# RESULTS OF APPLYING FILTERS 1 AND 2 TO THE 2013 STATISTICAL DATA REPORTED DURING 2014

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## **SUMMARY**

This document presents the results of applying the SCRS filtering criteria to the 2013 fisheries statistics information reported to ICCAT during 2014. This filter instrument, designed to validate the data formats reported to ICCAT, and to some extent its quality in terms of homogeneity and minimum levels of detail, was approved in 2013. The study was conducted to the Task I and Task II data reported in the five standard SCRS forms. The results of its application, involving four different scenarios (starting with the most flexible one and ending with the most restricted one) are in general not very optimistic. In summary, applying the most relaxing scenario indicates that an important portion of the data arriving in the forms had to be completed/corrected by the Secretariat in order to be used. The most restrictive scenario gives a more pessimist view with a larger portion of the datasets received being rejected. Adding to it, the information not "yet" reported and the late reported data, the overall picture of the fisheries data reporting status, can be understood as poor.

## RÉSUMÉ

Ce document présente les résultats de l'application des critères de filtrage du SCRS aux informations statistiques des pêcheries de 2013 déclarées à l'ICCAT en 2014. Cet instrument de filtrage, conçu pour valider les formats de données déclarés à l'ICCAT, et dans une certaine mesure leur qualité en termes d'homogénéité et de niveaux minimum de détail, a été approuvé en 2013. L'étude a porté sur les données de la Tâche I et de la Tâche II déclarées dans les cinq formulaires standard du SCRS. Les résultats de son application, mettant en scène quatre différents scénarios (en commençant par le plus flexible et en terminant par le plus strict) ne sont pas très optimistes de façon générale. En résumé, si l'on applique le scénario le plus flexible, on constate qu'une grande partie des données consignées dans les formulaires ont dû être complétées/corrigées par le Secrétariat afin de pouvoir être utilisées. Le scénario le plus strict donne une vue plus pessimiste, une plus grande partie des jeux de données reçus ayant été rejetés. Ajouté à cela, l'information pas « encore » déclarée et les données déclarées tardivement donnent une image assez négative de la situation de déclaration des données halieutiques.

## RESUMEN

Este documento presenta los resultados de aplicar los criterios de filtrado del SCRS a la información de estadísticas pesqueras de 2013 comunicada a ICCAT durante 2014. Este instrumento de filtrado, diseñado para validar los formatos de datos comunicados a ICCAT y, en cierta medida, su calidad en términos de homogeneidad y niveles mínimos de detalle, fue aprobado en 2014. El estudio se llevó a cabo con los datos de Tarea I y Tarea II comunicados en los cinco formularios estándar del SCRS. Los resultados de esta aplicación, referidos a cuatro escenarios diferentes (empezando con el más flexible y finalizando con el más restringido) no son, en general, muy optimistas. En resumen, aplicar el escenario más relajado indica que una parte importante de los datos que llegan en los formularios debe ser completada/corregida por la Secretaría para poder usarlos. El escenario más restrictivo ofrece una visión más pesimista, con una gran parte de los conjuntos de datos recibidos rechazada. Además, teniendo en cuenta la información no comunicada "aun" y los datos comunicados tarde, la imagen global de la situación de comunicación de datos pesqueros puede considerarse negativa.

#### **KEYWORDS**

Fishery statistics, Data validation, Quality control

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#### Introduction

The Secretariat has to face every year a complex and time consuming task of managing all the statistical and biological data (Task I, Task II, and Tagging) reported to ICCAT. A reasonable portion of the information received is not properly qualified to be integrated into the ICCAT database system (ICCAT-DB). The various types of deficiencies (some easily corrected, others with impossible solutions) includes, among others, datasets without the correct SCRS formats (<a href="www.iccat.int/en/submitSTAT.htm">www.iccat.int/en/submitSTAT.htm</a>), incomplete forms, data without SCRS standard codes, and data which does not respect the minimal SCRS required level of detail to be used in scientific studies. This situation causes a burden to the Secretariat, not only in terms of data management inefficiencies (requiring several attempts to obtain a final acceptable dataset, risk of inaccuracies/errors while appropriately correcting the datasets received, etc.), but specially in the time spent in assembling the information with high standards and make it available to the SCRS.

The SCRS recognised the need of an instrument (set of validation rules and minimum standards) for data acceptance. After a two year period co-working with the Secretariat, approved in 2013 a preliminary version of the SCRS Filtering Criteria (Anon, 2014) for the acceptance of Task I, Task II and Tagging data. These criteria will be subject to revisions in the following years, depending on the results achieved with their application, and, the benefits expected in terms of data reinforcement obligations, data improvements and availability.

For 2014, the SCRS requested a report from the Secretariat on the results of applying the filtering criteria to the 2013 data, noting that any outcome should be viewed with caution and with no particular implications, due to its novelty. This document serves that goal. It was only applied to Task I and Task II data because this year the Secretariat lacked the required conditions (databases ready to check/accommodate filter results, time availability, etc.) to use filters on tagging data reported.

## **Material and Methods**

The SCRS filtering criteria is made of a set of rules and constraints contained in two filters. Filter 1 is more general and globally applied to all forms. Filter 2 is more detailed and has rules specific to each form. They were built in a way that, Filter 2 is only used if Filter 1 has passed all the conditions. Together, they reflect two different levels of examination of statistical and biological data received, and jointly define a standard process to accept or reject each dataset received by ICCAT. The SCRS recommended the use of the filtering criteria, only for testing purposes, to the 2013 statistics.

Currently, ICCAT has 49 Contracting Parties (CP) and 4 Cooperating non-Contracting Parties (NCC). Two CPs are Organisations (EU: European Union; UK-OT: Overseas Territories of the United Kingdom) with more than one country. In order to properly capture the reporting status of each data reporting entity (following the SCRS general approach), 13 EU Member States and 4 UK-OT Member States, were added to the analyses. The resulting number of data reporting entities (hereafter flags), were 68 in total:

$$68 \text{ flags} = (47 \text{ CPs} + [13 \text{ EU members} + 4 \text{ UK-OT members}]) + 4 \text{ NCCs}$$

## Material

The files reported to the Secretariat during 2014 were the main source of data (hereafter the "reporting period", going from 2013-12-01 to 2014-09-05), containing all the Task I and Task II with 2013 information. All the data arriving in the standard SCRS forms (Task I: ST01-T1FC, ST02-T1NC; Task II: ST03-T2CE, ST04-T2SZ, ST05-CAS), or in any valid special data exchange format (**Table 1**), were used in the analyses.

Overall, the number of files received during the reporting period with Task I and Task II data (**Table 2**), were about 1,800 (~500 MB in size) which represents around 850 thousand records integrated into the ICCAT-DB system. These amounts are in line with the observed tendency over the last lustre, both in number of files reported (oscillating between 1,700 to 2,500 files) and in number of new records processed (oscillating between 700 thousand and 1,200 thousand records).

#### Methods

Each file (SCRS form or special format) was examined against the criteria of Filter 1 and then against Filter 2.

The Filter criteria are described below:

**Filter 1 (F1):** General criteria applied to all forms (4 rules for acceptance/rejection):

- a) Data must come in one of the SCRS valid formats (electronic forms, exchange formats)
- b) Header section must be complete
- c) Detail section must be filled-in using ICCAT codes
- d) Revisions/updates must be indicated in notes: "COMPLETE revision" or "PARTIAL revision"

Item (d) was removed from the analyses because none of the 68 flags has followed that rule, which would mean that none of the forms would pass Filter 1 criteria.

Filter 2 (F2): Specific form criteria (number of rules depends on the form):

## ST01-T1FC (Task I fleet characteristics):

a) Number of vessels in LOA classes should equals the number in GRT classes

#### ST02-T2NC (Task I nominal catch)

- a) For each row, all fields must be filled-in using correct ICCAT codes
- b) All quantities (landings, discards/live]) should be in kilograms (live weight)ST03-T2CE (Task II catch & effort)

## ST03-T2CE (Task II catch & effort)

- a) Effort cannot be NULL (rows with NULL effort are discarded)
- b) Use gear based SCRS approved effort units (LL: Number of hooks; PS: fishing days; etc.)
- c) Time resolution: month
- d) Geographic resolution: LL (5x5 grid or higher); surface gears (1x1 grid)
- e) Not mix up in the same form <> geographic grids (1x1, 5x5)
- f) Species catch composition should be as complete as possible (number or weight (kg))
- g) Revisions for one or more species should be submitted with all other species

Rule (e) was not fully tested (only annotated, not counting in the test). Rules (f) and (g) were not evaluated due to their complexity and the lack of efficient algorithms that allow its verification.

## ST04-T2SZ (Task II size samples):

- a) Time resolution: month
- b) Geographic resolution:
  - Species specific Sampling Areas (<a href="http://www.iccat.int/Forms/CODES">http://www.iccat.int/Forms/CODES</a> Sampling Areas.xls), OR
  - The following spatial grids: 1x1, 5x5, 5x10, 10x10
- c) Each size class frequency should be a multiple of the interval defined in header section (e.g.: 2 cm intervals: 20, 22, 24, 26, etc.). Classes frequencies with "zero" fish are optional.
- d) Size classes within valid ranges [defined for each species by the respective Working Groups]

Rule (d) was not evaluated because not all the species have defined valid size and weight ranges.

# ST05-CAS (Task II catch-at-size reported):

- a) Only valid for BET, YFT, SKJ, BFT, SWO in number of fish (others species DISCARDED)
- b) Only the SCRS standard format on size frequencies (1cm lower limit size class intervals)
- c) Time resolution: month OR trimester
- d) Geographic resolution: LL (5x5 grid), [all other surface gears (1x1 grid)]

Four scenarios (conditional application of F1 and F2, observable by a colour scheme in the resultant report cards) were drawn:

Scenario 1 (S1F0) - "status quo" (last 4 years) with NO filters applied:

- Good data: arriving in time [green] / arriving late [yellow]
- Incomplete/erroneous data with Secretariat corrections: [green]
- Incomplete/erroneous data, requested again [not shown]

Scenario 2 (S2F1) - Filter 1 applied in a flexible way:

- Good data: arriving in time [green] / arriving late [yellow]
- Incomplete/erroneous data with Secretariat corrections: [orange]
- Incomplete/erroneous data, requested again [not shown]

Scenario 3 (S3F1): Filter 1 fully used

- Good data: arriving in time [green] / arriving late [yellow]
- Incomplete/erroneous data with Secretariat corrections: [red]
- Incomplete/erroneous data, requested again [not shown]

Scenario 4 (S4F2): Filter 2 applied after passing Filter 1

- Good data: arriving in time [green] / arriving late [yellow]
- Incomplete/erroneous not passing Filter 1 & Filter 2 [red]

The flow diagram of the filter criteria (F1 and F2) application is summarised below:

- Evaluate data against F1
- ALL criteria have passed?
- YES: F1 OK (data registered, processed and stored in ICCAT-DB) → GOTO II
- NO (1 or more failures): F1 failure → GOTO to III
- II. Evaluate data (already in the DB) against F2
- ALL criteria have passed?
- YES: F2 OK
- NO: (1 or more failures): F2 failure (END)
- III. Can be easily corrected by the Secretariat?
- YES: F1 OK  $\rightarrow$  GOTO II
- NO: F1 failure (END)

In the cases of failure to pass F1 and F2 the data was rejected. For those cases, the Secretariat is informing the respective CPC about the reasons for data rejection and requesting again the revised datasets. Presently, this process is not automatic and requires a certain amount of time to verify, bookmark the problems, and request the revisions in a proper way. This could lead to some delays in the response times. Previewing the need for faster response times, the Secretariat has started to implement a special framework (set of tools aimed to deal with the SCRS filtering criteria) aimed to automate the feedback process and consequently reduce this time lag in a drastic way in the near future.

There is one important side-effect in this analysis. The results are presented by flag, however each flag has many fisheries (combinations of, fleets, gears, targeting a species or groups of species) which require different dataset submissions. This means that, there is a merge process that aggregates all flag related fisheries into only one reporting status indicator. Thus, the results should take into account this side-effect (an example shown in **Table 3**):

"For a given flag, NOT all Fisheries had reporting "errors". If, for a given flag, only one fleet/gear combination didn't pass F1 or F2 in a given species, the entire flag will have reporting errors".

In addition, data arriving in the forms ST04-T2SZ (size frequencies) and ST05-CAS (catch-at-size reported) were merged into only one evaluation process. This merge was applied only in cases where no T2SZ size data was available but instead a CAS dataset was reported (for instance in the case of the European tropical purse seine related fisheries, where only ST05-CAS is available).

## Results

Overall, the results of applying the SCRS filter criteria with the four different scenarios (starting with the most flexible one and ending with the most restricted) are not very optimistic.

The Scenario 1 ("status quo", not taking into account the SCRS filtering criteria) does not show any major improvement in terms of data reporting ratios, when compared with the last three years. Overall, Task I datasets

(T1FC and T1NC) reported, are more complete and with less errors, than the Task II datasets (T2CE, T2SZ/CAS).

In the case of the Task I information, the results were:

- T1FC (fleet characteristics): about 72% of the flags reported the information totally or partially (66% in time, 6% after the deadlines), and 28% have not reported any valid dataset (includes 3% of flags with data reported with insolvable errors).
- T1NC (nominal catches): the average flag reporting ratio (with at least one dataset for the 10 major tuna and tuna-like species: ALB, BFT, BET, SKJ, YFT, SWO, BUM, WHM, SAI, SPF), including "zero" catch, represented about 43% of the total (40% in time, 3% after the deadlines). The flags who have not reported any valid T1NC dataset represented 57% (includes 3% of flags with data reported with insolvable errors).

## For Task II data, the results were:

- T2CE (catch and effort): the average flag reporting ratio (with at least one dataset for the 10 major tuna and tuna-like species), including "zero" catch, was about 37% of the total (34% in time, 3% after the deadlines). The flags who have not reported any valid T2CE dataset was 63% of the total (includes 3% of flags with data reported with insolvable errors).
- T2SZ (size samples): the average flag reporting ratio (with at least one dataset for the 10 major tuna and tuna like species), including "zero" catch, was about 23% of the total (22% in time, 1% after the deadlines). The flags who have not reported any valid T2SZ (or CAS) dataset represented 77% of the total (including 3% of flags who reported datasets with insolvable errors).

The results of scenario 2 (S2F1: F1 used in a flexible way), clearly identifies the flags whose datasets (at least one) were corrected (in a way that would pass F1; note that, less important fields like "phone", "address", etc., were not taken into account either) by the Secretariat. The ratios of the flags with datasets corrected within the eligible (greens and yellows) ratios of scenario S1F0, is shown below:

- T1FC: corrected 15% of the flags from a total of 72% eligible flags
- T1NC: corrected 10% of the flags from a total of 43% eligible flags
- T2CE: corrected 17% of the flags from a total of 37% eligible flags
- T2SZ: corrected 2% of the flags from a total of 23% eligible flags

Scenario 3 results (effective use of F1) don't count with the corrected datasets. The effective eligible ratio of flags with the data passing F1 can be directly estimated by discounting the ratio of flags with dataset corrections (in S2F1) from the eligible flag ratios of scenario S1F0, and, the error ratio. Thus, the ratios of flags for which their datasets have passed F1 are:

- T1FC: 57% passed F1; 18% failed F1 (not reported 25%)
- T1NC: 33% passed F1; 13% failed F1 (not reported 54%)
- T2CE: 20% passed F1; 20% failed F1 (not reported 60%)
- T2SZ: 21% passed F1; 5% failed F1 (not reported 74%)

With the most restrictive scenario, 4 (S4F2 - use of F2 after passing F1), the number of flags in which the datasets have passed both F1 and F2, is even smaller:

- T1FC: 49% passed F2 (26% failed)
- T1NC: 18% passed F2 (27% failed)
- T2CE: 13% passed F2 (27% failed)
- T2SZ: 17% passed F2; (9% failed)

The summarised results are presented in **Table 4**. However, when looking the ratio results on a species basis, for the datasets T1NC, T2CE and T2SZ, some species are better represented (in particular, ALB, BFT, BET, YFT, SKJ, and, SWO) than others. The details per species are presented in **Table 5**.

The detailed flag scores of applying SCRS filters (1 & 2) by scenario (from which **Tables 4** and **5** were derived) are presented in **Table 6** (form ST01-T1FC), **Table 7** (form ST02-T1NC), **Table 8** (form ST03-T2CE), and **Table 9** (forms ST04-T2SZ and ST05-CAS), and their graphical representation respectively in **Figures 1**, **2**, **3**, **and 4**. **Figure 5** shows an alternative view (all species by scenario) only for the dataset types, T1NC, T2CE and T2SZ/CAS, which permits to clearly visualise the results of each scenario as an all.

## **Discussion**

Applying the most relaxing scenario (S1F0) indicates that, an important portion of the data arriving in the forms can only be used if completed/corrected by the Secretariat (shown by scenario S2F1). Applying fully filter 1 criteria (S3F1) would put apart (not be used by the SCRS) the datasets corrected by the Secretariat. The most restrictive scenario (S4F2) shows an even more pessimist view, with an increasing larger portion of flags reporting at least one dataset discarded by filter 2. The situation is even worst with Task II datasets (having T2CE more rejected data than T2SZ). Adding to it, the information not "yet" reported and, the late reported data, the overall picture of the fisheries data reporting obligation status, is effectively in a bad shape.

However, these results should be viewed with caution once it is an experimental year, and that, not all the ICCAT CPCs were aware (or did had some doubts on the utilisation) of the SCRS filtering criteria. In addition, applying Filters 1 & 2, as criteria to accept/reject statistical information resulted in a complex process to both, the Secretariat & ICCAT CPCs.

The major causes of failure to pass the SCRS filtering criteria were basically two:

- Forms incompleteness in general,
- No systematic and correct use of the ICCAT coding system.

Others factors could also have influenced these results, were:

- Task I Sampling Areas entered in force in 2014.
- All STAT forms were revised in 2014 to accommodate new SCRS requests and trilingual automatic choice.
- The SCRS filtering criteria doesn't have yet a proper infrastructure (inside the ICCAT-DB system) that would allow an error prone evaluation, and thus can simplify enormously its systematic use.

The Secretariat is currently integrating the proper filtering criteria infrastructure required (classification, automation, etc.) inside the ICCAT-DB system. It is a time consuming process. This schedule would give time to the Secretariat to implement it. Prepare automatic form validators in code and automate the response process when data arrives.

## **Conclusions**

Firstly, as identified in the past by the SCRS, late reporting continues to be a major cause of concern. A large portion of information arrives during the SCRS meetings (both, Species Groups and Plenary) and sometimes after the SCRS meeting and before the Commission meeting held in November. This situation puts the Secretariat in serious problems (with the obligation to report to the SCRS the most up-to-date information), because it doesn't have sufficient time to work with the late reported information. As a consequence, it could affect the work of the SCRS with possible side effects on producing the required responses to the Commission.

Despite the poor results obtained with the utilisation of the SCRS filtering criteria for the first time, the potential of this tool can be very high in relation to the accomplishment with ICCAT policy related to fishery data reporting obligations. It is a fact, that some criteria would require some "tuning" in the following years to take advantage of the learning process.

In summary, the SCRS filtering criteria can be a powerful tool to:

- Put some "order" on the data reporting obligations;
- Impose to CPCs the responsibility to verify the information before being reported to ICCAT;
- Improve the quality of statistical and biological information by, imposing standards and rules, and, constraining the data aggregation levels to minimum standards;
- Contributing to the homogeneity in data series;

- Optimize the Secretariat workload with benefits to the work of the SCRS and the Commission;
- Provide timely available (and better verified) datasets at the meetings;
- Benefit the SCRS long-term strategic plan in terms of data availability/quality.

## References

Anon, 2014. Report of Standing Committee on Research and Statistics (Addendum 2 to Appendix 8): Report for biennial period, 2012-13 Part II (2013) - Vol. 2 (English).

**Table 1.** List of ICCAT special data exchange formats for reporting Task II data.

				~			
				Special form	ats (Task-II on	ly)	
		T2	2CE	T	2SZ		CAS
Flag	Fleet	format	Gears/fisheries	format	Gear (Species)	CAS	Gear (Species)
Belize	BLZ-ETRO	*.m11	PS & BB			*.tm5	PS/BB (trop sp.)
Cape Verde	CPV-ETRO	*.m11	PS & BB			*.tm5	PS/BB (trop sp.)
Curação	CUW-CW-ETRO	*.m11	PS & BB			*.tm5	PS/BB (trop sp.)
EU.España	EU.ESP-ES-ETRO	*.m11	PS & BB			*.tm5	PS/BB (trop sp.)
_	EU.ESP-ES-SWO	IEO (SWO)	LL-surf			IEO (SWO)	SWO
EU.France	EU.FRA-FR-ETRO	*.m11	PS & BB			*.tm5	PS/BB (trop sp.)
* EU.Portugal	EU.PRT-PT-MAINLND	*.csv	LL-surf	*.csv	all	*.csv	all
Guatemala	GTM.ETRO	*.m11	PS & BB			*.tm5	PS/BB (trop sp.)
Japan	JPN	fixed (koji) OR	LL	*.csv	LL(all)	*.csv	LL(all) with variants
		*.csv (kotaro)					(koji/kotaro/etc)
Panama	PAN-PAN-ETRO	*.m11	PS & BB			*.tm5	PS/BB (trop sp.)
U.S.A.	USA-Com			XLS -> CSV	LL/RR(all)	XLS -> CSV	LL/RR(all)
	USA-Rec			XLS -> CSV	LL/RR(all)	XLS -> CSV	LL/RR(all)

<sup>\*</sup> VEN, MEX, ESP (WHM/BUM) and others do make use of one special format (Portugal LL-surf)

**Table 2.** Summary of files received during 2014 (up to 2014-09-05) with Task I and Task II (STAT group), and its equivalent number of records integrated into the ICCAT-DB system (2013 data presented for comparison).

	STAT files received by ICCA	Т			Nun	nber of re	cords proc	essed	
	(involved in data processing	:)				(T1 & T2	databases	)	
Year	STAT group	No. of files	total size	dataset	Pending	New	Revisions	Total	%revisions
			(MB)		(preDB)	(curDB)	(hisDB)		
2014	Task I & Task II	1810	523	t1fc	0	263	34	297	11%
				t1nc	399	4848	132	5379	2%
				t2ce	4901	49894	5447	60242	9%
				t2sz	0	750933	12749	763682	2%
				Sub-total	5300	805938	18362	829600	2%
	Tagging	60	265						
	Others (obsProgs, birds, turles, ISSF, JDMIP)	141	44						
	Bycatch	199	134						
	2014 Total	2210	966						
2013	Task I & Task II	1551	972	t1fc	3	182	8	193	4%
				t1nc	625	3905	664	5194	13%
				t2ce	0	50489	9122	59611	15%
				t2sz	5965	877933	64996	948894	7%
				Sub-total	6593	932509	74790	1013892	7%
	Tagging	90	23						
	Others (obsProgs, birds, turles, ISSF, JDMIP)	160	36						
	Bycatch	598	328						
	2013 Total	2399	1359						

**Table 3.** Example of the side-effect of grouping in scenario 2, various fleets and gears into a unique flag (EU-Portugal).

T2C	E (example)									Sc	enario	2 (S2F	1)				
							Τι	ma (n	najor s	sp.)				Tuna (small)	Shark	s (maj	or sp.)
Grouping	Flag	FleetCode	GearGrpCode	ALB	BET	BFT	BUM	SAI	SKJ	SPF	swo	WHM	YFT	(any of 14 sp)	BSH	POR	SMA
	EU.Portugal	EU.PRT-PT-AZORES	BB	-0.2	-0.2				-0.2				-0.2				
			GN											-0.2			
			LL								-0.2				-0.2		-0.2
Fleet/		EU.PRT-PT-MADEIRA	BB	-0.2	-0.2				-0.2				-0.2				
gear grp.		EU.PRT-PT-MAINLND	LL		- 1	1							1				
			SU			1											
			TP			1											
			UN	- 1			1	- 1	- 1		- 1				- 1		1
Flag (all)	EU.Portugal	(in the report	cards)	-0.2	-0.2	1	- 1	- 1	-0.2		-0.2		-0.2	-0.2	-0.2		-0.2

**Table 4.** Summarised scores (ratios, %) of flags who reported data to ICCAT, by dataset type, scenario and datasets classification status (good in time, good late, good after correction, with errors, not reported) after applying filters 1 and 2. The average of the 10 major tuna and tuna-like species was used for T1NC, T2CE and T2SZ.

	Avera	ge of L	OA &	GRT			Av	erage o	ver th	e 10 ma	ijor tui	na & tu	na-like	sp.		
Dataset ->	T1FC	!			T1NC					T2	CE		T1SZ			
Status \ scenario ->	S1F0	S2F1	S3F1	S4F2	S1F0	S2F1	S3F1	S4F2	S1F0	S2F1	S3F1	S4F2	S1F0	S2F1	S3F1	S4F2
Good (1)	66	54	54	46	40	30	30	17	34	. 18	18	12	22	20	20	16
Late report (0)	6	5 3	3	3	3	3	3	1	3	2	2	. 1	1	1	1	. 1
corrected (-0.2)	0	15	0	0	0	10	0	0	0	17	0	0	0	2	0	0
Errors (-1)	3	3	18	26	3	3	13	27	3	3	20	27	3	3	5	9
Not reported (blank)	25	25	25	25	54	54	54	54	60	60	60	60	74	74	74	74
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

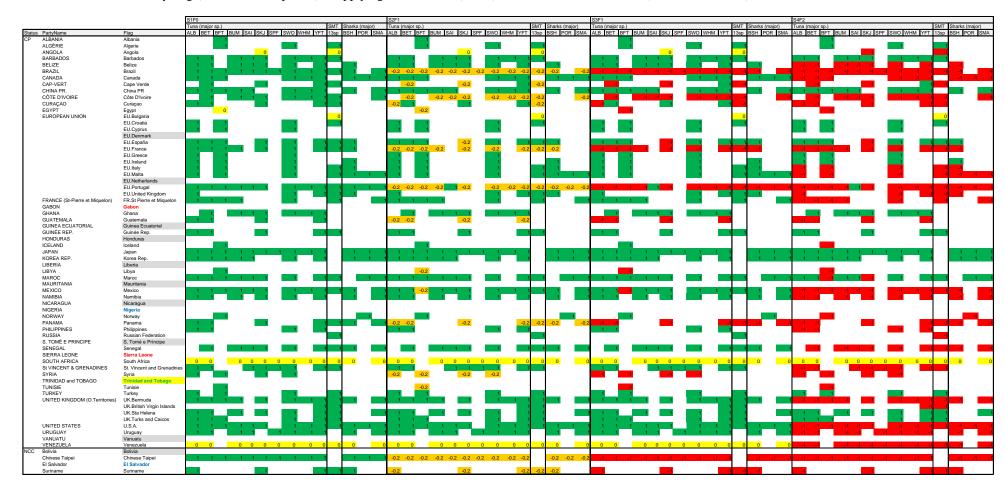
**Table 5.** Detailed results of the scores (number of flags and ratios) obtained while applying F1 and F2 for each dataset type (by species in T1NC, T2CE and T2SZ) within the four scenarios.

Time Interpreted   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   37   46   49   60   66   51   82   38   71   43   46   57   79   62   49   60   60   60   60   60   60   60   6	No flag:	Good(1) solution (1) corrected (-0.2) errors not reported total Good(1) late rep (0) corrected (-0.2) errors not reported total total total total total total total	S1F0   S2F1   S3F1   S4F2   GRT   LOA   GRT   GRT				
Section   Sect	T1N	NC .					
No good(1) + *** catch   90 - 33   \$2   \$2   1   \$2   8   6   \$3   \$1   20   1   20   2   2   4   20   20   2   2   2   2   2   2   1   1   1   1	Dec.	101 011					
Interspe(i)   3   3   1   3   3   4   3   3   3   4   3   3   3	No	good(1) + "0" catch gs late rep (0) corrected (-0.2) errors not reported	h 39 33 32 23 19 28 8 38 2 2 1 2 2 3 2 2 0 0 0 0 0 0 0 0 0 2 2 2 2 2 2 2 2 2	16 35 31 25 12 22 30 25 2 2 2 4 2 0 2 2 2 0 0 0 0 0 0 0 9 8 2 2 2 2 2 2 2 2 48 29 31 39 54 42 25 31 3	24 18 16 17 6 32 12 27 23 19 10 17 0 2 2 3 2 2 2 4 2 0 2 9 5 3 111 2 6 4 8 8 6 2 5 2 2 2 2 2 2 2 2 2 2 2 2 2 3 31 39 14 45 35 56 6 48 29 31 39 54 42	30 26 24 18 16 17 6 32 12 27 23 19 10 1 2 2 0 2 2 3 2 2 2 2 4 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 11 10 11 7 5 13 4 8 6 10 10 8 4 25 31 33 41 45 35 56 26 48 29 31 39 54 4	17 13 15 10 10 8 4 18 7 14 12 8 6 8 1 1 0 1 1 1 1 1 1 2 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
State   Stat	%	late rep (0) corrected (-0.2) errors not reported	3 3 1 3 3 4 3 3 0 0 0 0 0 0 0 0 0 0 3 3 3 3 3 3 3 3	3 3 6 3 0 3 3 3 3 0 0 0 0 0 0 0 13 12 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 3 3 4 3 3 3 6 3 0 3 13 7 4 16 3 9 6 12 12 9 3 7 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 0 3 3 4 3 3 3 3 6 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 0 1 1 1 1 1 1 1 1 3 1 0 1 1 0 0 0 0
No good(1) +0° catch (-10) -0°	T2C	)E					
No good(1) + 0" catch   00   02   23   19   16   24   8   33   33   32   25   27   70   9   14   4   18   7   15   13   11   4   10   10   15   16   10   8   11   5   16   7   15   13   11   4   10   10   13   8   5   4   9   5   9   5   11   9   8   4   18   18   18   18   18   18	Ma	/0/ Ctetus					
Table   Trans   Trans	No	good(1) + "0" catch gs late rep (0)			16 10 8 11 5 16 7 15 13 11 4 10		
Table	%	errors not reported total good(1) + "0" catch late rep (0) corrected (-0.2) errors	2 3 1 2 2 2 1 3 0 0 0 0 0 0 0 0 0 0 2 2 2 2 2 2 2 2 2 2	2 3 3 2 0 2 1 1 2 0 0 0 16 15 2 2 2 2 2 2 2 2 2 3 3 3 68 68 68 68 68 68 68 68 68 68 68 68 68	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Tura (major sp.)   SMT   Sharks (major)   Sharks (major)   SMT   Sharks (major)   Sharks (major)   SMT   Sharks (major)   SMT   Sharks (major)   Sharks (major)   Sharks (major)   SMT   Sharks (major)   Sharks (maj	%	errors not reported total good(1) + "0" catch late rep (0) corrected (-0.2) errors not reported	2 3 1 2 2 2 1 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 3 2 0 2 1 1 2 0 0 0 16 15 2 2 2 2 2 2 2 2 2 2 2 3 4 8 8 68 68 68 68 68 68 68 68 68 68 68 68	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
No 76 Status ALB   BET   BET   BLW    SAI   SKJ   SPF   SWO   WHH   WFT   Tags   BSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   BSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   BSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   ALB   BET   BFT   BLW    SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SSH   POR   SMA   SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SAI   SKJ   SPF   SWO   WHM   WFT   Tags   SAI   SKJ   SKJ	%	errors not reported total good(1) + "0" catch late rep (0) corrected (-0.2) errors not reported total	2 3 1 2 2 2 1 3 0 0 0 0 0 0 0 0 0 2 2 2 2 2 2 2 2 3 3 3 3 4 4 5 48 40 57 30 68 68 68 68 68 68 68 68 1 44 44 3 28 24 35 12 49 1 3 4 1 3 3 3 3 1 4 0 0 0 0 0 0 0 0 0 0 3 3 3 3 3 3 3 3 3 3	2 3 3 2 0 2 1 1 2 0 0 0 16 15 2 2 2 2 2 2 2 2 2 2 2 3 4 8 8 68 68 68 68 68 68 68 68 68 68 68 68	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Integral lister right)   1 2 0 0 0 1 0 1 0 2 1 1 0 1 1 2 0 0 0 1 0 1	%	errors not reported total good(1) + "0" catch late rep (0) corrected (-0.2) errors not reported total	2 3 1 2 2 2 1 3 0 0 0 0 0 0 0 0 0 0 2 2 2 2 2 2 2 2 2 2	2 3 3 2 0 2 1 1 2 0 0 0 16 15 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
notreported 47 43 43 57 58 48 61 47 58 41 48 55 59 56 47 43 43 57 58 48 61 47 58 41 48 55 59 55 59 50 10al		errors not reported total good(1) + "0" catch late rep (0) corrected (-0.2) errors not reported total	2 3 1 2 2 2 1 3 0 0 0 0 0 0 0 0 0 2 2 2 2 2 2 2 2 2 3 3 3 3 4 4 45 48 40 57 30 68 68 68 68 68 68 68 68 68 1 44 44 3 28 24 35 12 49 1 3 4 1 3 3 3 1 4 0 0 0 0 0 0 0 0 0 0 3 3 3 3 3 3 3 3 3 3	2 3 3 2 0 2 1 1 2 0 0 0 16 15 15 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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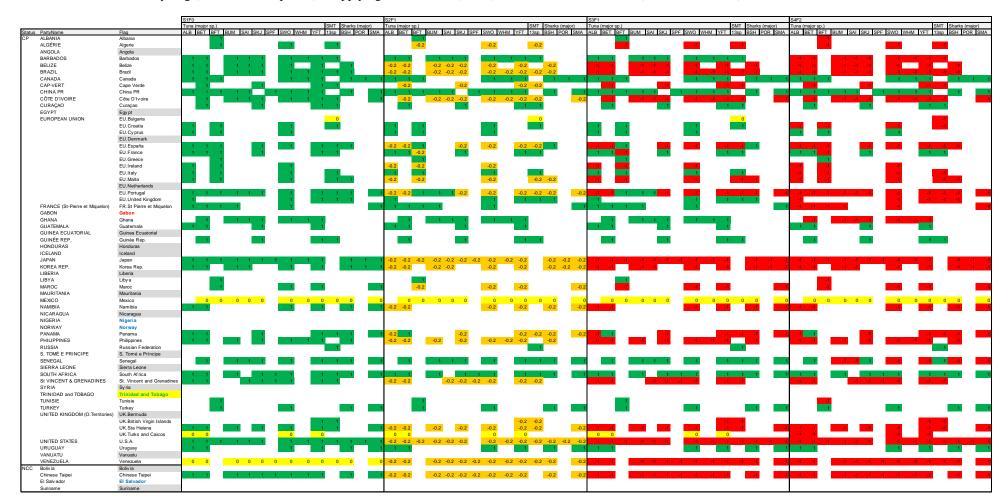
**Table 6.** Detailed flag scores (by scenarios and characteristics) of applying SCRS filters (1 & 2) to Task I Fleet characteristics (form ST01-T1FC) datasets.

# # # # # # # # # # # # # # # # # # #	Party ALBANIA ALGÉRIE ANGOLA BARBADOS BELIZE BRAZIL CANADA CAP-VERT CHINAPR CÔTE D'IVOIRE CURAÇAO ECYPT EUROPEAN UNION  FRANCE (St-Pierre et Miquelon) GABON GHANA GUATEMALA GUINEA ECUATORIAL GUINÉE REP.	FlagName Albania Algaria Angola Barbados Belize Brazil Granda Cape Verde China PR Côte D'Ivoire Curaçao Egypt EU.Bulgaria EU.Croatia EU.Cyprus EU.Denmark EU.España EU.France EU.Greece EU.Ireland EU.Italy EU.Malta EU.Nentelands EU.Portugal EU.Netrelands EU.Portugal EU.Netrelands EU.Portugal EU.Netrelands EU.Portugal EU.Netrelands EU.Portugal Gabon Ghana Guatemala Guinea Ecuatorial	GRT	LOA	GRT	LOA	GRT	LOA	GRT	LOA
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H J K L	GUINEE REP.									
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J K L	HONDURAS	Honduras	_							
k L	ICELAND	Iceland	1		100				100	
L	JAPAN	Japan	100		100				100	
	KOREA REP.	Korea Rep.	100		100				100	
	LIBERIA	Liberia								
	LIBYA	Libya			100				100	
1	MAROC	Maroc			100				100	
,	MAURITANIA	Mauritania								
	MEXICO	Mexico								
	NAMIBIA	Namibia								
	NICARAGUA	Nicaragua								
	NIGERIA	Nigeria								
	NORWAY	Norway								
	PANAMA	Panama			-0.3	43	-		4	
F	PHILIPPINES	Philippines			100					
F	RUSSIA	Russian Federation								
	S. TOMÉ E PRINCIPE	S. Tomé e Príncipe					1		l	
	SENEGAL	Senegal								
	SIERRA LEONE	Sierra Leone					1		l	
	SOUTH AFRICA	South Africa							1	
	St VINCENT & GRENADINES	St. Vincent and Grenadines								
	SYRIA	Syria	- 1		.02	43		100	4	
	TRINIDAD and TOBAGO	Trinidad and Tobago								
7	TUNISIE	Tunisie			43	43			- 4	
T	TURKEY	Turkey			1					
ι	UNITED KINGDOM (O.Territories)									
-	, , , , , , , , , , , , , , , , , , , ,	UK.British Virgin Islands			42	42				
		UK.Sta Helena								
		UK.Turks and Caicos								
	UNITED STATES	U.S.A.								
	URUGUAY	Uruguay	1	1	100	100		100		
١	VANUATU	Vanuatu								
	VENEZUELA	Venezuela								
	Bolivia	Bolivia								
	Chinese Taipei	Chinese Taipei				43				
	El Salvador									
E S		El Salvador Suriname								

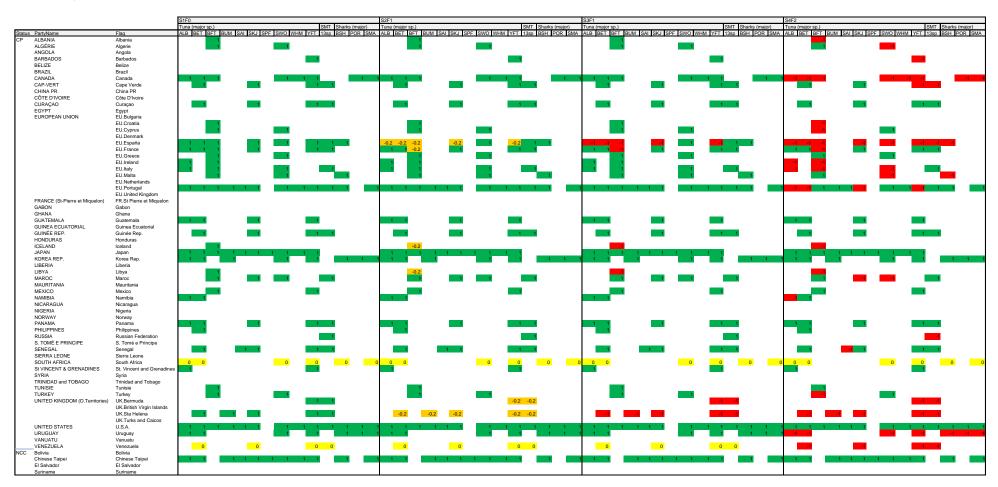
**Table 7.** Detailed scores by flag (scenarios and species) of applying SCRS filters (1 & 2) to Task I Nominal Catches (form ST02-T1NC) datasets.



**Table 8.** Detailed scores by flag (scenarios and species) of applying SCRS filters (1 & 2) to Task II catch and effort (form ST03-T2CE) datasets.



**Table 9.** Detailed scores by flag (scenarios and species) of applying SCRS filters (1 & 2) to Task II size samples (form ST04-T2SZ) OR Task II catch-at-size reported (form ST05-CAS) datasets.



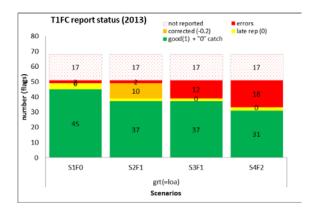


Figure 1. T1FC reporting status (2013 data) by scenario for 68 flag CPCs.

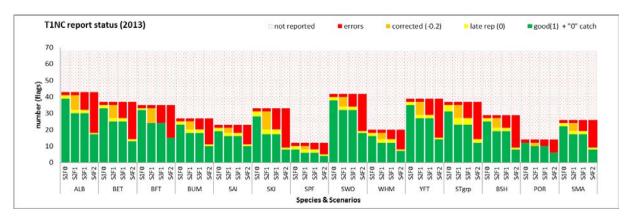


Figure 2. T1NC reporting status (2013 data) of each major ICCAT species by scenario, for the 68 flag CPCs.

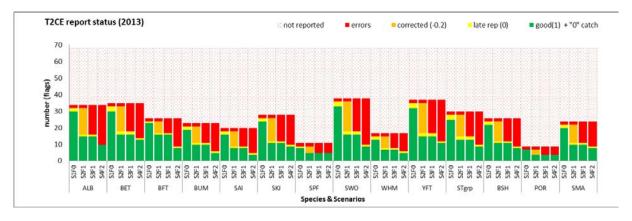


Figure 3. T2CE reporting status (2013 data) of each major ICCAT species by scenario, for the 68 flag CPCs.

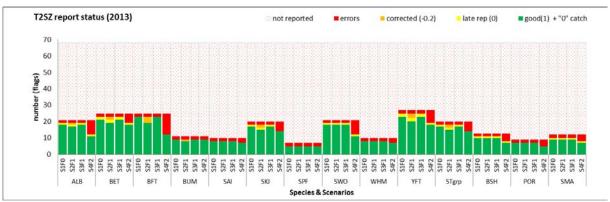
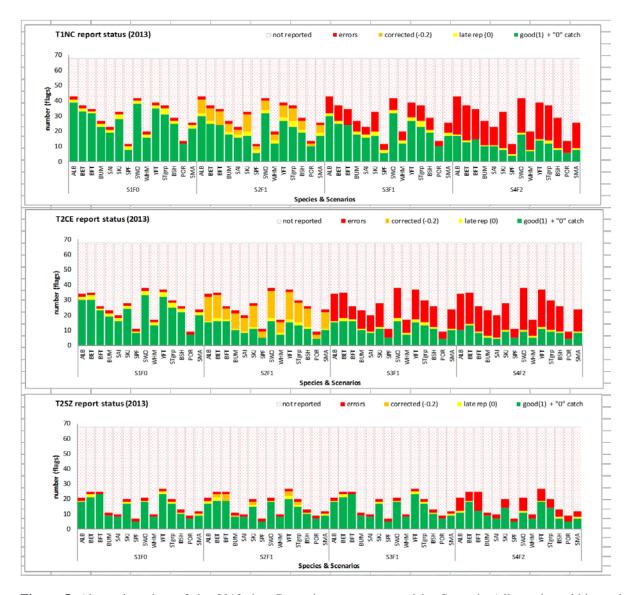


Figure 4. T2SZ reporting status (2013 data) of each major ICCAT species by scenario, for the 68 flag CPCs.



**Figure 5.** Alternative view of the 2013 data Reporting status grouped by Scenario (all species within each scenario) for the three datasets types with species: T1NC (upper panel), T2CE (mid panel) and T2SZ (lower panel).