

### Working Group on *Crangon* fisheries and life history (WGCRAN)

The Working Group on *Crangon* fisheries and life history (WGCRAN), chaired by Claudia Günther\*, Germany, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2019	8–10 October	IJmuiden, Netherlands		Claudia Günther was elected as new chair from 2019 onwards
Year 2020				
Year 2021				

TOR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
A	Data collection of the status of the Crangon stock.	To report and evaluate population status indicators like recent landings and effort trends in the brown shrimp fisheries or length based mortality estimates from Dutch and German scientific surveys. Generate a standardized lpue time-series and provide a detailed description of the process of collecting the dataserie effort, landings & LPUE for WGCRAN.	1.1; 2.1	year 1,2,3	A time-series analysis of the standardized stock indicators shall be delivered by all WGCRAN members within each annual report.
B	Compilation of Logbook information & VMS analysis	To combine VMS, landings and effort data to gain a population distribution indicator and to monitor regional distribution and regional shifts in fishing effort.	2.1; 2.4; 3.5; 5.4	year 1,2,3	Results will be summarized in a peer-reviewed paper.
C	To develop a suite of decision-support tools	To develop and evaluate brown shrimp-specific management decision-support tools to evaluate strategies on how to sustainably and efficiently harvest the brown shrimp stock.	2.1; 2.2; 5.1; 5.4 6.1	year 1,2,3	The results will be presented in technical reports and shall be summarized in a peer-reviewed paper.
D	To evaluate the effects of the efficiency of new gears on shrimp catches	To evaluate the effects of new gears (e.g. pulsetrawl, combined pulse-trawl and standard gears, large or new mesh types, pumpsystem, letterbox etc.) and their implications on the Crangon stock, the bycatch, the catch efficiency and the possible lpue based management strategies.	2.1; 2.2; 5.4	year 1,2,3	An overview of the considerations shall be summarized in the WGCRAN reports.
E	To synthesise the status of research	To review the status and results of research of bottom impact and	2.4; 3.2	year 1,2,3	This work will be compiled and the

	of bottom impact of Brown shrimp fishing practices	consider the implications for management.			results will be summarized in a peer-reviewed paper.
F	To review the status of research on bycatch	To review the status and results of research on bycatch timeseries and consider the implications for management. Evaluate methods and procedures used on board for collecting data on bycatch. Gather, compile and evaluate information on the onboard and ashore sieving fractions and processes and new national bycatch/discards data from e.g. DCF	3.1; 3.2	year 1,2,3	To standardize the available and agreed sampling procedures and compile results in the WGCAN report.
G	To examine the life cycle dynamics of brown shrimps	To gain a better understanding of the life cycle dynamics and life history of brown shrimp in order to optimize models of population dynamics that are used for management purposes.	1.7; 5.2; 6.1	year 1,2,3	Results shall be summarized in a peer-reviewed paper.
H	To analyze German, Belgian and Dutch survey data	The analysis of spatio-temporal trends of survey based stock indicators (biomass, distribution, mortality, etc.) will be conducted. Additionally the ground-truth of VMS derived lpue estimates will be used as complementary information. The inclusion of Belgian survey data will help to complement this analysis.	3.1; 3.2	year 1,2,3	The results overview will be presented in each annual report.
I	To facilitate information exchange	Information on national legislation, laws (e.g concerning Natura 2000) and developments (MSC process) concerning the brown shrimp fisheries in the whole North Sea will be synthesised.	7.1	year 1	An overview of relevant legislations will be included in the report.
J	To provide supporting information on ongoing research	To present and review ongoing brown shrimp research in the ICES area, which can help to support and consider management implications.	6.1	year 1,2,3	The summaries of updates will be included in the annual report(s)

## Summary of the Work Plan

Year 1	Stock status indicators (ToR a) shall be updated and harmonized between countries. German and Dutch survey data will be analysed and reported, Belgian data will be included in the analyses (ToR h)
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	Information on national legislation, laws (e.g concerning Natura 2000) and developments (MSC process) concerning the brown shrimp fisheries in the whole North Sea will be summarized (ToR i). Data used for the compilation of manuscripts in support of ToR b, c, e, g will be made available. New information generated from ToRs d, f, j will be reported
Year 2	Stock status indicators (ToR a) will be updated and harmonized between countries. German, Belgian and Dutch survey data will be analysed and reported (ToR h). Data for manuscripts related to ToR b, c, e, g will be made available. New information from ToR d, f, j will be reported.
Year 3	Stock status indicators (ToR a) will be updated and harmonized between countries. German, Belgian and Dutch survey data will be analysed and reported (ToR h). Data for Manuscripts related to ToR b, c, e, g will be made available. New information from ToR d, f, j will be presented and reported

## Supporting information

Priority	Crangon fisheries are economically important with landings value ranking this species among the top three species caught from the North Sea. The priority of WGCRAN is to understand the interactions between the brown shrimp population (structure and abundance) and human behaviour (mainly fishing effort), the environment, and the ecosystem. One important aspect is and will be the monitoring, investigation and development of population status indices. WGCRAN is the only expert group to evaluate the Brown Shrimp Fisheries Management Plan which was developed by the industry in the course of the MSC certification.
Resource requirements	The research programmes that provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 10 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and group under ACOM	WGCRAN aims at a permanent linkage with ACOM after year 2 when sound and proven stock indicators and tools to evaluate management strategies have been developed (ToR a, b, c).
Linkages to other committees or groups	There is a linkage to WGBEAM as similar surveys are used. WGELECTRA as the use of the pulse gear by a larger fraction of the fisherman might have implications on the stock, WGINOSE by providing data for the integrated assessment. WGSAM as the SMS key runs will be used to estimate natural mortality of brown shrimp. Members of WGCRAN are also members in these groups.
Linkages to other organizations	CWSS = Common Wadden Sea Secretariat; TMAP = Trilateral Monitoring and Assessment Programme; RCM –NSEA