Extracted from Report of the Scientific Council, June 2014, SCS Doc. 14/17

(http://archive.nafo.int/open/sc/2014/scs14-17.pdf)

ix) Risk assessment for SAI on VME elements and species (Item 12)

The Fisheries Commission requests the Scientific Council to continue to develop work on Significant Adverse Impacts in support of the reassessment of NAFO bottom fishing activities required in 2016, specifically an assessment of the risk associated with bottom fishing activities on known and predicted VME species and elements in the NRA.

The Scientific Council responded:

Scientific Council notes that work on significant adverse impacts on VME is on-going and that final results are not due until 2016, and indicates that good progress is been made. These analyses involved the production of fishery pressure layers based on VMS data, and VME biomass layers from RV surveys. Preliminary results indicated the important fractions of the recent effort are exerted in relatively small regions within the fishing footprint, and at least for some areas, this fishing effort seems to be concentrated in the near neighborhood of VMEs, suggesting a potential functional connection between some VMEs and commercially exploited fish species. This and other issues will continue to be explored as part of the process of developing the assessment of bottom fishing activities due in 2016. Specifically, the adopted approach has to be refined to take account of known and predicted VME habitat evaluated as part of the review of fishery closures.

As part of a past FC Request, SC developed a work-plan to achieve the reassessment of all NAFO fisheries by September 2016 and every 5 years thereafter, identifying the necessary steps to be taken, as well as the information and resources to do so. This work-plan has been updated, and specific leads were identified to progress the required fisheries assessment tasks. The plan also indicates how the assessment tasks relate to the FAO criteria for the assessment of SAI which are:

i. the intensity or severity of the impact at the specific site being affected;
ii. the spatial extent of the impact relative to the availability of the habitat type affected
iii. the sensitivity/vulnerability of the ecosystem to the impact;
iv. the ability of an ecosystem to recover from harm, and the rate of such recovery;
v. the extent to which ecosystem functions may be altered by the impact; and
vi. the timing and duration of the impact relative to the period in which a species needs the habitat during one or more of its life history stages

The proposed work-plan of fishery assessment tasks in relation FAO criteria and the tasks to be undertaken is as follows:

No.	Fisheries Assessment Task	FAO Criteria	Approach	Lead
1	Type(s) of fishing conducted or contemplated, including vessels and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing (harvesting plan)	i	Information and data is required to describe the fleet activities spatially and temporally. This will require integrating VMS data with information on the fishery e.g. fleet register and catch. NAFO has the catch data for the different gear types/fisheries. It was agreed that WGESA will work with	WGESA with input from NAFO Secretariat for presentation and approval by Scientific Council and

No.	Fisheries Assessment Task	FAO Criteria	Approach	Lead
			NAFO Secretariat to prepare a fisheries data table which can be integrated with the existing VMS data records. Additional long time-series catch/landings data will be summarised at the highest possible spatial resolution. The fisheries data table will be produced before WGESA 2014 and linked to the VMS data for the period 2008 – 2013.	STACFIS in 2015.
2	Existing baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes can be compared	i, ii, iii	The outcome of the "review of fisheries closures" should provide much of the seabed habitat data necessary to address this task. Additional spatial data from the AZMP ecoregion analysis should be integrated with the detailed habitat maps within the NRA to provide broad-scale spatial context. For the NRA as a region. Also analyse the environmental data from the NRA used as part of the habitat suitability modelling so as to assess possible dominant fisheries habitat associations. Time series analysis of the oceanography is required, e.g. long-term changes in production potential, SST, etc. This should include the work of STACFEN in relation to assessing the long-term physical oceanography. The data sources (above) will be identified and collated and a summary meta-data table compiled for presentation at WGESA 2014.	WGESA with input from AZMP and STACFEN, for presentation and approval by Scientific Council and STACFEN in 2015.
3	Identification, description and mapping of VMEs known or likely to occur in the fishing area	iii	The outcome of the "review of fisheries closures" should provide much (if not all) of the necessary information. In addition further work to develop habitat suitability models for VME in the NRA will be useful. E.g. for VME indicator species or assemblages of VME indicator species. At the WGESA meeting in 2014 a plan of what additional information should or could be included in the assessment should be made.	SC WGESA
4	Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered	i, ii	The work undertaken to address FC Request 16 (2012) and FC Request 12 (2013) by Scientific Council contributes to this task. We interpret this as the impact of the fishery	SC WGESA

No.	Fisheries Assessment Task	FAO Criteria	Approach	Lead
	by the assessment on VMEs		on VME's. We have started to integrate the fishing effort layers (2008 – 2012) with known and predicted VME (from the review) to show which areas (that correspond to a certain level of fishing effort) are at risk of SAI as they are not part of current closed areas.	
5	Consideration of VME elements known to occur in the fishing area	iii	The outcome of the "review of fisheries closures" should provide much (if not all) of the necessary information. An evaluation of the VME elements in relation to their potential to support VME indicator species should be investigated, possibly using model output – this will be considered and developed at WGESA 2014.	SC WGESA
6	Data and methods used to identify, describe and assess the impacts of the activity, the identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;	N/A	To be done in due course	SC WGESA
7	Risk assessment of likely impacts by the fishing operations to determine which impacts on VMEs are likely to be significant adverse impacts	ii, iii, iv, v	The work undertaken to address FC Request 16 (2012) and FC Request 12 (2013) by Scientific Council contributes to this task. The development of a risk assessment framework to be planned at WGESA 2014. We have started to integrate the fishing effort layers (2008 – 2012) with combined VME species biomass layers (2005 – 2013) to show which areas (that correspond to a certain level of fishing effort) are at greater risk of fishing impact. Further work is required to model the biomass of VME species whose presence is predicted at levels below VME thresholds. The predicted biomass can then be compared to observed biomass values in areas of fishing activity. This difference can be used to assess the potential for SAI outside closed areas. Furthermore, a method for assessing the resilience of the VME indicator taxa from a	SC WGESA

No.	Fisheries Assessment Task	FAO Criteria	Approach	Lead
			combination of fishing pressure and biomass for the same assemblage should be explored – this should be initiated at WGESA 2014. Finally, function can be inferred by examining the proximity of fishing effort (percentiles) to known VME, e.g. more effort (by fleet sector) near to VME. In addition, an assessment of the long-time series of catches (over several decades) in relation to predicted VME extent could be examined . Use of available commercial fishing data on by-catch could also be useful for validating model results.	
8	The proposed mitigation and management measures to be used to prevent significant adverse impacts on VMEs, and the measures to be used to monitor effects of the fishing operations	N/A	To be done in due course WGESA should provide some possible options at WGESA 2015	Joint FC/SC Working Group on the Ecosystem Approach Framework to Fisheries Management