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| Document title | Status of development of HELCOM core indicators |
| Code | 3-4 |
| Category | CMNT |
| Agenda Item | 3- Activities of relevant HELCOM projects or processes |
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| Submitted by | Secretariat |

Background

The development of pre-core and candidate indicators continues through the Lead Country approach agreed at HOD 48-2015. Contracting Parties were invited to inform the Secretariat on their possibility to take the Lead or co-lead in the indicator development (para 3.64). The most recent update on representatives Lead and co-Lead countries is included as Attachment 1 to this document. Offers to Lead the development is missing for some indicators, in particular for benthic, phytoplankton and hazardous substance indicators. Representatives of Co-Lead Countries have highlighted that the lack of Lead Country severely hampers the further development of the indicators and due to the lack of a dedicated lead the indicators may not be ready in 2016.

HOD 48-2015 furthermore agreed that the indicator development should be taken forward using HELCOM expert groups, projects and networks as a platform for the development of the indicators. The request for HELCOM bodies to prioritize their role as platform for development of indicators and as support for HELCOM assessments and to make arrangements for the work as necessary (para 3.54), has been taken up by the annual meetings of the relevant expert bodies and also resulted in the revision of terms of reference for e.g. the intersessional expert network on benthic habitat monitoring. Reports from HELCOM expert bodies were presented to STATE & CONSERVATION 4-2016 ([SEAL EG document 4J-2](#), [FISH-PRO II document 4J-3](#), [ZEN-ZIIM document 4J-4](#), [JWG Bird document 4J-5](#), [hazardous substance EN document 4J-6](#), [eutrophication EN document 4J-14](#), [benthic EN document 4J-16](#)).

This document summarizes the status of adoption of indicators and associated GES boundaries and the evaluation by Lead and Co-Lead Countries and relevant expert meetings on whether the pre-core and candidate indicators are anticipated to be finalized for adoption in 2016 and ready for use in HOLAS II. Plans for further development work during 2016 received from Lead Countries are available in [document 4J-15](#), State and Conservation 5-2016.

Action requested

The Meeting is invited to:

- take note on the status of adoption of GES boundaries and remaining study reservations,
- take note of the progress of development of pre-core and candidate indicators and their anticipated availability for HOLAS II,
- consider the need to prioritize work by Lead and co-Lead countries to finalize indicators during 2016.

Status of adoption of core indicators

The status of adoption of core indicators and associated GES boundaries is indicated in Tables 1a-d. The following background applies:

- HOD 39-2012 agreed on targets for five eutrophication core indicators (Outcome, para 2.20).
- HOD 48-2015, taking note of study reservations by Denmark and Germany, agreed on GES boundaries for 19 additional core indicators and on the further development of the set of indicators as indicated in Annex 4 of the Outcome of HOD 48-2015, including their use in HOLAS II assessment according to the recommendation by the Gear Group, and the publication of agreed core indicator reports at the HELCOM website as they become ready for publishing (Outcome para 3.63). At present 10 core indicators reports have been published on the [HELCOM website](#).
- At HOD 49-2015 Denmark lifted the study reservation on GES boundaries for the core indicators on 'Abundance of waterbirds in the wintering season', 'Abundance of waterbirds in the breeding season', 'Hexabromocyclododecane (HBCDD)', 'Perfluorooctane sulphonate (PFOS)', 'Polybrominated Diphenyl Ethers (PBDE)', 'Metals (Cd, Pb, Hg)' and 'Radioactive substances'.(para 4.125).
- HOD 49-2015 adopted the core pressure indicator on oil spills affecting the marine environment, pending the confirmation by Germany by end of the year (para 4-93).
- State and Conservation 4-2016, taking note of the study reservation by Germany, endorsed the GES boundaries for 'Polychlorinated biphenyls (PCB) and dioxin and furan', 'Polycyclic aromatic hydrocarbons (PAH) and their metabolites', 'TBT and imposex' and the proposed revision of GES boundaries for Cd and Pb in offshore assessment units. The GES-boundaries will be submitted for endorsement at HOD 50-2016.
- At State and Conservation 4-2016, Finland lifted the study reservation on the GES definition for the distribution of ringed seals (para 4J.12).

Germany has in addition to the general study reservation on GES boundaries for core indicators also specific study reservations on some indicators (State and Conservation 2-2015). Only the specific German study reservations are indicated in Table 1a.

The status of GES agreement in Table 1 a-d reflects the current status of adoption. Expert level proposals exist for several indicators listed as 'Not presented for endorsement', however these values have not yet been presented for consideration by HELCOM subsidiary bodies.

Status pre-core and candidate core indicators for use in HOLAS II

HOLAS II 4-2015 requested that the stage of development of the pre-core and candidate indicators should be clarified and that an evaluation should be made to indicate which indicators are likely to be ready, with GES-boundaries or comparable GES assessment criteria, for use in HOLAS II.

A summary of the status pre-core and candidate indicators in relation to anticipated use in HOLAS II is included in Tables 1 c and 1 d. For most of them, GES proposals are still under development. Their use in thematic assessments of HOLAS II is dependent on their endorsement by relevant HELCOM working group meetings, mainly STATE & CONSERVATION 5-2016 (7-11 November 2016), including the associated GES-boundaries or comparable GES assessment criteria, and adoption by HOD in December 2016.

Based on this evaluation by Lead Countries, Figure 1 shows the number of indicators anticipated to be available for use in HOLAS II. It includes only those pre-core and candidate indicators that have been indicated as being ready for use in HOLAS II (i.e. indicated with "YES" Table 1a-d). It should be noted that while indicators with GES boundaries or targets may not be available for all descriptors (at this time for marine litter and seafloor integrity), the topics will still be possible to address in HOLAS II e.g. through information on current levels or trends.

Status of adoption GES boundaries and development of indicators for use in HOLAS II.

Table 1 a. Status of core indicators. "Use in HOLAS II" indicates the evaluated status by end of 2016 by Lead Countries.

| Abbreviated name | Full indicator name | Lead Country | Status of GES agreement | Use in HOLAS II |
|--------------------|---|--------------------------|---|------------------|
| BIRDS ABUND BREED | Abundance of waterbirds in the breeding season | DE | Adopted | YES |
| BIRDS ABUND WINTER | Abundance of waterbirds in the wintering season | DE | Adopted | YES |
| EUTRO CHLA | Average chlorophyll-a concentration in the surface (0 – 10 m) during summer | Operational | Adopted | YES |
| EUTRO CLARITY | Average Secchi depth during summer | Operational | Adopted | YES |
| EUTRO DIN | Average DIN concentration in the surface (0 – 10 m) during winter | Operational | Adopted | YES |
| EUTRO DIP | Average DIP concentration in the surface (0 – 10 m) during winter | Operational | Adopted | YES |
| EUTRO OX DEPT | Oxygen debt | Operational ¹ | Adopted | YES |
| FISH COAST FUNC | Abundance of coastal fish key functional groups | SE | Adopted, remaining DE and DK study reservation | YES ² |
| FISH COAST KEY | Abundance of key coastal fish species | SE | Adopted; remaining DE and DK study reservation | YES ³ |
| FISH LFI | Proportion of large fish in the community | SE | GES proposal exists, final adjustments being discussed to reach expert consensus expert agreement pending | YES |
| FISH SALMON REPR | Abundance of salmon spawners and smolt | FI | Adopted, remaining DK study reservation | YES |
| FISH SEATROUT REPR | Abundance of sea trout spawners and parr | FI | Adopted, remaining DK study reservation | YES |
| HAZ EAGLE REPR | White-tailed eagle productivity | SE | Adopted, remaining DK study reservation | YES |
| HAZ HBCDD | Hexabromocyclododecane (HBCDD) | Co-Leads | Adopted | YES |

¹ Required re-coding of the indicator to the data arrangement of eutrophication assessment will be carried out in EUTRO-EXTENDED

² Survey based monitoring is currently not carried on in DE and DK

³ Survey based monitoring is currently not carried on in DE and DK

| Abbreviated name | Full indicator name | Lead Country | Status of GES agreement | Use in HOLAS II |
|-----------------------|---|-----------------|--|------------------|
| HAZ METALS | Metals | PL | Adopted, revised GES proposal for Cd and Pb endorsed by S&C 4-2016 | YES |
| HAZ PAH | Polyaromatic hydrocarbons (PAH) and their metabolites | DE | GES proposal endorsed by S&C 4-2016 | YES |
| HAZ PBDE | Polybrominated biphenyl ethers (PBDE) | <i>Co-Leads</i> | Adopted | YES |
| HAZ PCB | Polychlorinated biphenyls (PCB) and dioxins and furans | <i>Co-Leads</i> | GES proposal endorsed by S&C 4-2016 | YES |
| HAZ PFOS | Perfluorooctane sulphonate (PFOS) | <i>Co-Leads</i> | Adopted | YES |
| HAZ RAD | Radioactive substances: Cesium-137 in fish and surface waters | PL | Adopted | YES |
| HAZ TBT IMPO | TBT and imposex | SE | GES proposal endorsed by S&C 4-2016 | YES |
| NIS ARRIVAL | Trends in arrival of new non-indigenous species | FI | Adopted | YES |
| PELA ZOOPLANKTON | Zooplankton mean size and total stock | SE | Adopted | YES ⁴ |
| BENTHIC BQI | State of the soft-bottom macrofauna community, offshore | <i>Co-Leads</i> | Not presented for endorsement | YES |
| BENTHIC POP STRUCTURE | Population structure of long-lived macrozoobenthic species | <i>Co-Leads</i> | Not presented for endorsement | NO |
| SEALS DISTR | Distribution of Baltic seals | <i>Co-Leads</i> | Adopted; remaining DE and DK study reservation | YES |
| SEALS POP | Population trends and abundance of seals | SE | Adopted; remaining DE and DK study reservation | YES |
| SEALS NUTRITION | Nutritional status of marine mammals | SE | Adopted; remaining DE and DK study reservation | YES |
| SEALS REPR | Reproductive status of marine mammals | SE | Adopted; remaining DE and DK study reservation | YES |

⁴ Principles for defining GES agreed but GES calculations have not been carried out in all sub-basins.

Table 1 b. Status of pressure core indicators. “Use in HOLAS II” indicates the evaluated status by end of 2016 by Lead Countries.

| Abbreviated name | Full indicator name | Lead Country | Status of agreement on target | Use in HOLAS II |
|------------------|--|--------------|---|-------------------------|
| BYCATCH | Number of drowned mammals and waterbirds in fishing gear | DE | Target concept adopted, due to lack of data no quantitative boundary proposed | YES - but not vs target |
| OIL SPILLS | Oil-spills affecting the marine environment | IWGAS | Adopted | YES |
| EUTRO MAI | Actual inputs of nitrogen and phosphorous to the basins | Operational | Adopted | YES |

Table 1c. Status of pre-core indicators. Table 1 a. “Use in HOLAS II” indicates the evaluation by Lead Countries. Use in HOLAS II requires the adoption of the indicators as core indicators with associated GES-boundaries by HOD in December 2016.

| Abbreviated name | Full indicator name | Lead Country | Status of GES agreement | Use in HOLAS II |
|------------------------|--|--------------|--|--|
| BENTHIC DISTR BIOTOPES | Distribution, pattern and extent of benthic biotopes | EE | Not presented for endorsement | YES -in some form, possibly not full evaluation |
| SEAFLOOR CUM IMPACT | Cumulative impact on benthic habitats | Co-Leads | Not presented for endorsement | TENTATIVELY – the required assessment scale is not determined and thus it is not clear if the concept can be developed in time |
| BENTHIC VEG DEPTH | Lower depth limit distribution of the macrophyte community | Co-Leads | Not presented for endorsement | NO – State and Conservation 2-2015 advised that WFD assessments for comparable indicators should be used in HOLAS II |
| PELA SEASON SUCC | Seasonal succession of functional phytoplankton groups | EE | Not presented for endorsement | YES |
| PELA DIATOM DINOS | Diatoms/dinoflagellates index | Co-Leads | Not presented for endorsement | NO – no Lead Country |
| HAZ DFC | Diclofenac concentration | Co-Leads | Not presented for endorsement (proposed EQS exists COM (2011) 876 Final) | NO – data not sufficient to support evaluation |
| HAZ ESTRO | Estrogenic-like chemicals and effects | SE | Not presented for endorsement | NO – data not sufficient to support evaluation |

| Abbreviated name | Full indicator name | Lead Country | Status of GES agreement | Use in HOLAS II |
|-----------------------|--|-----------------|--|---|
| HAZ BIOEFF ACI | Acetylcholinesterase inhibition | - | Not presented for endorsement | NO – No Lead- Country nor co-lead country |
| HAZ EFF LMS | Lysosomal membrane stability (LMS) | <i>Co-Leads</i> | Not presented for endorsement | YES – in some form, data might not be available from the whole Baltic Sea |
| HAZ EFF AMP EELP REPR | Reproductive disorders: malformed eelpout and amphipod embryos | <i>Co-Leads</i> | Proposal presented to S&C 2-2015, further development needed | YES – in some form, data might not be available from the whole Baltic Sea |
| HAZ EFF FISH DISEASE | Fish disease Index | <i>Co-Leads</i> | Not presented for endorsement | NO – No Lead Country |
| HAZ EFF GENOTOX | Micronucleus test | <i>Co-Leads</i> | Not presented for endorsement | NO – No Lead Country |
| LITTER BEACH | Beach litter | PL | Not presented for endorsement | TENTATIVELY - GES-boundary might not be in place but available data will be presented in some form. |
| NOISE CONTINUOUS | Continuous low frequency anthropogenic sound | PL | Not presented for endorsement | YES |
| EUTRO NTOT | Total nitrogen concentration | DE | Not presented for endorsement | TENTATIVELY - pending GES target modelling/availability |
| EUTRO PTOT | Total phosphorous concentration | DE | Not presented for endorsement | TENTATIVELY - pending GES target modelling/availability |
| EUTRO CSA | Cyanobacterial surface accumulations | FI | Not presented for endorsement | YES - by EUTRO-OPER EXTENDED |
| EUTRO SPRING BLOOM | Phytoplankton spring bloom intensity based on chl-a | FI | Not presented for endorsement | TENTATIVELY - pending GES target modelling/availability |

Table 1d. Status of candidate indicators. “Use in HOLAS II” indicates the evaluation by Lead Countries. Use in HOLAS II requires the adoption of the indicators as core indicators with associated GES-boundaries by HOD in December 2016.

| Abbreviated name | Full indicator name | Lead Country | Status of agreement on GES | Use in HOLAS II |
|----------------------------|--|-----------------|-------------------------------|--|
| NOISE IMPULSIVE | Distribution in time and space of loud low- and mid-frequency impulsive sounds | DE | Not presented for endorsement | YES |
| CETACEAN HARBOUR PORP DIST | Harbour porpoise distribution and abundance | - | Not presented for endorsement | NO |
| BENTHIC VEG RATIO | Biomass ratio of opportunistic and perennial macroalgae | EE | Not presented for endorsement | TENTATIVELY – testing done by June to conclude on continued development |
| FISH LMAX | Maximum length fish in the pelagic community | SE | Not presented for endorsement | TENTATIVELY – concept available, data for testing in other than SE EEZ unclear |
| PELA PHYTO COMM | Phytoplankton community composition as a food web indicator | FI | Not presented for endorsement | YES |
| PELA PHYTO CLUSTER | Phytoplankton species assemblage clusters based on environmental factors | <i>Co-leads</i> | Not presented for endorsement | NO – no Lead Country, not prioritized by State and Conservation 2-2015 |
| HAZ EFF EROD | EROD activity | SE | Not presented for endorsement | TENTATIVELY – data availability for testing currently restricted to SE data |
| LITTER SEAFLOOR | Litter on the seafloor | <i>Co-leads</i> | Not presented for endorsement | NO |
| LITTER MICRO WATER | Microlitter in the watercolumn | FI | Not presented for endorsement | NO |
| NOISE IMPULSIVE | Distribution in time and space of loud low- and mid-frequency impulsive sounds | DE | Not presented for endorsement | YES |
| EUTRO SHALLOW OX | Shallow-water bottom oxygen | DE | Not presented for endorsement | YES - by EUTRO-OPER EXTENDED |
| EUTRO DEEP OX | Deep-water oxygen consumption | SE | Not presented for endorsement | TENTATIVELY - pending concept, assessment protocol, GES boundary |

Other

| Abbreviated name | Full indicator name | Lead | Status of agreement on GES | Use in HOLAS II |
|------------------|---------------------|------|---|-----------------|
| COMM FISH 3.1 | D3.1 FISHING | ICES | To be agreed by ICES Advisory Committee | YES |
| COMM FISH 3.2 | D3.2 FISH | ICES | To be agreed by ICES Advisory Committee | YES |

Figure 1. Minimum anticipated indicators for use in HOLAS II, based on the agreed core indicators and information from Tables 1b-1d. Indicators in bold are pre-core and candidate core indicators under development towards approval during 2016. List of abbreviations and full names of indicators is provided in Table 1a-d.

| | | | | |
|---|---|---|---|---|
| D2 Non indigenous species | Birds | Mammals | Fish | D8 Contaminants |
| NIS ARRIVAL (C-GES) | BIRDS ABUND BREED (C-GES) BIRDS ABUND WINTER (C-GES) | SEALS DISTR (C-GES) SEALS POP (C-GES) MAMMALS NUTRITION (C-GES) MAMMALS REPR (C-GES) | FISH COAST FUNCT (C-GES) FISH COAST KEY SP (C-GES) FISH SALMON REPR (C-GES) FISH SEATROUT REPR (C-GES) FISH LFI (C) <i>Expected: COMM FISH 3.2 (ICES- GES)</i> | HAZ HBCDD (C-GES) HAZ METALS (C-GES) HAZ PBDE (C-GES) HAZ PFOS (C-GES) HAZ RAD (C-GES) HAZ EAGLE REPR (C-GES) HAZ PCB (C)* HAZ PAH (C)* HAZ TBT IMPO (C)* HAZ EFF LMS (PC) HAZ EFF AMP EELP REPR (PC) |
| D3 Commercial fish | Benthic habitats | Pelagic habitats | Food webs | *GES endorsed by State and Conservation 4-2016 |
| <i>Expected: COMM FISH 3.1 (ICES-GES)</i> | BENTHIC BQI (C) BENTHIC DISTR BIOTOPES (PC) | PELA ZOOPLANKTON (C-GES) PELA SEASON SUCC (PC) | PELA PHYTO COMM (Cand) | |
| D5 Eutrophication | D6 Seafloor integrity | D10 Marine litter | D11 Energy and noise | Annex III pressure |
| EUTRO DIN (C-GES) EUTRO DIP (C-GES) EUTRO CHLA (C-GES) EUTRO CLARITY (C-GES) EUTRO OX DEBT (C-GES) EUTRO CSA (PC) EUTRO SHALLOW OX (Cand) | - <i>If indicator with GES is not available for HOLAS II, the BSII can provide information on impact and loss of extent.</i> | - <i>If indicator with GES is not available for HOLAS II, existing data on beach litter can be presented as a minimum.</i> | NOISE CONTINUOUS (PC) NOISE IMPULSIVE (Cand) | EUTRO MAI (C-Target) INCIDENTAL CATCH (C) OIL SPILLS (C-Target) |

Attachment 1 - Continued development of HELCOM indicators: Lists of Lead/co-Lead countries, appointed experts, and members of relevant HELCOM expert groups, networks and projects, 2016-04-19

This document is thematically organized and includes updates from Denmark, Estonia, Finland, Germany Latvia, Lithuania, Poland and Sweden as of 2016-04-19 including:

- Information on Lead countries, co-lead countries and appointed national experts to develop HELCOM indicators
- Contacts lists for HELCOM expert groups, projects and networks.

Please submit further information and updates to the Secretariat (ullali.zweifel@helcom.fi).

Contact Lists of HELCOM Expert Groups/Project relevant for indicator work

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Mammals

Mammals indicators

| Core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|--------------|--|-----------------|--|
| Distribution of Baltic seals | | | Denmark | Anders Galatius, Jonas Teilmann |
| | | | Sweden | Tero Härkönen, Olle Karlsson, Karl Lundström |
| Population trends and abundance of seals | Sweden | Tero Härkönen Olle Karlsson, Karl Lundström | Denmark | Anders Galatius, Jonas Teilmann |
| Nutritional status of marine mammals | Sweden | Tero Härkönen, Karin Hårding, Charlotta Moraeus, Britt-Marie Bäcklin, Karl Lundström | Finland | Kaarina Kauhala |
| Reproductive status of marine mammals | Sweden | Tero Härkönen, Karin Hårding, Charlotta Moraeus, Britt-Marie Bäcklin, Karl Lundström | Finland | Kaarina Kauhala |

| Candidate indicator | Lead Country | LC representative | Co-Lead Country | CLC representative |
|---|--------------|-------------------|--------------------|---|
| Harbour porpoise distribution and abundance | | | Denmark | Anders Galatius |
| | | | Finland Germany | Penina Blankett Ursula Siebert/Andrea Fais |

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**Indicates contacts who have not participated in the last three meetings of the SEAL EG.*

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Birds

Bird indicators

| Core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|---|--------------|-------------------|-------------------|--|
| Abundance of waterbirds in the breeding season | Germany | Volker Dierschke | Finland Sweden | Jukka Rintala Leif Nilsson, Fredrik Haas |
| Abundance of waterbirds in the wintering season | Germany | Volker Dierschke | Finland Sweden | Markku Mikkola-Roos Leif Nilsson, Fredrik Haas |

Nominations for ICES/OSPAR/HELCOM JWG Birds

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| | | |

Coastal Fish

Coastal fish indicators

| Core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|---|--------------|-------------------|-----------------|--------------------|
| Abundance of coastal fish key functional groups | Sweden | Jens Olsson | Finland | Antti Lappalainen |
| Abundance of key coastal fish species | Sweden | Jens Olsson | Finland | Antti Lappalainen |

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Pelagic habitats – zooplankton

Zooplankton indicators

| Core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|---------------------------------------|--------------|-------------------|------------------------------|--|
| Zooplankton mean size and total stock | Sweden | Elena Gorokhova | Finland Latvia Estonia | Maiju Lehtiniemi Solvita Strake Aarno Põllumäe |

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Pelagic habitats – phytoplankton

Phytoplankton indicators

| Pre-core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|----------------|----------------------|---|---|
| Seasonal succession of functional phytoplankton groups | Estonia | Andres Jaanus | Finland Latvia Sweden | Harri Kuosa Sirpa Lehtinen Iveta Jurgensone Marie Johanssen |
| Diatoms/ dinoflagellates index | | | Estonia Finland Germany Latvia Poland Sweden | Andres Jaanus Harri Kuosa Sirpa Lehtinen Norbert Wasmund Iveta Jurgensone Janina Kownacka Marie Johanssen |

| Candidate indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|----------------|-------------------------------|--|---|
| "Phytoplankton community composition as a food web indicator". | Finland | Sirpa Lehtinen Harri Kuosa | Lithuania Sweden Latvia Estonia Poland | Irina Olenina Chatarina Karlsson Siv Huseby Iveta Jurgensone Andres Jaanus Janina Kownacka |
| Phytoplankton species assemblage clusters based on environmental factors | | | Finland Latvia Sweden | Harri Kuosa Sirpa Lehtinen Iveta Jurgensone Marie Johanssen Andres Jaanus |

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Benthic habitats

Indicators of benthic communities and habitats

| Core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|--------------|-------------------|---|--|
| Population structure of long-lived macrozoobenthic species | | | Finland Germany | Samuli Korpinen Henrik Nygård Alexander Darr Michael Zettler |
| State of the soft-bottom macrofauna community | | | Estonia Finland Germany (Sweden) | Kristjan Herkul Henrik Nygård Alexander Darr (Mats Blomqvist) |

| Pre-core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|----------------|--|---|---|
| Cumulative impact on benthic biotopes | | | Estonia Finland Germany Latvia Lithuania | Kristjan Herkul, Georg Martin Samuli Korpinen Aarno Kotilainen Thorsten Berg Alexander Darr Juris Aigars Darius Daunys |
| Distribution, pattern and extent of benthic biotopes | Estonia | Georg Martin, Kristjan Herkul | Finland Germany Latvia Lithuania Sweden | Samuli Korpinen Alexander Darr Juris Aigars Darius Daunys Antonia Nyström Sandman, Nicklas Wijkmark |
| Lower depth limit distribution of the macrophyte community | | | Estonia Finland Germany Latvia (Sweden) | Kaire Torn, Georg Martin Samuli Korpinen Kolja Beisiegel Juris Aigars (Mats Blomqvist) |

| Candidate indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|---|----------------|---------------------|-----------------|--------------------|
| Biomass ratio of opportunistic and perennial macroalgae | Estonia | Georg Martin | | |

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Eutrophication

Five core indicators and associated GES boundaries were agreed at HOD 39-2012, namely dissolved inorganic nitrogen, dissolved inorganic phosphorus, chlorophyll a, secchi depth and oxygen debt.

Four pre-core indicators (listed below) were initiated by the EUTRO-OPER project (2014-2015) but was not development of GES boundaries was finalized within the time frame of the project. Some of the remaining development work may be taken forward under a short-term extension of the project in 2016: EUTRO-EXTENDED. Plans for further development of the indicators are discussed under the HELCOM intersessional expert network on eutrophication to be clarified by HOLAS II 5-2016.

| Pre-core indicators | Lead Country |
|---|--------------|
| Total nitrogen concentration | Germany |
| Total phosphorous concentration | Germany |
| Cyanobacterial surface accumulations | Finland |
| Phytoplankton spring bloom intensity based on chl-a | Finland |

| Candidate indicators | Lead Country |
|-------------------------------|--------------|
| Shallow-water bottom oxygen | Germany |
| Deep-water oxygen consumption | Sweden |

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Russia**Input of nutrients**

The indicator on progress towards fulfilling Maximum Allowable Inputs for nitrogen and phosphorus is available [at the HELCOM web-site](#) and a proposal for operationalization of the indicator is contained in document 3.3 to HOD 48-2015.

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|--|---|
| Inputs of nitrogen and phosphorous to the sub-basins | RedCore DG (Lars Svendsen, DCE Denmark, Bo Gustafsson, BNI Sweden, and the Secretariat) Ricardas Paskauskas (LT) |

Hazardous substances

Hazardous substances indicators

| Core indicators | Lead Country | LC representative | Co-Lead Country | CLC representatives |
|--|-----------------------------|------------------------------------|------------------------------|--|
| Hexabromocyclohexane (HBCDD) | | | Finland Sweden | Jaakko Mannio Sara Danielsson |
| Metals | Poland | Tamara Zalewska | Denmark Finland Sweden | Martin M Larsen Harri Kankaanpää Sara Danielsson |
| Polybrominated biphenyl ethers (PBDE) | | | Finland Sweden | Jaakko Mannio Sara Danielsson |
| Perfluorooctane sulphate (PFOS) | | | Finland Sweden | Jaakko Mannio Sara Danielsson |
| Polyaromatic hydrocarbons (PAH) and their metabolites | Germany | Ulrike Kammann | Finland Sweden | Harri Kankaanpää Sara Danielsson |
| Polychlorinated biphenyls (PCB) and dioxins and furans | | | Finland Sweden | Jaakko Mannio Sara Danielsson |
| TBT and imposex | Sweden (tentatively) | | Denmark Finland | Jakob Strand Jaakko Mannio |
| White-tailed eagle productivity | Sweden | Björn Helander, Peter Hellström | Finland | Toni Laaksonen |

| Pre-core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|---------------|-----------------------|--|---|
| Acetylcholinesterase inhibition | | | | |
| Diclofenac concentration | | | Denmark Finland | Jakob Strand Kari Lehtonen |
| Estrogenic-like chemicals and effects | Sweden | Niklas Hansson | Denmark Finland | Jakob Strand Kari Lehtonen |
| Lysosomal membrane stability (LMS) | | | Denmark Finland | Jakob Strand Kari Lehtonen |
| Reproductive disorders: Malformed eelpout and amphipod embryos | | | Denmark Finland Sweden (on amphipod embryos (Monoporeia)) | Jakob Strand Kari Lehtonen, Brita Sundelin |
| Fish Disease Index (no work done in CORESET II) | | | Denmark Finland | Jakob Strand Kari Lehtonen |

| | | | | |
|---|--|--|--------------------|-------------------------------|
| Micronucleus test (no work done in CORESET II) | | | Denmark Finland | Jakob Strand Kari Lehtonen |
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| Candidate indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|----------------------|--------------|-------------------|-----------------|--------------------|
| EROD activity | Sweden | Niklas Hansson | | |

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¹ DE study reservation: indicator is considered „supplementary indicator“

Radioactive substances

Radioactive substances indicators

| Core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|---------------|-------------------|-----------------|--------------------|
| Radioactive substances: Cesium-137 in fish and surface waters | Poland | Tamara Zalewska | Finland | Meerit Kämäräinen |

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Oil pollution

Oil pollution indicator

| Core indicators | Lead | | | |
|---|-------|--|--|--|
| Oil-spills affecting the marine environment | IWGAS | | | |

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Marine litter

Marine Litter indicators

| Pre-core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|---------------------|---------------|-------------------------------|-------------------|--|
| Beach litter | Poland | Włodzimierz Krzyminski | Denmark Sweden | Jakob Strand Per Nilsson, Eva Blidberg |

| Candidate indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--------------------------------|----------------|-------------------|--------------------|------------------------------|
| Litter on the seafloor | | | Denmark Sweden | Jakob Strand Per Nilsson |
| Microlitter in the watercolumn | Finland | Outi Setälä | Denmark Germany | Jakob Strand Elke Fischer |

HELCOM Expert Network on Marine Litter

Updates after Pressure 3-2015 included

| Name | Organisation | Email address |
|---|--|--|
| As agreed in ToR of the network: the nominated experts will be invited to meet in the framework of meetings of Pressure WG and State and Conservation WG, to be chaired by the Chair/Co-Chairs of these Working Groups, respectively. | | |
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Underwater noise

Underwater noise indicators

| Pre-core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|---------------|-------------------|---|---|
| Continuous low frequency anthropogenic sound | Poland | Zygmunt Klusek | Denmark Finland Germany Sweden | Jakob Tougaard Jukka Pajala Jens Fisher Peter Sigray, Mathias Andersson |

| Candidate indicators | Lead Country | LC representative | Co-Lead Country | CLC representative |
|--|----------------|--|------------------------------|---|
| Distribution in time and space of loud low- and mid-frequency impulsive sounds | Germany | Maria Boethling Jens Fischer | Denmark Finland Sweden | Jakob Tougaard Jukka Pajala Mathias Andersson |

HELCOM Expert Network on Underwater Noise

Updates after Pressure 3-2015 included

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Additional indicators

i.e. indicators that are not linked to previously listed experts groups/networks/projects.

| Core indicators | Lead Country | LC representative | Co-Lead Country | CLC representative | Working arrangements |
|--|--------------|-------------------------------------|--|--|---|
| Abundance of salmon spawners and smolt | Finland | Tapani Pakarinen, Atso Romakkaniemi | | | Taken forward under FISH WG <i>Note: When operational, the indicator is proposed to be updated in cooperation with ICES WGBAST</i> |
| Abundance of sea trout spawners and parr | Finland | Tapani Pakarinen | | | Taken forward under FISH WG <i>Note: When operational, the indicator is proposed to be updated in cooperation with ICES WGBAST</i> |
| Number of drowned mammals and waterbirds in fishing gear | Germany | Sven Koschinski Volker Dierschke | Poland | Tomasz Linkowski (tomasz.linkowski@mir.gdynia.pl) | Taken forward under FISH Group and State & Conservation WG (e.g. target development)" |
| Proportion of large fish in the community | Sweden | Michele Casini, Håkan Wennhage | Germany Finland | Christian Pusch Thurid Otto Antti Lappalainen | Taken forward under FISH WG <i>Note: When operational, the indicator is proposed to be updated in cooperation with ICES WG BFIFS. Elaboration of data flows will take place through BalticBOOST.</i> |
| Trends in arrival of new non-indigenous species | Finland | Maiju Lehtiniemi | Germany Latvia Sweden Denmark | David Johannes Christian Buschbaum Kai Hoppe Solvita Strake Ann-Britt Florin Ulrik Berggreen | Proposed to be taken forward under TG BALLAST |

| Candidate indicators | Lead Country | LC representative | Co-Lead Country | CLC representative | Working arrangements |
|--|--------------|---------------------|-----------------|--------------------|-----------------------------|
| Maximum length fish in the pelagic community | Sweden | Michele Casini (SE) | | | Taken forward under FISH WG |

