North Sea Advisory Council

NSAC Advice Ref. 03-1819

NSAC Advice on Best Practices for Avoidance, Selectivity, and Survival of Skates and Rays to the Scheveningen Regional Group

This paper was approved by the NSAC Executive Committee on the 16th of May 2019 via fast-track written procedure.

On Friday 12th of April 2019 the North Sea Advisory Council received an invitation to draft guidelines for best practice when handling catches of skates and rays to increase their survivability, building on existing knowledge. After a discussion at the Demersal Working Group on the 16th of April in Gothenburg it was agreed to create a format for collecting best practices across the industry. Due to a short deadline we had to take the approach of collecting separate measures and combining them in a joint document, while not producing a consensus advice. We have received a list of best practices from VisNed, Rederscentrale, the Dutch Elasmobranch Society, CNPNM and Wageningen Marine Research which we have collated in a table below. We would indicate that this is not a complete list of all measures that are now/or could be applied, but rather a collection of measures that are currently being applied or considered theoretically possible by these organisations, primarily in the southern part of the North Sea. Similar or different measures may already be applied or considered in other Member States or fleet segments. Further engagement between the Scheveningen Group and the North Sea Advisory Council will be of use to identify additional measures and discuss future implementation.

Furthermore, more data from fishers all over the North Sea needs to be collected as to share the awareness of the ray discussion among fishermen and to increase the knowledge about the distribution patterns for the different rays.

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Collected measures

The following table shows best practices collected from individual organisations in Belgium, the Netherlands, United Kingdom and France. Please note that this is not a comprehensive list of measures used in the North Sea but rather a list of collected measures that are currently being applied or considered by these organisations primarily in the southern part of the North Sea.

Table: Best Practices for Avoidance, Selectivity, and Survival of Skates and Rays in the North Sea

	North Sea Advisory Council NSAC	**Best Practices for Avoidance, Selectivity, and Survival of Skates and Rays in the North Sea**	May 2019				
	Type a. Avoidance; b. Selectivity; c. Handling on board	**Measure** Short description (max 200 words)	**Applicability** Metier/gear code	**Applicability** Area (ICES rectangle)	**Applicability** Species	**Status** i. research still needed; ii. could be trialled; iii. could be implemented	**More info** Provide link to more info on project/knowledge; if available
	EXAMPLE						
Example	*a. Avoidance*	***Move on principle -*** *Fishermen have indicated that they already move on if they notice high amounts of unwanted catches of skates and rays.*	*All*	*All*	*All*	*iii. could be implemented (currently used)*	
Example	*c. Handling on board*	***Handle with care -*** *Skates should not be lifted or thrown back by the tail but supported in the middle to prevent organ and spine damage and releasing them below the water line decreases the chance of predation.*	*All*	*All*	*All*	*iii. could be implemented*	
Country	***Measure***	***Description***	**Applicability**	**Applicability**	**Applicability**	**Status**	**More info**
GENERAL	*a. Avoidance*	Use of side-scan sonar to identify aggregations	trawls	All	i.	Potentially valuable in combination with 'move on rules' or in forward predictions f aggregations	
	b. Selectivity	Deterrents - making use of sensory organs (lights, magnets)	trawls and nets	All	Thornback ray, spotted ray and blonde ray.	i. & ii.	New field of research in development, acitve trails conducted (not in The Netherlands)
	c. Handling on board	Keep catch wet before and during sorting	trawls	All	Thornback ray, spotted ray and blonde ray.	iii.	
BE + NL	*a. Avoidance*	Avoid known spawning/nursery areas.	All	All	All	i. research still needed	There is a research effort under Life-IP to map the presence, abundance and use of the Dutch coastal area by skates and rays. This research will start in 2019 and conclude in 2021. Also see: Hunter et al. (2006) seasonal migrations thornback rays; genetic study INNORAYS to study population structure and size.
BE	*b. Selectivity*	Modified beam trawl: SumWing, Ecoroll, Aqua Planning Gear to minimize seabed disturbance.	Beam trawl	All	All	iii. Currently used + more information by the EMFF project Benthis Nationaal	Skates and rays not part of this survey but could be extended to inform on skate interactions
BE	*b. Selectivity*	Increasing selectivity with square mesh: square mesh - T90 Codend, Flemish Panel, large meshes in the back of the net.	Beam trawl	All	All	iii. Currently used	Measure not specific for skates and rays, research needed on effect on elasmobranchs.

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BE	*b. Selectivity*	Escape Panel: Benthos Release Panel, Flip-up rope to minimize benthis and stones in the net. This is mandatory for the Belgian large fleet segment under the Landing Obligation in NWW waters (7a-7k).	Beam trawl (BT2)	All	All	iii. Currently used	Measure not specific for skates and rays, research needed on effect on elasmobranchs.
BE	*c. Handling on board*	HAROKIT (EFF project in 2015). Guide and video for correct identification and handling of rays and sharks (only in Dutch).	All	All	All	iii. Could be implemented	https://www.youtube.com/watch?v=Gg4l8iHJahk https://www.ilvo.vlaanderen.be/language/nl-BE/NL/Diensten-en-producten/Harokit#.XMa-qGgzbIU
BE	*c. Handling on board*	SUMARiS (ongoing Interreg-project from July 2017 - July 2020). Under this project an Identification Guide, a Trainingvideo and Trainingsessions for fishermen, auction staff and students for correct identification and handling of rays will be developed.	All	All	All	iii. Could be implemented	https://www.rederscentrale.be/sumaris/ https://www.youtube.com/watch?v=WImPuDmbYfU
NL + BE	*a. Avoidance*	Identify and avoid known spawning/nursery areas	trawls and nets	All	Thornback ray, spotted ray and blonde ray.	i.	EU project Probyfish (Brunel T.) in which cluster analyzes and spatial distribution of fish are modeled, rays can be part of this; Hunter et al. (2006) seasonal migrations thornback rays; genetic study INNORAYS to study population structure and size
NL	*a. Avoidance*	Avoid areas with rays hotspots, which are mainly located in the southwestern part of the North Sea.	trawls	All	The main species the Dutch fleet interacts with are thornback ray, spotted ray and blonde ray. Starry ray is also relevant as this prohibited species has a condition in a MSC-certified plaice fishery wish has led to the development of potential broadly applicable measures.	iii.	Fishermen's organisations informed the members how to act when they must discard rays - voluntary measues.
NL	*a. Avoidance*	ProbyFish - This survey looks at the collective occurrence of species in areas based on survey and catch data and also uses innovative statistical methods to predict spatial and temporal distribution.			Thornback ray, spotted ray and blonde ray.		http://www.nwwac.org/_fileupload/Papers%20and%20Presentations/2018/ProByFish%20for%20NWWAC%20Sept%202018%20v3.pdf
NL	*a. Avoidance*	Research INNORAYS: decreasing mortality or skates and rays - Electronic Monitoring / Computer vision: Provides insight into the catch composition of the fleet in the North Sea. - Close-kin Mark Recapture: Provides insight into the population structure and size of blonde and thornback.			Thornback ray, spotted ray and blonde ray.	*i. research is still needed*	https://www.wur.nl/nl/project/Innorays-videomonitoring.htm - this work will help get a better undrerstandng of population structure and abbundaces of rays to help predict high abundances / sensitive areas or times
NL	*a. Avoidance*	Active sharing of information between operators	trawls and nets	All	Thornback ray, spotted ray and blonde ray.	i. & ii.	This is already happening on a voluntary basis (see NL 1.1) worth to explore which technological advances can be made to fascilitate active, real time sharing of information.

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NL	*a. Avoidance*	Move on rules	trawls	All	Thornback ray, spotted ray and blonde ray.	i.	See: Brunel et al. 2019 research in to spatio/temporal spread and discards, shows that move on had to be at least...miles to be sure to avoid high abundacne which makes this an unlikely uselful measure (part of Probyfish research program) - Predicitve models of skate and ray aggregations can be fed with results from INNORAYS catch monitoring using Electronic Monitoring and computer vision project by WUR Marine and Life_IP (see NL 1.2) focussing on migration patterns and use of coastal zone by skates and rays.
NL	*b. Selectivity*	Behaviour of rays in and around the net	trawls and nets	All	Thornback ray, spotted ray and blonde ray.	i.	Research by Wur Marine (Pieke Molenaar) for NL government for flatfish. Methodology should be applied for skates and rays too in order to develop species specific selectivity measures.
NL	*b. Selectivity*	Tow speed & Tow duration	trawls	All	Thornback ray, spotted ray and blonde ray.	i. & ii.	Has been proven to reduce bycatch (REF) but also reduces catch of target species
NL	*b. Selectivity*	Mesh size	not applicable	All	Thornback ray, spotted ray and blonde ray.	ii. & iii.	Increasing mesh size to avoid skates would get rid of all other target species too as they are the biggest animals in the catch
NL	*b. Selectivity*	Escape Panel	trawls	All	Thornback ray, spotted ray and blonde ray.	iii.	
NL	*b. Selectivity*	Selective grid: 'zeefflap' (seive net) used in brown shrimp fishery in The Netherlands separates large fish and allows them to escape	trawls	All	All	i, ii. & iii.	
NL	*b. Selectivity*	Improving selectivity by accounting for behaviour of skates and rays in and around the net			Thornback ray, spotted ray and blonde ray.	*i. research is still needed*	Platvis in beeld https://www.wur.nl/nl/project/Platvis-in-Beeld-1.htm
NL	*c. Handling on board*	Handle with care - Skates should not be lifted or thrown back by the tail but supported in the middle to prevent organ and spine damage and releasing them below the water line decreases the chance of predation.	All	All	Thornback ray, spotted ray and blonde ray.	*iii. could be implemented*	For this, we use newsletters and brochures make clear best practices handling skates and rays
NL	*c. Handling on board*	Effects of fishing practice and gears - A research project on estimating and improving survivability in the Dutch pulse fisheries was conducted by Schram and Molenaar, also into account the survivability of thornback ray and spotted ray. Three However no alternatives have been identified to effectively decrease the mortality of those species of rays.	BT2 80mm	All	Thornback ray, spotted ray	*i. research is still needed*	Schram, E. & P. Molenaar. 2018. Discards survival probabilities of flatfish and rays in North Sea pulsetrawl fisheries. Wageningen Marine Research report number C37/18. Wageningen, Wageningen University and Research Centre, 41p. Factsheet on improving survivability: https://www.wur.nl/upload_mm/6/2/7/69dceabf-4547-45b7-a376-8ede5291e04c_Factsheet_survival_fish_improvements_FINAL.pdf

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NL	*c. Handling on board*	Prompt release below water line after catch	trawls	All	Thornback ray, spotted ray and blonde ray.	ii. & iii.	In vessels using a conveyor skates and be released swiftly without unneccesary handling - for small vessels VisNed has send round advisories and handling guides through newsletter.
NL	*c. Handling on board*	Effects of fishing practice and gears	trawls and nets	All	Thornback ray, spotted ray and blonde ray.	ii.	Study on survival by Scharm and Molenaar 2018. Indication of survival for spine and spotted ray in pulse fishing.
FR	*a. Avoidance*	given th e very llimited quota available; professionnal already work to avoid hotspots of rays. It's on a volountary basis that shall go on this way.	All	All	All	iii. Currently used	
FR / BE / UK	*c. 1 - Handling on board*	SUMARiS (ongoing Interreg-project from July 2017 - July 2020). By organizing several seatrips to observ the survival rate of rays, the project will allow to evaluate the impact of quick release after catch. Indeed, time is noted when arriving on deck and when releasing at sea, or kept in monitoring boxes. Just need to wait for the results	All	All	All	i. research is still needed	
FR / BE / UK	*c. 2 - Handling on board*	SUMARiS (ongoing Interreg-project from July 2017 - July 2020). Under this project an Identification Guide, a Trainingvideo and Trainingsessions for fishermen, auction staff and students for correct identification and handling of rays will be developed.	All	All	All	iii. Could be implemented	https://www.rederscentrale.be/sumaris/ https://www.youtube.com/watch?v=WImPuDmbYfU
FR / BE / UK	*c. 3 - Handling on board*	SUMARiS (ongoing Interreg-project from July 2017 - July 2020). By organizing several seatrips to observ the survival rate of rays, the project will allow to evaluate the impact of keeping the catch wet during sorting. Just need to wait for the results	All	All	All	i. research is still needed	
FR / BE / UK	*c. 4 - Handling on board*	SUMARiS (ongoing Interreg-project from July 2017 - July 2020). By organizing several seatrips to observ the survival rate of rays, the project will allow to evaluate the impact the different gears and different practices. Indeed, seatrips are led on OTB, TBB, GTR and GTN. Just need to wait for the results	All	All	All	i. research is still needed	

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