2021/FT/HAPISG10 The **Methods Working Group** (MGWG), co-chaired by Christopher Legault, USA; and Anders Nielsen, Denmark, will work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2022	14–18 November	Lowestoft, UK		Incoming chair: Anders Nielsen, Denmark
Year 2023	13–17 November	East Lansing, USA		
Year 2024			Final report by DATE to SCICOM	

ToR descriptors

ToR	Description	Background	Science Plan Codes	Duration	Expected Deliverables
a	Evaluate technical details of stock assessment models	At typical EG meetings (benchmark and assessment) there is often insufficient time and expertise to evaluate the inner workings of the applied models. The focus is on input and output (black box). This ToR addresses the need for a forum where model developers "open the box" in front of fellow model developers. The goal is to find better solutions and avoid accumulating unfortunate hidden ad-hoc "fixes".	5.1; 5.4	3 years	Report on details examined and why they are important. Report specifically to the expert groups that could be affected by examined details (and connected benchmarks). Scientific publications when possible.
b	Share new techniques for use in stock assessment	Increased awareness of new techniques (e.g. modelling software or statistical innovations) can be enormously beneficial and improve efficiency for model developers. This ToR promotes such sharing across EG's and regions and can serve as early notification of techniques that may become useful or problematic to a number of EGs.	5.1; 5.4	3 years	Report on techniques examined with pros and cons of each for specific situations. Scientific publications when possible.
c	Validate new methods	Model developers are in short supply. The inherent conservatism and non-technical focus in the	5.1; 5.4	3 years	Report on steps taken to validate each method examined and any caveats.

		advice process can leave young model developers demotivated. This ToR creates a forum where fellow experienced model developers evaluate new methods through a combination of simulation study, empirical application, theoretical basis examination, and by comparing to existing methods. This will both motivate talented developers and promote the take-up of actual improvements by providing a quality assurance check on new methods.			Write clear conclusions in report (e.g. as: "method X is a valid alternative when …"). Scientific publications when possible.
d	Identify need for ices training courses	Identify if new courses are to be proposed for the ICES training program based on new tools or methods presented at the WGMG	5.1; 5.4	3 years	Report the need in the WGMG report and pass suggestion to the training group
e	Prioritize and address modeling questions supplied by ICES EGs	As time allows and interests/expertise of MGWG members overlaps, address one or more modeling issue supplied by other expert groups. The MGWG would not be expected to address every issue raised every year. ICES HAPISG leadership would help with prioritizing issues.	5.1; 5.4	3 years	Report on MGWG response to concerns addressed
f	Provide a reference document describing the set of stock assessment model diagnostics that should routinely be reported by assessment working groups and benchmarks to evaluate the adequacy of the model fit. The document should include the mathematical description of the indicators, an explanation of what they measure, guidance on evaluation and a practical example.	ACOM requested this ToR as an addition to the ToR e) for this group. There has already been a lot of work done on this topic, but a single reference document for ICES has not been produced. This ToR will create such a reference document.	5.1	2 years	A reference document citing recent work on diagnostics and including a worked example of their application.

Summary of the Work Plan

Year 1	Address all ToRs
Year 2	Continue working on all ToRs.
Year 3	Finalise manuscripts. Reporting to parent organisations. Plan for continuation of the EG.

Supporting information

Priority	Single-species stock assessment methods, for estimating stock size and harvest rate, are a well-defined topic of central importance for managing fisheries around the world. The activities of this Group will ensure visibility of ICES in the international arena in the field of fish stock assessments. Consequently, these activities are considered to have a very high priority.
Resource requirements	The research programmes which 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 20–25 members and guests.
Secretariat facilities	Standard EG support
Financial	No financial implications
Linkages to ACOM and group under ACOM	EGs under Fisheries Resources Steering Group (FRSG)
Linkages to other committees groups	ICES Training Group
Linkages to other organization	CAPAM, ICCAT, WFC, other RFMOs to be included in GAMe