

WORKSHOP ON REVIEWING BALTIC SURVEYS TO SUPPORT ECOSYSTEM-BASED MANAGEMENT ADVICE (WKBALSUR)

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Contents

i	Executive summary	1
ii	Expert group information	2
1	General information	3
	1.1 Meeting goals	3
	1.2 Participation.....	3
2	Overview of main challenges in the Baltic.....	4
	2.1 Ecosystem	4
	2.2 Fish stock assessment.....	5
3	Overview of monitoring in the Baltic	7
	3.1 Fish (all stages) monitoring, including stomach sampling	7
	3.2 Monitoring of hydrographic parameters	8
	3.3 Monitoring of lower trophic levels (phyto- and zooplankton, including jellyfish).....	8
	3.4 Monitoring of top predators.....	8
4	Data use for fish stock and ecosystem assessments.....	9
	4.1 Current data use from research surveys.....	9
	4.2 New requests	15
	4.2.1 Increased insight in the available data	16
	4.2.2 Additional data collection	16
	4.3 Evaluation of survey data	17
	4.3.1 Trawl surveys (BITS [G2916], [G8863])	17
	4.3.1.1 Evaluation of experiments	17
	4.3.1.2 Evaluation of biological data.....	18
	4.3.1.3 Evaluation of acoustic data.....	18
	4.3.2 Acoustic survey data (BIAS/GERAS [A1588], SPRAS/BASS [A7041], GRAHS [A2217])	18
5	Data collection.....	20
	5.1 Data collected on research surveys that is currently not used routinely in ecosystem or stock assessments	20
	5.2 Research surveys and the current data requests	21
6	The way forward: BS-CIRCLE	23
	6.1 Short-term goals: achieve/arrange in 0-3 years	23
	6.1.1 Data collection and evaluation	23
	6.1.2 Data use	27
	6.2 Middle term goals: achieve/arrange in 2-6 years	29
	6.3 Long term goals: achieve/arrange in 5-10 years:.....	30
7	References	31
Annex 1:	List of participants.....	32
Annex 2:	Resolutions	34
Annex 3:	WKBALSUR Agenda	36

i Executive summary

The Workshop on reviewing Baltic Surveys to support ecosystem-based management advice aimed to (i) review data user's requirements and additional requests from research surveys, to improve the quality of the fish stock and ecosystem assessments, (ii) list the data collected and the options for additional data collection during current research surveys, including the input from (i). Finally, the workshop aimed to (iii) define concrete steps towards improved data collection and data use.

The group discussed current data use of fishery-independent data in the Baltic Sea, the bottlenecks in that data use, and the potential for additional data collection. Next to that, the group created overviews of data collected during the research surveys that are not used in ecosystem and stock assessment at the moment.

Based on the information exchange, needs and overviews, the plan for improvement of the Baltic Surveys, Collaboration, Information, Research, Communication, Links and Ecosystems (BS-CIRCLE) was developed. This contains concrete steps to improve communication between groups and increase transparency on data use and data collection in the Baltic Sea. Furthermore, the current data collection during research surveys will be evaluated, such as the number of fish stomachs, the stratification of otolith sampling, and number of stations sampled. Some additional data will be collected, such as lipid content of herring and sprat in the acoustic surveys.

ii Expert group information

Expert group name	Workshop on reviewing Baltic Surveys to support ecosystem-based management advice (WKBALSUR)
Expert group cycle	Annual
Year cycle started	2026
Reporting year in cycle	1/1
Chair(s)	Ingeborg de Boois, the Netherlands
Meeting venue(s) and dates	26-30 January 2026, Copenhagen, Denmark, 20 participants

1 General information

1.1 Meeting goals

The Workshop on reviewing Baltic Surveys to support ecosystem-based management advice aimed to (i) review data user's requirements and additional requests from research surveys, to improve the quality of the fish stock and ecosystem assessments, (ii) list the data collected and the options for additional data collection during current research surveys, including the input from (i). Finally, the workshop aimed to (iii) define concrete steps towards an improved data collection and data use.

The terms of reference are in Annex 2; the agenda in Annex 3.

1.2 Participation

WKBALSUR took place as a combined in-person (at ICES, Denmark, Copenhagen) and online meeting, from 26-30 January 2026. In total, eighteen people attended the workshop (Annex 1:), about 50% online and 50% in person.

Following the three prime goals, the workshop was split into three parts to allow experts to think freely and get the optimal result. The focus in part 1 was on the data requirements, attended by fifteen people: fourteen workshop members and one observer. Part 2 focused on data collection and was attended by twelve participants. Part 3 was attended by a mix of participants from the previous parts, in total fourteen people.

2 Overview of main challenges in the Baltic

2.1 Ecosystem

In general, the ecosystem in the Baltic Sea is suffering from multiple pressures. The most prevalent pressures relate to nutrient discharge from multiple sources as well as impacts from species extraction, e.g. fishery including bycatch and substrate disturbance. Furthermore, contaminants and litter, mainly due to their persistence and widespread prevalence, were identified as significant pressures in the Baltic Sea (ICES 2024a).

The Baltic Sea is naturally prone to low oxygen conditions, especially in the deep basins. While the extent of hypoxic bottom water ($< 2 \text{ ml/L O}_2$) has been largely stable for the past two decades, the extent of the anoxic area ($< 0.5 \text{ ml/L O}_2$) has increased since the mid-1990s, mainly because of eutrophication (ICES 2025a). A shift towards earlier, more prolonged spring blooms (but with lower average biomass) has taken place in the central Baltic Sea over the past 20 years. Summer phytoplankton community composition has gone through a gradual shift towards an increase in species richness, partly because of anthropogenic stressors (ICES 2025a). Zooplankton composition has shifted because of climate-induced changes, eutrophication, and predation, leading to a decline in large copepods and an increase in small-bodied cladocerans and rotifers. This shift, along with seasonal abundance variations driven by temperature and ice conditions, impacts sub-basins differently and has led to a long-term decrease in zooplankton size across the ecoregion (ICES 2025a).

All in all, the changes in the ecosystem lead to changes in (commercial) fish stocks. One of the most prominent changes is the steep decline of cod (*Gadus morhua*) landings between 1985 and 1995. While in the past the decrease of cod biomass was primarily caused by fishing, currently the unaccounted mortality for Western Baltic cod is much higher than accounted mortality, and could be caused by (a combination of) unfavorable environmental conditions, e.g. rising temperatures, low oxygen conditions and an increase of predators such as seals and cormorants. Simultaneously, sprat (*Sprattus sprattus*) biomass increased, resulting in landings of fish dominated by pelagic species herring (*Clupea harengus*) and sprat (ICES 2024b). Sprat profits from the decline of the cod stock and the warming waters. However, the sprat stock increase also causes a higher predation on cod eggs. Furthermore, the biomass and recruitment of three out of the four herring stocks (except for the Gulf of Riga) also decreased. Increased warming winters cause a phenological mismatch for herring recruitment and spawning areas are degraded by eutrophication, both impeding stock recovery.

Two main groups explicitly focus on the assessment of the Baltic ecosystem. The ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea (WGIAB) is a scientific forum that develops and combines ecosystem-based assessments with management efforts for the Baltic Sea. The ICES Working Group on Ecosystem-Based Fisheries Management of the Western Baltic Sea (WGECOBAL) aims to better understand environmental, especially climate, effects on the living marine resources of the Western Baltic Sea. Next to that, the ICES Baltic International Fish Survey Working Group ([WGBIFS](#)), and the ICES Baltic Fisheries Assessment Working Group (WGBFAS) look at the Baltic ecosystem from their viewpoints.

2.2 Fish stock assessment

Nineteen commercial fish stocks are distinguished in the Baltic Sea (**Error! Reference source not found.**, ICES stock information database¹). WGBFAS provides scientific assessments on all the stocks in the Baltic Sea and adjacent areas ranging from Kattegat to the Gulf of Bothnia apart from her.27.20-24 (assessed in the working group HAWG), trs.27.22-32 and sal.27.32 (assessed in the working group WGBAST).

For four stocks, ICES has not been requested to provide advice on fishing opportunities since 2019 (dab.27.22-32, tur.27.22-32), and 2020 (bll.27.22-32, bwp.27.2729-32).

For five stocks, cod.27.1, her.27.20-24 (since 2019), cod.27.24-32 (2020), cod.27.22-24, sol.27.20-24 (2026), zero catch advice is in place.

For sal.27.22-31 the catch advice for 2026 is above zero, for the first time since 2020. Catch advice is limited to a period in the year, and specific areas.

All in all, about half of the stocks are in a form that (commercial or recreational) fisheries advice is above zero.

Table 2.1 Stock assessments in the Baltic Sea

Scientific name	Species	Stock code	Area name	Assessment type ²	Assessment frequency	Assessment group ³
<i>Scophthalmus rhombus</i>	brill	bll.27.22-32	Baltic Sea	survey based	biannual	WGBFAS
<i>Platichthys solemdali</i>	Baltic flounder	bwp.27.2729-32	Northern central and Northern Baltic Sea	CAT3	biannual	WGBFAS
<i>Platichthys</i> spp.	flounder	bzq.27.2425	West of Bornholm and southwestern Baltic	CAT3	biannual	WGBFAS

¹ ICES. 2026. [Stock Information Database \(SID\)](#)

² <https://doi.org/10.17895/ices.pub.26056306>

CAT1 – Stocks with quantitative assessments, either full analytical assessments and forecasts or quantitative assessments based on production models.

CAT1.2: Extremely low biomass, requiring zero catch advice.

CAT2 – Stocks with analytical assessments and forecasts that are only treated qualitatively. Includes stocks with quantitative assessments and forecasts that, for a variety of reasons, are considered indicative of trends in fishing mortality, recruitment, and biomass.

CAT3 – Stocks for which landings and/or catch and reliable stock size indicator(s) exist. Includes stocks for which survey or other indices are available that provide reliable indications of trends in stock metrics, such as total mortality, recruitment, and biomass.

CAT3.2 – Stocks for which harvest control rule applies

CAT4 – Stocks for which only reliable catch data are available. Includes stocks for which a time-series of catch can be used to approximate maximum sustainable yield (MSY).

Survey based-only survey data used

³ **WGBFAS** - ICES Baltic Fisheries Assessment Working Group provides scientific assessments on the stocks in the Baltic Sea and adjacent areas ranging from Kattegat to the Gulf of Bothnia.

HAWG - The Herring Assessment Working Group for the Area South of 62°N provides scientific advice on the herring, sprat and sandeel stocks in the North Sea and the adjacent areas spanning from the Celtic Sea to the Western Baltic.

WGBAST - The Assessment Working Group on Baltic Salmon and Trout assesses the status and trends of salmon and sea trout stocks in the Baltic Sea and provides annual catch advice on salmon.

Scientific name	Species	Stock code	Area name	Assessment type ²	Assessment frequency	Assessment group ³
<i>Platichthys spp.</i>	flounder	bzq.27.2628	West of Gotland and Gulf of Gdansk	CAT2	biannual	WGBFAS
<i>Gadus morhua</i>	cod	cod.27.21	Kattegat	CAT3	biannual	WGBFAS
<i>Gadus morhua</i>	cod	cod.27.22-24	Western Baltic Sea	CAT3	biannual	WGBFAS
<i>Gadus morhua</i>	cod	cod.27.25-32	Eastern Baltic Sea	CAT3	biannual	WGBFAS
<i>Limanda limanda</i>	dab	dab.27.22-32	Baltic Sea	CAT2	biannual	WGBFAS
<i>Platichthys flesus</i>	flounder	fle.27.2123	Kattegat, Belt Seas and the Sound	CAT2	biannual	WGBFAS
<i>Clupea harengus</i> '	herring	her.27.20-24	Skagerrak and Kattegat, Western Baltic Sea (spring spawners)	CAT1.2	annual	HAWG
<i>Clupea harengus</i>	herring	her.27.25-2932	Central Baltic Sea, excl. Gulf of Riga	CAT1	annual	WGBFAS
<i>Clupea harengus</i>	herring	her.27.28	Gulf of Riga	CAT1	annual	WGBFAS
<i>Clupea harengus</i>	herring	her.27.30-31	Gulf of Bothnia	CAT1	annual	WGBFAS
<i>Pleuronectes platessa</i>	plaice	ple.27.21-32	Kattegat and Baltic Sea	CAT1	annual	WGBFAS
<i>Salmo salar</i>	salmon	sal.27.22-31	Baltic Sea, excl. Gulf of Finland	CAT1	annual	WGBAST
<i>Salmo salar</i>	salmon	sal.27.32	Gulf of Finland	CAT3	annual	WGBAST
<i>Solea solea</i>	sole	sol.27.20-24	Skagerrak and Kattegat, western Baltic Sea	CAT1	annual	WGBFAS
<i>Sprattus sprattus</i>	sprat	spr.27.22-32	Baltic Sea	CAT1	annual	WGBFAS
<i>Salmo trutta</i>	sea trout	trs.27.22-32	Baltic Sea	CAT4	biannual	WGBAST
<i>Scophthalmus maximus</i>	turbot	tur.27.22-32	Baltic Sea	CAT3.2	biannual	WGBFAS

3 Overview of monitoring in the Baltic

3.1 Fish (all stages) monitoring, including stomach sampling

Multiple fisheries-independent research surveys are conducted in the Baltic Sea that deliver information to fish stock assessment (see **Error! Reference source not found.**). Some information is used directly or indirectly (via stock assessment output) in assessments of the ecosystem (**Error! Reference source not found.**).

The ichthyoplankton surveys (under a) are coordinated by the ICES Working Group on Surveys on Ichthyoplankton in the North Sea and Adjacent Seas ([WGSINS](#)), the acoustic and trawl surveys (under b and c) by WGBIFS. An overview of monitoring activities is available in the most recent reports of the coordinating ICES groups.

The prime aim of the surveys varies:

- a) Two ichthyoplankton surveys (Baltic ichthyoplankton surveys BIS, Rügen herring larvae survey RHLS [I8486]), focussing on the early life stages (eggs, larvae) of fish, are presently used in stock assessment (BIS for Eastern Baltic cod, and RHLS for Western Baltic Spring Spawning herring). Data of the BIS are not yet publicly available but will be submitted to the ICES database [Eggs and larvae](#).
The BIS is a compilation of ichthyoplankton surveys in the Western Baltic⁴, running since 1986. The gear is a Bongo net, the target species is Western Baltic cod (eggs), and the ichthyoplankton phases of several other species. Zooplankton and jellyfish are also registered (ICES 2025b).
Since 1977, the RHLS has measured herring larval density in the Greifswald Lagoon and Strelasund, the main spawning area of western Baltic Spring spawning herring, to predict year-class strength. This long-term dataset informs western Baltic Spring spawning herring stock assessment via the N20 recruitment index and is based on an extensive sampling effort of 36 stations sampled over 16 weeks each year using a Bongo net.
At least one other survey on early fish life stages is conducted: the ichthyoplankton survey in the eastern Baltic (Gotland Basin & Gdansk Basin), conducted by the Latvian institute BIOR⁵. This has been carried out regularly for several decades.
- b) Acoustic surveys (BIAS/GERAS [A1588], SPRAS/BASS [A7041], GRAHS [A2217]⁶), provide fisheries-independent information on the pelagic fish species, i.e. mainly herring and sprat. Acoustic and biotic information is uploaded to the ICES database for [Acoustic](#)

⁴ Presently, the following partners are involved in the BIS:

1. DTU Aqua – National Institute of Aquatic Resources, Kgs. Lyngby, Denmark
2. NMFRI – National Marine Fisheries Research Institute, Gdynia, Poland
3. TI-OF – Thünen Institute of Baltic Sea Fisheries, Rostock, Germany
4. GEOMAR – Helmholtz Centre for Ocean Research Kiel, Germany
5. IMF – Institute of Marine Ecosystem and Fishery Science, Hamburg University, Germany
6. AU - Section for Aquatic Biology, Department of Biology, Aarhus University
7. BIOR – Institute of Food safety, Animal health and Environment, Riga, Latvia

⁵ [Institute "BIOR" - BIOR](#)

⁶ BIAS=Baltic International Acoustic Survey; GERAS=German acoustic survey
SPRAS=Sprat Acoustic Surveys; BASS=Baltic Acoustic Sprat Survey
GRAHS=Gulf of Riga Acoustic Herring Survey

[trawl surveys](#). However, as the primary goal of the database in this phase was to centrally store the unaggregated data, WGBIFS provides WGBFAS directly with the stock indices of herring and sprat as it requires acoustic survey expertise to aggregate data in a scientifically sound manner.

- c) The demersal trawl surveys (BITS-Q1 [G2916] and BITS-Q4 [G8863]⁷) target demersal fish of commercial interest with an otter trawl to provide fisheries-independent abundance indices, mainly for stock assessment. The surveys also sample non-target species, including herring and sprat and collect additional biological information. Data is stored in the ICES database [Datras: DATRAS](#). Further a sole trawl survey is used in stock assessment (presently not uploaded to the DATRAS) and a cod trawl survey (also not uploaded in DATRAS). During the trawl surveys, also data on fish stomachs is collected. Although the stomach contents are not always analysed, the data for the analysed stomachs is available in [ICES - Stomach Content Data](#).
- d) Other survey types: a gillnet survey targeting flounder (*Platichthys* sp.) and poundnet survey targeting Western Baltic cod FEJUCS⁸ [N2828].

3.2 Monitoring of hydrographic parameters

At all surveys information on salinity, temperature and oxygen is collected. Furthermore, other oceanographic measurements take place through hydrographic cruises or by autonomous probes (e.g. [Argo data | Argo](#)). Hydrographic information collected during fish surveys is submitted to ICES [Oceanography](#), where also information from dedicated hydrographic cruises is stored.

3.3 Monitoring of lower trophic levels (phyto- and zooplankton, including jellyfish)

Phytoplankton and zooplankton data from dedicated monitoring, available in ICES Biological communities (available via [ICES Datasets](#)).

In most ichthyoplankton surveys, jellyfish is systematically recorded but not yet uploaded to a public portal.

3.4 Monitoring of top predators

Systematic monitoring for the complete Baltic Sea takes place in the SCANS survey (1994, 2005/2007, 2016). This survey covers shelf and offshore waters of the European Atlantic and aims to provide abundance estimates and trend assessment of the regularly occurring cetacean species by a population-wide survey. Due to its setup (using planes and vessels covering a large area), the survey cannot take place frequently.

Information on a smaller scale is often not available from long term monitoring, but from dedicated projects. Information on cetacean recordings (ICES [Cetaceans](#)), sealcounts ([HELCOM](#)), sea-bird observations ([European Seabirds At Sea](#)) are accessible, although the amount of data in the Baltic is very limited.

⁷ BITS=Baltic International Trawl Survey; Q1=first quarter, Q4=fourth quarter

⁸ FEJUCS=Fehmarn Juvenile Cod Survey

4 Data use for fish stock and ecosystem assessments

4.1 Current data use from research surveys

The data use in ecosystem assessments (**Error! Reference source not found.**) and fish stock assessments (**Error! Reference source not found.**) was evaluated, and the group discussed whether improvement of the data, or expansion or reduction of data collection would be necessary or possible from a data user's perspective. In general, data user groups pointed out that consistent data collection (timeseries, comparable methodology, spatial coverage) is very relevant. Next to that, data availability, findability and accessibility of data and calculations is key. It is strongly advised that data is submitted to centralised (ICES) databases and used directly from these databases. In this manner all data users also have access to the latest updates of the information.

Transparency of data use and analytical outcomes for stock assessments may improve when both the survey and the assessment group use TAF for raising indices and the stock assessments.

It turned out that, next to requirements with respect to the research survey data, there was also a need for a firmer connection between the data user groups.

Table 4.1 Research survey information used in ecosystem assessments.

Data user ⁹	Component	Information used	Suggested improvements related to data use	Additional information related to suggested improvements
All data users	oxygen content	CTD data from different surveys	Standardization of O ₂ measurements, and validation of O ₂ values. Could it be flagged if it is probe data or validated O ₂ data.	ICES Oceanography has options for quality flagging for all parameters. Examples of flagging schemes: QFSetID=ODVGENERICQF (referred to in the format description for ICES oceanography)
EU commission	modelled marine litter index for setting thresholds	BITS-Q1, BITS-Q4	No improvements suggested	
WGECOBAL	benthic macrofauna	IOW (Warnemünde)	Data from only German areas in Western Baltic	BITS will start collecting macrofauna sampling (see paragraph 4.3.1.1)

⁹ **WGIAB** – Working Group on Integrated Assessments of the Baltic Sea is a scientific forum that develops and combines ecosystem-based assessments with management efforts for the Baltic Sea.

WGECOBAL - WGECOBAL aims to better understand environmental, especially climate, effects on the living marine resources of the Western Baltic Sea.

WGSAM - Working Group on Multispecies Assessment Methods aims at enabling research on predator-prey interactions for developing advice on the ecosystem approach to fisheries management

WGBFAS – the ICES Baltic Fisheries Assessment Working Group provides scientific assessments on the stocks in the Baltic Sea and adjacent areas ranging from Kattegat to the Gulf of Bothnia.

Data user ⁹	Component	Information used	Suggested improvements related to data use	Additional information related to suggested improvements
WGECOBAL	benthos	Epibenthos data from DATRAS from other surveys than BITS surveys	No improvements suggested	
WGECOBAL	herring acoustic survey data for food web modelling	BIAS	No improvements suggested	
WGECOBAL	marine mammals and seabirds	SCANS survey data combined with scattered data from scientific literature and grey literature.	For high trophic-level taxa, a standardized and homogeneous dataset on harbour porpoises and seals would be highly desirable, including annual abundance and biomass estimates per subdivision, as well as seasonal patterns of spatial distribution. Availability of data of seals is limited; centralized storage would be beneficial. Increased temporal coverage is required, as the SCANS survey is not conducted annually.	
WGECOBAL	phytoplankton	ICES CTD and bottle data	Use phytoplankton information from dedicated surveys.	ICES hosts the phytoplankton data for HELCOM. There were issues with the consistency of the historic information, so the information could not be transferred to the ICES database. Countries have to resubmit information directly to ICES, for phytoplankton this is not completed.
WGECOBAL	trawl surveys	catch data from trawl surveys	SD 23 is data poor, SD 22 and SD 24 are fine	The data poorness is caused by a closed area for fishing activities; an additional survey is conducted by Sweden. This

Data user ⁹	Component	Information used	Suggested improvements related to data use	Additional information related to suggested improvements
				information will be added to the inventory of additional work done in the Baltic (see paragraph 6.1)
WGIAB	acoustic surveys	acoustic survey data	In the northern areas the survey series is still short	
WGIAB	commercial fish stocks	output from fish stock assessments	Biomass information on a slighter smaller scale than provided by stock assessment	RDBES may provide catch information on the required level; survey data is already publicly available on a detailed level.
WGIAB	HELCOM fish survey data (coastal gillnet survey)	all information	Data not easily accessible	
WGIAB	recreational fisheries	recreational fisheries monitoring	National surveys, data accessibility is a bottleneck	RDBES may provide catch information on the required level.
WGIAB	stomach	stomach data from trawl surveys	Coverage in the north is limited (SWE, FIN, EST), SD 29-32	BITS survey does not cover that area, so no mandatory data collection takes place
WGIAB & WGECOBAL	acoustic surveys	acoustic survey data for food web models (ECOPATH & ECOSIM) herring and sprat from the report	in the northern areas the survey series is still short	
WGIAB & WGECOBAL	zooplankton	HELCOM data	Different methods for data collection so not all data are comparable; data only available upon request. Metadata limited, detail and consistency may differ between data series.	ICES hosts the zooplankton data for HELCOM. There were issues with the consistency of the historic information, so the information could not be transferred to the ICES database. Countries re-submitted information directly to ICES, so it should be complete.
WGSAM	stomach data to estimate natural mortality	stomach data from trawl surveys (collection mandatory in BITS)	Collecting stomachs is mandatory, but analyzing those and submitting information is not.	There is room to make it more efficient. WGBIFS has already amended

Data user ⁹	Component	Information used	Suggested improvements related to data use	Additional information related to suggested improvements
			The potential therefore seems to be underused, and it is not possible to evaluate if the number of stomachs collected is sufficient, or too much	the sampling scheme for 2025 Q4/2026 Q1. See also paragraph 4.3.1.1.

Table 4.2 Research survey¹⁰ information used in fish stock assessments (based on ICES advice sheets¹¹ and expert info)

Stock	Catch information (quantity, length frequency, weight of measured fish)	Individual information (default: length, weight)			Additional surveys used	Improvement needed?	Reduction possible
		maturity	sex	age			
bll.27.22-32	BITS-Q1, BITS-Q4	no	no	no	no	no	
bwp.27.2729-32	Estonian survey in SD 32) and SD 29 [N2197], Swedish survey SD 27 [N1147]	Estonian survey in SD 32) and SD 29 [N2197], Swedish survey SD 27 [N1147]	Estonian survey in SD 32) and SD 29 [N2197], Swedish survey SD 27 [N1147]	Estonian survey in SD 32) and SD 29 [N2197], Swedish survey SD 27 [N1147]	no	no	evaluate otolith collection, as stratification of otoliths may be made more effective
bzq.27.2425	BITS-Q1, BITS-Q4	BITS-Q1	BITS-Q1, BITS-Q4	BITS-Q1, BITS-Q4	no	no	evaluate otolith collection, as stratification of otoliths may be made more effective
bzq.27.2628	BITS-Q1, BITS-Q4	BITS-Q1, BITS-Q4	BITS-Q1, BITS-Q4	BITS-Q1, BITS-Q4	no	no	evaluate otolith collection, as stratification of otoliths may be made more effective
cod.27.21	BITS-Q1, BITS-Q4, IBTS-Q1, IBTS-Q3, CODS_Q4	IBTS-Q1	BITS-Q1, BITS-Q4, IBTS-Q1, IBTS-Q3, CODS_Q4	BITS-Q1, BITS-Q4, IBTS-Q1, IBTS-Q3, CODS_Q4	no	no	unclear, 0-catch advice for years, is all effort at all surveys needed?

¹⁰ See [Implementing decision - 2021/1168 - EN - EUR-Lex](#) for main survey acronyms

¹¹ ICES (2025). ICES Advice 2025. Browse ICES content by Type. Collection. <https://doi.org/10.17895/ices.pub.c.7488219>

Stock	Catch information (quantity, length frequency, weight of measured fish)	Individual information (default: length, weight)			Additional surveys used	Improvement needed?	Reduction possible
cod.27.22-24	BITS-Q1, BITS-Q4, FEJUCS	BITS-Q1	BITS-Q1, BITS-Q4, FEJUCS	BITS-Q1, BITS-Q4, FEJUCS	no	no	FEJUCS survey has a very low impact on the stock assessment, maturity only used from Q1
cod.27.25-32	BITS-Q1, BITS-Q4	BITS-Q1	BITS-Q1, BITS-Q4	BITS-Q1, BITS-Q4	historical larvae surveys, egg survey	input from WGSAM on diet (stomachs); submission larvae survey information to ICES eggs and larvae	evaluate otolith collection, as stratification of otoliths may be made more effective
dab.27.22-32	BITS-Q1, BITS-Q4	BITS-Q1	BITS-Q1, BITS-Q4	BITS-Q1, BITS-Q4	no	no	evaluate otolith collection, as stratification of otoliths may be made more effective
fle.27.2123	BITS-Q1, BITS-Q4	BITS-Q1	BITS-Q1, BITS-Q4	BITS-Q1, BITS-Q4	no	no	evaluate otolith collection, as stratification of otoliths may be made more effective
her.27.20-24	BIAS+GERAS, HERAS, BITS-Q1+IBTS-Q1, BITS-Q4+IBTS-Q3	BIAS+GERAS, BITS-Q1+IBTS-Q1	BIAS+GERAS, BITS-Q1+IBTS-Q1, BITS-Q4+IBTS-Q3	BIAS+GERAS, BITS-Q1+IBTS-Q1, BITS-Q4+IBTS-Q3, RHLS (N20)	no	no	Assess the number of genetic samples needed to split GERAS into populations
her.27.25-2932	BIAS	BIAS	BIAS	BIAS	no	no	evaluate otolith collection, as stratification of otoliths may be

Stock	Catch information (quantity, length frequency, weight of measured fish)	Individual information (default: length, weight)			Additional surveys used	Improvement needed?	Reduction possible
							made more effective
her.27.28	GRAHS	GRAHS	GRAHS	GRAHS	no	no	evaluate otolith collection, as stratification of otoliths may be made more effective
her.27.3031	BIAS	BIAS	BIAS	BIAS	historical commercial trapnet survey (till 2006)	survey coverage is according to the manual, but incomplete, potentially leading to inconsistent survey information, especially between age 1 and age 2.	evaluate otolith collection, as stratification of otoliths may be made more effective
ple.27.21-32	BITS-Q1+IBTS-Q1, BITS-Q4+BTS-Q3	BITS-Q1+IBTS-Q1	BITS-Q1+IBTS-Q1, BITS-Q4+BTS-Q3	BITS-Q1+IBTS-Q1, BITS-Q4+BTS-Q3	no	no	evaluate otolith collection, as stratification of otoliths may be made more effective
sal.27.22-31	River sampling for numbers of spawning salmon, smolt counts and parr densities					data accessibility (national), different levels of detail for different rivers.	benchmark 2026
sal.27.32	River sampling for numbers of spawning salmon, smolt counts and					data accessibility (national), different levels of detail for	benchmark 2026

Stock	Catch information (quantity, length frequency, weight of measured fish)	Individual information (default: length, weight)			Additional surveys used	Improvement needed?	Reduction possible
	parr densities					different rivers.	
sol.27.20-24	DTU fisher survey	no	DTU fisher survey	DTU fisher survey	no	no	no reason to collect sole otoliths on BITS
spr.27.22-32	SPRAS/BASS, BIAS	SPRAS/BASS, BIAS	SPRAS/BASS, BIAS	SPRAS/BASS, BIAS	no	spatial coverage of SPRAS/BASS is limited (no survey in northern area)	maturity information may be reduced, although some data is needed to frequently evaluate maturity estimates; evaluate otolith collection, as stratification of otoliths may be made more effective
trs.27.22-32	river sampling, spawners, smolt counts, parr densities				no	data accessibility (national), different levels of detail for different rivers.	
tur.27.22-32	BITS-Q1, BITS-Q4	BITS-Q1	BITS-Q1, BITS-Q4	BITS-Q1, BITS-Q4	no	no	evaluate otolith collection, as stratification of otoliths may be made more effective

4.2 New requests

New requests from data users can be grouped into two categories: increased insight into available data and products (paragraph 4.2.1), either from surveys or created by other data user groups, and new data series (paragraph 4.2.2).

4.2.1 Increased insight in the available data

1. Request from end users to get an overview of the acoustic data collected during BITS (years, countries, areas, acoustic frequencies, contact person). An inventory of all data collected in the Baltic surveys will be created (see paragraph 6.1).
2. More data and information on non-commercially fished species such as biomass are requested. These species (e.g. indicator species eelpout *Zoarces viviparus* or the invasive round goby *Neogobius melanostomus*) are caught as bycatch with targeted species and play relevant roles in the interaction with commercially caught species. There is no biomass estimate available in line with fish stock assessment biomass estimates, so a new product created from the trawl survey information for specific use for ecosystem assessments may be required. Demersal trawl survey data can be found in the [Datras: DATRAS](#) (survey: Baltic International Trawl Survey), including the existing standard products. If there is a need for new, dedicated products, the WGECOBAL and WGIAB groups can contact Working Group on DATRAS Governance (WGDG).
3. Improved alignment between products of WGECOBAL and WGIAB is requested to support ecosystem-based fisheries advice. Given that fishing is not the main driver for changes in Baltic Sea fish stocks anymore, there is a need to include additional information on ecosystem components and environmental factors in fish stock assessments conducted by WGBFAS. Initial plans for enhanced coordination and product exchange between WGBFAS, WGECOBAL, WGIAB and WGSAM were developed during the workshop. It is recommended that WGECOBAL and WGIAB participate in the benchmark processes for fish stock assessments.

4.2.2 Additional data collection

1. More detailed assessment of individual fish stock condition is requested. This includes evaluation of fat content in sprat (*Sprattus sprattus*), which is higher in the Baltic Sea than in the North Sea, but the underlying reasons are not fully understood. Additionally, it is requested to investigate the condition of plaice (*Pleuronectes platessa*), which is increasing strongly in terms of abundance in the recent years, while individual weight is decreasing.
2. A feasible distinction in acoustic surveys between the planktonic component (focussing on mysids) on one hand, and fish (sticklebacks, sprat and herring) on the other, is requested. This improves the work on stock assessments and the understanding of lower trophic levels. The EU [REMINDER](#) project will operationally start in May 2026. The primary goal is to test and develop acoustic algorithms to assess the mysid distribution and abundance as well as implement them in the acoustic surveys in the future. During the project, results will be validated against plankton samples (taken by multinet and MIK). Herring stomach contents will also be analysed to quantify the spatial, temporal and size-related variability of herring predation upon mysids and large zooplankton.
3. The central Baltic Sea food web has undergone dramatic changes in recent decades, with strong trends in the abundance of cod, herring, and sprat. At the same time, the numbers of three-spined stickleback (*Gasterosteus aculeatus*) fluctuate strongly spatially and sometimes make up a substantial part of the pelagic biomass. Despite their growing ecological importance, and the interest from (fish meal) industrial fishers, there is limited large-scale data on stickleback abundance and biomass in the Baltic Sea. Incorporating the stickleback information from BIAS and BASS into food web models will highlight knowledge gaps, and relevance for additional monitoring on sticklebacks. Within WGBIFS there is already some work done to create stickleback densities, and this could be expanded.

4.3 Evaluation of survey data

4.3.1 Trawl surveys (BITS [G2916], [G8863])

4.3.1.1 Evaluation of experiments

Currently, five experiments regarding data collection and analyses are in place for the trawl surveys. These were conducted during the Q4 surveys in 2025 and the upcoming Q1 surveys in 2026. WGBIFS aims to evaluate the results of the experiments during their meeting in 2026.

1. **Hauling duration reduction:** In 2025, trials were carried out to evaluate a reduction in trawl duration from 30 minutes to 15 minutes in the BITS survey. As part of this work, a new coding system was implemented to ensure that the correct reason for the shortened trawl duration was accurately recorded in the data. The WGBIFS will need to analyze the results to confirm that reducing the trawl time does not influence species composition or length distributions. This analysis will be a high priority, as shorter trawl durations could significantly reduce the time required during the survey and later on land when processing fewer fish. Additionally, fewer fish would be killed during the survey, supporting compliance with animal welfare regulations. A shorter haul duration can also be used in known areas with large number of small plaice (SD 22) or similar size cod (SD 25) and ensure only the fish needed will be killed. Shortened hauls (and their reduced influence on seabed habitats) would be an argument to allow trawl surveys in otherwise closed areas. Such discussions are currently conducted in Denmark and Sweden.
2. **Benthos sampling during trawl surveys:** It was agreed during WGBIFS 2025 to collect benthos during the standard survey trawls. This extra effort, and the benthos catches, will be evaluated during the next meeting based on feedback from the cruise leaders. If it is decided to continue with the benthic sampling a common guide on the species would be beneficial based on the most common species in the Baltic Sea, including the species codes. Also, a closed benthos submission list for DATRAS (like IBTS uses) is advised, as the gear is not designed for benthos sampling.
3. **Changed and improved station allocation system** between and within countries: the model for station allocation was first implemented in 2025 and allows WGBIFS to plan the stations at the annual meeting. The allocation model needs to be updated, as it now only defines the minimum distance between sampling stations, but should also contain a maximum distance to ensure an effective use of survey steaming time.
4. **Zero-minute hauls:** when the CTD shows oxygen levels below 0.5 ml/l, countries only conduct a zero-minute haul to see what is in the water column. In these hauls, even when acoustic data show no visible fish from the seafloor to the maximum height of the trawl opening, catches have still been observed. This implies that catches likely occurred during the setting and hauling of the gear. Since the gear used for the BITS survey is not fishing optimally in the water column the catch data from the zero-minute hauls should/could be verified or adjusted by fishing with a standardised pelagic trawl for which the swept area and the catchability for cod is known.
5. **Reduction of stomach data collection:** given that the Baltic Sea is a quite simple ecosystem, countries were quite likely oversampling cod and turbot stomachs. The number of stomachs sampled was reduced by switching to a different sampling scheme (mirroring IBTS sampling, where only 2 stomachs per 5 cm-length class and haul are taken). The new sampling scheme will be evaluated during WGBIFS 2026 (in regards of numbers of collected stomachs) and WGBIFS 2027 (in regards of stomach content data). The change in the sampling scheme is supported by a recommendation from WGSAM 2025 and will be, if continued, added into the DCF Regional Workplan for the Baltic 2028-2030.

The data users in WKBALSUR were asked to give guidance on the priorities from their perspectives:

- For stock assessment purposes it is most important to evaluate haul length reduction. WGBIFS plans to test for the loss of the outer length classes/ages of the range, and for species composition in the haul (missing less abundant species), and welcomes input from the stock assessment experts on further analyses.
- For ecosystem groups, the results of the benthos sampling have the highest priority. To guide the decisions and development of a benthos sampling scheme, it would be beneficial to get more feedback from the ecosystem groups regarding e.g. resolution, minimum data requirements and possible ways of providing these data to respective end-user.

4.3.1.2 Evaluation of biological data

From the current data use inventory, it was concluded that it is useful that the biological data collection (specifically: age information) is evaluated (**Error! Reference source not found.**, last column). WKBALSUR discussed some candidate stocks to begin with and selected sampling schemes that can likely be changed and the number of samples taken adjusted to the end-user needs.

- a) Individual biological information for small pelagic species (herring, sprat) from BITS, is not used in the assessment of the respective stocks and could be minimised or even stopped.
- b) In Eastern Baltic cod, otoliths are currently taken following the standard sampling scheme (1/cm/station). However, age reading has not been conducted for over ten years now. Since there is no clear end-user need, the number of otoliths stored shall be evaluated. Since an age-length-key cannot be used, WGBIFS needs to check other means, e.g. via the general length-distributions.
- c) Baltic Sea plaice on the other hand is using age data in the assessment. However, the otolith sampling during surveys and in the commercial fisheries is quite intense, resulting in several thousand otoliths taken and aged each year. An evaluation of this number of otoliths should be conducted, a reduction in age readings seems appropriate. The starting point can be the methodology developed by de Boois & Chin (2024).
- d) Afterwards, other species that are currently age-read during the surveys (flatfishes) should be evaluated in the same manner.

4.3.1.3 Evaluation of acoustic data

Currently, various countries collect acoustic data during BITS. Originally this data collection started to see if there is a behavioural change of cod in anoxic areas. It is not clear whether these data are still needed or if the collection of acoustic data can be reduced or even stopped. An inventory of acoustic data collected during the BITS is the minimum requirement, so data users are aware of the potential source of information.

4.3.2 Acoustic survey data (BIAS/GERAS [A1588], SPRAS/BASS [A7041], GRAHS [A2217])

To improve the usability of survey indices in the stock assessment, the survey group is asked to investigate the hydroacoustic survey data. Three tasks (a, b, c) relate to the data use and should be dealt with in close collaboration with WGBFAS. Two (d, e) relate to the number of individual biological samples and may reduce workload on board. All points are taken into account in chapter 6 'The way forward'.

- a. Acoustic herring indices from BIAS in SD 30 and GRAHS in SD 28.1 show a strong year effect. There are years when almost all cohorts are higher than in the year before. The cause(s) of this pattern should be investigated e.g. data issues, area coverage or fish behaviour.
- b. Develop a workflow to give estimates of uncertainty around point estimates of abundance for herring and sprat. These uncertainty estimates cannot be used immediately in the stock assessment but could be introduced at the next benchmark to give the model an indication about how much to trust individual data points of the survey index. This becomes especially important if spatial survey effort is changing over time, e.g. due to unexpected survey shortages. This task has a high priority if there is a benchmark for sprat or herring scheduled. Currently the uncertainty estimates are available for central Baltic herring and herring in Gulf of Bothnia, but this can be expanded to other stocks.
- c. Collaborate in investigating options for a modelling approach for calculating indices from acoustic surveys. Drivers, such as climate change, might lead to a change in spatial-temporal distribution of fish species over time. To explain changes in patterns observed during the surveys, it is important to understand the ecological factors driving these changes. This helps to understand if the survey is still covering the distribution area of the stock. Factors that might influence distribution patterns of pelagic surveys can be various, but temperature might be one of the major drivers influencing distribution of pelagic species. When events, such as very strong recruitment classes in a small survey area or inconsistent cohort tracking is observed, it is important for the assessment group to understand reasons for this, and the survey group is asked to bring forward possible reasons for this. As this information can be directly used to help explaining patterns seen in the stock dynamics, this task is given high priority by WKBALSUR.
- d. To spare capacities during working up the individual sprat and herring samples during the survey, the survey group is asked to evaluate the number of otoliths taken and aged. As growth patterns might deviate between different survey areas and years, it is important to look at patterns in a spatial-temporal resolution. It is very likely that currently ages are oversampled in the surveys.
- e. Maturity data of sprat collected during the SPRAS/BASS is not routinely used in the sprat's stock assessment. It is, however, used to regularly assess if there are changes in maturity over time that should be updated during the next benchmark. Effort in collecting maturity data could likely be reduced to still detect changes.

5 Data collection

5.1 Data collected on research surveys that is currently not used routinely in ecosystem or stock assessments

During the surveys, more than only the mandatory information is collected (**Error! Reference source not found.**). Partly, the data collection is already in place for a long time, other elements were introduced more recently. The information is mostly submitted to publicly available ICES data portals or survey groups await the option to add the information. During the annual meeting in 2026, WGBIFS will create an inventory of additional data collection, including an overview for which areas and which years the information is available, and who the contact person for the data collection is.

Table 5.1 Data collected during fish monitoring, and not used in fish stock or ecosystem assessments

Survey	Information	Potential use	Comments
BITS	liver weight cod	health state of individual fish	
BITS	gonad weight cod	spawning potential	
BITS	parasites and diseases for commercial fish species (may vary per country)	health state of all individual fish	Not yet possible to submit in DATRAS but based on flagging parasite Y/N it is possible to get an idea for how many fish parasite information is available, as data collection may vary per country. Earlier, the fish disease index was in place, HELCOM also provides indicators for fish disease.
BITS	macrozoobenthos	ecosystem assessments	See paragraph 4.3.1.1
BITS	acoustic data	ecosystem assessments, background information fish stock assessments	See paragraph 4.3.1.1
BITS	zero-minute hauls	background information fish stock assessments	See paragraph 4.3.1.1
BITS	contaminants in herring	ecosystem assessments, food web models	Sweden routinely collects samples of herring to assess concentrations of contaminations like PCB's and heavy metals on BITS surveys.
BIAS	semi-quantitative index of Mysids index in Bothnian sea	food web models	This index will be improved based on input from the REMINDER project (see paragraph 4.2)

Survey	Information	Potential use	Comments
BIAS	individual weights	cod condition factor of cod	
BIAS, BASS/SPRAS	Abundance, size and weight of non-commercial species	Ecosystem modelling	Around 50 species. The representativity of those species is conditioned by the sampling, which targets the main small pelagic species (herring and sprat, secondarily stickleback)
BITS (cod recruit vae) surveys	Fish larvae index	eggs and food Mysid models, stock assessment	web fish assess- larva The data is not publicly available yet, WGSINS will coordinate the data submission to ICES eggs and larvae
Ichthyo-surveys	plankton jellyfish information	infor-	The data is not publicly available yet, WGSINS will coordinate the data submission to ICES eggs and larvae
projects	information on top predators (seals, cormorants)	on food predators models, stock assessment	web fish assess- larva Information on top predators is collected, but only on a project basis by different institutes. There is a high level of detail needed; WGBFAS will do some pilot runs on predation of western Baltic cod by top predators.

5.2 Research surveys and the current data requests

During the meeting, options for additional data collection during fish surveys were proposed, by data users as well as by the survey expert group (**Error! Reference source not found.**). Survey experts provided a response to the requests. In general, it looks like the requested data can be collected. WGBIFS will discuss further implementation during their annual meeting in 2026.

Table 5.2 Potential additional during fish monitoring, requested by data users or relevant according to survey coordination group

Survey	Request from	Request	Survey experts' response
BITS	WGECOBAL	The catch data from trawl surveys from SD 23 are data-poor due to an un-trawlable area. Can the data availability be improved in other ways?	Additional national survey data
BIAS	multiple groups	Is it possible to collect more information on sticklebacks?	Stickleback weight information (per length class) can be collected. It is not possible to collect individual weight due to the accuracy of the scale.
BIAS	multiple groups	Is it possible to collect more information on sticklebacks?	Some countries already collect otoliths. Age reading processes are under development.
BIAS, SPRAS/BASS, BITS	multiple groups	Fat content information of sprat and herring	This is possible when an instrument is found that is

			suitable to collect information from small fish
BIAS, SPRAS/BASS	WGBIFS	To better represent the spatial distribution of target species it is proposed to expand the survey area for SPRAS/BASS to the Gulf of Finland, and the BIAS to the shallow areas of the Bothnian Sea	This is highly relevant as especially the younger age groups live in shallower areas. Sampling those fish in a more representative manner means that the index for stock assessment is more robust

6 The way forward: BS-CIRCLE

The workshop outcomes are split up into actions for the short, middle and long term. Mostly, the middle and long term topics follow from activities that already start on the short term. Together, the actions form the BS-CIRCLE: the plan for improvement of the Baltic Surveys, Collaboration, Information, Research, Communication, Links and Ecosystems. The acronym was developed by copilot and the meaning amended by the workshop participants.

6.1 Short-term goals: achieve/arrange in 0-3 years

Error! Reference source not found. (data collection and evaluation) and **Error! Reference source not found.** (data use) contain an overview of the steps on the shorter term (0-3 years) to implement the developments as discussed in WKBALSUR.

6.1.1 Data collection and evaluation

Nr	Action	owner	Concrete steps	Expertise needed	Expertise available in WG	Specific input needed from others (and who)	Timeline (start year)
D1	Analyse the amount of data collections taken during surveys (start with plaice otoliths)	WGBIFS demersal group	Presentation of script results of preliminary result on plaice otoliths in the North Sea taking data directly from DATRAS	Yes	Yes	End-user (stock coordinator/assessors) to feedback on the results.	2026 - 2028
D2	Revision of the number of stomachs collected during surveys	WGBIFS demersal group	<ul style="list-style-type: none"> Review the change in sampled quantities in Q4 2025 and Q1 2026 surveys. Run the Lindmark et al. model with stomach data from 2024 and backwards? 	Yes	Yes	Support and feedback from the Lindmark et al., authors. Feedback from WGSAM (as end-user) on the results.	2026-2028
D3	Investigate the change of the allocation of trawls being done based on cod abundance and distribution in spring to allocation of trawls including other species as well (WGIS-DAA)	WGBIFS demersal group	<ul style="list-style-type: none"> Test the allocation by plaice length data Add distance buffer around trawl tracks Add maximum distance between stations 	No external expertise needed	Yes	No	2026

Nr	Action	owner	Concrete steps	Expertise needed	Expertise available in WG	Specific input needed from others (and who)	Timeline (start year)
D4	Standard report: review the current structure. Develop an R script for interactive standard reports (html or shiny).	WGBIFS demersal group	Compare current approaches, agree on a common format and standard output, compile R script (on github) and get results reviewed by group. Check if the inclusion of a Latex script is also possible	No external expertise needed	Yes	Check with other survey groups if similar approaches exist (check WGBEAM github). Check with ICES about delivery formats.	2026-2028
D5	Evaluate the 5 experimental changes planned in WGBIFS 2025 (see paragraph 4.3.1.1)	WGBIFS demersal group	Check and evaluate the results of the experiments conducted during BITS Q4 2025 and Q1 2026	Partly	Yes	End-user feedback (WGIAB, WGECOBAL, WGBFAS) to the agreed changes	2026
G1	Create an overview of any additional data that are collected during the WGBIFS surveys.	WGBIFS	<ul style="list-style-type: none"> List the additional data collections Identify potential end-users Contact person 	Knowledge on data collection during surveys for all participating countries	Yes	WGBFAS, WGIAB, WGECOBAL to define potential use in	2026-2027
G2	Create an overview of existing national surveys that are not used in ICES products yet	WGBIFS	<ul style="list-style-type: none"> Full list of monitoring survey in the Baltic (e.g., trawl, recreational, acoustic, ichthyoplankton) Highlight from which surveys no data is used in WGBFAS, WGIAB, WGECOBAL Inform data user groups on the unused information Contact person 	Knowledge on national data collection in the Baltic	Partly (trawl, acoustic surveys)	WGSINS, national persons (e.g. via RCG)	2026-2027
G3	Create a list of national practices in particular countries on quality assurance in hydrographical data	WGBIFS	<ul style="list-style-type: none"> List of data collected to ICES oceanography by country, including contact persons for submission to ICES List quality assurance practices for collecting data, e.g. 	Knowledge on hydrographic data collection during surveys for all participating countries	Yes	Probably not	2026-2027

Nr	Action	owner	Concrete steps	Expertise needed	Expertise available in WG	Specific input needed from others (and who)	Timeline (start year)
			calibration frequency of probes, validation of measurements				
G4	Decide on the quality flagging scheme for oxygen data (OSetID=ODVGENER-ICQF lists the schemes accepted by ICES oceanography)	WGBIFS	Ask the ICES Data Centre to make selected flags mandatory	No	Not applicable	Not applicable	2026-2027
G5	Flagging the quality of uploaded oxygen data	Individual countries	<ul style="list-style-type: none"> Quality flagging scheme provided by WGBIFS (G4) Submission by national submitters 	Submission rights to oceanographic data portal	Not applicable	If other bodies are responsible for the submission of oceanographic data, those people should be informed	2027
G6	Implement guidelines on oxygen measurements and calibration	Survey cruise leaders	WGBIFS to check if existing guidelines are clear or that additional information is needed	Oceanographic experts, to provide guidance on best practices	No (partly)	Data submitters	2026-2028
G7	Alignment of survey coding: report the unique survey ID code for every survey, use ICES coding (4 number code), align acronyms in WGBIFS reporting and manuals	WGBIFS	All contributors are aware of the acronyms as well as the stock assessment codes for the surveys, and use those in reports and manuals, next to acronyms.	Information on the survey codes	Partly	ICES Data Centre	2026
I1	Create an overview of ichthyoplankton surveys that are not available via ICES portals yet	WGSINS	<ul style="list-style-type: none"> List the surveys and prime targets List the (potential) data users Contact person for the survey 	Knowledge on ichthyoplankton surveys in the Baltic	Yes	Not applicable	2026-2028
I2	Create an overview of core and additional data that are collected during the WGSINS and other	WGSINS	<ul style="list-style-type: none"> List the core data collection List the additional data collections Identify potential end-users Contact person 	Knowledge on data collection during surveys for all participating countries	Yes	WGBFAS, WGIAB, WGECOBAL to define potential use	2026-2028

Nr	Action	owner	Concrete steps	Expertise needed	Expertise available in WG	Specific input needed from others (and who)	Timeline (start year)
	ichthyoplankton surveys in the Baltic.						
I3	Data availability of fish early life stages	WGSINS	Submit data from ichthyoplankton surveys in the Baltic, including information on jellyfish, to ICES eggs and larvae	Data submission to the portal	Yes	Maybe from Governance group for the eggs and larvae database (WGELFADG)	2026-2027
P1	WGBIFS & WGIPS to collaborate in investigating options for a modelling approach for calculating indices from acoustic surveys	WGBIFS	<ul style="list-style-type: none"> • get in contact with chairs • discuss options for modelling approaches • Scan relevant reports (WGFAST, CRR, WKUSER3) for relevant information for WGBIFS (e.g. bad weather, calibration, survey effort reduction) and give presentation at WGBIFS 	Time series modelling	-	<ul style="list-style-type: none"> • WGIPS • WGBFAS (on background for reasoning for modelling approach) • WGISDAA • WKUSER 	2026-2028
P2	Harmonize length and weight collection of sticklebacks in the pelagic surveys	WGBIFS	<ul style="list-style-type: none"> • List countries with current and planned sampling of stickleback in BIAS and SPRAS/BASS • Update survey manual accordingly the decision 	-	Yes	Not applicable-	2026
P3	Create products with respect to stickleback data collection	WGBIFS	<ul style="list-style-type: none"> • Spatial distribution • Biomass information • Index (e.g. length index) 	<ul style="list-style-type: none"> • Acoustic survey expertise • R skills 	Yes	Not applicable	2026
P4	Evaluate expansion of pelagic surveys	WGBIFS	Discussion during WGBIFS to evaluate gaps in coverage	-	Yes	WGBFAS	2026

Nr	Action	owner	Concrete steps	Expertise needed	Expertise available in WG	Specific input needed from others (and who)	Timeline (start year)
P5	Quality of submitted data to the acoustic portal	WGAcousticGov, WGBIFS	<ul style="list-style-type: none"> • Check current quality checks and suggest new ones; • Correct old data; • Compare workflow from national DBs to ICES DB 		Yes	Current list of quality checks from WGAcousticGov	2026-2028
P6	Explore the needed possibility of measuring fat content in sprat and herring	WGBIFS	Invite end-user and industry to check, if fat measurements from acoustic surveys are beneficial and easily implementable. Discuss with industry, if data can be made available to end-user	Yes (Finnish colleagues who are already collecting the data), Industry	Yes, partially	Input from end-user on the need of these data. Input on methods by industry and Finland.	2026-2028
P7	Share information on age reading on sticklebacks in WGBIFS, and decide on reliability of age reading	WGBIFS	Invite an expert with experience on age reading on stickleback otoliths to WGBIFS meeting to present bottlenecks, and results	Age reading of stickleback otoliths	no	Not applicable	2026-2027

6.1.2 Data use

Table 6.1 Short-term actions related to stock/ecosystem assessments, including concrete steps and expertise needed, to improve data use, data quality, and communication.

Nr	Action	owner	Concrete steps	Expertise needed	Expertise available in WG(s)	Specific input needed from others (and who)	Timeline (start year)
E1	New data products	WGIAB, WGECOBAL	agree on what specific products from the ICES acoustics database would be required	Knowledge on the acoustic surveys and the data thereof, knowledge on the data use.	No	Acoustic governance group (WGAcousticGOV), Pelagic subgroup of WGBIFS	2027-2028
E2	New data products	WGIAB, WGECOBAL	consider standard products from DATRAS of non-commercial species for use in ecosystem	Knowledge on the trawl surveys and the data thereof, knowledge	Limited	DATRAS governance group (WGDG), demersal	2026-2028

Nr	Action	owner	Concrete steps	Expertise needed	Expertise available in WG(s)	Specific input needed from others (and who)	Timeline (start from year)
			assessments (on top of the CPUE product) (e.g. biomass estimate).	on the data use.		subgroup of WGBIFS Potential other users: Working Group on Marine Bio-invasions (WGBIO-INV)	
E3	Information on available data	WGIAB, WGECON-BAL	Invite ICES Data centre contact person for phyto- and zooplankton data to working group	no	Not applicable	ICES Data Centre	2026
S1	Investigate how the workflow from the data in the acoustic data portal can be made more transparent	WGBFAS, WGBIFS,		Knowledge on the acoustic surveys and the data thereof, knowledge on the data use.	Mostly	Acoustic governance group (WGAcousticGOV), WGIPS (alignment of products)	2026-2028
S2	Increase transparency of data used	WGBFAS	<ul style="list-style-type: none"> • Create an overview of additional (survey) datasets that are used in the assessments but are not in the official ICES data portals. • List information in the respective stock annexes 	Knowledge which survey data is used in stock assessments, and for which surveys data is uploaded to portals.	Yes	No	2026-2027
S3	Increase transparency on quality of survey data used	WGBFAS	<ul style="list-style-type: none"> • Add the use of uncertainty estimates in the stock assessment to the benchmark issue list. Uncertainty estimates currently cannot be used immediately in the stock assessment but could be introduced at the next benchmark to give the model an indication about how much to trust 	<ul style="list-style-type: none"> • For which stocks and surveys uncertainty estimates are generated • Access to ICES stock information database and issue list 	Yes	No	2026

Nr	Action	owner	Concrete steps	Expertise needed	Expertise available in WG(s)	Specific input needed others (and who)	Timeline (start from year) (and)
			individual data points of the survey index. • Include the availability of uncertainty estimates to chapter on the quality of the assessment in the advice, and for the presentation of surveys to WGBFAS.				
S4	Investigate if there are end-user (stakeholder) needs for stickleback information (and what is the need)	WGBFAS	Contact Baltic Sea Advisory Committee (BSAC) if there is a potential end-user need	Contact details of BSAC	Yes	BSAC	2026-2027
U1	Create an overview of any additional data that are collected during the WGBIFS surveys.	WGECO-BAL, WGIAB, WGBFAS, WGBIFS, WGSINS	Invite chairs of the other WGs to your meeting for a combined session or a presentation on their work	Knowledge on who are the chairs of the groups (on group's page)	Yes	Contribution from the invited chair(s)	2026-continuous
U2	Start investigate if use of parasite and disease data for natural mortality estimates and other purposes can be used.	WGECO-BAL, WGIAB, WGBFAS, WGSAM	Download information from DATRAS when available (submission possible from March 2026)	Previous work: the fish disease index	Unknown	WGPDMO ¹²	2026-2028

6.2 Middle term goals: achieve/arrange in 2-6 years

- WGAcousticGOV and/or ICES data centre to check on the end-user wish list on ICES acoustic data products.
- WGBIFS:
 - If industry data are promising, then start collecting fat content sprat and herring
 - Analyse the amount of data collections taken during surveys (especially the number of other species otoliths).
 - Agree on a location or method to store the additional surveys and make them as good available as possible (e.g. existing ICES database, github, TAF).

¹² WGPDMO=ICES Working Group on Pathology and Diseases of Marine Organisms

- Building on EU-REMINDER outcomes: develop and evaluate detection and echo-integration methodology of macrozooplankton (including mysids) in acoustic surveys
- WGSINS: start data submission to the ICES eggs and larvae database for the ichthyoplankton surveys in the Baltic. TAF might be a reasonable alternative if no common database format can be agreed on.
- WGBFAS & WGECOBAL & WGIAB:
 - Explore the potential usefulness of national surveys for ecosystem and fish stock assessments, including monitoring in shallower waters via HELCOM. Agree on formats and database for uploading data.
 - Move data processes to TAF when possible and otherwise use github.

6.3 Long term goals: achieve/arrange in 5-10 years:

- WGBIFS: Implement recommendations on using acoustic/sampling protocols for macroplankton identification and abundance indices in routine monitoring cruises (follow-up of the EU-REMINDER project)
- WGBIFS & WGSINS: Additional surveys are uploaded to the ICES data portals.

7 References

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Annex 1: List of participants

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(Department of Fish biology
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Observer

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Annex 2: Resolutions

WKBALSUR - Workshop on Reviewing Baltic Surveys to Support Ecosystem-based Management Advice

Approved on 01 June 2025

Workshop

2024/WK/EOSG06 The Workshop on Reviewing Baltic Surveys to Support Ecosystem-based Management Advice (WKBALSUR), chaired by Ingeborg de Boois (Netherlands) will work on ToRs and generate deliverables as listed below.

	Meeting Date(s)	Venue	Report Deadline
2026	26 January - 28 January	ICES HQ, Copenhagen, Denmark	
	28 January - 30 January	ICES HQ, Copenhagen, Denmark	
	29 January	ICES HQ, Copenhagen, Denmark	28 January 2026
	To be decided	Online meeting	

ToR	Description	Background	Sci- ence Plan Codes	Year	Expected Deliverables
a	Create a prioritized inventory of end-user requirements (Must have-Useful to have-Nice to have) of the Baltic research surveys.	The ecosystem in the Baltic Sea is changing. The requirements (Must have-Useful to have-Nice to have) of the Baltic research surveys primarily serve stock assessment goals. It is important to have a list of data requirements, including the level of relevance/obligation for fisheries and ecosystem management. It is very important that all data users working on stock and ecosystem assessment are aware of the full set of requirements and requests, and the priorities.	1.3, 3.1, 3.4, 3.5	2025	Overview of prioritized data requirements, including frequency (e.g. twice a year, in Q1 or Q4, annual, biannual or triennial), and spatial components (complete Baltic Sea, only deep areas, only shallow areas, ...)
b	Evaluate to which extent the data needs and requirements are met by the current output of the Baltic research surveys.	To prevent the loss of crucial data and information from the surveys, it is important to have good insight in the current relevance of the survey output for all data requirements. It may also be that data collection exists, but	3.1, 3.4, 3.5, 5.1	2025	Overview of fulfillment of data requirements.

		the (data)infrastructure is not available to make use of the information.		
c	Evaluate the list of data requirements and the fulfillment with the current surveys, and define data collection needed for these.	The minimum data collection to meet requirements will provide insight in the use of all data that are currently collected, and which of those should be kept. From there, redundant or new data collection can be defined.	3.1, 3.2, 2025 3.3, 3.4, 3.5	Finalized overview of fulfillment of data requirements.
d	Proposals how data requirements that are not or only partly met can be (better) met.	Discussions on and proposals for additional data collection, different stratification or survey design, alternative methods of data collection to get more out of the same activity (e.g. additional sensors on CTDs, automated recordings of parameters), alternative sources of fisheries independent data.	3.1, 3.2, 2025 3.3, 3.4, 3.5	Overview of data collection that can and that cannot be done in the surveys, including the costs/effort/shiptime/personnel/expertise that is needed for it. If it is unclear if data collection can take place (e.g. incorporation of new techniques, a plan for follow-up will be created.
e	Over-all evaluation of requirements, and options to meet those.	It is important that survey experts and end-users together understand the (im)possibilities to meet end-user requirements, and the potential solutions.	1.3, 3.1, 2025 3.4, 3.5, 5.1	(a) Finalized document with end-user requirements, and the ways to meet those (or not) (b) Define strategy and roadmap to find funding/expertise/personnel/shiptime to meet the requirements

Scientific Justification

The ecosystem in the Baltic Sea is changing. The research surveys primarily serve stock assessment goals. It is important to have a list of data requirements, including the level of relevance/obligation for fisheries and ecosystem management. Reflection on this list from a survey perspective is key to align data collection with data needs, and to create a development plan for the survey or even monitoring programme in the Baltic.

Resource Requirements

No specific requirements

Linkages to other ICES Committees or Groups

ACOM, EAMSG, EOSG, WGBFAS, WGECOBAL, WGIAB

Linkages to other Organizations

HELCOM

Annex 3: WKBALSUR Agenda

ICES, Copenhagen & online

Part 1: Monday 26th January 2026 13.00-Wednesday 28th January 2026 14.30
(combined session) Wednesday 28th January 13.00-14.30

Part 2: Wednesday 28th January 2026 13.00-Friday 30th January 2026 10.30

Part 3: Friday 30th January 2026 10.30-12.00

Part 1

ToR DESCRIPTION	BACKGROUND	DELIVERABLE
a Create a prioritised inventory of end-user requirements (Must have- Useful to have-Nice to have) of the Baltic research surveys	The ecosystem in the Baltic Sea is changing. The research surveys primarily serve stock assessment goals. It is important to have a list of data requirements, including the level of requirements, including the level of relevance/obligation for fisheries and ecosystem management. It is very important that all data users working on stock and ecosystem assessment are aware of the full set of requirements and requests, and the priorities.	Overview of prioritised data requirements, including frequency (e.g. twice a year, in Q1 or Q4, annual, biannual or triennial), and spatial components (complete Baltic Sea, only deep areas, only shallow areas, ...)
b Evaluate to which extent the data needs and requirements are met by the current output of the Baltic research surveys	To prevent the loss of crucial data and information from the surveys, it is important to have good insight in the current relevance of the survey output for all data requirements. It may also be that data collection exists, but the (data)infrastructure is not available to make use of the information.	Overview of fulfillment of data requirements

Monday 26th January

13.00 Welcome, logistics, meeting aims, [code of ethics and professional conduct](#)

13.15 Who is who? Name, affiliation, what contribution can we expect from you during this part of the workshop?

13.30 Workshop setup, and aims for Wednesday 12.00

13.45 Inventory of current end user requirements¹³ from fisheries independent monitoring for different aspects – based on the available experts (ToR a)

- Fish stock assessment (e.g. WGBFAS)
- Ecosystem advice (e.g. in WGE COBAL, WGIAB)
- MSFD (HELCOM)
- Introduction to the draft BSAC advice on implementation of Ecosystem-Based Approach to Fisheries Management in the Baltic Sea
(Matti Ovaska)

14.30 Potential sources of additional information for current end user requirements from fisheries independent monitoring

15.00 Tea

15.30 Searching the additional sources (subgroups)

16.15 Findings from search on additional current end user requirements

¹³ Current requirements are the requirements the survey group is or should be aware of

- 17.00 Prioritising the current end user requirements
 17.45 Wrap up and plan for Tuesday
 18.00 End of day

Tuesday 27th January

- 09.00 Additional (new) end user requirements – based on the available experts and/or Monday's additional information sources (ToR a)
 10.30 Coffee
 11.00 Potential sources of additional information for current end user requirements from fisheries independent monitoring
 12.00 Prioritising the additional end user requirements
 12.30 Lunch
 13.30 Fulfillment of data requirements, and bottlenecks (ToR b)
 15.00 Tea
 15.30 Open ends from discussions on Monday and Tuesday
 16.30 Report writing in small subgroups
 17.45 Wrap-up, plan for Wednesday
 18.00 End of day

Wednesday 28th January

- 09.00 Finalising the Overview of data requirements including fulfilment
 09.30 Report text review and preparation of presentation for Wednesday's combined session (transfer of information)
 10.30 Review presentation, more open ends?
 12.00 Lunch

Part 1.5

Wednesday 28th January

- 13.00 Combined session
- Summary of process and presentation of outcomes workshop part 1
 - Questions from participants workshop part 2 on outcomes part 1
 - Decide on date for ToR e
- 14.30 End of combined session

Part 2

Wednesday 28th January

- 14.45 Who is who? and [code of ethics and professional conduct](#)
 14.45 Terms of reference for part 2, and approach

ToR	BACKGROUND	DELIVERABLE	
DESCRIPTION			
c	Evaluate the list of data requirements and the fulfillment with the current surveys, and define data collection needed for these	The minimum data collection to meet requirements will provide insight in the use of all data that are currently collected, and which of those should be kept. From there, redundant or new data collection can be defined.	Finalised overview of fulfillment of data requirements
d	Proposals how data requirements that are not or only partly met can be (better) met	Discussions on and proposals for additional data collection, different stratification or survey design, alternative methods of data collection to get more out of the same activity	Overview of data collection that can and that cannot be done in the surveys, including the costs/effort/shiptime/

ToR DESCRIPTION	BACKGROUND	DELIVERABLE
	(e.g. additional sensors on CTDs, automated recordings of parameters), alternative sources of fisheries independent data	personnel/expertise that is needed for it. If it is unclear if data collection can take place (e.g. incorporation of new techniques, a plan for follow-up will be created.

- 15.00 Reflect on the Overview of data requirements including fulfilment current data requirements: is the impression of the data users in line with the survey people's view? (ToR c)
- 16.00 Tea
- 16.30 Inventory of possible additional data collection during surveys
- 17.45 Wrap up, and plan for Thursday
- 18.00 End of day

Thursday 29th January

- 09.00 Additional insights based on Wednesday afternoon
- 10.00 Coffee
- 10.30 Prioritise all goals in short, middle and long term actions (subgroups)
- 12.30 Lunch
- 13.30 Define concrete steps to achieve short term goals related to surveys (subgroups)
- 15.00 Tea
- 15.30 Report writing in small subgroups
- 17.00 Open ends from discussions on Wednesday and Thursday
- 17.45 Wrap up, plan for Friday
- 18.00 End of day

Friday 30th January

- 09.00 Review steps and timeline for implementation new tasks/modified data collection during surveys
- 10.00 Coffee

Part 3

ToR DESCRIPTION	BACKGROUND	DELIVERABLE
e Over-all evaluation of requirements, and options to meet those	It is important that survey experts and end-users together understand the (im)possibilities to meet end user requirements, and the potential solutions.	(a) Finalised document with end-user requirements, and the ways to meet those (or not) (b) Define strategy and roadmap to find funding/expertise/personnel/shiptime to meet the requirements
10.30	Review prioritisation for data user goals, and discuss concrete steps	
12.00	Review report text, agree on timeline for finalisation of the report	
	Closure of the meeting	