Baltic Marine Environment Protection Commission

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Background

The HELCOM working groups HELCOM Pressure and HELCOM State & Conservation have expressed the importance of communicating the expected time-lag of status core indicators to the implementation of measures to reduce pressures relevant to the indicator. HELCOM STATE 1-2014 supported in principle the proposal by the CORESET II Project Manager to communicate response time using a three step descriptive approach in a similar way as confidence. The meeting agreed that the CORESET II project is to develop an approach to communicating the time-lag issue and include this into the indicator reports.

The GES/sub-GES status of an assessment unit will not change directly once a measure is put in place, and the expected lag in a changing status will vary between the different status indictors. HELCOM core indicators currently constitute mainly status core indicators with a small number of pressure core indicators being developed. In the future indicators on response in the form of implemented measures may also be developed. The indicators are conceptually linked though the DPSIR-framework.

This document presents options, for communicating purposes, on describing the time-lag between a change in status and an implemented measure for status core indicators as a basis for discussion.

Action required

The meeting is invited to consider the proposed three-step approach to communicating response time and test the approach on the indicators under discussion.

Communicating time-lag in status core indicators to implemented measures

When measures are implemented to improve the status of the environment, it will take some time before an improvement in the status can be expected to take place. Identifying and describing this time-lag requires identification of the key pressures affecting the status as well as the turn-over time of the species/community in question or time-scale of the ecological- or chemical process the indicator evaluates.

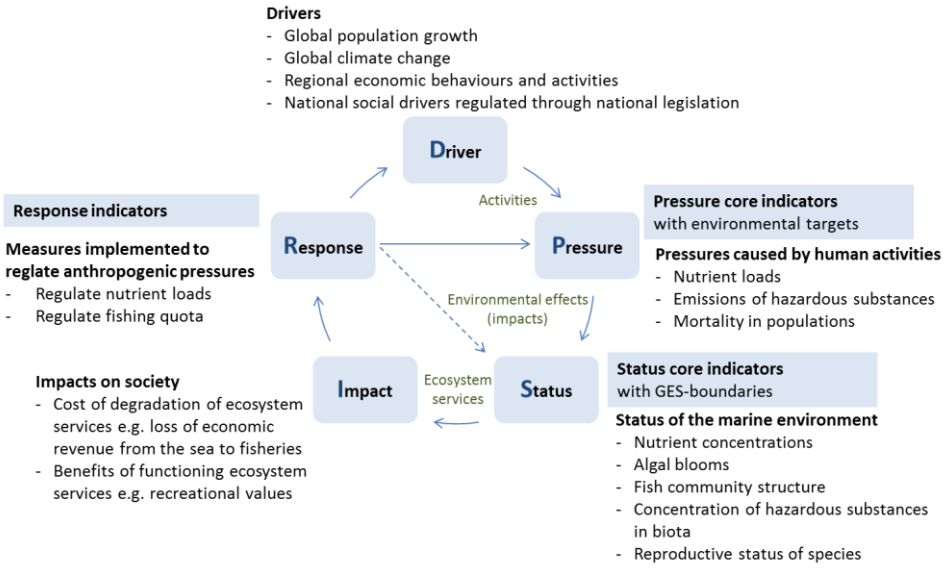

Figure 1. HELCOM core indicators as they are currently structured in the DPSIR-framework. Included to illustrate the relationship between status core indicators (Status) and measures (Response)

The time-lag of any status indicator to implemented measures is also dependent on the lag of the actual reduction of a pressure. The time-lag will vary due to a large number of natural causes, especially between the status and the pressure. The aim of informing on the expected time-lag is thus NOT to give an exact estimation of how quickly a status will change. Instead the aim is to communicate to the general public a general understanding of how quickly the status can be expected to change, an 'order of magnitude' of sorts, also showing that the current set of status indicators are expected to respond differently.

A **small** time-lag could be expected in indicators based on communities with fast turn-over rates, examples could include the plankton community indicators that can react quickly to changes in e.g. overall eutrophication, also noise pressure levels can be expected to decline fast once measures are implemented.

An **intermediate** time-lag could be expected in indicators where the ecological- or chemical process takes some years to respond, examples include the fish communities and possibly mammal populations where a change in population size is determined by generation time of the species.

A **large** time-lag could be expected in indicators based on slow chemical processes, such as radioactivity where the natural half-life of radionucleids will bring about a status change only slowly after completed measures that have reduced the emissions.

The expected time-lag of status core indicators could be presented as a box/table or as part of the over-all descriptive text on the key message front page in relation to the relevant pressures.

Option 1 – describe inherent qualities of the process the indicator is based on

The status core indicators are structured around a variety of ecological and chemical processes that are quite well known. The temporal scale at which these processes occur are also known, at least on a rough scale. The time-lag in a status change could thus be described through the known speed at which the process operates that the indicator is built on.

The time-lag could be communicated as **inertia** where the inherent qualities of the ecological- or chemical process is described

1. **Low inertia**; annual changes to the status possible as the turn-over rate in a community is fast
2. **Intermediate inertia**; status changes expected after ~6 years (BSAP and MSFD relevant cycle)
3. **High inertia**; the status is not easily shifted from the current status and shifts are expected to be slow

Other terms than inertia could be used, e.g. slowness/resistance/ecological stability/constancy

Pros: Assigning the indicator to one of three categories is only dependent on the status indicator itself and does not have to cover in full the network of interactions with all possible relevant pressures and measures that can be implemented to affect those pressures.

Cons: The approach does not reflect the relationship between the status indictor and the relevant pressures and measures (in many indictors this relationship is currently not likely to be sufficiently known).

Option 2 – describe status-pressure-response relationship

Time-lag could be presented as ***response time*** with three options where the response of a status indicator to a decreasing pressure due to an implemented measure is qualitatively described;

1. **Fast response**; annual changes possible after completed management action on the relevant pressure
2. **Intermediate response**; status changes expected after ~6 years (BSAP and MSFD relevant cycle) after management actions have been taken on the relevant pressures
3. **Slow response**; decadal scale, even after management actions have been taken and the pressure is very much reduced a much delayed response in the status is expected

The term ‘response’ might become confused with the use of ‘Response’ in the DPSIR framework as being related specifically to measures, not status, so it might be appropriate to consider a different term.

Pros: The concept is relatively easy to understand and communicate, and the output is clearly of relevance to managers.

Cons: For this approach to be accurately applied to an indicator a very good understanding of the relative effect all pressure has on the status must be well known and the response of the status must be described both to specific pressures and measures implemented on those measures. A status is generally affected by several pressures, and one pressure may in addition be affected by several different measures.