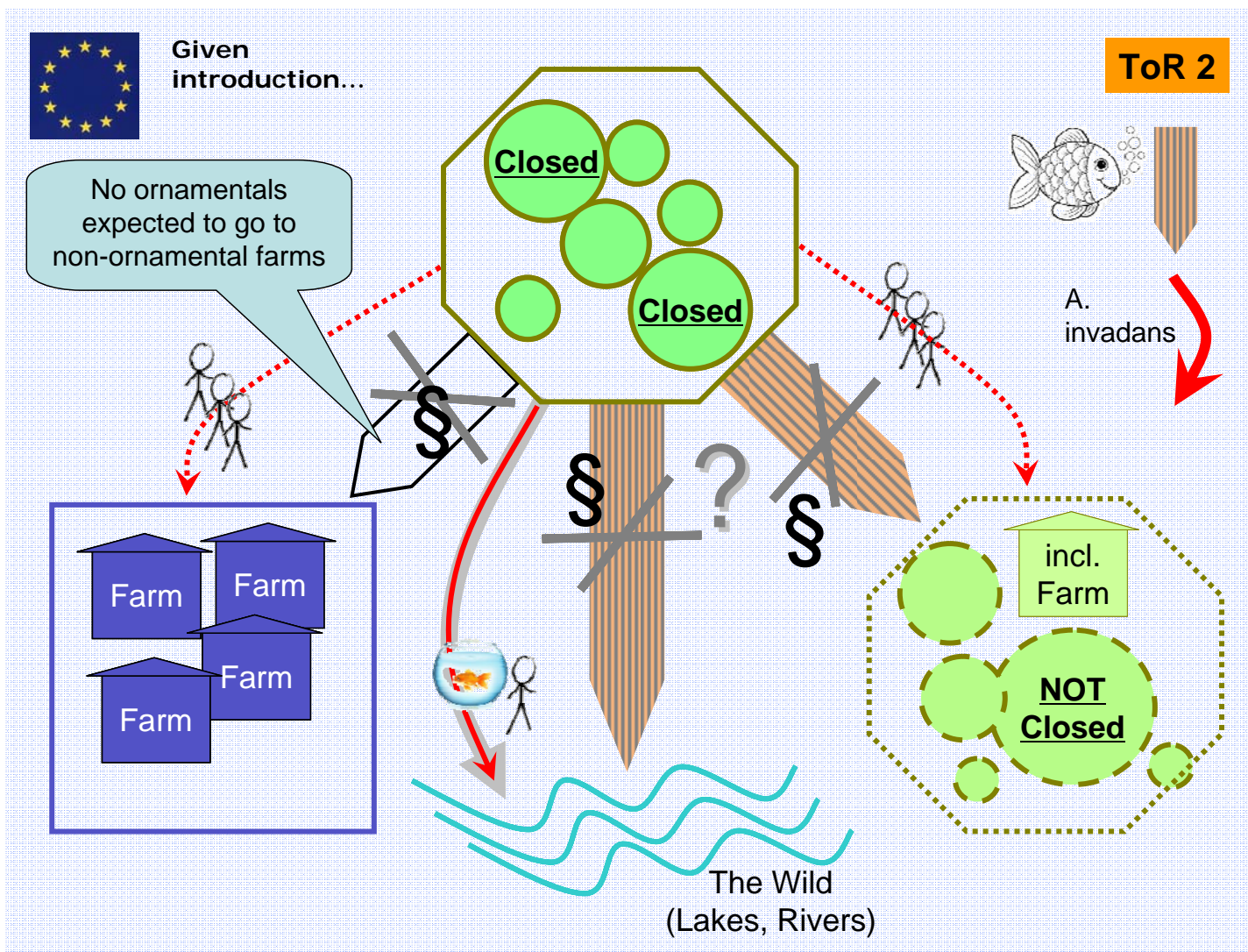
- FVO inspections in three of the main ornamental fish **exporters** have reported insufficiencies regarding certification for export and biosecurity in ornamental fish production sites.
- Visual inspection of live fish consignments at the **BIP** is sub-optimal (large number of boxes, large numbers of fish per box, difficult observation conditions, mixed consignments, reduced time available for inspection).
- Programmes of health monitoring/surveillance of ornamental fish are not in place in more than 50% of **EU MS**.
- EUS surveillance is based on passive surveillance

Conclusions – Risk of entry

- Limited traceability of the origin of live ornamental fish.
- Imported ornamental fish originate from countries with historic or recent reports of EUS
- No certification of EUS free status for imports to COF - **PROBABILITY**
- The large majority of live fish (>99%) imported into Europe is classed as ornamental fish - **FREQUENCY**.
- There is a greater **RISK** of entry of *A. invadans* into closed ornamental facilities compared to facilities other than closed ornamental facilities.
- It is likely that EUS has repeatedly entered into EU via ornamental fish import from third countries.

- To assess the risk of EUS to spread and persist within the EU, in particular the risk of spread from closed ornamental facilities.

Risk of spread

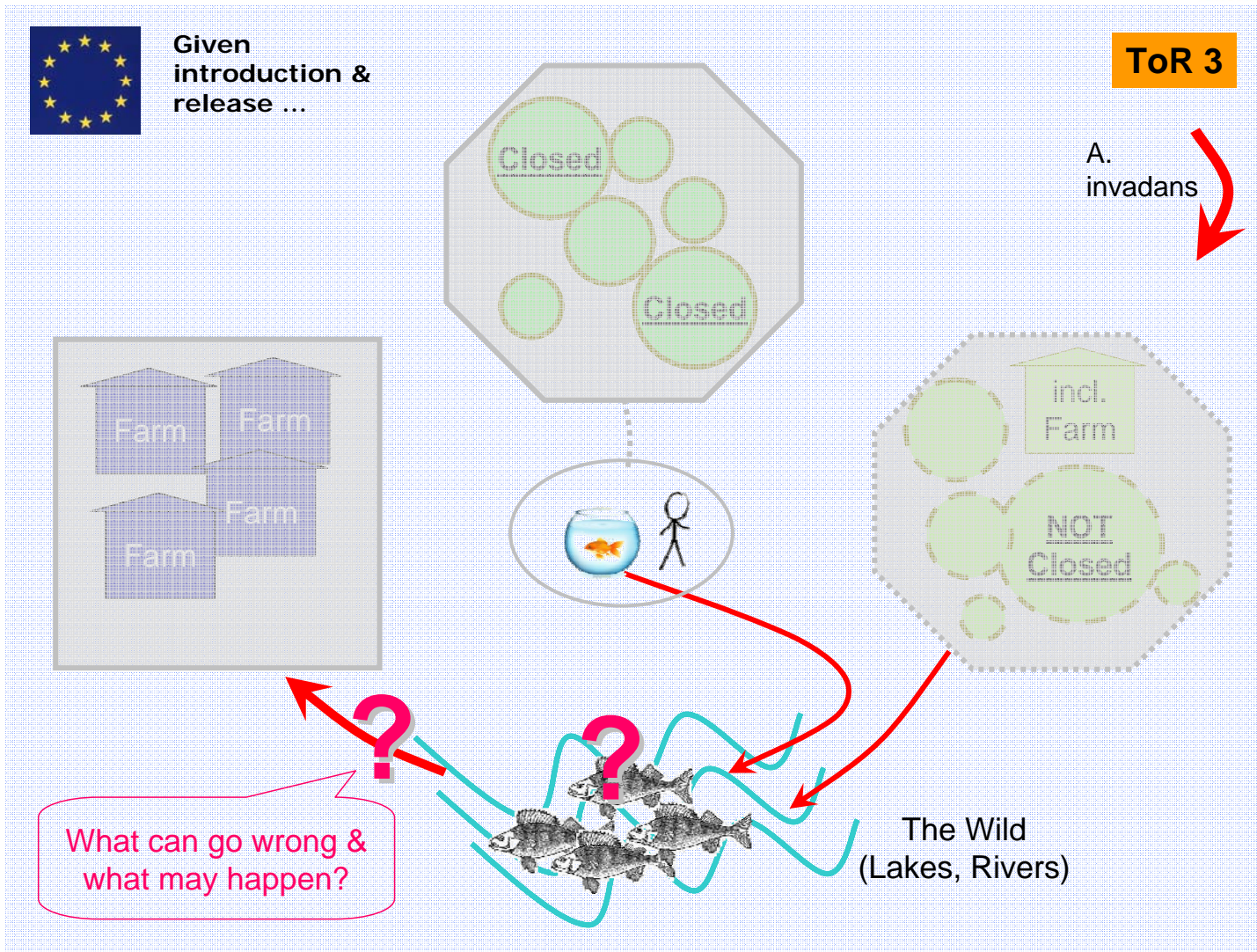


How closed is closed?

- Closed ornamental facilities as defined by Council Directive 2006/88/EU do not avoid the release of *A. invadans*.
- Release occurs with the
 - movement/sale of live fish or
 - insufficient effluent treatment or
 - unintentional contact with natural waters.

- To assess the possible significance and impact on **EU aquaculture** taking account of the pathogenesis, epidemiology, the available diagnostic methods, the susceptible species range, and the relevant environmental conditions.

Risk of establishment/Impact



- There is **evidence of economic impact** on EUS-affected countries, both by decline in capture fisheries and mortality in aquaculture.
- **Impact on biodiversity** is probably high in affected water bodies but there is a lack of studies documenting this effect.
- More recent outbreaks (with exception of the large outbreak in the Zambezi River) have been reported as **low or no mortality**. However, a possible effect on productivity has not been investigated.

- In natural infections, the disease was reported at water temperatures as low as 10 to 15 °C and as high as 33 °C.
- The majority of fish species produced by EU aquaculture are not known to be highly susceptible to EUS.

- Risk of entry – import is expected
- Climatic conditions and susceptible species do not exclude establishment of *A. invadans* in Europe.
- **However: So far no report exists?**
- Moreover:
 - EUS outbreak may not be associated with high morbidity/mortality
 <-> low chance of clinical detection
 - EUS awareness and diagnostic capability in the EU is low (2008)
 <-> low chance of laboratory detection

1. Fish in European waters have never been exposed to *A. invadens*
No spread
2. EUS does not establish but fades out after introduction due to unfavourable conditions.
No impact
3. EUS epidemics repeatedly establish and spread unnoticed in EU as certain circumstances prevent massive disease expression.
No disease
4. EUS is already endemic in EU and regularly misdiagnosed
Low impact

No data from monitoring of aquaculture fish in Europe or wild stocks in rivers and other natural water bodies is available to allow for confirmation of either scenario or its likelihood.

However, if EUS is endemic (Scenario 4)

the impact may change in the future if conditions such as climate, water quality or availability of susceptible species, either in aquaculture or in natural water bodies, become favourable for initiating epidemics and disease expression.

- In order to provide evidence on the actual epidemiological situation of EUS within the EU, scientifically based surveys for aquaculture, live imports and the wild should be considered.
- In order to increase confidence in the EUS health status of imported ornamental fish it is recommended to gain knowledge of the surveillance systems in place that support health certification by the exporting countries.
- It is recommended to increase traceability of ornamental fish movements within the EU.
- Differential diagnosis of *A. invadans* infection should be undertaken for fish exhibiting clinical signs consistent with EUS. Histopathology provides a presumptive diagnosis, whereas further molecular analysis and/or culture are recommended as confirmatory diagnostic tools.
- New scientific evidence regarding a wider temperature range for disease expression and the variety of pathological lesions observed should be taken into account in the case definitions applicable to EUS.
- To minimize the risk of releasing *A. invadans* from COF it is recommended to ensure and monitor that adequate biosecurity measures are in place.
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Thank you:

- WG: Hans-H. Thulke, Fulvio Salati, Mo Salman, James M. Sharp, Nicholas Stinton and Birgit Oidtmann
- Hearing experts: Niels Jorgen Olesen, Guenther Kotterba, Melba Reantaso
- Observers: Alex Ploeg and Andrea Fabris
- The AHAW panel and AHAW unit EFSA
- DG SANCO colleagues