European Parliament, June 2018

Underwater Noise.
How can it be effectively reduced.
A way forward with a focus on Descriptor 11.1. Impulsive Noise.

Nicolas Entrup, OceanCare, Member Organisation of Seas at Risk

ANTHROPOGENIC NOISE

19th United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (ICP19)
18th – 22nd of June 2018

1. Sources and environmental and socioeconomic aspects of anthropogenic underwater noise

2. Cooperation and coordination in addressing anthropogenic underwater noise

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THE IMPACT OF OCEAN NOISE POLLUTION ON FISH AND INVERTEBRATES

LINDY WEILGART, PH.D.
OCEANCARE & DALHOUSIE UNIVERSITY

1 MAY 2018

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DALHOUSIE UNIVERSITY
Inspiring Minds

Impact of noise: Cod and Haddock

Shooting with air guns for 5 days:

- significant reduction in distribution abundance
- catch rates declined up to 70%
- effects in 5,550 km^2 study area

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… follow up research also showed **behavioural changes** and **increased bycatch rates** of many species following the seismic survey period.

Engås, A. Løkkeborg, S., Ona, E., and Soldal, A.V. 1996. Effects of seismic shooting on local abundance and catch rates of cod (Gadus morhua) and haddock (Melanogrammus aeglefinus). Can. J. Aquat. Sci. 53: 2238-2249.

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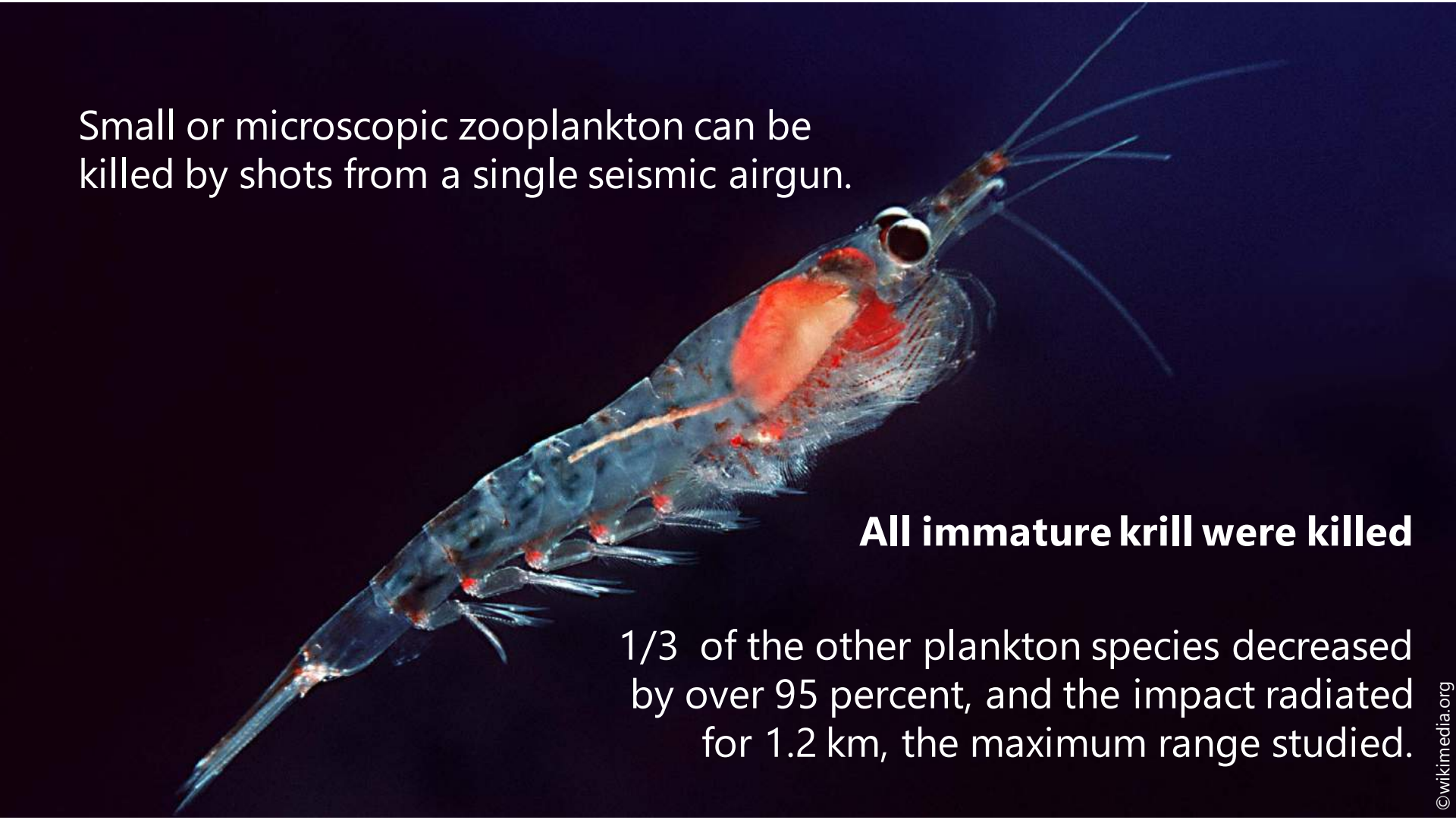
Impact of noise: Zooplankton



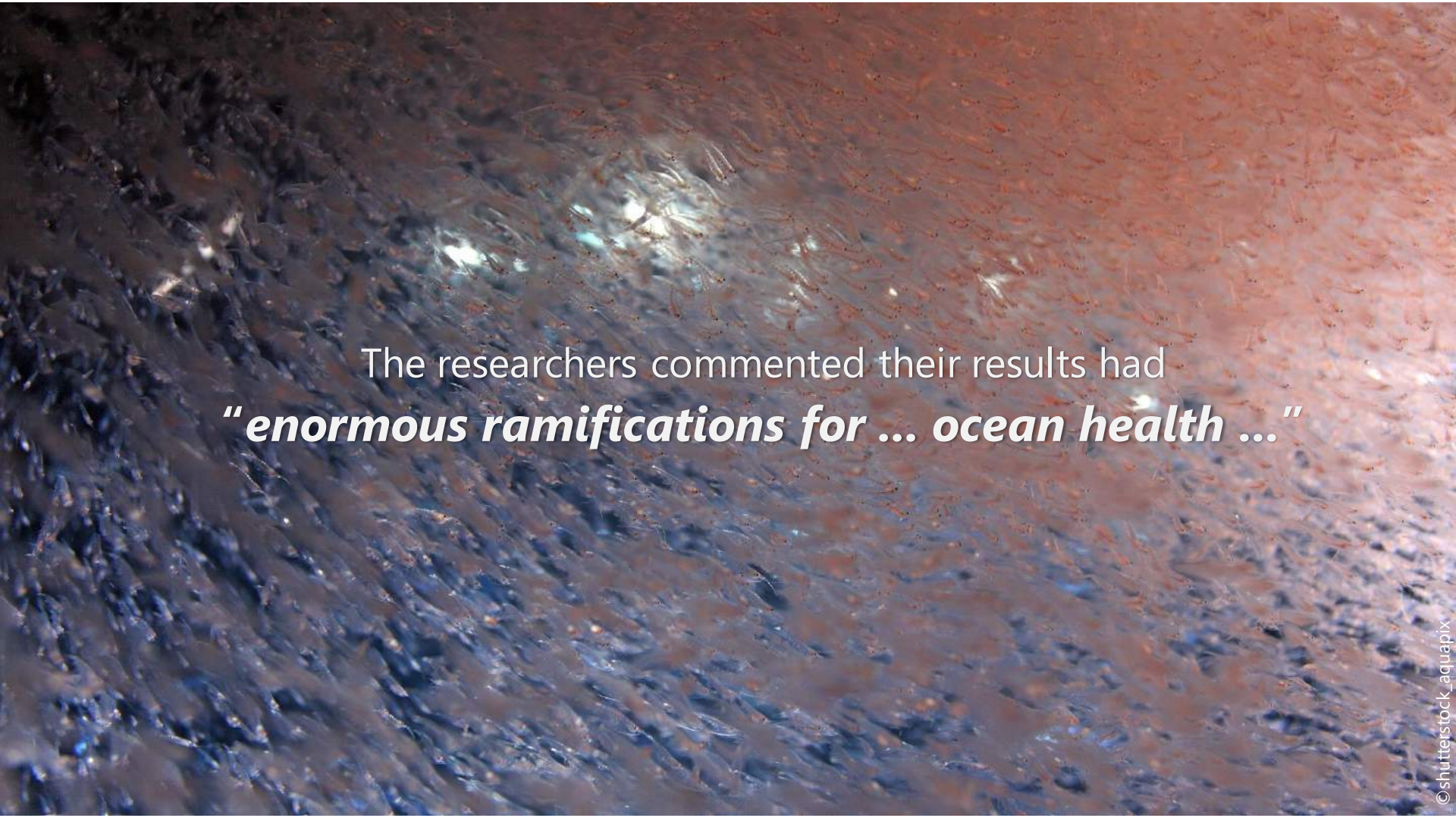
Small or microscopic zooplankton can be killed by shots from a single seismic airgun.

All immature krill were killed

1/3 of the other plankton species decreased by over 95 percent, and the impact radiated for 1.2 km, the maximum range studied.

McCauley RD, Day RD, Swadling KM, Fitzgibbon QP, Watson RA, Semmens JM. Widely used marine seismic survey air gun operations negatively impact zooplankton. Nature ecology & evolution. 2017 Jul;1(7):0195;

Impact of noise: Zooplankton



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Best Practice.
Regional, technical and capacity building approaches

Core elements of decisions (incl. Resolutions) at Multilateral and/or Regional Environmental Agreements addressing "anthropogenic noise"

1. **Take measures** to avoid, minimise & mitigate adverse impacts of anthropogenic underwater noise on marine and coastal biodiversity
2. Conducting **Environmental Impact Assessments (EIAs)**
3. Specific consideration for **management plans** of **protected areas** and critical habitat
4. Promote further **research**
5. Develop and apply Best Available Techniques (**BAT**) and Best Environmental Practice (**BEP**)

Weakness of Marine Mammal Observers, Safety Zones, Ramp-Ups

- Poor visibility (night, sea state, rain, fog)
- Deep divers, require longer shutdowns; Eggs, larvae, plankton, or benthic organisms cannot avoid the noise by swimming away
- Poor MMO training
- Impacts, including masking, extend to areas beyond not just immediate safety zone etc.

Environmental Impact Assessments (EIAs)

COP12, October 2017 in Manila, the Philippines

Adoption of Resolution 12.14

Adverse Impacts of Antrhopogenic noise on Cetaceans and other migratory Species

CMS Family Guidelines on Environmental Impact Assessmemts (EIAs) for Marine Noise-generated Activities

Time-Area Closures

- Separate & protect sensitive animals from noise source
- Avoid protected/sensitive areas
- Ecosystem-based MPAs can be effective to protect habitat from cumulative or synergistic impacts

Diversity of "protection status of species and habitats"

- Different criteria and scientific concepts, differing legal status
- Need for the prohibition of certain activities e.g. impulsive noise activities propagating into protected areas
- Exclusion Zones & Buffer Zones

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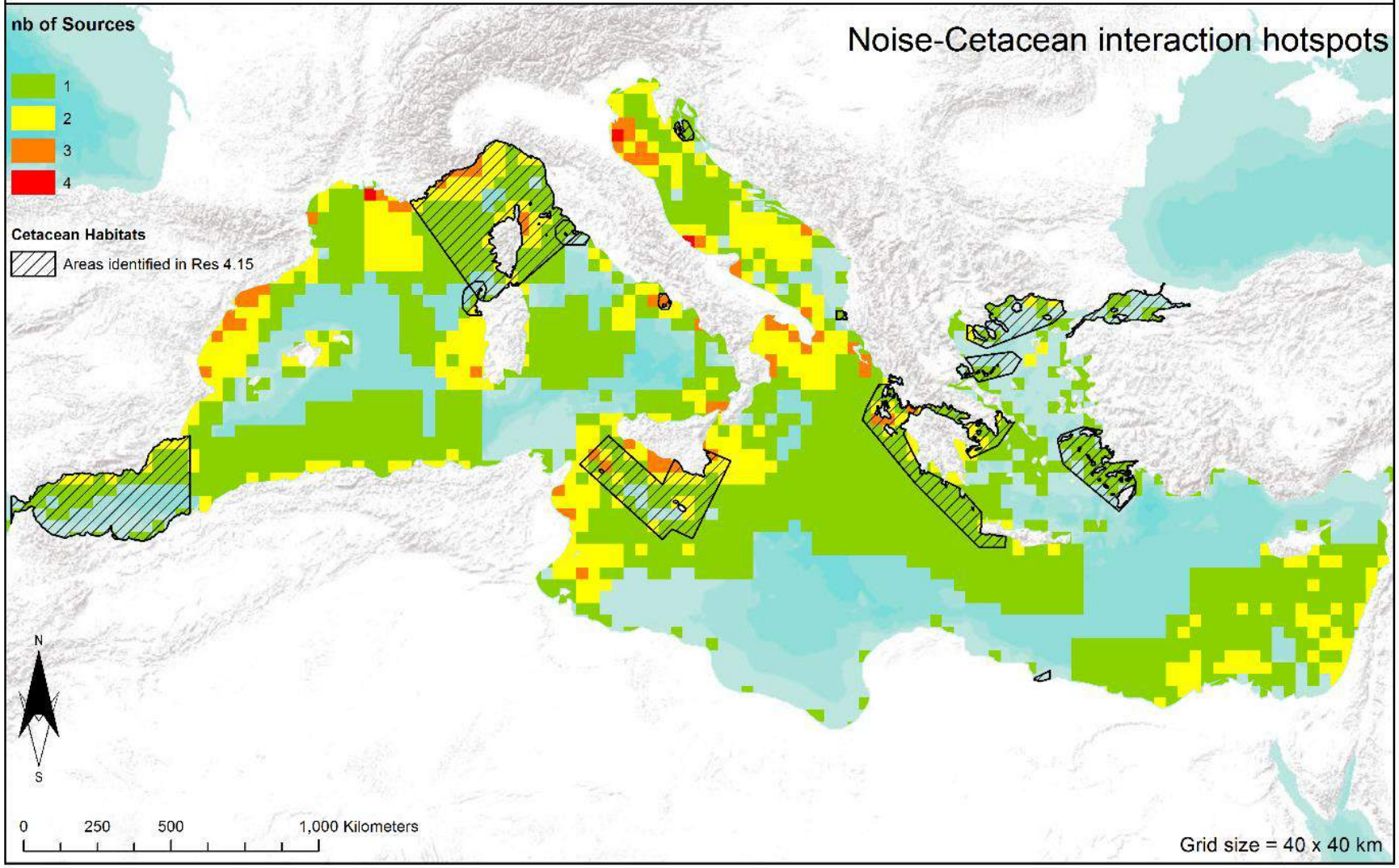
Overview of the noise hotspots in the ACCOBAMS area

ACCOBAMS



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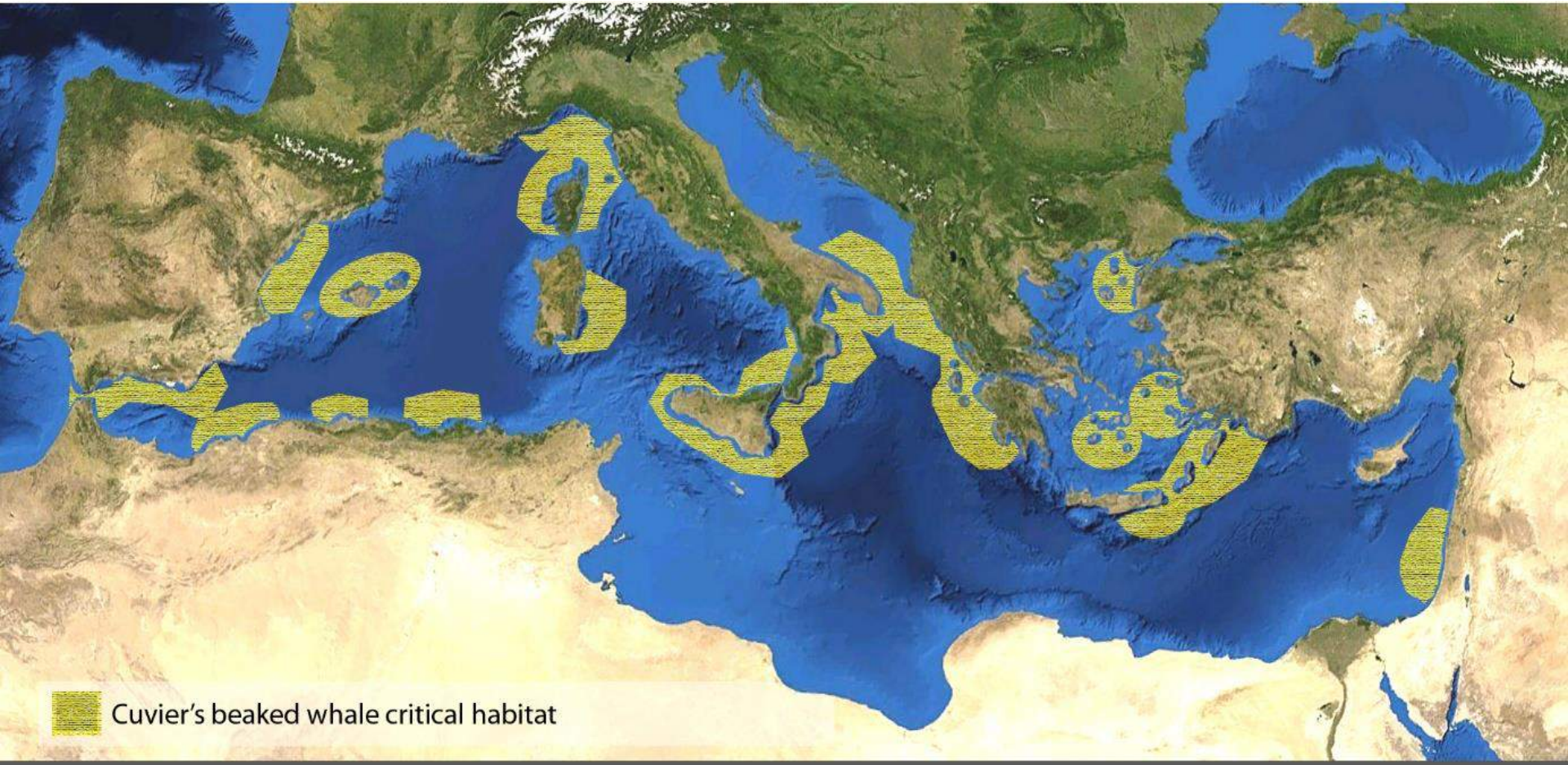

Map adapted from: Google Earth and Ana Cañadas/ACCOBAMS

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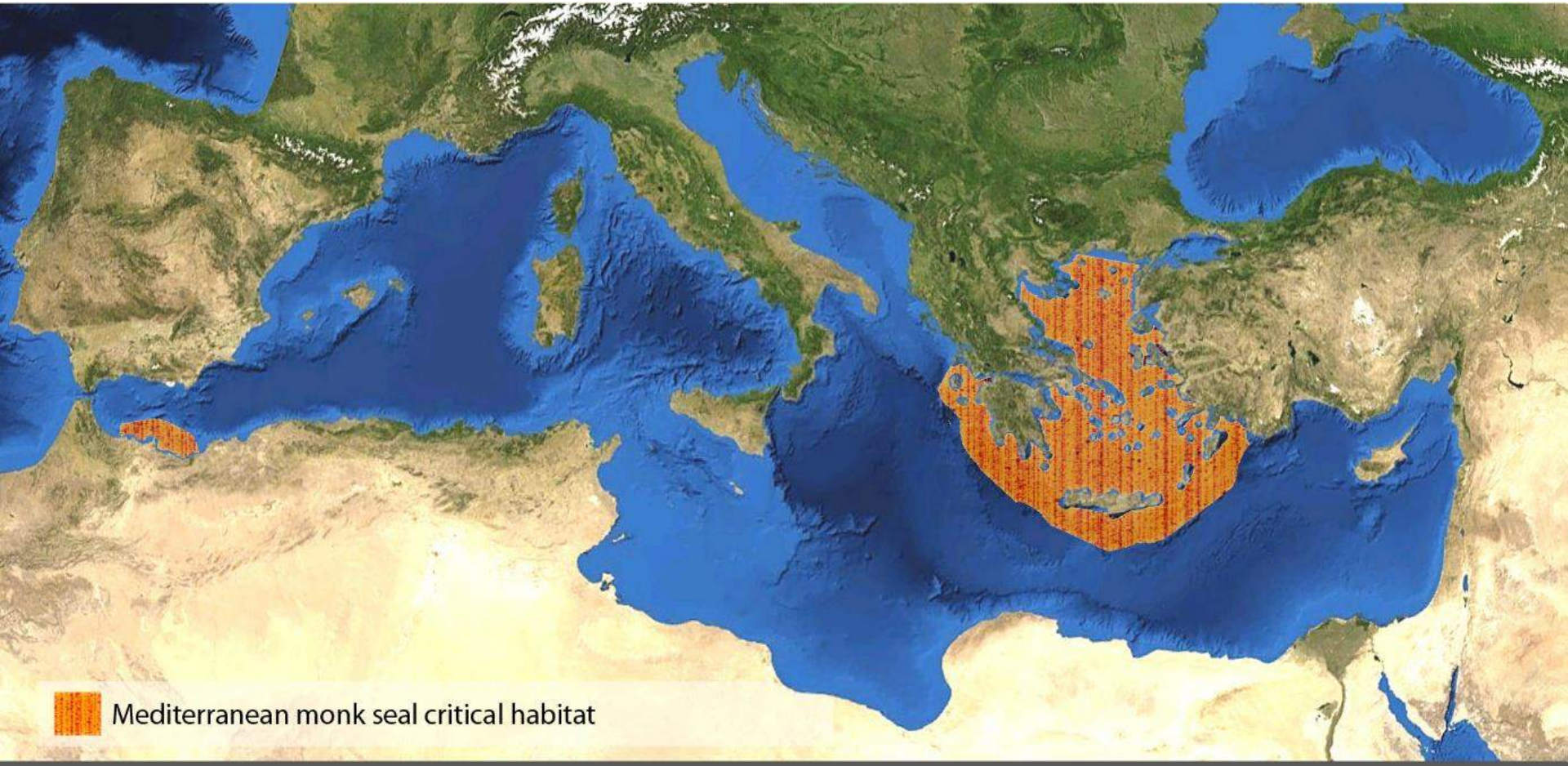

Map adapted from: Google Earth and Matthias Schnellmann/ The Monachus Guardian, 2006

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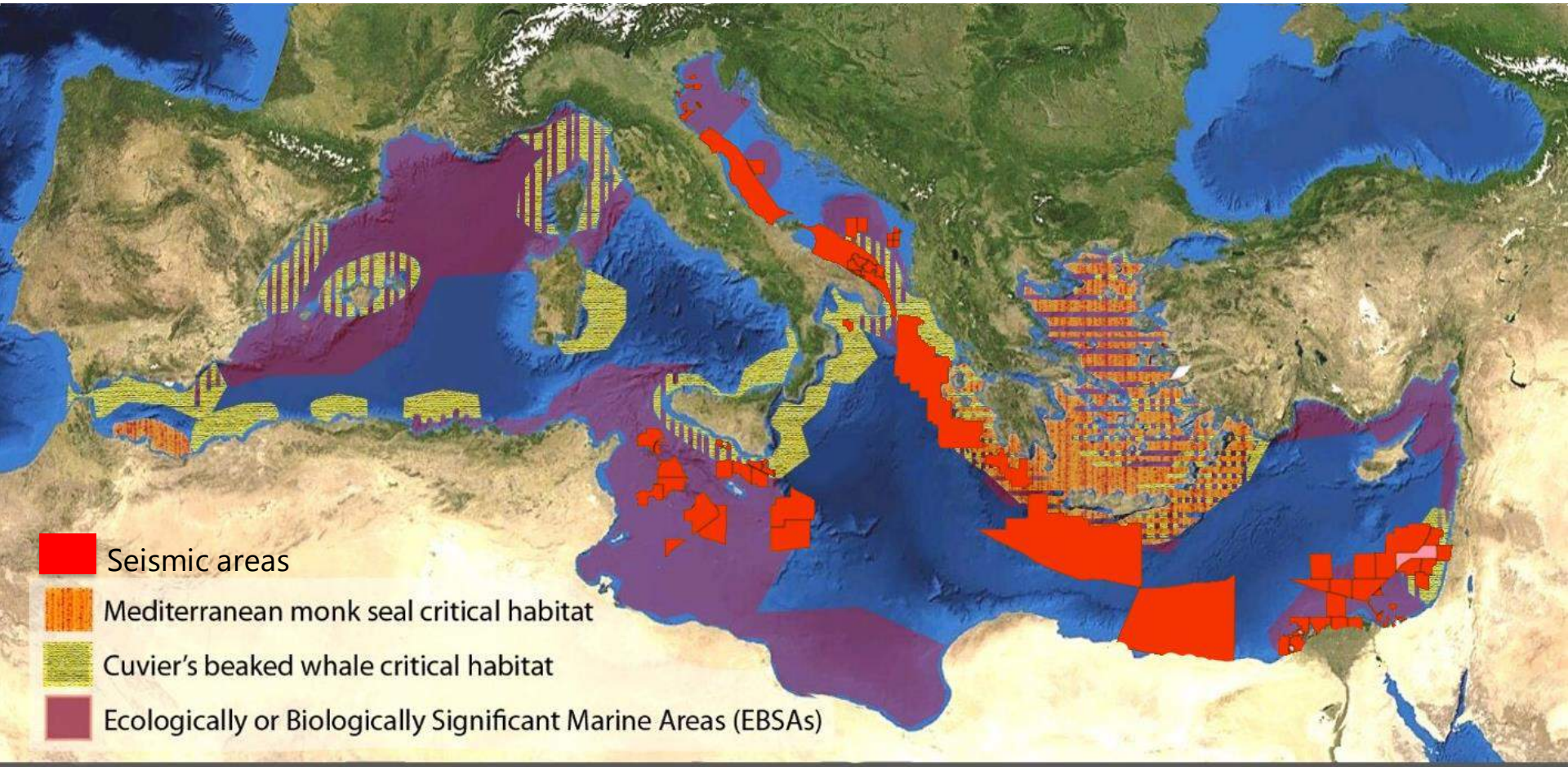

Map adapted from: Google Earth and Ana Cañadas/ACCOBAMS

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CAPACITY BUILDING WORKSHOP
November 22-23, 2017 in Split, Croatia

16 Recommendations, including 8.

Promote the development and mandate the use of best-available quieting technologies, such as *Marine Vibroseis*, **by means of regulatory pressure** and requiring operators to demonstrate they are not using sources that are more powerful than necessary and at unnecessary frequencies. This should be a **component of each EIA** … as detailed in the CMS Noise EIA Guidelines.

Exploration of oil & gas resources: seismic surveys

- Reduce source level better than any visual mitigation
- Apply time area closures
- Avoid duplication and improve transboundary consultation
- Apply CMS EIA Guidelines
- Apply BAT & BEP (Marine Vibroseis (MV) likely best alternative to seismic airgun)

Some progress made in relation to Pile driving

E.g. Germany's noise reduction concept

Approach:

→ Imposing noise reduction & mitigation measures: e.g. bubble curtains, soft-start, etc.

→ Setting threshold value (160 dB / 190 dB peak)

→ Imposing requirement to apply best available technology

MSFD: Programme of Measures (PoMs)

Focus on Monitoring.

Implementation of the Noise Registry:
→ major differences between the RSCs
→ used as monitoring rather than management tool

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CORE RECOMMENDATIONS

- Promote the development & mandate the use of **best available technologies** by means of regulatory pressure and requiring operators to demonstrate they are not using sources that are more powerful than necessary and at unnecessary frequencies.
- Apply and consequently transpose **CMS EIA Noise Guidelines** into domestic legislation
- Establish **Quiet Zones** & apply **Time Area closures** as appropriate
- **Noise Register** shall be used as management tool, considering potential cumulative or synergistic impacts, both from other noise and non-noise threats
- Adopt a **precautionary approach**

The Sustainable Fisheries Resolution (A/RES/68/71) of the United Nations General Assembly already encourages the Food and Agriculture Organization (FAO) to consider this issue closely, specifically it

> *'[e]ncourages further studies, including by the Food and Agricultural Organization of the United Nations, on the impacts of underwater noise on fish stocks and fishing catch rates, as well as associated socioeconomic effects'*

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