



Serial No. N6342

NAFO SCR Doc. 14/045

SCIENTIFIC COUNCIL MEETING – JUNE 2014

Standardizing the traffic light approach for reporting on Convention Objectives

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Abstract

A traffic light approach was implemented in June 2013 to report on Convention Objectives for all stock summary sheets. These reports were well received by the Fisheries Commission (FC) and they have expressed support for Scientific Council (SC) to continue providing these reports. However, inconsistencies in the determination of these reports were noted by SC. This document provides a proposed framework for reporting on Convention Objectives. For each of the objectives, the message that SC should convey to FC, how to report and general rules for assigning green, yellow, red or white.

Introduction

One of the challenges that SC faces in reporting on the Convention Objectives is that they are largely management and enforcement outcomes. Additionally, three Objectives out of five are related to stocks but the other two are much broader and relate to ecosystems. Therefore, SC needs to consider carefully how they will report on these Objectives. It is important to report on the Objectives themselves and not on our ability to report. The five Convention Objectives are found in GC doc 08/3: Restore to or maintain Bmsy, Eliminate Overfishing, Apply PA according to the United Nations Fish Stock Agreement, Minimise harmful impact on ecosystem and Preserve Marine Biodiversity.

This document describes a proposed approach for reporting on Convention Objectives on the Summary sheets for stock advice. This approach builds on what was developed in June 2013 which uses a traffic light approach where green means “OK”, yellow means “intermediate”, red means “not accomplished” and white means “unknown”. Guidance is given to what should be reported, how and some general rules for assigning colours. Additionally, a tool for reporting using standard language is also proposed. This approach and tool will help bring consistency to the reports on each of the Summary Sheets.

Proposed approach by Convention Objectives

1. Restore to or maintain Bmsy

What we should be reporting: Is the stock increasing? Is the stock at a high level?

Indicator: Stock status and trajectory.

Reference points such as Bmsy and Blim will be useful however SC should assess the stock status and/or trajectory even in the absence of reference points. This may require a judgement call in some cases.

General Rule

Colour	Situations
Green	Stock is at high level and/or above Bmsy
Green	Stock is at high level and increasing or stable but Bmsy is unknown
Yellow	Stock is above Blim but below Bmsy and increasing or stable
Yellow	Stock is at relatively low levels and is stable or increasing. Reference points are unknown.
Red	Stock is below Blim
Red	Stock is at very low level
White	Not enough information to assess quantitatively or qualitatively

2. Eliminate Overfishing

What we should be reporting: Is the fishery sustainable? Are catches too high?

Indicator: Fishing mortality against stock trajectory. May require judgement call when F and/or F-based reference points are unknown or factors other than fishing are playing a role.

General rule:

Colour	Situations
Green	$F < F_{lim}$ and stock is stable or increasing
Green	F is low, F_{lim} unknown, and stock is stable or increasing
Yellow	F is low but stock is declining
Yellow	$F < F_{lim}$ and stock is stable or increasing but TAC set substantially higher than catch.
Yellow	Level of by-catch is delaying recovery
Red	$F > F_{lim}$
Red	Current level of F is causing a decline
Red	Level of bycatch is preventing recovery
White	Not enough information to assess quantitatively or qualitatively

3. Apply PA

What we should be reporting: How are we doing with the implementation of the PA as outlined in the United Nations Fish Stock Agreement?

Indicator: Have reference points been defined? Are clear Harvest Control rules being applied?

General rule:

Colour	Situations
Green	Stocks with reference points and harvest control rules
Green	Stocks with reference points and a risk-based management strategy is being used to avoid limits
Yellow	Stocks with only reference points
Yellow	Stocks with only a HCR
Red	Stock has no reference points or harvest control rules

4. Minimise harmful impact on ecosystem

What we should be reporting: How are we doing with implementation of ecosystem approach?

Indicators: VMEs, bycatch and other ecosystem considerations.

General rule:

Colour	Situations
Green	Ecosystem approach is fully implemented; bycatch measures and VME closures are in effect.
Yellow	Ecosystem approach is partially implemented i.e. bycatch measures and/or VME closures are in effect.
Red	Ecosystem approach is not implemented at all; no bycatch measures or VME closures in effect.

All stocks in the NRA should be yellow as there are VME closures, low bycatch for some fisheries but little implementation an ecosystem approach.

5. Preserve marine biodiversity

This objective requires more discussion as to what it entails and what SC should be reporting. In the meantime, SC should either report as a white (unknown) or yellow (intermediate) as some of the measures that NAFO have implemented contribute to this objective. Whatever SC chooses, SC should apply it consistently across all stocks until further developments.

Tool for Reporting

This document provides a standard set of rules that apply to all stocks and provide a consistent way to determine the colours of the traffic lights in the advisory sheets used to report to FC. To facilitate this and ensure a constant approach for all stocks, we suggest the development of a spreadsheet to semi-automate the colour determination process based on a set of pre-determined drop-down menus relevant to each of the convention objectives. An example of such a spreadsheet is presented in the below series of screenshot images. The spreadsheet is designed such that the selection of criteria from the drop-down menus automatically determines the colour of the traffic light based on conditional control rules entered *a priori* into the spreadsheet. For example, under the 'Restore to or maintain Bmsy' objective, there are drop-down menus pertaining to stock trend, Blim and Bmsy. The combination of 'stock is increasing', 'stock is above Blim' and 'stock is at or above Bmsy' will result in the traffic light being green (Fig. 1). If in the Bmsy

drop-down menu we instead select 'stock is below Bmsy' (i.e. the stock is between Blim and Bmsy) then the traffic light automatically turns yellow (Fig. 2).

In the 2013 traffic light reporting, the lack of an estimate of Bmsy typically resulted in traffic lights being designated as white, since stock status relative to Bmsy could not be determined (unless the stock was below Blim, in which case it was designated as red). Here it is proposed that Scientific Council and the respective stock designated experts, even in the absence of Bmsy estimates, often have other information (historic stock trends, etc.) to indicate stock status. The proposed spreadsheet does allow for this somewhat subjective assessment of the stock. For example, if Blim and Bmsy are not known, a fourth drop-down menu can be accessed that allows a non-reference point based perception of stock status to be chosen and the colour of the traffic light to be changed. For example, choosing 'stock likely at high level' will result in a green traffic light (Fig. 3). Likewise there is the option to provide an evaluation of F in the 'Eliminate Overfishing' objective based on estimates of F relative to Flim, or a Fproxy, or on perception of F (despite not having an estimate) (Fig. 4).

	A	B	C	D	E	F	G
1							
2		CONVENTION OBJECTIVE					
3	Stock	Restore to or maintain Bmsy		Eliminate overfishing		Apply PA	
4	stock X		stock is increasing		no directed fishing		no directed fishing
5	stock is above Blim		stock is increasing		Blim, Flim, Bmsy, F		
6	stock is at or above Bmsy		F>Flim				
7		<div style="border: 1px solid black; padding: 2px;"> stock is at or above Bmsy stock is below Bmsy Bmsy is unknown </div>					
8							
9							
10							

Figure 1. Demonstration of drop-down menus in traffic light tool. The light is green when the stock is at or above Bmsy.

	A	B	C	D	E	F	G
1							
2		CONVENTION OBJECTIVE					
3	Stock	Restore to or maintain Bmsy		Eliminate overfishing		Apply PA	
4	stock X		stock is increasing		no directed fishing		no directed fishing
5	stock is above Blim		stock is increasing		Blim, Flim, Bmsy, F		
6	stock is below Bmsy		F>Flim				
7		<div style="border: 1px solid black; padding: 2px;"> stock is at or above Bmsy stock is below Bmsy Bmsy is unknown </div>					
8							
9							

Figure 2. Demonstration of drop-down menus in traffic light tool. The light turns yellow when the stock is between Blim and Bmsy.

	A	B	C	D	E	F	G
1							
2		CONVENTION OBJE					
3	Stock	Restore to or maintain Bmsy		Eliminate overfishing		Apply PA	
4	stock X		stock is increasing		no directed fishing		no directed fishing
5	Blim is unknown		stock is increasing		Blim, Flim, Bmsy, Fr		
6	Bmsy is unknown		F>Flim				
7			stock likely at high level				
8			stock likely at high level				
9			stock likely at low level				
10			insufficient information				
11							

Figure 3. Demonstration of drop-down menus in traffic light tool. When reference points are unknown there is still the option to provide SC's perception of stock status and the traffic light colour will change accordingly.

	A	B	C	D	E	F	G
1							
2		CONVENTION OBJE					
3	Stock	Restore to or maintain Bmsy		Eliminate overfishing		Apply PA	
4	stock X		stock is increasing		no directed fishing		no directed fishing
5	stock is above Blim		stock is increasing		Blim, Flim defined		
6	Bmsy is unknown		F<Flim				
7				F unknown			
8				F unknown, likely low			
9				F unknown, likely high			
10				Fproxy low			
11				Fproxy high			
12				F<Flim			
13				F>Flim			

Figure 4. Demonstration of drop-down menus in traffic light tool. Fishing mortality can be assessed based on F relative to Flim, a Fproxy, or on SC's general perception of F.

ANNEX

Convention Objectives										
Stock	Restore to or maintain Bmsy		Eliminate overfishing		Apply PA		Minimise harmful impact on ecosystem		Preserve marine biodiversity	
	Color	Comment	Color	Comment	Color	Comment	Color	Comment	Color	Comment
3M cod		Bmsy unknown,stock increasing	Red	Current F not sustainable	Yellow	Only Blim defined	Yellow	VME closures in effect, no specific measures		Cannot be evaluated
3M Redfish	Green	Bmsy unknown,stock at a high level	Yellow	Fmsy unknown, catch at a low level	Green	Reference points not defined	Yellow	VME closures in effect, no specific measures, low bycatch		Cannot be evaluated
3LNO Yellowtail		Stock increasing B>Bmsy	Green	F<Fmsy	Green	Stock in safe zone of the Paf	Yellow	VME closures in effect, no specific measures, low bycatch		Cannot be evaluated
3NO White Hake		Bmsy unknown,stock at low level	Yellow	Fmsy unknown, Fishing mortality is low	Red	Reference points not defined	Yellow	no specific measures, ME closures in effect		Cannot be evaluated
3NO Capelin	Red	Bmsy unknown,stock at low level	Green	NDF		Reference points not defined	Green	VME closures in effect,NDF	Green	NDF
3NO Cod	Red	Stock is below Blm	Green	F is very low, F<Flim	Green	Blim and Flim established, NDF	Green	NDF	Green	NDF
3O Redfish		Bmsy unknown,stock increasing since the 2000s	Green	Fishing mortality is low		Reference points not defined	Green	VME closures in effect, low bycatch rates reported		Cannot be evaluated
2J3kl Witch	Red	Stock below blim	Green	NDF	Green	Blim established, NDF	Green	NDF	Green	NDF
3+4 Squid		Bmsy inappropriate given life history		Not quantifiable	Yellow	Reference points based on productivity level	Green	VME closures in effect, no by-catch in SA3 jig fishery, no SA4 directed trawl fishery since 1999		Cannot be evaluated
SA 0 + 1A offshore and Div. 1B-1F GH		no traffic lights given. Old template used								Cannot be evaluated
2+3 RH grenadier		cannot be evaluated	Green	Fishing mortality rate is low		Reference points not defined	Green	VME closures in effect,		Cannot be evaluated

Figure 1. Traffic lights as applied for stocks assessed in June 2013

Convention Objectives										
Stock	Restore to or maintain Bmsy		Eliminate overfishing		Apply PA		Minimise harmful impact on ecosystem		Preserve marine biodiversity	
	Color	Comment	Color	Comment	Color	Comment	Color	Comment	Color	Comment
3M cod	Green	Stock is healthy and increasing, back at the levels of the 80's	Red	Current F not sustainable	Yellow	Only Blim defined, no HCR's	Yellow	VME closures in effect,no specific measures, ecosystem approach under development		Cannot be evaluated
3M Redfish	Green	Stock at a high level and has been increasing.	Green	Catch levels appear to be sustainable	Red	Reference points not defined, No HCRs	Yellow	VME closures in effect,no specific measures,low bycatch,ecosystem approach under development		Cannot be evaluated
3LNO Yellowtail	Green	Stock increasing B>Bmsy	Green	F<Fmsy	Green	Reference points are defined. NHCRs but TAC is precautionary	Yellow	VME closures in effect,no specific measures,low bycatch,ecosystem approach under development		Cannot be evaluated
3NO White Hake	Yellow	Stock stable at relatively low levels	Yellow	Current catch levels appear to be sustainab, concern with TAC	Red	Reference points not defined, no HCRs	Yellow	no specific measures,VME closures in effect, ecosystem approach under development		Cannot be evaluated
3NO Capelin	Red	Stock stable at very low level		not applicable because NDF	Yellow	Ref points not defined, no HCRs, NDF	Yellow	VME closures in effect,NDF, ecosystem approach under development		Cannot be evaluated
3NO Cod	Red	Stock is below Blim		not applicable because NDF	Green	Blim and Flim established, NDF	Yellow	VME closures in effect,NDF, ecosystem approach under development		Cannot be evaluated
3O Redfish	Green	Stock appears healthy and has been increasing since the 2000s	Yellow	F is low and appears to be sustainable, TAC may be a concern	Red	Reference points not defined, no HCRs	Yellow	VME closures in effect,low bycatch rates reported, ecosystem approach under development		Cannot be evaluated
2J3kl Witch	Red	Stock below blim		not applicable because NDF	Yellow	Only Blim established, NDF	Yellow	NDF,ecosystem approach under development		Cannot be evaluated
3+4 Squid	Yellow	????		????	Yellow	Reference points based on productivity level	Yellow	VME closures in effect,no by-catch in SA3 jig fishery, no SA4 directed trawl fishery since 1999		Cannot be evaluated
SA 0 + 1A offshore and Div. 1B-1F GH	Green	Stock at a high level and is increasing.	Green	Current catch levels appear to be	Yellow	Blim established, no HCRs	Yellow	Some closures in effect		Cannot be evaluated
2+3 RH grenadier	Red	Stock at relatively low levels and decreasing	Yellow	Fishing mortalit rate is low but appears unsustainable	Red	Reference points not defined, no HCRs	Yellow	VME closures in effect, ecosystem approach under development		Cannot be evaluated

Figure 2. Traffic lights resulting from proposed approach for stocks assessed in June 2013