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<b>Document title</b>	Seafloor integrity and by-catch in the HELCOM ACTION Project
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## Background

The [HELCOM ACTION Project](#) is an EU co-funded project for which HELCOM is the coordinator. The project works closely with the HELCOM Sufficiency of Measures Platform (SOM Platform), and two topics on which the ACTION project will focus are by-catch and impacts on the seafloor (separate Work Packages, WPs). The by-catch WP will focus on identifying areas of high risk, evaluate technical measures to reduce by-catch of harbour porpoise and estimate the cost and effectiveness of the measures. The impacts on the seafloor WP will look at pressures and activities on the seafloor and focus on aspects related to spatial regulation of offshore fisheries (utilizing the DISPLACE model) and restoration measures in coastal areas, including effects on benthic communities and the cost of measures. Furthermore, the two WPs will also cooperate to assess the impact of spatial fisheries closures on by-catch.

The two topics are briefly introduced in the document below, and the inception report, the outcome of the project partner kick of meeting, in which methods and plans for the work for each WP is available at [this link](#).

## Action requested

The Meeting is invited to:

- take note of the information provided;
- provide suggestions on additional scenarios that could be tested using the model used.

## The HELCOM ACTION Project



The [HELCOM ACTION Project](#) is an EU co-funded project for which HELCOM is the coordinator. Two work packages (WPs) in the project focus on by-catch and impacts on the seabed, respectively. The by-catch WP will focus on identifying areas of high risk, evaluate technical measures to reduce by-catch of harbour porpoise, and estimate the cost and effectiveness of the measures. The impacts on the seafloor WP will look at pressures and activities on the seafloor and focus on aspects related to spatial regulation of offshore fisheries (utilising the DISPLACE model) and restoration measures in coastal areas, including effects on benthic communities and the cost of measures. Furthermore, the two WPs will also cooperate to assess the impact of spatial fisheries closures on by-catch.

The outcome of the project partner kick off meeting, in the form of the inception report, in which methods and plans for the work for each WP is available at [this link](#).

### WP1 By-catch

By-catch of marine mammals and seabirds have been documented in many gillnet fisheries. By-catch is regarded as a major anthropogenic impact. This work package (WP1) will identify high-risk areas for by-catch of marine mammals and birds, currently focussing on the southwestern Baltic Sea area (i.e. covering German, Swedish and Danish fisheries). Furthermore the effects and costs for the implementation of measures to reduce by-catch will be evaluated, including gear modifications and gear use restrictions.

### WP2 Brief overview of the DISPLACE model and its application

The impacts on the seafloor WP will look at pressures and activities on the seafloor and focus on aspects related to spatial regulation of offshore fisheries (utilizing the DISPLACE model) and restoration measures in coastal areas, including effects on benthic communities and the cost of measures.

DISPLACE ([www.displace-project.org](http://www.displace-project.org)) is an impact evaluation platform developed to support marine spatial planning (MSP) and marine fisheries-related management issues through an underlying agent-based simulation model (Bastardie *et al.* 2014, 2015, 2017). The model primarily simulates individual fishing agents as a function of individual incentives and the spatial availability of fisheries' resource, and further projects scenarios of alternative harvest control rules with the consequent time and space redistribution of fishing effort. It allows a detailed evaluation of the fisher's decision-making process when confronted to particular management measures, together with evaluating the economic viability related to these policy decisions constrained by the conditions of the underlying harvested stocks. The benefit of the approach is to helping predicting the most likely displacement of the fishing pressure in reaction to measures and changes in stock distributions, within the space of possibilities that make economic sense to the fisheries, and therefore anticipate the effects on the Common Fisheries policy (CFP) and the Marine Strategy Framework Directive (MSFD) related estimates and indicators. Informing the modelling platform with existing monitoring systems is used to benchmark the effectiveness of alternative management measures and spatial plans affecting fisheries, and pressuring other ecosystem components (e.g. link to WP1 bycatch). The model is designed so that other human activities than fishing and creating pressure on the seafloor such as shipping lanes can also accumulate to the impact.

Within HELCOM ACTION WP2 (Impacts on the seabed), this benchmarking should support the identification of areas most suitable for implementing spatial fishery regulations. Analysis of where fishing effort distributes shows that the effort typically concentrate on the same areas (fishing grounds) while low but potentially highly impacting effort could apply on their margins. To reduce the impact on the Baltic seafloor, spatial management scenarios can be investigated that would limit the extent of current fishing grounds especially from their margins. Instead of just removing effort, such measures might create some concentration of fishing effort on the remaining narrowed opened areas that may or may not offset the benefit obtained from released pressure on conservation areas. Unfortunately, if the net effect is negative, it will move the system

further away from Good Environmental Status (GES). Hence, the relationships between benthos state (e.g. expressed as the ratio of measured benthos abundance over a carrying capacity) and the reduction in fishing pressure will be investigated by testing a gradient of effort cut and make sure the effort cut is followed by a reduction in impact on the sea floor.

The investigation under WP2 should further report on the cost and effect of mitigating or displacing the fishing pressure in the Baltic Sea, also including economic distributional effects, information of direct relevance to WP6. Consistent with the MSFD (Art. 13.3) we should conduct impact assessment for concerns on social and economic effect for setting/testing environmental targets, anticipate the socio-economic effects of choosing targets and alternative pathways to achieve GES, while GES being achieved might sometimes have adverse effects on some economic components. Anticipating these aspects should help informing the policy makers about the impacted stakeholders and prepare facilitation for acceptance/compliance to the identified measures most likely to close the gap towards GES. The aim is to contribute integrating to the transboundary context for consistent and coordinated measures across the Baltic subregions. By testing and analyzing the effectiveness of measures and by identifying potential new measures, the project is expected to contribute directly to the update of the HELCOM BSAP and the implementation and tentative update of MSFD Programs of Measures in the Baltic Sea for countries being EU Member States. There is a need for “greater coherence with related EU legislation, in particular the Habitats and Birds Directives (92/43/EEC and 2009/147/EC) and the Water Framework Directive (2000/60/EC), and for more coherent and coordinated approaches within and between marine regions and subregions” and Article 11(1) in particular creates a direct link from the CFP to the MSFD.

Bastardie, F.; Angelini, S.; Bolognini, L.; Fuga, F.; Manfredi, C.; Martinelli, M.; Nielsen, J.R.; Santojanni, A.; Scarcella, G.; Grati, F. 2017. Spatial planning for fisheries in the Northern Adriatic: working toward viable and sustainable fishing. *Ecosphere*, 8: e01696.

Bastardie, F.; Nielsen, J. R.; Eigaard, O.R.; Fock, H.O.; Jonsson, P.; Bartolino, V. 2015. Competition for marine space: modelling the Baltic Sea fisheries and effort displacement under spatial restrictions. *ICES Journal of Marine science*, 72: 824-840.

Bastardie, F.; Nielsen, J. R.; Miethe, T. 2014. DISPLACE: a dynamic, individual-based model for spatial fishing planning and effort displacement – integrating underlying fish population models. *Canadian Journal of Fisheries and Aquatic Sciences*, 71: 366-386.