

Subgroup on actionable and climate informed ecosystem overviews

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Objectives

- Identify and rank short term risks associated with failing to achieve a set of high-level, putative ecosystem objectives
- Identify most relevant conflicts and opportunities/synergies between ecosystem objectives and main human pressures on marine ecosystems
- Inform sectors prioritisation for the identification of measurable indicators and operational objectives, and the development of ecosystem-level trade-offs analyses in ICES overviews



Putative high-level ecosystem objectives

Six main challenges framed as wider ecosystem objectives:

1. Climate change
2. Biodiversity
3. Sustainable food from the sea
4. Pollution
5. a more crowded marine space
6. human dimension



Putative high-level ecosystem objectives

Six main challenges framed as wider ecosystem objectives:

1. Climate change mitigation and adaptation
2. Biodiversity conservation and restoration
3. Sustainable seafood production
4. Pollution reduction
5. Managing competition for marine space
6. Human dimension: maintaining economic and social benefits from MES



Subgroup tasks

1. Score each ecosystem objective for short-term (2026-2030) impacts and likelihood of impact (perceived risks)
2. Identify potential conflicts (X) and opportunities or synergies (O) between pressure-objectives pairs
3. Discuss cases where the delivery of ecosystem/climate information in ecosystem services and effects advice is most pressing/required



Score each objective for perceived short-term (2026-2030) impact (magnitude) and likelihood of impact associated with failing to achieve the objective



Perceived risk	Climate change adaptation and mitigation	Biodiversity conservation and restoration	Sustainable seafood production	Pollution reduction	Managing competition for marine space	Human dimension: maintaining economic and social benefits from MES
Impact						
Likelihood						

Scoring: 1=Low, 2=Moderate, or 3=High

Note: Area-specific or regional considerations are deliberately avoided here. Scoring to consider the entire ICES Area
 MES = Marine ecosystem services

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High-level ecosystem objectives/ Main human pressures	Climate change adaptation and mitigation	Biodiversity conservation and restoration	Sustainable seafood production	Pollution reduction	Managing competition for marine space	Maintaining economic and social benefits from MES
Selective extraction of species (11)						
Intro. of contaminating compounds (9)						
Physical seabed disturbance (9)						
Marine litter (9)	Identify potential conflicts (x) and synergies/opportunities (o) for the different pressure-objective pairs					
Noise (5)						
Nutrient and organic enrichment (4)	The relative strength of potential conflicts/synergies can be indicated by adding several (X)(X) or (O)(O)(O)					
Intro. of non-indigenous species (NIS) (2)						
Collateral Mortality (2)						

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Collateral Mortality (2)						

Glossary of main human pressures in ICES ecoregions

(Source: ICES Ecosystem Overviews Technical Guidelines)



Table A2 Glossary of main human pressures in ICES ecoregions.

Pressure	Explanation and examples
Physical seabed disturbance*	Physical seabed disturbance can occur via abrasion (the scraping of the substrate), resuspension of the substrate (siltation), removal of the substrate, and deposition (smothering). The impacts associated with such disturbances include the biotic impacts linked to the physical action and include additional mortality through, for example, collisions with both bottom-contacting mobile and set fishing activities. Other activities such as aquaculture, tourism/recreation, coastal infrastructure, hydrodynamic dredging, shipping (anchoring), and cable burial may also contribute.
Introduction of contaminating compounds	Examples of this pressure include discharges from ships, hydrocarbon exploration and production, atmospheric deposition, and riverine inputs. Compounds of concern include: • For marine sediments the main transition elements and compounds of concern include arsenic, cadmium, chromium, copper, mercury, nickel, lead, and zinc. • Organometallic compounds such as tributyltin (TBT) and its derivatives can be highly persistent and even low levels of exposure can cause chronic toxicity. • Hydrocarbons, including polyaromatic hydrocarbons (PAH). • Priority substances listed in Annex II of Directive 2008/105/EC². • Synthetic compounds, including pesticides, antifoulants, and pharmaceuticals.
Introduction of non-indigenous species (NIS)	The direct or indirect introduction of NIS, e.g. Chinese mitten crab (<i>Eriocheir sinensis</i>), slipper limpet (<i>Crepidula fornicate</i>), and Pacific oyster (<i>Crassostrea gigas</i>) and their subsequent spreading and out-competing of native species. Ballast water and hull fouling can facilitate the spread of NIS. This pressure is also associated with aquaculture, translocation of organisms, and accidental releases.
Marine litter	Marine litter is any persistent, manufactured, or processed solid material that is discarded, disposed of, or abandoned in the marine and coastal environment. Marine litter consists of items that have been made or used by people and deliberately discarded or unintentionally lost into the sea and on beaches, including such materials transported into the marine environment from land by rivers, draining, or sewage systems, or by winds. For example, marine litter consists of: plastics, wood, metals, glass, rubber, clothing, paper, etc. Land-based sources of marine litter include tourism, sewage, and illegal or poorly managed landfills. Sea-based sources include shipping and fishing.
Noise	Underwater noise refers to sounds made by human activities that can temporarily or permanently interfere with or impair the ability of marine animals to hear natural sounds in the ocean. Noise may also cause physiological or behavioural effects. Human activities that cause ocean noise include marine traffic (shipping), recreational boating, fishing vessels, energy exploration, military sonar, and inshore and offshore infrastructures (construction and operations).

The following modifications (+ one addition) to this glossary were approved by ADGEO in 2025:

Selective extraction of species

The targeted commercial exploitation and capture of marine mammals, fish and shellfish stocks, including smaller-scale harvesting, recreational fishing, and scientific sampling. Ecological consequences can be seen in, for example, the sustainability of stocks, energy flows through foodwebs, and the size and age composition within fish stocks. This pressure does not include incidental bycatch associated with fishing activities

Physical seabed disturbance

Physical seabed disturbance can occur via abrasion (the scraping of the substrate), resuspension of the substrate (siltation), removal of the substrate, and deposition (smothering).. Other activities such as aquaculture, tourism/recreation, coastal infrastructure, hydrodynamic dredging, shipping (anchoring), and cable burial may also contribute.

Collateral mortality

Unintentional mortality resulting from human activities, including incidental bycatch in fisheries, collisions from trawling, ship strikes, and wind turbines, etc.

Light	Light pollution consists of artificial light that can alter animal behaviour. Light distracts and disorients seabirds, causing vessel collisions, injury, and mortality. It can also affect fish and zooplankton behaviour. The pressure is especially relevant for the Arctic with a high incidence of long periods of darkness and/or bad visibility (snow storm, fog). As more traffic occurs during darker months, the risk increases.
Nutrient and organic enrichment	Increased levels of nitrogen, phosphorus, silicon (and iron) in the marine environment compared to background concentrations. Human sources include wastewater, terrestrial/agricultural run-off, sewage discharges, aquaculture, and atmospheric deposition. Nutrient enrichment may lead to eutrophication (see also organic enrichment).
Selective extraction of species	The commercial exploitation and capture of marine mammals, fish and shellfish stocks, including smaller-scale harvesting, recreational fishing, and scientific sampling. Ecological consequences can be seen in, for example, the sustainability of stocks, energy flows through foodwebs, and the size and age composition within fish stocks. This pressure includes bycatch associated with fishing activities.



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