

DRAFT AGENDA

Joint NWWAC/NSAC Focus Group Skates & Rays

Virtual meeting via Teams

08 December 2022

09:00 – 10:30 IE | 10:00 – 11:30 CET

Participants

Pauline Delalain	CNPMEM
Annemiek Hermans	Wageningen University
Michael Keatinge	Seaview Marine Economic Consulting
John Lynch	IS&EFPO
Mo Mathies	NWWAC Secretariat
Geert Meun	VisNed
Solène Prévalet	FROMNord
Amerik Schuitemaker	Nederlandse Vissersbond
Tamara Talevska	NSAC Secretariat
Jasmine Vlietinck	Rederscentrale
Johnny Woodlock	Irish Seal Sanctuary

1. Welcome and introductions

The Chair welcomed all participants. The agenda was adopted, as were the minutes from the last meeting

Action points 14 October 2022

1	Secretariat to contact MARE D3 regarding use of facilities for the workshop. 2 meeting rooms have been requested but not yet confirmed (07/12/2022)
2	Members to contact the NWWAC Secretariat with names of experts that need to be invited to the workshop. One response received, discussion under agenda item 3
3	Secretariat to circulate Save the Date email to interested parties once facilities have been agreed discussion under agenda item 3
4	Secretariat to update draft Terms of Reference and draft agenda and circulate to members. Circulated on 17/10

2. ElasmoPower – Annemiek Hermans, Wageningen University

Annemiek Hermans thanked the Chair for the invitation to present at this meeting. Her PhD research is on the effects of electromagnetic fields of subsea power cables on benthic elasmobranchs in the Dutch North Sea. Elasmobranchs might be most influenced by electromagnetic fields coming from offshore export cables, as they have the highest amount of power transported. These cables could potentially have the biggest impact also because they stretch over long distances of seabed perpendicular to the coast, so that migrating species will have to encounter many of these cables already in existence.

Introductory video to the ElasmoPower project available here: <https://www.wur.nl/en/Research-Results/Chair-groups/Animal-Sciences/Marine-Animal-Ecology-Group/ElasmoPower.htm>.

AC cables generate both an electric field and a magnetic field. The electric field is generally shielded inside the cable. But the magnetic field that protrudes into the environment can create an induced electric field as anything that moves through the magnetic field will generate an electric field as they are linked together. The ampullae of Lorenzini on both sharks and rays are channels that are filled with liquid which transport the electrical signals to the brain. Sharks and rays are special because they are both electro-sensitive and magneto sensitive. This can be seen from a very early age. Research of the University of West Australia by Kempster et al. exposed bamboo sharks to an electric field. When the field is turned on, the gill movement stops meaning they have a freeze response. This is believed to be due to predation as sharks exchange water with the outside. Researchers believe that if they freeze, they stop exchanging and thus have less electric field that they extrude themselves so that they are less at risk of predation. If an embryo is constantly exposed to changing EMF, they might expend a lot of energy freezing and adapting which should put into growing and developing.

This impact could be worrying for juveniles, though in adults there might be an attraction to cables as seen in the Mars cable observed by Barry et al. in 2008. During a Visual survey 126 times more long nose skates gathered around the cable and were simply sitting there appearing to be doing nothing. “And the question becomes, why are they there? Are they there because they feel that there is something that they should be there, like a prey or a mate?”

To summarise, there could be effects on

- Predator-prey relationship
- Development
- Migration
- Foraging

The ElasmoPower project has six phases:

1. Measure electromagnetic fields at live cables
2. Lab research on behavioural response of adults under different circumstances
3. Field research on abundance of rays in WF
4. Development research using embryos
5. Modelling
6. Data sharing

The 6-year project started 2 years ago. Data collection is complete at this stage with 12 months of data collected. Modelling has been carried out with input from cable owners to reflect different cable types, however, the number of cables is expected to increase significantly. A risk characterisation was carried out for both alternating current and direct current cables. Some studies on species in the North Sea are available which were included in this work, and it can be shown that the sensory range overlaps with electromagnetic fields that are extruded into the environment. For the behavioural study six tanks have been set up with 16 cameras linked, and a control experiment has been carried out. The project also looks at the embryo genesis, as it is known that the nursery grounds of sharks and rays overlap with cable routes. This means that there is a potential that the eggs are laid in electromagnetic fields. As some adults are attracted to these EMF, there could potentially be many eggs inside an electromagnetic field. In the lab, shark and ray eggs will be exposed to different electromagnetic field circumstances throughout their embryogenesis. Pictures and movies will be taken to evaluate the ventilation rate and the tail beats to see if they are stressed, as well as the respiratory rate.

Contact has been made with researchers in France, the UK, the US and Belgium on other research currently being carried out. A knowledge gap analysis was published by Hutchinson and Gill in 2021.

You can view the all the details of the ElasmoPower project [here](#).

The Chair thanked Hermans for her presentation and opened the floor to questions.

Johnny Woodlock commented that research seems to be concentrated on egg bearing species and asked if any research had been carried out on rays that birth live young, and specifically in relation to how spurdog could be impacted by electromagnetic fields as they are an aggregating species.

Hermans stated that none had been carried out to her knowledge though some work is available on the electro and magneto senses themselves.

Solène Prévàlet asked if the project had looked at the abundance of ray species over time in the areas of cables.

Hermans stated that this was examined together with Cefas but the fisheries data available to do this is at a large scale with a large grid size whereas the effects are seen in a much smaller area. The resolution of data available does not suit the purpose of this examination. The trend of releasing skates and rays once they were caught also impacts this data.

The Chair commented that it seems that the different types of EMF affect various species differently.

Hermans stated that the image she showed in her presentation was from a control experiment but the hypothesis is that this is dependent on foraging behaviour. (RED: the image has been changed in the presentation to avoid confusion.)

Action: Secretariat to contact Hermans to see if presentation can be shared.

3. Draft Workshop Agenda & participants list

A discussion followed on the organisation of the workshop for 09 February. Mathies stated that MARE C% had requested two rooms in the Commission but that these have yet to be confirmed. Members agreed that if the rooms fell through, alternative facilities would be rented by the ACs.

Tamara Talevska confirmed that the date for the workshop was 09 February. She also enquired regarding the update to the purpose of the workshop. Mathies responded that this was dependent on the conclusions from the STECF EWG 22-08 which have yet to be published.

Action: Secretariat to investigate availability of STECF EWG 22-08 report, circulate once available.

Action: Secretariat to adjust agenda timings based on results from STECF, update ToR purpose according to STECF conclusions.

Action: Secretariat to follow-up on rooms with MARE C5

Action: Secretariat to contact speakers

Action: Secretariat to circulate “save the date” notice to all members

4. Commission response to joint AC advice

Members reviewed the response received from the Commission to the ACs’ request on harmonisation of ID guides. It was agreed to follow this up pending the presentation on the Rayscan project at the workshop in February.

5. AOB

No AOB were raised.

6. Summary of actions agreed and decisions adopted by the Chair

1	Secretariat to contact Hermans to see if presentation can be shared.
2	Secretariat to investigate availability of STECF EWG 22-08 report, circulate once available.
3	Secretariat to adjust agenda timings based on results from STECF, update ToR purpose according to STECF conclusions.
4	Secretariat to follow-up on rooms with MARE C5
5	Secretariat to contact speakers
6	Secretariat to circulate “save the date” notice to all members