By-Catch in fishing gear is considered the most serious threat to cetacean populations in Europeans waters ++

Monitoring and Mitigation

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SPECIES AFFECTED

* Incomplete information

Species	Baltic ++		North Sea		Channel / VIIe		North Atlantic			Mediterranean*	
	Trawls	Nets	Trawls	Nets	Trawls	Nets	Trawls	Static	LL	Trawls	Nets
Harbour porpoise		++		++	+	++	+	++	+		
Common dolphin					++	+	++	++			
Bottlenose dolphin					+	+	++	++		+	
Striped dolphin							+	+		+	
White sided d.				+				+			
White beaked d.				+			(+)	+			
Risso's dolphin						(+)					
Pilot whale							++				
Killer whale							+				
Minke whale							+	+?			
Humpback whale								+?			
Harbour seals							++	++			
Grey seals		++					++	++	+		
Harp Seal								+			
Ringed seal		++									

Main By-Catch Problem - cetaceans

Bottom set gill nets & tangle nets
- Harbour porpoise

Pelagic trawls
- Common and striped dolphins

Driftnets
- Harbour porpoise

Creel lines, seines, ghost netting
- Minke & humpback whales

★ Harbour Porpoise

★ Common & Striped Dolphin

★ Minke & Humpback Whale
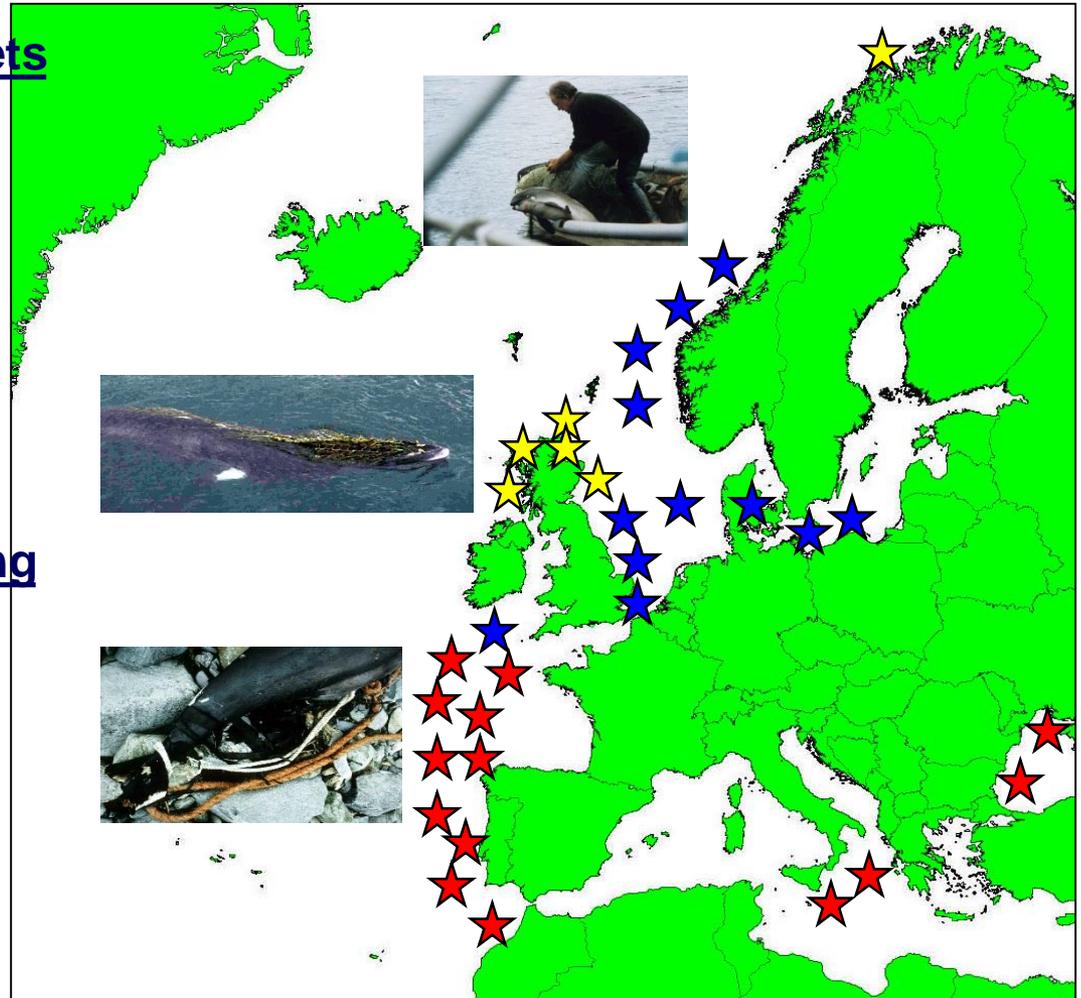
EVALUATE RISK

1a) Overall By-catch estimate

By-Catch rates (fisheries monitoring)
Fishing Efforts

1b) Population size (population monitoring)

2) Evaluate Risk
Acceptable or not, according to conservation objectives

3) Management measures needed or not

Evaluate Risk

Will depend on both
Bycatch rates & Fishing efforts

• **High by-catch rate but low fishing effort**

• **Low by-catch rate but high fishing effort**
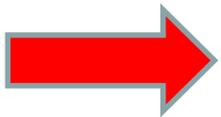
➡ **Essential to know the overall fishing effort**

Coverage presently overestimated as mostly reported for vessels > 10m, but …

MS	8.00m and under	8.01 – 10.00m	10.00m and under	10.01-15.00m	15.01m and over	Total	% Fleet <10m
SE	631	344	**975**	294	125	1,394	**70**
DK	1,713	437	**2150**	306	287	2,743	**78**
DE	980	170	**1150**	137	264	1,551	**74**
NL	220	88	**308**	67	475	850	**36**
BE	-	-	**-**	11	201	212	**0**
FR	3,672	1,524	**5196**	1,186	761	7,143	**73**
UK	3,474	1,558	**5032**	695	679	6,406	**79**

By-Catch Monitoring

- **Dedicated on-board observers**
- **Remote Electronic Monotoring (REM)**
- **Reference Fleets**
- **Specific Projects (combined PETS)**
- **DCF observers**
  - with MM protocol, w.o. MM protocol
- **Logbook reports**
  - mandatory, non-mandatory
- **Questionnaires**
- **Strandings**

Dedicated vs. non dedicated DCF monitoring ????
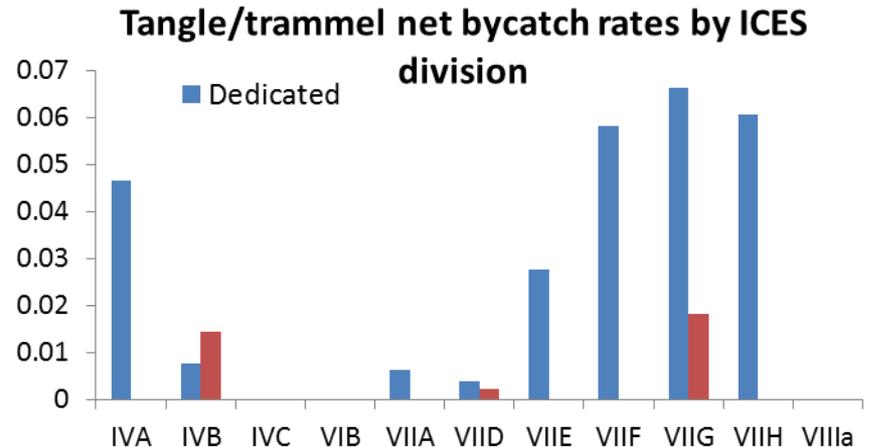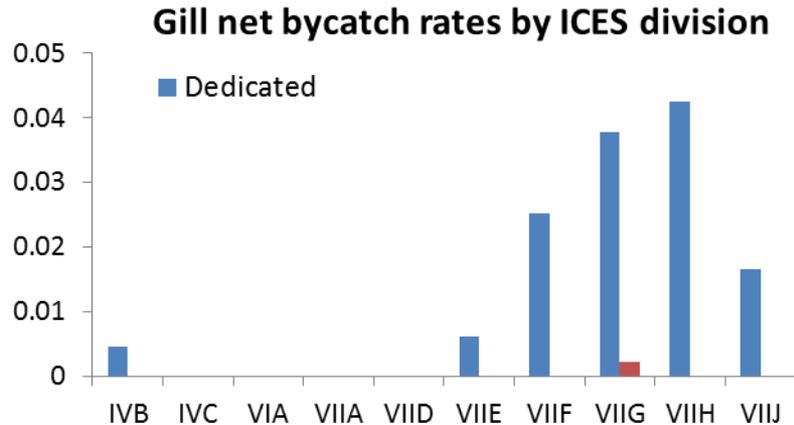
UK 2014, MM, no. animals per haul

Monitoring Type	No. Observed Hauls (2005-2014)	No. of Marine Mammals observed (2005-2014)	Marine Mammal Bycatch Rates (2005-2014)	Cetacean Bycatch Rates (2011-2013)
Dedicated	7433	188	0.025	0.025
Non-dedicated	3142	6	0.002	0.001

Monitoring - recommended approach:

- **Dedicated on-board observers**
- **REM**
- **Reference Fleet**
- **Specific Projects (combined PETS)**

Only qualitative data
- *DCF observers*
  - *with MM protocol, w.o. MM protocol*
- *Logbook reports*
  - *mandatory, non-mandatory*
- *Interviews with fishermen*
- *Strandings*

Mitigation

- **Acoustic Deterrent Devices (ADDs)**
- **Modifying fishing method**
  - **Depth, mesh size**
- **Alternative fishing gears**
- **Seasonal and area closures**
- **Consequence closures**

Mitigation - Recommended approach

- **Will depend on circumstances
  species at risk, area, gear, etc**

- **Set regionally and fishery specific**

- **Should apply to the risk (e.g. the gear), not be dependent of vessel size**

- **Focus should be placed on high-risk areas**

- **Can be a combination of several**

Mitigation - Recommended approach

DDDs: works for harbour porpoises, many kinds

Table 1.5.1.1   Overview of commercially available ADDs that have proven effective in deterring harbour porpoises from fishing gear. ADDs listed in italics do not have a published study of their effectiveness, but have the same specification as those with such a study. The maximum distance between any netting and the nearest ADD is half the effective distance between ADDs.

ADD type	Source levels dB re 1 μPa rms at 1 m	Signal frequency (kHz)	Pulse duration (nominal)	Interpulse interval (s)	Maximum distance between any netting and the nearest ADD[1]	Reference
Dukane Netmark 1000	132	10	300 ms	4	100 m	Gönener and Bilgin (2009)
Fumunda 10 kHz	*132*	*10*	*300 ms*	*4*	*50 m*	
Aquamark 300	*132*	*10*	*300 ms*	*4*	*50 m*	
Aquamark 100	145	20–160	200–300 ms	5–30	227 m	Larsen and Krog (2007)
DDD-03 L	174	5–500	0.5–9 s	Random	2 km	Northridge *et al.* (2011)
DDD-03 N	*174*	*5–500*	*0.5–9 s*	*Random*	*2 km*	

according to ICES WKREV812, 2011

Mitigation - Recommended approach

Acceptable ADDS:

→ proven ability to reduce bycatch of the relevant species in the setting of a commercial fishery,

- the device *significantly reduces (>80%)* bycatch
- with a *high level of confidence (>95%),*
- under a rigorously designed experiment

  - parties with a vested interest in the results cannot influence the outcome.
  - it includes at least one control and one treatment group.
  - it is covered 100% by independent on-board observations.
  - By-catch rates should be based on statistically independent by-catch events.

(ICES WKBYC 2013)

Mitigation - Recommended approach

Alternative fishing gears:

- Hooks
- Pots for cod and flatfish
- Traps for salmon, whitefish, herring
- Fish aggregating devices

IMPLEMENTING EUROPEAN FRAMEWORK

➢ **Achieve and maintain a FCS/ GES - marine mammals (all or specific)**

➢ **Achieving conservation and sustainable use of resources (all or specific)**

– **Regular evaluation of fisheries for direct & indirect/predictable removals**

➢**Total removals vs. population size**

– **Taking management measures if needed**
– **Evaluating long-term efficiency of those measures**

Implementing European framework

Regular evaluation of fisheries

All

- **Habitats Directive**

- **ASCOBANS (incl. HP Plans)**

- **CMS, CBD, HELCOM, OSPAR**

- **NAMMCO, IWC**

Some

- **CR (EC) No. 812/2004**

  - **Only pelagic trawl, driftnet, some set nets // size**

  - **[Not gillnet: high bycatch --- e.g. NS]**

Implementing European framework

Habitats Directive

- **Monitoring**
  - Encompasses all activities where killing of Annex IV (a) species occurs, thus includes recreational fisheries

UK and Ireland have implemented by-catch monitoring of Protected Species

France: programme Obsmer

NL: REM project; DK: REM project in the Baltic+ but nothing in NS

Management strategies / plans not yet finalised for Natura 2000 marine areas

Implementing European framework

Habitats Directive

- **Implementing conservation measures _as required_**
  - Monitoring long-term effectiveness of conservation measures

Needs Management Objectives, but not defined

Unknown risk (No reporting of full fishing effort, patchy bycatch estimate)

Mitigation measures according to R. 812 (i.e. few fisheries with high risk) and experimental alternative mitigation measures

Implementing European framework

CR (EC) No. 812/2004

- Using pinger in specific net fisheries, vessels =>12m
- Ensuring that ADD are fully operational when setting the gear
- Monitoring and assessing the effects of pinger use overtime

- Monitoring specific fisheries, period, vessels => 15m,
- Pilot projects for specific fisheries, period, vessels < 15m

- [Facing out driftnets]

- Annual reporting to the EU

Implementing European framework

CR (EC) No. 812/2004

– **Annual reporting to the EU**

Some do, with much information and in time (UK, France, NL)

Some are sparing information and data and/or do not use the required format for reporting effort (DE), or do not report fishing effort

Some don't: Finland, Spain, Sweden, France (2013). Germany (2014)

Uncertainty of the representativeness of total fishing effort reported for all MS

- Pingers

o **On any bottom-set
   gillnet or entangling net**
o **Operational at setting**
o **Effect over time**

TL < 400 m, 08-10

Mesh => 220 mm, 01-12

**All year, VIIdefghj**

➤ **Do: UK**
➤ **?: DK, PL**
➤ **Don't: FR, IE, NL, SE**
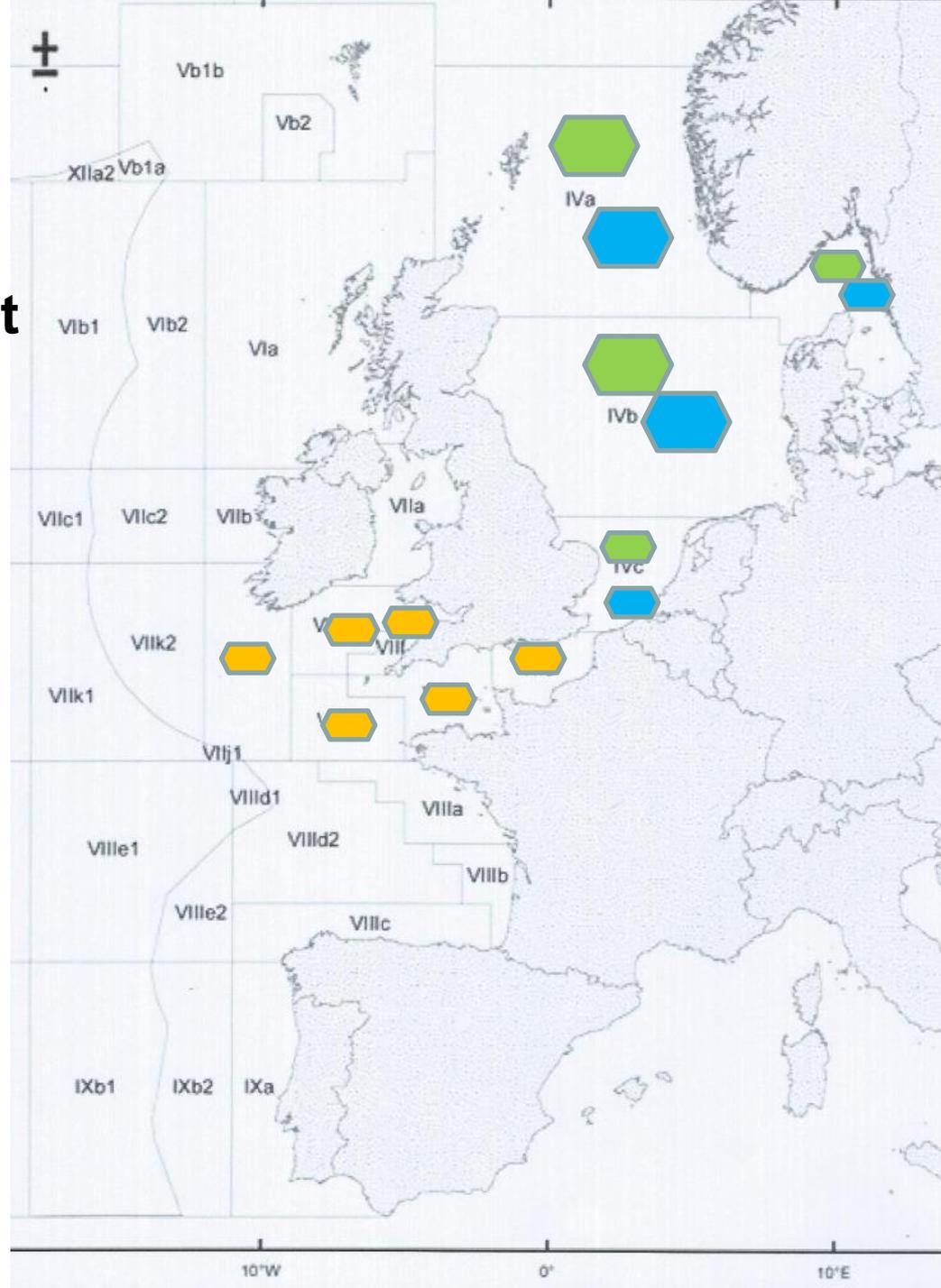
- Monitoring

o **Monitoring level /fleet size > 15 m**
o **Projects < 15 m**

Pelagic trawls (s + p)

Bottom-set GEN, MS=>80mm

Driftnets

> **Pelagic trawl: ok**
> **GEN: some, low effort**
> **Driftnet > 15, none**
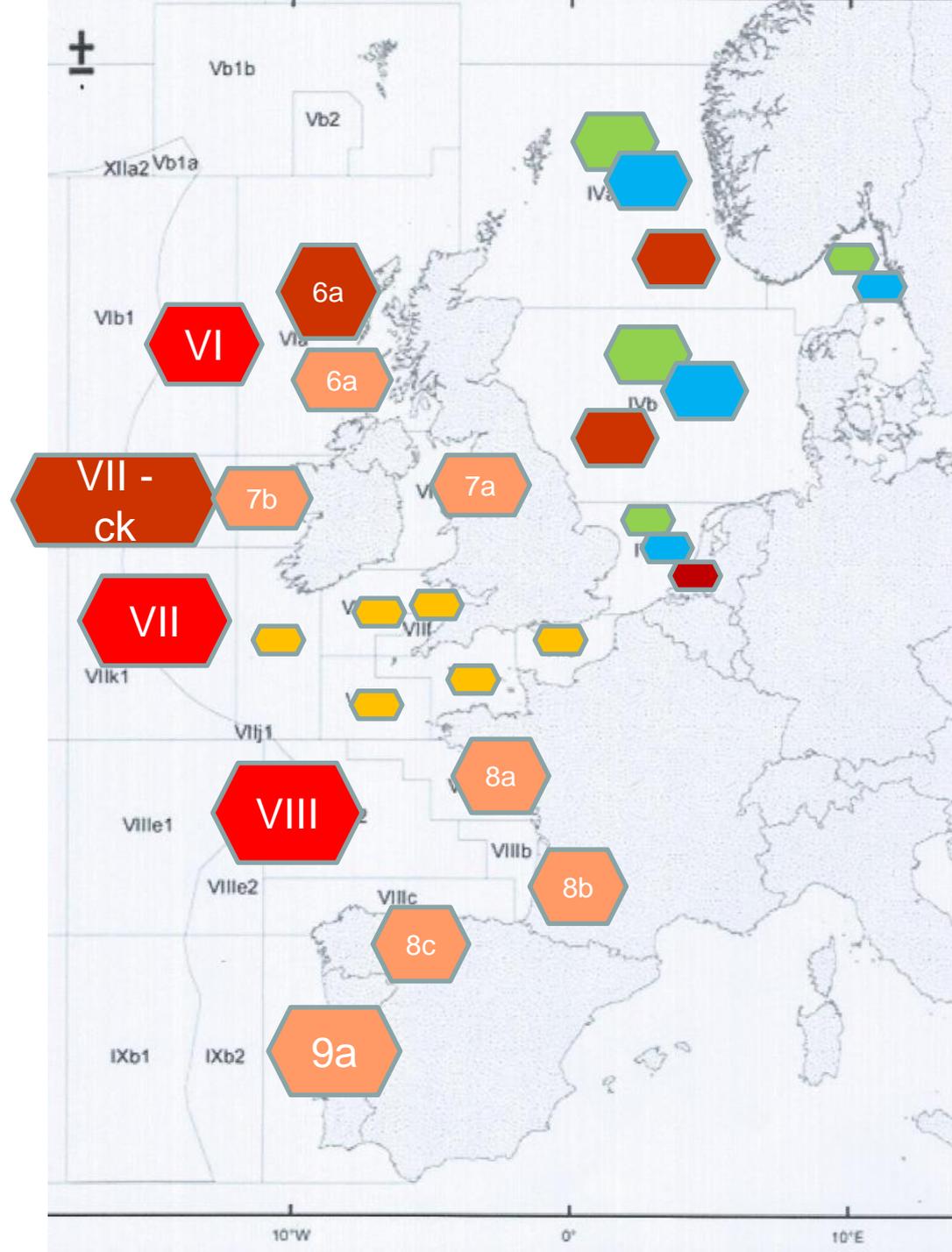
Implementing European framework
e.g. NS

Regular evaluation of fisheries – risk assessment

- **Except in a few sectors, the level of bycatch monitoring is very low and below 1%,**

- **Overall, the dedicated monitoring of bycatch is conducted at a level of 0.5% or less in the Channel, North Sea proper and ICES area IIIa, except NL**

over 99% of net fishing in the NS is conducted without any marine mammal bycatch monitoring
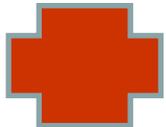
DCF framework & coverage overestimated

EFFECTIVE BY-CATCH MONITORING AND MITIGATION

Flexibility for accommodating dynamic process

Pragmatic approach: principle of sufficient sampling - low enough impact of fisheries

Synergy in monitoring between EU instruments, with all PETs species listed under HD and other instruments

Addressing recreational fisheries

Measures directed at high impact fisheries (high fishing effort / high bycatch)

Monitoring effectiveness of mitigation measures

Homogeneity across requirements (vessel length)

Incentives, but robust penalties for non-compliance

By-catch effective monitoring and mitigation

Reporting

Accessibility, transparency and harmonisation

Required standard format of reporting BC information and fishing effort data / penalties if not

- D.A.S <u>and</u> net metre/fishing hr (nets), fishing hr (trawl)

- ICES area not over-aggregated (e.g. VII ed)

- Non aggregated gear type, clear definition of gears

- All vessel size

Infringement reporting for all vessels

Polyvalent fisheries – BC unit: landing of target species

By-cath effective monitoring and mitigation

Monitoring

Target: **prioritise high impact fisheries**

       All set net fisheries, hake set net, bass & tuna fisheries, VHVO

       vessels <=> 15m, w/wo pingers

       keeping some monitoring on Fish. having had a high BC

Level: **target coverage / risk assessment minimum sampling**

Combined monitoring: increase data pool & cost effectivity

       inclusion of all PETS in all EU monitoring schemes

       DCF does not fulfill requirement for PETs - necessity for defining protocol and target

Incentives for accepting observers / REM onboard

By-catch effective monitoring and mitigation

Mitigation

<u>Measures</u>: **no measure but target to bycatch reduction**

necessity of defining 'hard' target for bycatch reduction - so efficiency can be assessed

financial resources available for improvement and alternative mitigation methods

<u>Target</u>: **based on likely bycatch rate (BRA) associated to specific bycatch rate limits**

➡️ **needs total overall fishing effort in the areas of risk**

➡️ **needs specific bycatch rate limits**

➡️ **all size vessels targeted, not only > 12m**

<u>Enforcement</u>: **clearly defined and efficient, penalties**

By-cath effective monitoring and mitigation

Mitigation methods

ADDs: no specification, but a proven ability in reducing bycatch in commercial fisheries

       significant reduction (> 80%)

       high level of confidence (> 95%)

       rigorous experimental design

<u>randomization of signal emission</u> (reduce habituation)

handling-friendly (longevity, easy to use, safe…)

Alternative MM: incentives for continuing effort

       socio-economic benefits

       eco-labelling

       [good work in Sweden and Denmark]

THANKS …

Fish wireless, solve the bycatch problem!