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## **NSAC Advice on the Evaluation of Technical Measures Regulation** **NSAC Advice Ref. 01-2324**

*This paper was approved with consensus by the NSAC Executive Committee on 8 December 2023 via written procedure.*

### 1 Background

On 2 October 2023, the Commission invited the Advisory Councils to provide input to the evaluation of the EU Technical Measures Regulation (TMR), on which the Commission is preparing report on the implementation. The standing NSAC Focus Group on Technical Measures reconvened on the 7<sup>th</sup> November 2023 with the intention to respond to the Commission's second questionnaire on the implementation of the TMR. The first report on implementation was adopted in September 2021, where the NSAC input<sup>1</sup> was among stakeholder contributions feeding into the report. Article 31(1) of the TMR requires the Commission to report on the implementation every three years. The second questionnaire focuses on the gaps identified in the first implementation report, and is thus centered on minimizing the impact on sensitive species and the environment.

In this advice we provide our members' insights and experience with the TMR, and an overview of research projects either supported by the NSAC or benefiting from our members' involvement in relation to the TMR provisions, particularly on innovative gear for improving selectivity, REM and fully documents fisheries, improving scientific knowledge on stock assessments, spatial/temporal measures to protect juveniles, increase in MCRS and others.

We thank the Commission for considering this advice showcasing our members' efforts and commitment to improving fisheries sustainability and minimizing their impact on the ecosystems. We remain at your disposal should you wish to receive further information on the measures listed below.

Last but not least, we would like to note that in the spring of 2024, we will, together with the European Association of Producer Organisations (EAPO), organize a symposium on innovative fishing, where best practices and challenges will be addressed with a view to identify possible solutions in overcoming the barriers to innovation in the fishing sector. We will be sending further details shortly and hope that your services will be able to join us.

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<sup>1</sup> <https://www.nsrac.org/wp-content/uploads/2021/12/10-2021-NSAC-Advice-on-Technical-Measures-evaluation.pdf>

## 2 NSAC Response to the Questionnaire

### **1. Has your Advisory Council identified difficulties in the implementation of the Technical Measures Regulation? If so, please indicate the relevant Article and the difficulties encountered.**

The NSAC has not identified any specific issues/problems with the implementation of the TMR, however the rules on catch composition, mesh size and landing obligation could create conflicts with this regulation. The new TMR includes no target species and the discussion on targeted fishery for Squid has so far been the only discussion related to directed fisheries. This might be in conflict with the provision on the landing obligation.

At the same time, overly rigid rules on targeted fisheries should also be avoided. The NSAC therefore suggests to avoid setting of the definition of targeted fisheries rather than forcing managers to manage the unmanageable. The definition itself has so far proven extremely difficult to set and neither the Commission nor the STECF succeeded in this task. The task is now delegated to the Member States, who are also struggling to establish such a definition. We believe that the rules should apply to the gear and not the catch composition.

We would also like to point to the inconsistency between the TACs and Quotas regulation and TMR for protection of plaice. While the first stipulates protection of plaice in ICES area IV, the TMR also includes the Skagerrak. This creates confusion and should be rectified.

### **2. Since the 2021 report on the implementation of the TMR, has your AC recommended additional technical measures aimed at improving the size/species selectivity of commercially exploited species?**

This question is unclear with regards to whether the improved size/species selectivity mean catching more of the larger fish or smaller fish.

Furthermore, one issue with the TMR is that it focuses on one species, which creates limitations for those fisheries trying to be more selective. We believe that the regulation should focus on efficiency rather than selectivity. Inefficient fisheries will inevitably be more carbonmonoxide, carbondioxide and NOx intensive, with further negative effects on the environment through prolonged operations.

In this respect, we would also like to note that there are examples of gears and methods proposed by the industry that could never be used despite their effectiveness (i.e. pulse fishing, T90 gear in the Skagerrak). There is a general observation that the STECF procedure for the adoption of innovative gear is too lengthy and overly rigid to foster industry-led innovation, which explains the low uptake of innovative gear.

Moreover, gear-related provisions appear both in TACs and Quotas, as well as TMR, which creates confusion. We would suggest sticking to one regulation to ensure that no inconsistencies arise.

The NSAC produced several advice papers on technical measures over the years, many of which were proactive meaning that the fishers did not wait for legislative proposals, but instead proposed solutions on their own initiative.

These are:

- NSAC Advice on technical measures in directed fishery for squid<sup>2</sup>
- NSAC Advice on the Scheveningen Group JR concerning regional technical measures for Atlantic halibut in Skagerrak and Kattegat<sup>3</sup>
- Joint NWWAC/NSAC/MAC Advice on Brown Crab<sup>4</sup>
- Joint NWWAC/NSAC Advice on Skates & Rays Management<sup>5</sup>
- NSAC Advice on European eel management in inland waters<sup>6</sup>
- NSAC/NWWAC Advice on European eel management<sup>7</sup>
- NSAC/NWWAC Response to Scheveningen Group on best practice measures for the management of skates and rays in the North Western Waters and the North Sea<sup>8</sup>
- NSAC Advice on draft Joint Recommendation of the Scheveningen Group concerning technical measures for the conservation of fishery resources of the North Sea<sup>9</sup>
- NSAC Response to the Scheveningen Group request for guidelines for best practice in handling catches of Skates and Rays in the North Sea and Skagerrak<sup>10</sup>
- NSAC Response to Consultation on the Scheveningen Regional Group Joint Recommendation on sorting gear in Norway pout fishery<sup>11</sup>

Measure	Area (1)	Fleets involved (2)	Additional comments (3)
Gear modifications: use of new and innovative gear techniques and selectivity devices (0)	1) ICES IIIa, Baltic 2) ICES IV	1) DK, SE, DE 2) NL	1) T90 Gear: not trialled in Skagerrak therefore deemed illegal in Skagerrak, despite its use in the Baltic. 2) Pulse fishing.
Spatial-temporal measures to protect juveniles and spawning aggregations (New closure/Modification of existing)	ICES IV	All	Plaice box; ambiguous scientific backing of the effectiveness

<sup>2</sup> <https://www.nsrac.org/wp-content/uploads/2023/10/18-2223-NSAC-Advice-to-Sch-Group-JR-on-Technical-measures-for-Directed-Fisheries-for-Squid.pdf>

<sup>3</sup> <https://www.nsrac.org/wp-content/uploads/2023/06/11-2223-NSAC-Advice-to-Sch-Goup-JR-on-Atlantic-halibut-in-Skagerrak-and-Kattegat.pdf>

<sup>4</sup> [https://www.nsrac.org/wp-content/uploads/2023/09/15-2223-NWWAC\\_NSAC\\_MAC\\_Advice-on-Brown-Crab.pdf](https://www.nsrac.org/wp-content/uploads/2023/09/15-2223-NWWAC_NSAC_MAC_Advice-on-Brown-Crab.pdf)

<sup>5</sup> <https://www.nsrac.org/wp-content/uploads/2023/05/06-2223-NWWAC-and-NSAC-Advice-on-Skates-and-Rays-2023.pdf>

<sup>6</sup> <https://www.nsrac.org/wp-content/uploads/2022/09/14-2122-NSAC-Advice-on-Eel-management-in-inland-waters.pdf>

<sup>7</sup> [https://www.nsrac.org/wp-content/uploads/2022/04/09-2122-NSAC\\_NWWAC-Advice-on-Eel-management.pdf](https://www.nsrac.org/wp-content/uploads/2022/04/09-2122-NSAC_NWWAC-Advice-on-Eel-management.pdf)

<sup>8</sup> [https://www.nsrac.org/wp-content/uploads/2021/04/12-2021-NSAC\\_NWWAC-Advice-to-Scheveningen-Group-on-Skates-and-Rays\\_2021-1.pdf](https://www.nsrac.org/wp-content/uploads/2021/04/12-2021-NSAC_NWWAC-Advice-to-Scheveningen-Group-on-Skates-and-Rays_2021-1.pdf)

<sup>9</sup> <https://www.nsrac.org/wp-content/uploads/2020/10/16-1920-NSAC-Advice-on-Scheveningen-JR-on-plaice-box-2.pdf>

<sup>10</sup> <https://www.nsrac.org/wp-content/uploads/2020/06/11-1920-NSAC-Advice-to-Scheveningen-Group-on-Skates-and-Rays-1.pdf>

<sup>11</sup> <https://www.nsrac.org/wp-content/uploads/2020/04/06-1920-NSAC-Response-to-JR-on-sorting-gear-in-Norway-pout-fishery.pdf>

Moving on rules and real time closures	ICES IV	All	Closures might not have the intended effect; issue with (conservative) trigger values in recruitment
Increase the current MCRS	ICES IV and IIIa	All	Turbot in ICES IIIa Skates and rays ICES IV
Others (please, specify)	ICES IV	NL, DE, DK	Maximum landing amount for brown crab in ICES IV.

- (0) Including, but not limited to, DISCARDLESS, ICES advice on innovative gears...
- (1) (ICES division/sub, GFCM GSAs). If relevant, please indicate the name and code of MPAs
- (2) Gear code(s) and if possible, approximate number of vessels affected.
- (3) Free field to share any relevant information

**3. Since the 2021 report, has your AC recommended additional mitigation measures or set up training, capacity building and collaborative support activities engaging fishers?**

In terms of mitigation and handling, the NSAC produced the following advice:

- Joint NWWAC/NSAC Advice on Skates & Rays Management<sup>12</sup>
- NSAC Advice on European eel management in inland waters<sup>13</sup>
- Request for harmonisation of skates and rays identification guides on an EU wide basis<sup>14</sup>
- NSAC/NWWAC Advice on European eel management<sup>15</sup>
- NSAC/NWWAC Response to Scheveningen Group on best practice measures for the management of skates and rays in the North Western Waters and the North Sea<sup>16</sup>
- NSAC Response to the Scheveningen Group request for guidelines for best practice in handling catches of Skates and Rays in the North Sea and Skagerrak<sup>17</sup>
- NSAC Response to Consultation on the Scheveningen Regional Group Joint Recommendation on sorting gear in Norway pout fishery<sup>18</sup>

There are several MSC monitoring programmes of which our members have been part of (i.e. MSC monitoring programme for joint demersal species and MSC monitoring programme for ETP in Brown shrimp fishery. For participants in MSC Joint Demersal Fisheries, the [MOFI app](#) has been developed to register Endangered, Threatened, or Protected (ETP) species.

	Specific possible measure	Target group of species	Area concern	Fleet concerned (2)	Link to pub	Additional remarks
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<sup>12</sup> <https://www.nsrac.org/wp-content/uploads/2023/05/06-2223-NWWAC-and-NSAC-Advice-on-Skates-and-Rays-2023.pdf>

<sup>13</sup> <https://www.nsrac.org/wp-content/uploads/2022/09/14-2122-NSAC-Advice-on-Eel-management-in-inland-waters.pdf>

<sup>14</sup> [https://www.nsrac.org/wp-content/uploads/2022/09/15-2122-NWWAC\\_NSAC-SkatesRays-Request-2022.pdf](https://www.nsrac.org/wp-content/uploads/2022/09/15-2122-NWWAC_NSAC-SkatesRays-Request-2022.pdf)

<sup>15</sup> [https://www.nsrac.org/wp-content/uploads/2022/04/09-2122-NSAC\\_NWWAC-Advice-on-Eel-management.pdf](https://www.nsrac.org/wp-content/uploads/2022/04/09-2122-NSAC_NWWAC-Advice-on-Eel-management.pdf)

<sup>16</sup> [https://www.nsrac.org/wp-content/uploads/2021/04/12-2021-NSAC\\_NWWAC-Advice-to-Scheveningen-Group-on-Skates-and-Rays\\_2021-1.pdf](https://www.nsrac.org/wp-content/uploads/2021/04/12-2021-NSAC_NWWAC-Advice-to-Scheveningen-Group-on-Skates-and-Rays_2021-1.pdf)

<sup>17</sup> <https://www.nsrac.org/wp-content/uploads/2020/06/11-1920-NSAC-Advice-to-Scheveningen-Group-on-Skates-and-Rays-1.pdf>

<sup>18</sup> <https://www.nsrac.org/wp-content/uploads/2020/04/06-1920-NSAC-Response-to-JR-on-sorting-gear-in-Norway-pout-fishery.pdf>

General measure						ned (1)		lish ed mea sure	
		Cetaceans	Reptiles	Birds	Fish				
Mitigation	Spatial-temporal measures								
	ADD								
	Bird scaring lines								
	Hook-protecting devices								
	Frangible hooks and snoods								
	Large animal excluder devices (LAEDs) in trawls								
	Raised panels in static nets								
	Frangible nets								
	Other (please specify)				European Eel	NS, NWW	Coastal fleets, all MS		Increase in MCRS and other
Monitoring	Observer coverage								
	REM/CCTV				Cod	Kattegat	73 vessels in DK		CCTV monitoring programme
	e-DNA surveys								
	Passive acoustic monitoring								
	Citizen science monitoring								
	Beach stranding surveys								
		Other (please specify)				MSC monitoring programme for ETP in Brown shrimp fishery and MSC monitoring programme Joint demersal fisheries		NL, DK, DE (shrimp) DK, DE, NL, SE (joint demersal)	
Additional research (knowledge)	Test LAED effectiveness								
	Develop automated e-DNA sampling methods								
	Other (please specify)								
Stakeholder engagement	Trainings to fishers, capacity building...				See skates and rays advice; MSC monitoring programme				

					for joint demersal fisheries; app for identification of ETP species				
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**4. Have you found any difficulties in implementing the prohibition of catching, retention, transshipment or landing of the species referred to in Article 11?**

In the NSAC we have not encountered any difficulties in implementing the prohibition of catching, retention, transshipment or landing of the species referred to in Article 11. In relation to our advice on the Prohibited Species List<sup>19</sup>, the NSAC would like to note the confusion caused by having the list present in more than one regulation. While noting that, as it stands, the list seems aligned in both the TACs and quotas regulation and the TMR, we suggest in the future to maintain the list in only one of the regulations (preferably in the TACs and quotas regulation, as this one is subject to annual review and might accommodate and reflect more effectively any changes to the Prohibited Species List, while also ensuring clarity on the most recent version of the list).

**5. Since the 2021 report, has your AC recommended additional measures to minimise the impact on the environment?**

Since 2021, the NSAC supported and commented on several North Sea Member States' proposals for MPAs and produced advice on other factors impacting the environment. These include:

- NSAC Advice on Climate Change and North Sea fisheries<sup>20</sup>
- NSAC Advice on Marine Spatial Planning and Stakeholder Engagement<sup>21</sup>
- NSAC response to request of the Dutch Ministry on six Dutch MPAs<sup>22</sup>
- NSAC/NWWAC Advice on the MSFD Review<sup>23</sup>
- NSAC Advice on the EU Biodiversity Strategy<sup>24</sup>
- NSAC Advice on the Fisheries regulation in five Danish Natura 2000 sites in the North Sea and Skagerrak<sup>25</sup>
- NSAC Advice on Danish proposal for JR on MSFD-areas in the Kattegat<sup>26</sup>

<sup>19</sup> <https://www.nsrac.org/wp-content/uploads/2020/06/07-1920-NSAC-Letter-to-Commission-on-Prohibited-Species-List.pdf>

<sup>20</sup> <https://www.nsrac.org/wp-content/uploads/2023/10/17-2223-NSAC-Advice-on-Climate-change-and-North-Sea-Fisheries.pdf>

<sup>21</sup> <https://www.nsrac.org/wp-content/uploads/2023/08/12-2223-NSAC-Advice-on-MSP-and-stakeholder-engagement.pdf>

<sup>22</sup> <https://www.nsrac.org/wp-content/uploads/2023/09/14-2223-NSAC-Advice-on-Dutch-MPAs.pdf>

<sup>23</sup> [https://www.nsrac.org/wp-content/uploads/2022/03/05-2122-NSAC-NWWAC-Advice-on-MSFD-review\\_final.pdf](https://www.nsrac.org/wp-content/uploads/2022/03/05-2122-NSAC-NWWAC-Advice-on-MSFD-review_final.pdf)

<sup>24</sup> <https://www.nsrac.org/wp-content/uploads/2021/09/17-2021-NSAC-Advice-on-EU-Biodiversity-Strategy.pdf>

<sup>25</sup> <https://www.nsrac.org/wp-content/uploads/2022/09/16-2122-NSAC-Advice-on-Danish-Natura-2000-areas.pdf>

<sup>26</sup> <https://www.nsrac.org/wp-content/uploads/2020/11/02-2021-NSACAdvice-on-the-JR-on-Danish-MSFD-areas-in-Kattegat.pdf>

- NSAC Response to the Scheveningen Group on Joint Recommendation on Fisheries Management Measures in Marine Protected Areas in the German Exclusive Economic Zone of the North Sea<sup>27</sup>

Measure	Purpose			Area (1)	Affected fleet	Other MS involved, where relevant (2)	Additional comments
	Seabed protection	Sensitive species protection	Other				
Designation of new protected areas							See NSAC advice on MPAs
Effort limitation or restriction of certain gears			Brown Shrimp effort limitation in relation to MSC label	4	TBB (16-32mm)	NL, DK, DE	
Special conditions to operate in protected areas Others...							

1. (ICES division/sub, GFCM GSAs). When relevant, please indicate the name and code of MPAs.
2. Gear code(s) and if possible, approximate number of vessels affected.

**6. Since the 2021 report on the implementation of the TMR, are your members participating in scientific research programmes for the objective of increasing the size/species selectivity of commercially exploited species?**

The NSAC has been committed to increasing size and species selectivity of commercially exploited species since its inception and we have been looking for solutions not only within the NSAC and the EU, but also through third countries' best practice examples and international projects. One result of such endeavour is our Advice on the functioning of the Landing Obligation<sup>28</sup> with important recommendations on selectivity, innovative gear and methods, Fully Documented Fisheries, landing of undersized fish etc. To follow up on this work, the NSAC together with our partners in European Association of Producer Organisation (EAPO) intends to organise a symposium on innovative fishing in spring 2024, where the state of play and challenges in improving selectivity and reducing seabed disturbance through innovation will be addressed.

The NSAC Advice on post-2023 exemptions<sup>29</sup> is also an important contribution, relevant to the gear and other technology trials to improve selectivity and reduce discards.

Some of our members have been proactively participating in CCTV pilot projects, notably the Danish (cod fisheries in the Kattegat) and the Dutch demersal fisheries.

<sup>27</sup> <https://www.nsrac.org/wp-content/uploads/2021/04/11-2021-NSAC-Advice-on-JR-on-MPAs-in-German-EEZ.pdf>

<sup>28</sup> <https://www.nsrac.org/wp-content/uploads/2023/05/08-2223-NSAC-Advice-on-the-functioning-of-Landing-Obligation.pdf>

<sup>29</sup> <https://www.nsrac.org/wp-content/uploads/2023/04/05-2223-NSAC-Advice-on-Exemptions-from-the-Landing-Obligation-post-2023.pdf>

Please see in **Annex** the extended lists of projects.

Measure	Area (1)	Fleets involved	MS involved (if relevant)	Aprox date of results (2)	Aprox date of adoption of new measures	Additional comments (3)
Gear modifications: up take of new and innovative gear techniques and selectivity devices (0)		NL, DK, FR, BE				ANNEX See projects: 3, 5, 13, 15, 27, 37, 43, 46, 48, 49, 50, 51, 52, 53, 56, 57
Spatial-temporal measures to protect juveniles and spawning aggregations (New closure/Modification of existing)						
Moving on rules and real time closures						
Increase the current MCRS						
Pilot projects that develop a system of full documentation of catches and discards		NL, DK, BE				ANNEX See projects: 4, 30, 31, 32, 57
Others (reduction/investigation of bycatch)		NL, DK, BE				ANNEX See projects: 10, 14, 38, 55, 57
Others (stock assessment)		NL, DK, BE				ANNEX See projects: 2, 9, 11, 12, 29, 35, 36, 40, 42, 54
Others (knowledge exchange/collaboration)		NL, DK, BE				ANNEX See projects: 1, 7, 13, 33, 40, 43, 55, 56

**7. Since the 2021 report, are you planning or participating in scientific research programmes or engagement activities for fishers, for the objective of minimising the impact on sensitive species?**

The NSAC has supported and is monitoring the [CIBBRiNA LIFE Bycatch](#) project to achieve EU cross-border cooperation and fisheries engagement to establish regional monitoring programmes to achieve a steep change in the reliability of bycatch estimates and further develop, test, and implement effective mitigation measures for the incidental bycatch of marine mammals, birds, turtles and non-commercial fish. In the NSAC we are directly engaged in minimisation and, where possible, elimination of bycatch in the North Sea, determination of risk species, identification of mitigation measures, and implementation of monitoring programmes.



A complete overview of NSAC members' involvement in projects can be found in the Annex.

General measure	Specific possible measure	Target group of species				Area concerned	Fleet concerned	Link to published research	Additional comments
		Cetaceans	Reptiles	Birds	Fish				
Mitigation	Spatial-temporal measures								
	ADD								
	Bird scaring lines								
	Hook-protecting devices								
	Frangible hooks and snoods								
	Large animal excluder devices (LAEDs) in trawls								
	Raised panels in static nets								
	Frangible nets								
	Other (reduce bycatch)				ANNEX See projects: 10, 27,38, 49, 50, 51, 52, 55, 56	North Sea	Danish, French, Dutch, Belgian		
Monitoring	Observer coverage								
	REM/CCTV								
	e-DNA surveys								
	Passive acoustic monitoring								
	Citizen science monitoring								
	Beach stranding surveys								
	Other (please specify)								
Additional research (knowledge)	Test LAED effectiveness								
	Develop automated e-DNA sampling methods								
	Other (please specify)				ANNEX See project: 55, 57		Belgian		
Stakeholder engagement	Trainings to fishers, capacity building...				ANNEX See project: 1, 55		Dutch, Belgian		
	Other (promotion of scientific work, experiments, dissemination)			ANNEX See project: 19	ANNEX See project: 55, 56, 57		Danish, Belgian		

(1) (ICES division/sub, GFCM GSAs). When relevant, please indicate the name and code of MPAs.  
 (2) Gear code(s) and if possible, approximate number of vessels affected.

**8. Since the last reporting obligation, are you planning or participating in scientific research programmes for the objective of minimizing the impact on the habitat?**

The NSAC has been engaged in and is monitoring the [SEAwisE project](#) on Ecosystem-based Fisheries Management (EBFM), and our members have equally participated in several national projects (see Annex).

Research programme	Area (1)	Participating fleet	Objective of the research	MS involved, where relevant	Timing (to obtain results) (2)	Additional comments (3)
3: Innovatieproject selectieve garnalenvisserij Waddenzee (2018-2022)		Dutch shrimp fishery	Examination of existing gear prototypes aimed at enhancing selectivity and reducing the environmental impact in the Dutch shrimp fishery.	NL		
5: Bottom Fishing Impact Assessment Tool (BFIAT) (2020-2022)			Developing a tool for predicting the ecological impact of new fishing gear.	NL		
28: Quantifying and reducing the physical impact of mobile fishing gears (ReFigure)		Bottom net fishery	Quantitative assessment of the physical impact of the most common fishing gear used by bottom net fishing vessels worldwide, both at component level and on a variety of seabed types.	DK		
47: Sandbanks and fisheries impact in relation to EU fisheries and environment policy		Danish sandeel and plaice fisheries	Addressing the lack of knowledge base for ongoing and future Natura 2000 and MSFD habitat implementation	DK		

			<p>s in the North Sea. For the habitat type "Sandbanks", Danish sandeel and plaice fisheries will be particularly affected by habitat protections.</p>			
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1. (ICES division/sub, GFCM GSAs). When relevant, please indicate the name and code of MPAs
2. Where relevant, planning including discussions in regional groups, ACs and submission of JR. If the scientific research is part of an ongoing project, please send also the results/approximate dates of availability.
3. Free space (with limited number of characters) for any additional remarks.

**9. Based on the projects of questions 7, 8 and 9, are you intended to propose to regional groups with joint recommendations?**

The cooperation between the NSAC and the Member States administrations has always been a close one. The NSAC regularly attends regional group meetings and comments on proposed JRs as well as proposes own-initiative advice. In parallel, Member State representatives follow the work of NSAC, which helps us identify areas and topics of MS interest and concern. When we see a certain national project could be of interest for the wider region, we tend to propose advice on such projects with view to raise awareness and engage at regional level.

### 3 Conclusion

We would like to thank the Commission once again for allowing us to feed into the evaluation of the TMR. Many of the comments from our previous observations and recommendations in 2021 Advice<sup>30</sup> remain the same, while a number of new projects have been kicked-off and supported by the NSAC. The objective remains the same: an EU regulation that supports the attainment of environmentally friendly food production and ensures socio-economic viability of our fleets. Important aspect is also a lean and intelligent regulation, with at least red tape as possible and with tools that are effective and efficient. We hope that though our work in the past years we have proven to be a valuable partner to this effect.

In relation to the current Technical Measures Implementing Acts (in preparation) we would like to inquire with the Commission's services whether the procedure currently ongoing on these acts will allow for a meaningful stakeholder engagement and what the timeline for such engagement would be.

As always, we remain at disposal to your services should you need more elaborate information on any of the aspects provided in this advice.

<sup>30</sup> <https://www.nsrac.org/wp-content/uploads/2021/12/10-2021-NSAC-Advice-on-Technical-Measures-evaluation.pdf>

## ANNEX

### a) Overview of research projects with involvement from the Netherlands

#### 1. OSW 2.0 (2017-2022)

An extensive research collaboration in fisheries, aimed at improving and innovating various aspects of the fishing industry.

- <https://www.wur.nl/nl/project/Onderzoekssamenwerking-visserij-2.0-OSW-2.0.htm>

#### 2. OSW 2.1 – InnoRays (2017-2022)

The research focuses on improving estimates of Thornback Ray and Blonde Ray stocks in the North Sea using video imagery, along with employing an innovative DNA methodology to estimate population sizes of Thornback Ray and Blonde Ray.

- <https://www.wur.nl/nl/project/osw2.1-innorays.htm>
- <https://www.wur.nl/nl/project/innorays-videomonitoring.htm>

#### 3. Innovatieproject selectieve garnalenvisserij Waddenzee (2018-2022)

This project involves the examination of existing prototypes aimed at enhancing selectivity and reducing the environmental impact in the Dutch shrimp fishery. It is a collaborative effort between fishermen, net manufacturers, and researchers from Wageningen Marine Research (WMR).

- <https://www.garnalenvisserij.com/portfolio/innovatieproject-selectieve-garnalenvisserij-waddenzee/>

#### 4. Fully Documented Fisheries (2019-2022)

The project aims to develop an autonomous, video-based monitoring system for recording catches, i.e., automated catch registration without the need for fishermen's involvement (logbooks) or onboard observers.

- <https://www.wur.nl/nl/project/Fully-Documented-Fisheries-FDF-R0B07a.htm>
- <https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksinstituten/plant-research/glastuinbouw/show-glas/Computers-herkennen-vissen-met-deep-learning.htm>

#### 5. Bottom Fishing Impact Assessment Tool (BFIAT) (2020-2022)

This research focuses on developing a tool for predicting the ecological impact of new fishing gear. This tool will enable gear developers to calculate the environmental disturbances caused by fishing gear and aid in minimizing them.

- <https://www.nioz.nl/en/news/four-nwo-grants-boost-nioz-north-sea-and-fishery-research> (subsidie 4)
- <https://www.nwo.nl/onderzoeksprogrammas/onderzoek-voor-duurzame-visserij>

#### 6. Bridging Knowledge gaps for sharks and rays in the North Sea (2021-2022)

This research aims to gain insights into the survival of rays post-capture and the life cycle and distribution of rays and sharks.

- <https://www.wur.nl/nl/onderzoek-resultaten/onderzoeksinstituten/marine-research/show-marine/nieuw-onderzoeksproject-haaien-en-rokken.htm>

#### 7. International Research Cooperation (IRC) Shrimp (2018-2023)

The platform aims to foster knowledge exchange in shrimp fishing among different countries, and as part of the project, multiple research trips are conducted each year to examine samples from shrimp catches.

- <https://www.garnalenvisserij.com/portfolio/irc-shrimp-nl/>

#### 8. De Juiste Sortering (2019-2023)

The research focuses on an innovative processing line for use on shrimp fishing vessels. Within this processing line, the detection system sorts the catch into marketable shrimp, undersized shrimp, and other bycatch based on camera images and automatic image recognition.

- <https://www.garnalenvisserij.com/portfolio/de-juiste-sortering/>

#### 9. OSW 2.2 (2019-2023)

This research focuses on enhancing our understanding of Norwegian lobster stocks through the exploration of an innovative data collection method in collaboration with fishermen.

- <https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksinstituten/marine-research/Themas/Visserij-in-transitie/Onderzoekssamenwerking-met-vissers/Noorse-kreeft-langoustine.htm>

#### 10. OSW Selov (2019-2023)

This research aims to reduce unwanted bycatch, with the goal of lowering fishing mortality through innovation.

- <https://www.vissersbond.nl/nieuw-onderzoeksproject-onderzoekssamenwerking-selectiviteit-en-overleving/>
- <https://www.vissersbond.nl/onderzoek-naar-selectief-vissen-op-tong/>

#### 11. Kennisplatform VISwijzer en Flyshoot (2019-2023)

This research focuses on gathering more scientific data on red mullet, squid, and tub gurnard in the North Sea and the Channel.

- <https://www.goodfish.nl/flyshoot/>
- <https://www.wur.nl/nl/project/VISwijzer-en-flyshootvis.htm>

#### 12. OSW Data Arme Visbestanden (2021-2023) (tarbot, griet, rog)

The research aims to empower the fishing sector to play a more significant role in data collection for stock assessments. This data collection involves a commercial survey for turbot and brill.

- <https://www.europaomdehoek.nl/projecten/osw-data-arme-visbestanden>

#### 13. Project Tuiginnovatie tongvisserij (2021-2023)

Within this project, fishermen and researchers collaborate to investigate an innovative, sustainable gear for sole and plaice fishing with reduced fuel consumption.

- <https://vissersbond.nl/tuiginnovatie-tongvisserij-2/>
- <https://www.vissersbond.nl/factsheet-wat-is-het-waterspraytuig/>
- <https://vissersbond.nl/resultaten-testreizen-met-rubberstrengen-twistertuig/>

#### 14. Self-sampling of bycatches in the Dutch shrimp fisheries (2021-2023)

The research focuses on investigating bycatch in shrimp fishing through self-sampling by fishermen.

- <https://www.wur.nl/nl/artikel/de-bijvangst-van-garnalenvisserij-in-kaart-brengen-samen-met-vissers.htm>
- <https://www.vissersbond.nl/bijvangstsamplingprogramma-garnalenvisserij-van-start/>

15. New stimulation techniques for flatfish trawling: StimTech (2021-...)

In this project, the goal is to devise alternative methods to replace the stimuli produced by the use of tickler chains in sole and plaice fisheries. The primary focus is on examining the swimming and burrowing behaviors of sole and plaice in response to various mechanical and optical stimuli.

- [https://www.nwo.nl/en/researchprogrammes/research-towards-sustainable-fisheries-rsf-\(zie-second-call\)](https://www.nwo.nl/en/researchprogrammes/research-towards-sustainable-fisheries-rsf-(zie-second-call))
- <https://www.nwo.nl/nieuws/nieuw-onderzoeksproject-voor-innovatie-visserij-gehonoreerd>
- <https://www.vissersbond.nl/gedrag-platvis-van-a-tot-z-doorgelicht/>

16. Overlevingskansen van schol, tong en tarbot discards in de boomkor en flyshoot visserijen en de effecten daarvan op de visbestanden (2023)

This project focused on studying the survival rates of discarded sole, plaice, and brill in the beam trawl and flyshoot fisheries.

- <https://research.wur.nl/en/publications/overlevingskansen-wisselen-met-seizoenen-resultaten-onderzoek-naa>
- <https://edepot.wur.nl/640360>

b) Overview of research and development projects from Denmark

**FAF Projects:**

Final commitments for 2022:

17. DFPO project - **Project Strengthening knowledge, competences, advice and marketing promotion**
18. DPPO in collaboration with DTU Aqua, DFPO and MID - **Project Tobi's marking expedition**
19. DTU Aqua in collaboration with FSKPO and DFPO **Project Promotion of scientific work, experiments, research and dissemination with value for Danish fisheries** (project on cormorants)
20. DTU Aqua in collaboration with DPPO and DFPO – **Project 0 group fishing for sandeel and sprat**
21. MID in collaboration with DPPO and DFPO – **Project Industrial PhD**

Final commitments for 2023:

22. DTU Aqua in collaboration with DFPO and DPPO – **Project Fisker researches teaching efforts**
23. DFPO project - **Project Strengthening knowledge, competences, advice and marketing promotion**

Conditional commitments for 2023:

24. DTU Aqua in collaboration with DFPO and DPPO – **Real-time monitoring for optimal use of sprat in the North Sea**
25. DTU Aqua in collaboration with DPPO and DFPO – **Project FAF-TRUST**

### Other projects

26. Fishing of beach crabs as a new sustainable resource in Danish coastal fisheries (**KRABFISK**) – Licensed

The purpose of KRABFISK is to establish a sustainable fishery for beach crabs (*Carcinus maenas*) in order to exploit the crabs for new products for human consumption as well as other established purposes. The project covers the entire value chain and has the specific goal of developing a profitable fishery of at least 10,000 tons of beach crabs per year. Applied 2 Feb 2022; Start 1/1-2023; End 31/12-2025.

27. Innovative materials to reduce fuel emission and increase cod exits (**MatRedEx**); funded by EMFF – Licensed

This project sets out to develop a trawl that is radically different from the current commercial trawl used in the Norway lobster fishery. The focus of the project is to accommodate two main challenges currently faced by the mixed trawl fishery targeting Norway lobster to comply with increased management requirements to reduce CO<sub>2</sub> emissions and catches of cod in all Danish waters. The new trawl will be designed to target Norway lobster as efficient as the current commercial trawl with very little or no bycatch of cod and other fish while reducing the fuel consumption needed to tow the gear.

Specifically, the aims of the project are to:

- Reduce towing resistance and thus fuel consumption considerably by developing a radically new gear design concept that will replace the upper front part of the trawl.
- Increase selectivity of all sizes of cod by developing low-flow zones in the codend using innovative gear materials and fish behaviour.

Applied 8 June 2020.

28. Quantifying and reducing the physical impact of mobile fishing gears (**ReFigure**); funded by EMFF – Licensed

The objective of the project is to quantitatively assess the physical impact of the most common fishing gear used by bottom net fishing vessels worldwide, both at component level and on a variety of seabed types. This will lead to better management of marine resources, sustainable use, restoration, and protection of marine habitats. Applied 8. June 2020.

29. **Spatial stock structure of sandeel**; funded by TRUST and EMFF – Licensed

The project will lead to a more solid geographical stock base for the MSY-based management of sandeel in the North Sea. New label methodology must be developed, and recapture results must either consolidate or reject hypotheses about the migration of sandeel at different geographical scales. Applied 7 October 2019.

**30. Discard advisor to Danish fisheries and Danish fishermen;** funded by EMFF – Licensed 2020-2023

The project has 3 main objectives.

- Collect knowledge and data about discard in order to improve the knowledge base and overview of any discard and compliance with the landing obligation in Danish fisheries.
- Contribute to reducing discard volumes in Denmark through direct discard advice to fishers based on the results for the first sub-purpose.
- Explore the possibilities for resource utilization of landed fish under target (MLS fish)

Applied 7 October 2019.

**31. Development and testing of DNA-based methods for quantitative assessment of species composition in mixed landings (DNA-MIX);** funded by EMFF – Licensed

The project aims to develop, test, and evaluate DNA-based methods for quantitative assessment of species composition in connection with human consumption and industrial fisheries. This includes assessing both current and future applications and implementation potential in relation to practical sampling, technical and biological uncertainties, sensitivity and cost-effectiveness. Applied 7 October 2019.

**32. Development of a real-time catch monitoring system with automatic detection of the catch composition to minimize catch of unwanted species and sizes (AutoCatch);** funded by EMFF – Licensed

The aim of the project is to develop an automatic catch information system that provides detailed information on the catch entering trawls to allow fishers to make an informed decision based on the ongoing fishing process in real time. By building on already established knowledge and developed technologies, the project will develop a product that for the first time can tell the fisher what he catches in real-time and what the ratio of the catch is between desired and unwanted catch. Applied 7 October 2019.

**33. Danish fisherman-researcher network: 3rd phase;** funded by EMFF – Licensed

Through networking activities, the aim of the project is to ensure the building and sharing of knowledge and to strengthen the dialogue between the Danish fishing industry and operational fisheries research for the benefit of the sustainable development of coastal communities, as well as providing scientists with first-hand information on the development of fisheries. The project is divided into 6 work packages: i) Teaching/communication seminars and knowledge and technology transfer across sectors and generations; ii) Workshops, after-work meetings, demonstration seminars with idea gathering for cooperation projects on current and future challenges for fisheries and management as well



as knowledge sharing at organizational level; iii) Development of ideas based on the fisher's everyday life in order to develop fishing opportunities and tackle obstacles in the exercise of a profession, iv) Researcher participation in international fisheries forums e.g. ACs, ICES benchmarks and initiations of possible certifications; (v) Development of an easily accessible platform with electronic marine maps to illustrate fishing patterns and environmental impact, as well as habitat and resource allocation, for spatial planning of sustainable fisheries and other maritime activities; and vi) Project management and planning and reporting of activities. Applied 7 October 2019.

#### **34. Development of Management Strategy Evaluations (MSEs) based on the Fmsy values obtained from the Fmsy-project for six high profile fish stocks – Licensed**

The relevant analysis will be:

- Based on the innovative idea that Surplus Production Model (SPM) can bridge the gap between science on ecosystem functioning and scientific advice on fisheries management a forecast software module to the existing Surplus Production Model (SPM) software available like SPiCT, will be developed that can perform MSEs.
- Creating relationship between growth and stock size based on meta-analysis including data from the ICES stock assessments, and from other similar data bases.
- Creating relationship between sexual maturity and stock size based on meta-analysis including data from the ICES stock assessments, and from other similar data bases.
- Used to establish relationship between natural mortality and stock size, where data on cannibalism are available from multispecies models.
- Based on the innovative idea that the theoretical CMS ecosystem model by Pope et al 2006 can be used to make relationship between natural mortality and stock size (via fishing pressure levels) (Figure 1), density dependent mortality models by stock will be constructed. This model basically uses the North Sea ecosystem in its parametrisation but can easily be moderated to other ecosystems.
- Based on extending the software used by ICES in its most recent MSE for a given stock, so that density dependent growth, maturity and natural mortality are included.

The project will apply the above approach to six important fish stocks for the Northeast Atlantic:

- Mackerel
- Baltic sprat
- Blue whiting
- North Sea plaice
- North Sea cod
- NSSP herring

Applied 7 June, 2019

#### **35. Pelagic species (PELA); funded by EMFF – Licensed**

The project presents a number of objectives:

1. AP1) Method for separating coast and sandeel and assessment of the extent of the mixture between sea and sandeel in area 2r and the Kattegat.

2. AP2) Continuation of the larval survey (BEBRIS), which is currently being conducted on an experimental basis at IBTS Q3, but focusing on sardine, anchovies, mackerel, and horse mackerel. So far, the focus has been sprat, but the other species have also appeared in the samples. In addition, an assessment of whether sandeel larvae collected on IBTS Q1 can be used to predict recruitment (we have samples from previous expeditions, so we do not need to collect new samples).
3. AP3) Optimization of sample collection.
4. AP4) Assess new knowledge about the distributions of herring stocks in time and space generated on the basis of analyses of new genetic and biological data collected and generated in the project, focusing on possible implications for stock estimation.
5. AP5) Dialogue and solving tasks towards the sandeel benchmark in 2021.

Applied 7 June 2019

36. North Sea Resource Distribution and Fishery Opportunities (**NORDFO**); funded by EMFF – Licensed

The aim is to evaluate changes in the distribution of North Sea fish species and improve the management of important Danish fish resources in the North Sea by explaining their changes in abundance that determine fishing opportunities on the basis of physical/biological environmental factors and fishing dynamics.

Applied 7 June, 2019

37. Biodegradable yarn (**BIOYARN**); funded by EMFF – Licensed

As nets can be lost during fishing for a number of reasons, e.g. when entangled in wrecks, reefs or other structures on the seabed, fishers will usually try to recover their lost gear, but this is not always possible. Modern nets are made of strong plastic materials such as nylon and, under the right conditions, can continue to catch fish for many months after loss. The use of biodegradable yarn would make the actual threads in the fishing net dissolve over time, will be able to eliminate the ghost fishing caused by lost nets. The project aims to test and compare the catch efficiency in biodegradable nets and in the conventional nylon nets used in Danish net fishing. In addition, the degradation profile of the biobreakable yarn is documented in order to assess the overall applicability of the biodegradable yarns. Applied 7 June, 2019.

38. **Bycatch reduction in the brown shrimp beam trawl fishery**; funded by EMFF – Licensed

The objective of the project is to reduce by-catches of fish species, including species subject to quotas below the current minimum size (e.g. plaice, whiting, sprat, herring) by means of by-catch reduction gear (GRDs) when fishing for shrimp in the North Sea. The project will also establish a cost-effective and well-documented by-catch monitoring programme in fisheries to improve the documentation of total annual by-catches of the species subject to quotas for use in fisheries management. Applied 7 June, 2019.

39. Documentation and protection of gentle coastal Fishing in Danish waters (**MAPFISH**); funded by EMFF – Licensed

The purpose of the project is to document the extent of coastal fishing in Danish waters as well as interactions between coastal fishing and other industrial activities, such as offshore wind farms, establishment and use of sites for dredging, sediment bypass, coastal feeding

and raw material extraction of waste from the seabed, etc. Applied 7 June 2019. Kick off meeting: 13 August 2020.

**40. Improved management of flatfish stocks in Danish waters**, funded by EMFF – Licensed

Objective: Through cooperation between the fishing industry and research, to improve the scientific basis for the management of several flatfish stocks in Danish waters. This will achieve a common understanding of spatial and temporal stock dynamics, which will strengthen fishers' ownership of the management process for the benefit of sustainable, knowledge-based, socially responsible fishing. Specifically, it wants to gain better knowledge about the distribution of turbot during the spawning period and the biology and life history of the fish, the distribution of biological populations and their migration in sole, and improve our understanding of plaice distribution, with a particular focus on differences in perception among fishermen and scientists. Finally, it will focus on how the new information can be used to improve stock assessment and thereby advice for individual stocks. Applied 7 June, 2019.

**41. Study of occurrence of ghost nets in Danish waters**; funded by SUPPLY – Licensed

The project concerns surveys of ghost nets in Danish waters, and it will build knowledge about the extent of ghost nets in Danish waters, including testing the hypothesis that the presence of ghost nets is concentrated in special conflict areas where various human activities can result in the loss of nets. The main objective of the project is to investigate (and quantify) the presence of ghost nets in presumed conflict areas for ghost nets in Danish waters. Applied April 2019.

**42. Coastal fish stocks and fishing opportunities on the west coast (ESTERHAVSFISK)**; funded by EMFF – Licensed

Purpose: During the project, new data will be collected from the coastal areas off the west coast of Jutland and fishing opportunities in the areas will be investigated. In this connection, the distribution of fish in relation to hydrographic conditions is explored with a focus on the distribution of the Jutland Coastal Current. The overall objective is to gain greater knowledge about the development of coastal stocks of commercially important fish species, with a view to better management and development of fishing opportunities in coastal areas of the North Sea. Applied December 2017.

**43. Sustainable, cost-effective and responsive fisheries solutions under the landing obligation (FAST TRACK II)**; funded by EMFF – Licensed

Objective: Continuation of FAST TRACK I, where a well-functioning and innovative collaboration platform has been established between industry, researchers, and managers. The purpose is to ensure the continued development of the Fast track platform, which is an effective way from idea to approval of selective tools. The project is based on dynamic cooperation between all parties in the fisheries sector and the setup ensures that all elements are present for a rapid approval process under the EU's Common Fisheries Policy. The platform thus allows for the continuous development of specialized gear that ensures

the best possible economic and biological sustainability for fishers during the landing obligation. Applied December 2017.

44. **Maintaining sustainable industrial fisheries - sprat in the North Sea and IIIa (BEBRIS)**; funded by EMFF – Licensed

The project applied for aims to support and maintain sustainable sprat fishing in the North Sea, Skagerrak and Kattegat; a fishery of great importance to Danish fishers and the Danish processing industry. The project applied for aims to contribute to the objectives of the CFP (specified under points a and b of Article 5). These are: (a) to promote competitive, environmentally sustainable, economically viable and socially responsible fisheries; (b) to promote the implementation of the CFP. The project will focus in particular on the following areas highlighted in the new Fisheries Reform: 1) Sustainability in depth, (EU 2) Maximum Sustainable Yield (MSY), 3) Knowledge of Fisheries, and 4) Multi-annual plans. Applied December 2017.

45. **Improving the management base for cod stocks in the Baltic Sea and Kattegat (FORCOD)**; funded by EMFF – Granted

The project aims to improve the scientific basis for the management of cod stocks in the Baltic Sea and the Kattegat, by developing solutions to the current key challenges in stock assessment and scientific advice, in order to ensure sustainable exploitation of fisheries resources. Applied December 2017.

46. **Real-time camera observation in trawl fishing – technology-based intelligent fishing (TECHNOFISK)**; funded by EMFF – Licensed

The purpose of the project is to develop and commercially test an innovative real-time camera system on board Danish trawl vessels that enables the individual fisherman to observe, assess and, if appropriate, actively react to the fishing process, e.g. by interrupting fishing and seeking alternative fishing depths or spaces. The project will, through innovative use of existing technology, develop a real-time decision-making tool and make fishing with trawling a more intelligent process where decisions about fishing exports can be made more actively and on a significantly better basis. Applied December 2017.

47. **Sandbanks and fisheries impact in relation to EU fisheries and environment policy**; funded by EMFF – Licensed

Objective: To address the lack of knowledge base for ongoing and future Natura 2000 and MSFD habitat implementations in the North Sea. For the habitat type "Sandbanks", Danish sandeel and plaice fisheries will be particularly affected by habitat protections. Applied December 2017.

**c) Overview of projects with involvement from France**

48. **SELUX**: The aim of the SELUX project (January 2019 - December 2020) was to test lighting systems which enable the selectivity of the 80 mm square mesh panel which is legally prescribed for use in the North Sea to be improved. This project

has contributed significantly to understanding the behavior of different species in response to light. Analyses revealed that whiting exhibit a tendency to avoid light, while horse mackerel tend to be attracted to it initially, yet are repelled when the light flashes. The aim was to enable a reduction in catches of horse mackerel and whiting (species which have to be landed and which are largely discarded by this fishing fleet) while retaining species which are commercially valuable. Results provide initial indications of how light can be used to improve the selectivity of this fishery. There are many different ways in which the light could be adjusted in relation to selective systems, in this project 2 light systems were tested, the first one called “Brezglow” a phosphorescent wire system, and the second the “PISCES” LED network added to the gear.

49. **DISCARDLESS:** DiscardLess helps provide the knowledge, tools and technologies as well as the involvement of the stakeholders to achieve the gradual elimination of discarding. The first focus was on preventing the unwanted catches from ever being caught. The second focus was on making best use of the unavoidable unwanted catch. DiscardLess evaluates the impacts of discarding on the marine environment, on the economy, and across the wider society. Furthermore, DiscardLess collaborates among scientists, stakeholders, and policymakers to facilitate the successful reduction of discards in European fisheries. By promoting collaborative efforts, it aims to support and promote practical, achievable, acceptable, and cost-effective strategies to mitigate discards.
50. **Gearing-up:** the aim of this project was to help fishermen, net makers and fisheries managers find practical ways to reduce bycatch – or unwanted catches – in commercial fisheries and to bring together data on gear selectivity trials that have taken place in the North Sea and North Western Waters since 2002 and make it available via an online tool. Gearing Up users will have access to precise results from the applications of gear innovations anywhere, anytime, so they can make an informed decision about modifications to their fishing gear.
51. **SELECCAB:** This project was carried out in 2009 and 2010 in collaboration between the regional committee on marine fisheries and marine culture of Nord-Pas-de-Calais/Picardie (CRPMEM), the French Research Institute for Exploitation of the Sea (IFREMER), the DDTM Pas-de-Calais and the Comptoir des Pêches d'Europe du Nord, the SELECCAB project aimed to address unwanted catches, particularly focusing on cod in mixed trawl fishery, 2 selective gears were tested. The large mesh trawl trials' results show there is a strong reduction of the cod catches of 90 %. But there is a strong reduction (60 %) of the total catch too. The escape for saithe, main species of this fishery which usually represent more than 90 % of the total catch, is 57 % and concerns all the range of sizes between 40 and 68 cm.
52. **SELECFISH:** Project SELECFISH aimed to test and to develop selective devices for the French artisanal trawlers fleet from eastern Channel and the North Sea. The pursued goal was to allow a reduction of discards operated by this fishery. Effects of tested devices were thus evaluated on whiting, plaice, horse mackerel, herring,

squid, cuttlefish, red mullet, mackerel and cod. The project allowed a test of square mesh cylinders (SMC) of various sizes (80, 100 and 115mm gauge) and various lengths (1 and 2m). The association of SMC in 80mm of 2m length with selective grids was also tested. The association of the SMC in 80mm of 2m length with selective grids gave varied results not inevitably much more interesting than when the SMC is used on its own. With SAUPLIMOR rigid grid discards are decreased by almost 80% but associated commercial losses are very important (in particular cuttlefish and squid where catches are divided by two). These tests highlight once again all the complexity of selectivity improvement for these fisheries characterized by multispecificism. Tested devices are thus to use in specific cases, for targeted species, but could not be appropriate for an all-year-round single selective device.

53. **SELECMER:** Project SELECMER (2008 -2009) aimed to improve trawl selectivity in order to reduce catches of undersized fish, especially for whiting, while limiting commercial losses. The first stage consisted in assessing impact of a trawl including square-mesh panels. The aim of the second stage was to develop a selective grid. The results are globally positive as regards the reduction of undersized whiting discards. Thus, the use of a square-mesh panel (120 mm mesh-size) positioned in the extension allows an escape rate of whiting inferior to 27cm between 13% and 40% (in abundance) by comparison with the standard trawl. The grid system leads to an escape of whiting inferior to 22cm of 16% in abundance or 30% depending to the space between bars. However, the devices should be improved in order to increase the escape rates and solve problems. Interesting results were obtained on other species, too. Thus, the use of the square-mesh panel allows a significant reduction of discards of undersized mackerels and horse-mackerels, while the use of the grid leads to a reduction of 50% of discards of undersized plaice (<27cm). However, those devices do not fit exactly fishermen's expectations and some information needs to be collected in particular on commercial losses and the economic sustainability of their implementation
54. **SMAC:** Project SMAC, launched in 2015, is focused on improving biological and ecological knowledge in order to improve Sole stock assessment modelling in the Eastern Channel, in a context of decreasing authorized catches. The studies revealed a strong spatial separation of 3 sub-populations (with few exchanges of adult individuals) and also helped identify Sole nursery areas. All of this work has been the subject of exchanges between the various stakeholders exploiting this stock, and has also been communicated to ICES.

#### d) Overview of projects with involvement from Belgium

55. **Raywatch:** a Belgian research programme by ILVO for better management of rays, both for stock assessment and within the context of the landing obligation. In the project, attention is given to the education and training of both crew members of fishing vessels and employees of fish auctions to continuously improve the identification of ray species. Additionally, Raywatch serves as an ILVO test case for more automated data collection through new technologies, specifically through the integration of electronically collected data and the use of camera images. Link:



<https://ilvo.vlaanderen.be/nl/nieuws/raywatch-moet-kennis-over-roggen-vergroten-in-functie-van-beter-beheer>

56. **LED there be light by ILVO:** The project kicked off in 2022 and aims to develop and optimize innovations in various professions practiced by Belgian fishermen to reduce bycatch and/or optimize commercial catches. In the sea, visual stimuli can be used to influence the fish's response during the capture process. ILVO tested various types of light sources to improve the catch efficiency and selectivity of various fishing methods. In addition to experiments with luminous net materials, LEDs, and other light sources in different net designs in various fishing techniques (active and passive), this project also includes budget and guidance to test and further develop innovative ideas from the beam trawl sector. Link: <https://rederscentrale.be/led-there-be-light/>
57. **Combituig by ILVO:** Within project COMBITUIG, ILVO investigates possible applications of LED lights, small electrodes and other new technologies using catch comparisons on board research vessels. Link: <https://ilvo.vlaanderen.be/en/dossiers/precision-fishing>