

ONLINE TOOLS FOR THE VALIDATION OF IOTC DATA SUBMISSIONS

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Purpose

To provide participants to the 19th Working Party on Data Collection and Statistics (WPDCS19) with an overview of the current state-of-the-art regarding interactive tools developed by the IOTC Secretariat (SEC) to support CPCs in validating their statistical datasets¹ *prior* to their submission to the IOTC.

Background

Until today, the submission and validation of mandatory statistical data from CPCs to the IOTC has been mainly an asynchronous and manual process:

- 1) CPCs compile the required datasets using either one of the *recommended* IOTC forms (until 2023), or any custom electronic format of choice
- 2) CPCs submit (by the deadline of June 30th each year) the compiled dataset to the IOTC Secretariat via e-mail
- 3) SEC acknowledges receipt of the submissions
- 4) SEC validates the *syntax* of the submitted dataset and feeds back to CPCs in case any issue is encountered (e.g., missing mandatory information, wrong reference codes, etc.)
- 5) SEC validates the *semantic* of all datasets combined to identify issues and inconsistencies (e.g., species reported in the catch and effort but not in the retained catches) and feeds back again to the CPC
- 6) Once the syntax and semantics of the received datasets have been verified, SEC includes the data in the IOTC databases
- 7) CPCs might submit updates to the datasets provided in 2) which in turns trigger another validation cycle by the SEC from 4) onwards

With the introduction of [e-MARIS](#), steps 2) to 7) of the process above are handled through the platform, although manual intervention from the Secretariat is still required to validate the syntax and semantic of the provided data.

This validation process (and in particular steps 4 and 5) is time consuming and error prone and can lead to a) an increased *time-to-market* for the release of updated statistical information to the public, b) less-than-optimal data being included in the IOTC databases, and c) inconsistencies in the assessed compliance levels of CPCs against data reporting requirements.

In the short to medium term, the *syntax* validation of each submitted datasets will be an integral part of e-MARIS and be automated accordingly. CPCs will see their submissions confirmed *if and only if* these are syntactically correct and only properly validated information will be further *semantically* assessed before being incorporated into the IOTC databases and CPCs.

While the IOTC Secretariat continues to work in this regard with the team responsible for the development of the e-MARIS platform, and *ad interim* approach has been devised and presented in its draft form at the last session of the WPDCS in 2022.

More specifically, the IOTC Secretariat has developed a set of interactive *data submission validators* which can be accessed through a common Internet browser and help CPCs verify that the submissions they have prepared are complete and syntactically accurate. The IOTC Secretariat will perform the same kind of checks upon receipt of the data submissions (if these are provided through the new IOTC data reporting forms) and confirm or not the acknowledgement of the data based on the results of this analysis.

¹ Compiled using one of the new [IOTC data reporting forms](#)

Data reporting scenarios

Current data reporting workflow

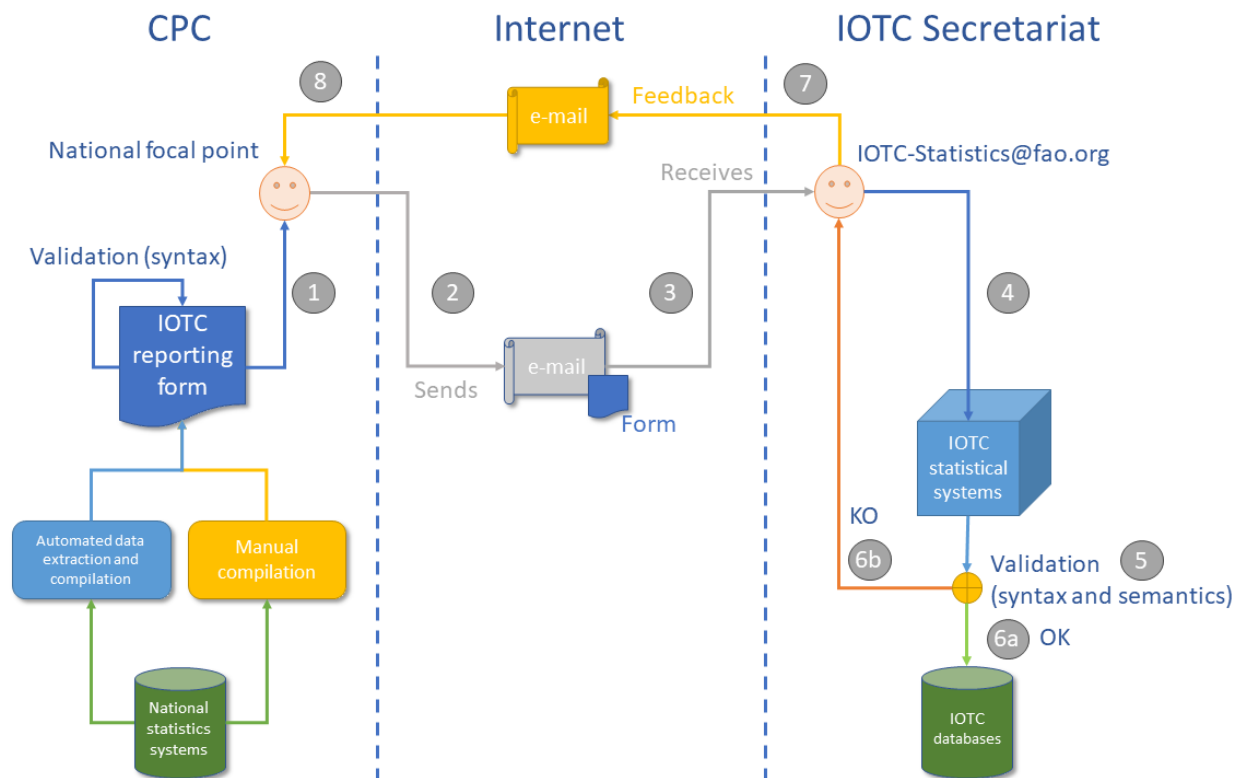


Figure 1 Current data reporting scenario, using the old recommended IOTC forms, with their basic included validations

The current data reporting scenario (**Figure 1**) has been in place for several years now, with the idea of being replaced in the long term by a more sustainable (and streamlined) process following the adoption of the e-MARIS platform by all CPCs.

Its major benefit is that it is a process well understood by the vast majority of CPCs, which have long familiarized with the less-than-optimal *recommended* IOTC forms and with the asynchronous exchange based on e-mails between national focal points and the Secretariat.

This scenario is described as follows:

- 1) CPCs national focal points receive / compile the IOTC *recommended* form for a given dataset (or provide the same information using another container, e.g., a custom Excel template or a set of CSV files)
- 2) CPC submits the form via e-mail to SEC (some CPCs have already started using e-MARIS for this purpose)
- 3) SEC receives the form and acknowledges CPC of its receipt (this is done automatically in case the CPC uses e-MARIS for the submission)
- 4) SEC analyses the content of the provided form using ad-hoc procedures implemented in the IOTC Statistical Working System
- 5) SEC validates the syntax and the semantics of the submitted form (this is particularly true if the CPC has submitted data using a custom template)
- 6) Two possible outcomes are considered:
 - a. The validation is successful, and the submitted data is eventually included in the IOTC databases
 - b. The validation fails, and data is not included in the IOTC databases
- 7) In both cases, SEC provides feedback to the CPC via e-mail (or through the e-MARIS platform for those CPCs that already use it)
- 8) CPC receives the feedback from SEC and either acknowledges the successful processing of their submission, or uses the feedback to correct the issues identified by SEC and re-submit the data starting again from point 1) above

The major pitfalls and issues with this process are as follows:

- Interactions are performed via e-mail (when CPC do not use e-MARIS) which increases the response time as it requires direct action from staff of either the CPC or the SEC
- CPCs might not necessary use the *recommended* IOTC forms for data reporting, and this requires extra efforts from SEC to process non-standard templates and reference codes
- Regardless, the IOTC *recommended* forms have been acknowledged as being difficult to manage: they require Excel macros to be enabled (and this is a security concern for some working environments), are not flexible, and embed each and every reference data, which can result in potential inconsistencies when recent updates are not reflected immediately in the form
- Syntax validation needs to be performed by SEC, and its results might reach the CPC with a long delay (depending on the workload of SEC)
- CPC can change / add the list of reference data within the form when a specific entry cannot be found (e.g., a new species is retained, or a new gear starts reporting information) and this process is far from being streamlined

Proposed data reporting workflow (ad interim)

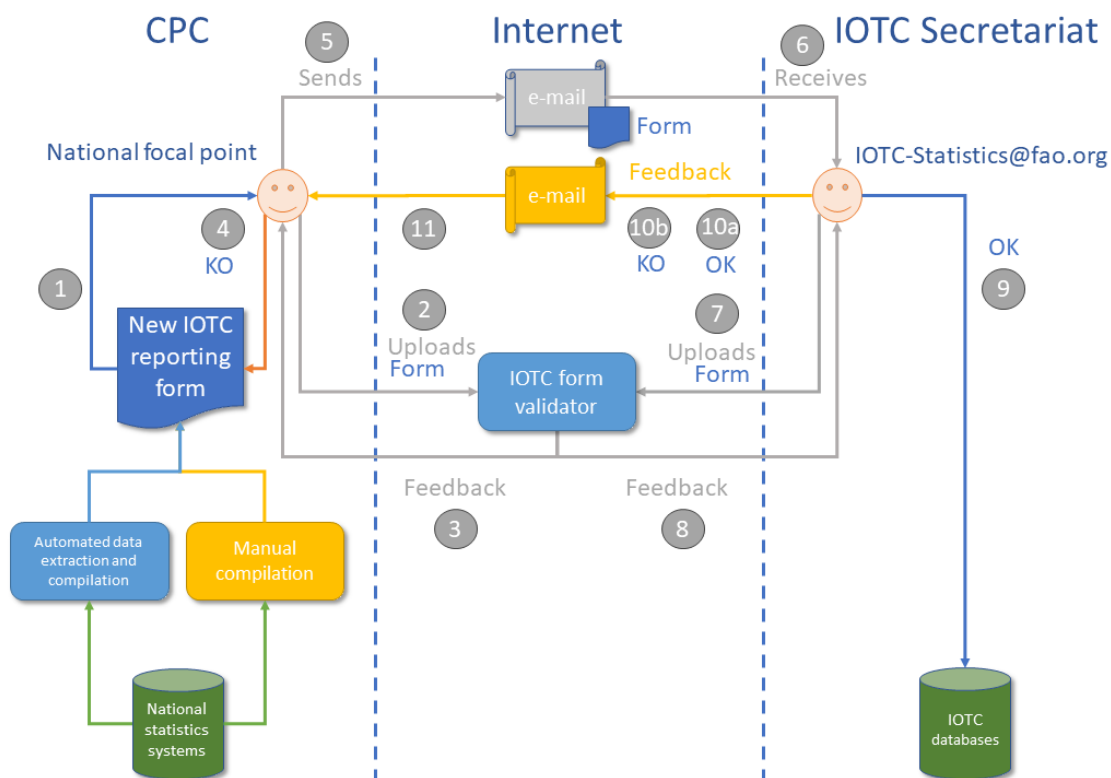


Figure 2 Proposed ad interim data reporting scenario, using the new IOTC forms and the interactive validators

To resolve the issues and idiosyncrasies identified for the previous scenario, the IOTC Secretariat has initiated direct collaboration with selected CPCs to progressively test an *ad interim* alternative scenario that builds on top of the legacy one and add significant improvements that will pave the ground for the future adoption of e-MARIS as a fully integrated system for the reporting of fishery statistics.

In particular:

- The process relies on CPC completing and submitting the *new* IOTC forms first presented at the WPDCS in 2022 and further amended / improved as described in [IOTC-2023-WPDCS19-14](#)
- CPC can use *online data validators* (described later in this document) to verify that the information entered in the forms meets the minimum IOTC requirements in terms of mandatory data elements, reference codes, and business logic for the underlying dataset
- SEC can use the same online data validators to verify that a submission from CPC can be successfully processed (i.e., do not trigger any validation error)
- Feedback from SEC is sent to CPC via e-mail, by attaching the list of errors found and their position (row / column) within the original form

The process can be described as follows:

- 1) CPCs national focal points receive / compile the new IOTC form for a given dataset
- 2) CPC uploads the form to the corresponding online validator
- 3) CPC retrieves the results of the validation
- 4) If the validation highlights one or more errors, CPC updates the form to ensure these are resolved, and proceeds again from 2)
- 5) Conversely (or even in case of errors, if the CPC so wishes) the form is sent via e-mail to SEC as an attachment
- 6) SEC receives the form and acknowledges receipt
- 7) SEC uploads the form to the corresponding online validator
- 8) SEC retrieves the results of the validation
- 9) If the validation is successful, the submitted data is eventually included in the IOTC databases
- 10) SEC compiles a feedback for CPC with the results of the validation. Depending on the outcomes, two alternative actions are considered:
 - a. SEC informs CPC that the validation is successful, and the data has been incorporated in the IOTC databases, or
 - b. SEC informs CPC that the validation is NOT successful, and provides feedback on the identified issues
- 11) CPC receives the feedback from SEC and if the validation is NOT successful updates the form and re-submits it as per point 5)

The major pitfalls and issues with this process are as follows:

- a) Interactions are performed via e-mail (when CPC do not use e-MARIS) which increases the response time as it requires direct action from staff of either the CPC or the SEC
- b) Validation is performed *twice*: once by CPC and then by SEC, with the latter to further guarantee that the submitted information is syntactically valid
- c) CPC can still submit a non-validated form, as there's no way of enforcing the contrary
- d) The submission still happens via e-mail (when CPC do not use e-MARIS) and therefore relies on the availability of personnel from SEC to acknowledge receipt and perform the second validation

Nevertheless, this process presents the following benefits:

- e) CPCs are required to use the *new* IOTC forms for data reporting, and therefore SEC does not need to process non-standard templates and reference codes
- f) By uploading the form to the validator, CPC gets immediate feedback on the status of their submission and can react accordingly
- g) CPCs can still submit non-validated forms: if so, and any error exists, these are identified by the validation step performed by the SEC and the process halts, requiring further action from CPC

Compared to the first scenario, that can only handle the *recommended* IOTC forms, this one requires exchanging data with the *new* IOTC forms and therefore CPC cannot change / add a new entry to the list of reference data within the form, as these are de-coupled from the form through the reference data catalogue (which is also used during the validation process) and serves as the single source of truth for everything related to reference codes.

Fully automated data reporting workflow

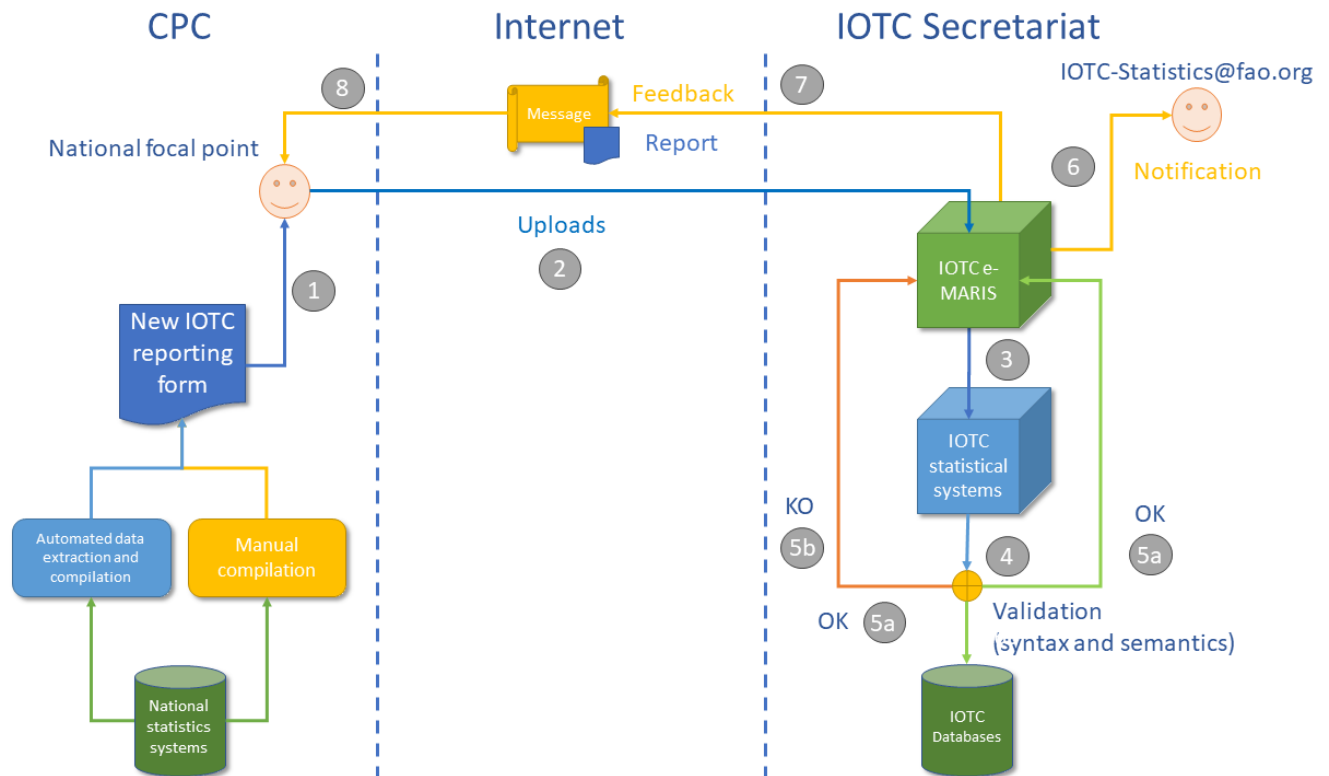


Figure 3 Final data reporting scenario, using the new mandatory IOTC forms with automated validations performed on data submission

The third scenario will be implemented once all CPCs have opted-in to use e-MARIS for the submission of statistical data, and e-MARIS itself is extended to directly interact with the IOTC validators to assess the status of each submission automatically.

In particular:

- The process relies on CPC completing and submitting the *new* IOTC forms first presented at the WPDCS in 2022 and further amended / improved as described in [IOTC-2023-WPDCS19-14](#)
- All data exchanges, including submissions of forms, their validation and the receipt of the validation feedback, are performed through e-MARIS and do not require any human intervention beside the initial submission

The process can be described as follows:

- 1) CPCs national focal points receive / compile the new IOTC form for a given dataset
- 2) CPC uploads the form to the e-MARIS in response to a specific reporting requirement
- 3) e-MARIS forwards the form to the Statistical Working System
- 4) The Statistical Working System analyses the form and submits it for verification to the dedicated IOTC validator
- 5) Two alternative outcomes are considered:
 - a. the form validation is successful, and data is persisted into the IOTC databases, or
 - b. the form validation is NOT successful and a list of errors is compiled by the system
 In both cases, the results of the validation are returned to e-MARIS to provide feedback to both CPC and SEC
- 6) e-MARIS informs SEC of the validation results
- 7) e-MARIS prepares and sends feedback to CPC
- 8) CPC receive feedback from e-MARIS and if the validation is NOT successful updates the form and re-submits it as per point 1)

This process presents the following benefits:

- a) CPCs are forced to use the *new* IOTC forms for data reporting, and therefore SEC does not need to process non-standard templates and reference codes
- b) CPC gets immediate feedback, through e-MARIS, on the status of their submission and can react accordingly
- c) Only one validation is performed per each submitted form, and its result are sent to both CPC and SEC

- d) No human intervention is required as all internal communications from the endpoint that receives the form, to the validation and the provision of feedback happens in the boundaries of e-MARIS and the IOTC Statistical Working Systems.

Work is underway to implement a communication mechanism between e-MARIS and the IOTC validators / statistical working system that will enable implementing this scenario in the next future.

Interactive data validators

The IOTC Secretariat has developed data validators for the new versions of the core IOTC forms, and namely:

- **1-RC interim** for the provision of *annual catches of retained species by gear, fishery, and IOTC main area*
- **1-DI interim** for the provision of *annual catches of discarded species by gear, fishery, and IOTC main area*
- **3-CE interim** for the provision of *annual georeferenced monthly efforts and catches of retained species by gear, fishery, fishing mode, and grid / area*
- **3-BU** for the provision of *monthly instrumented buoy positions by vessel and day*
- **4-SF interim** for the provision of *annual georeferenced monthly size-frequency data of retained and discarded species by gear, fishery, fishing mode, grid / area, and measurement type*

These validators are currently available to the public as distinct interactive web applications (one for each form) and in two distinct versions (default / multiple) for the forms 3-CE, 3-BU, and 4-SF, to allow for the validation of data files containing information for multiple fisheries / species (for 3-CE and 4-SF) and multiple vessels (3-BU) at the same time.

General principles

Each validator accepts the uploading of the specific IOTC form for which it has been designed.

After uploading the file, the system performs a series of checks on:

- 1) The file structure, to verify that the proper input form has been uploaded
- 2) The content of the metadata worksheet
- 3) The content of the data worksheet

And provides a summary of all the (potentially) detected issues, whose severity can be one of the following:

- **INFO** to report general information on the form and the data contained within (e.g., number of records)
- **WARNING** to report issues that while not blocking, can lead to the data to be assessed as *partially compliant* (e.g., reporting of gear or species aggregates)
- **ERROR** to report issues that are blocking and generally correspond to non-satisfied business rules (e.g., georeferenced grids for surface fisheries are of the wrong size)
- **FATAL** to report issues that are blocking and severe, and generally correspond to problems with the file format and structure (e.g., wrong form uploaded, or the form is not the correct version, or empty rows and columns are detected, or duplicate / empty strata are found)

All messages reference the row and column in the originally uploaded file where the issue was detected, so that providers can easily check the content of the offending cells and perform the necessary corrective actions.

The list of all detected issues can also be downloaded in CSV format for off-line review, and the original submission can be downloaded as well to cross-verify that the uploaded file is what originally intended.

At the end of the validation process, a summary panel indicates whether the file can be accepted for submission. CPCs can still submit the file even if the validation process confirms that it's not suitable for the purpose, but this is not recommended as the IOTC Secretariat will perform an independent run of the validation and report the form as invalid to the CPC anyways.

User interface

The IOTC validators are straightforward to use, and their general behaviour is similar in terms of the graphical interface presented to their end users.

On accessing a validator (we are referring here to the one for the Form 1-RC) users are presented with a single button to select a local file to be uploaded to the system (Figure 4).

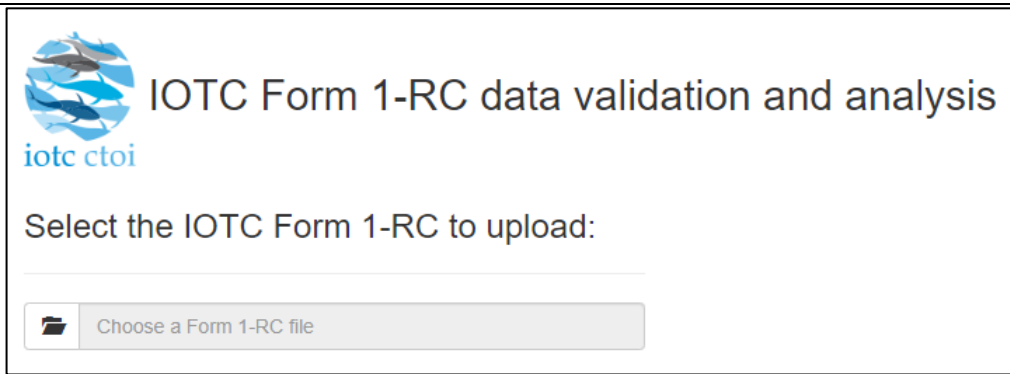


Figure 4 File uploading controls

Once the file is uploaded to the validator, the system performs all checks defined for the specific type of form and presents users with a summary of the results that include a general assessment of the validation, and a detailed list of all validation messages by severity (Figure 5). Messages can be filtered (via the 'Search' control in the top right of the message list panel), ordered (by clicking on one of the message list column headers), and navigated using the *Previous* and *Next* button in the bottom right corner of the message list panel (this only applies to list of messages that are paginated).

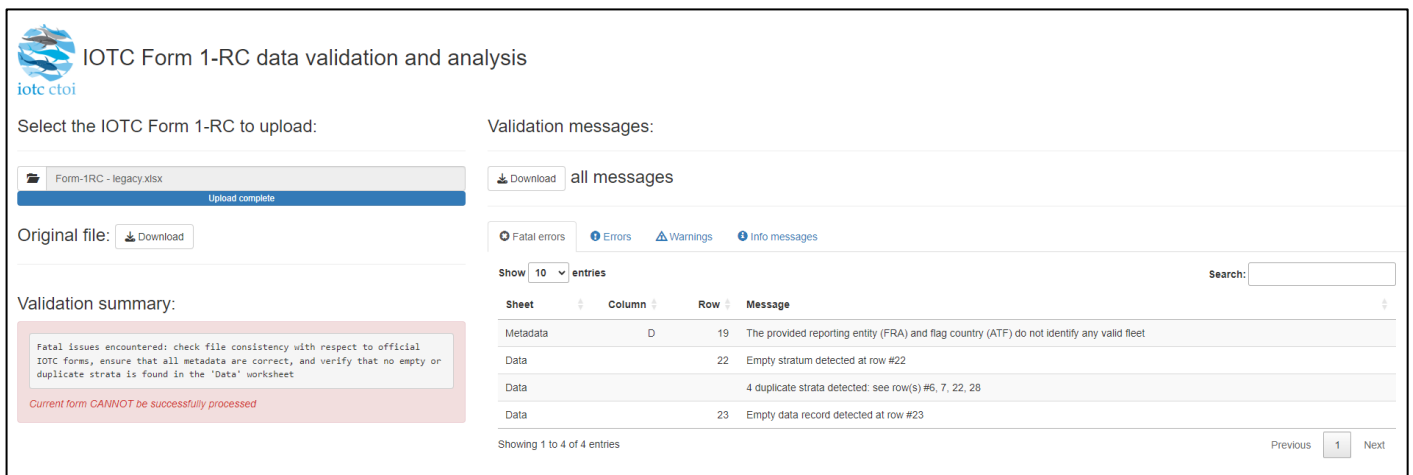


Figure 5 File upload summary

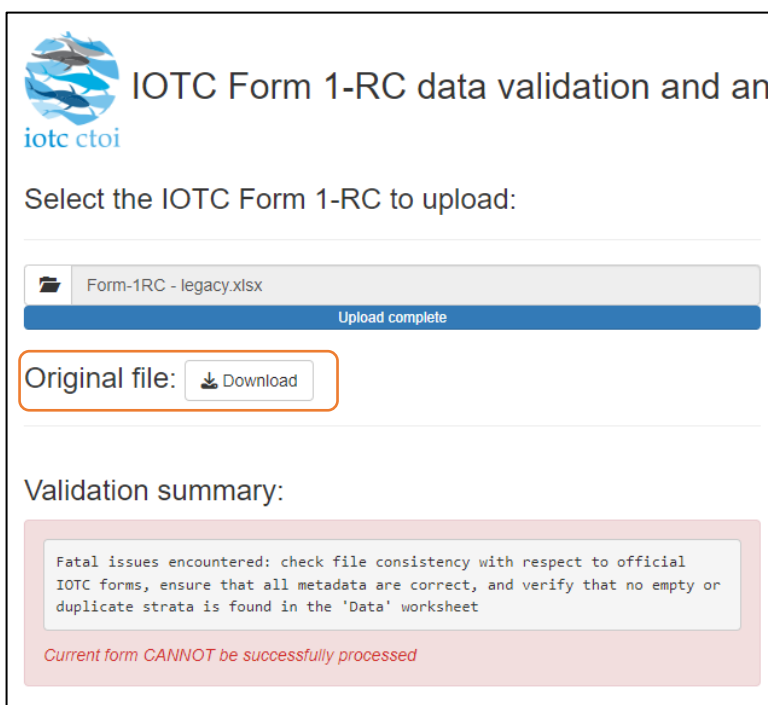



Figure 6 Unsuccessful validation summary, and original file download button (circled in orange)

The validation summary provides a first indication that the file has been successfully validated or not (Figure 6). In the example below, the file did not validate successfully, and users are requested to “(...) *check file consistency with respect to official IOTC forms, ensure that all metadata are correct, and verify that no empty or duplicate strata is found in the 'Data' worksheet*”.

The actual validation issues are provided in the message list panels, categorised by message severity, and paginated to allow better navigation when the list contains several entries (Figure 7).

Validation messages:

 Download all messages

Fatal errors
Errors
Warnings
Info messages

Show entries Search:

Sheet	Column	Row	Message
Metadata	D	19	The provided reporting entity (FRA) and flag country (ATF) do not identify any valid fleet
Data		22	Empty stratum detected at row #22
Data			2 duplicate strata detected: see row(s) #6, 7
Data		23	Empty data record detected at row #23

Showing 1 to 4 of 4 entries Previous Next

Figure 7 Overview of the message panels, and validation message download button (circled in orange)

Each message contains indication of the worksheet (either *Metadata* or *Data*) where the issue was encountered, together with the *column* and *row* of the cell triggering the issue.

Examples of fatal error messages

Figure 7 contains an example of *fatal* error messages, and namely:

- That the reporting entity and flag country provided at column, row #19 of the *metadata* worksheet *do not* identify any valid fleet (see Figure 8)
- That there is an empty stratum in the *data* worksheet at row #22
- That there are two duplicate strata in the *data* worksheet at rows #6 and #7
- That there is an empty record in the *data* worksheet at row #23

IOTC form 1-RC | metadata

Form	1-RC	Version	1.0.0-legacy
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Submission information

Focal point	Organization
Full name	Name
<input type="text" value="Focal Point"/>	<input type="text"/>
e-mail	e-mail
<input type="text"/>	<input type="text" value="org@aniz.ati.on"/>

Finalization date	<input type="text" value="2023/04/01"/>
Submission date	<input type="text" value="2022/04/01"/>

General information

Reporting year	<input type="text" value="2023"/>
Reporting entity	<input type="text" value="FRA"/>
Flag country	<input type="text" value="ATF"/>

Comments

Figure 8 Sample 'metadata' section of the form triggering the fatal errors (offending cells are highlighted in red)

IOTC form 1-RC data																													
Main stratum						Original data				Source coverage		Catch by species (live weight equivalent, t)																	
Quarter	Element	Target species	IOTC area	Rebale reason	Type	Source	Processing	Type	%	BOCDYF	SKJ	BET	ALB	SBF	MAK	ALN	BAF	BAO	BLM	BTS	BUM	CFW	CNT						
1	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	5,794.68	326.53	606.94	4.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
1	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	7.25	12.66	2.52	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
3	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	4,061.40	8,787.55	1,522.52	14.11	13.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
4	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	2,645.84	453.38	243.33	11.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
1	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	2,983.42	7,312.67	1,092.93	12.82	24.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
2	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	1,562.92	639.04	115.05	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-10.00	0.00					
3	PSFS	YFT	IOTC_WEST	FL	FI	LG	LS	FW	100	4,471.56	11,095.57	580.23	7.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
4	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	440.65	419.75	21.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ABC					
1	PS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	5,604.47	15,436.87	881.92	9.47	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
2	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
3	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.47	0.24	0.00					
4	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00					
1	GILL	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.04	0.00	0.00	0.00	11.28	0.00	0.39					
2	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
3	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.00	0.03	0.00	0.00	0.00	4.18	0.00	1.04					
4	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
1	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	60	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43						
2	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	50	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43						
3	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	20	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43						
0	HLOF	SWO	IOTC_EAST	FL	PR	RS	AU	BO	10	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43						
4	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	10	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					

Figure 9 Sample 'data' section of the form triggering the fatal errors (offending cells are highlighted in red)

Examples of error messages

Validation messages:

Download all messages

Fatal errors Errors Warnings Info messages

Show 25 entries Search:

Sheet	Column	Row	Message
Data		7	2 missing species codes
Data	Q	7	Missing species code in column Q
Data	AU	7	Missing species code in column AU
Data		7	1 invalid species code(s) reported. Please refer to https://data.iotc.org/reference/latest/domain/legacy/#species for a list of valid species codes
Data	L	7	Invalid species code 'POCDYFT' in column L
Metadata	G	9	The organization name is mandatory
Metadata	D	10	The focal point e-mail is mandatory
Data	C	10	Invalid fishery code 'TROL' in row #10
Data	C	11	Invalid fishery code 'TROL' in row #11
Data	Y	11	Negative catch value reported in cell [Y11]
Metadata	D	12	The submission date (2022-04-01) should follow the finalization date (2023-04-01)
Data	C	13	Invalid fishery code 'TROL' in row #13
Data	Y	13	Non-numeric catch value reported in cell [Y13]
Data	C	18	Invalid fishery code 'GILL' in row #18
Data	F	22	Missing retain reason code in row #22

Figure 10 Details of messages of 'Error' type extracted from a sample form 1-RC

The first five error messages in Figure 10 above provide the following information:

- That two species codes are missing (i.e., not provided) in row #7 of the data worksheet (see Figure 11 below)
- That the first missing species code is at column Q, row #7 of the data worksheet (see Figure 11 below)
- That the second missing species code is at column AU, row #7 of the data worksheet (see Figure 11 below)
- That one invalid species code has been reported, and that the reference codelist for the species accepted in this form is available at the provided URL (<https://data.iotc.org/reference/latest/domain/legacy/#species>)
- That the invalid species code is at column L, row #5 of the data worksheet (see Figure 11 below)

IOTC form 1-RC data																										
Main stratum				Original data				Source coverage				Catch by species (live weight equivalent, t)														
Quarter	Fishery	Target species	IOTC area	Retain reason	Type	Source	Processing	Type	Source	%	POCDYFT	SKJ	BET	ALB	SBF	MAK	ALN	BAF	BAO	BLM	BTS	BUM	CFW	CNT		
1	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	100	6,794.88	326.53	606.94	4.82	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	100	7.25	12.66	2.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	100	4,061.40	8,787.55	1,522.52	14.11	13.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	100	2,645.94	453.38	243.33	11.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	100	2,983.42	7,312.67	1,092.93	12.82	24.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	100	1,562.92	639.04	115.05	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-10.00	
3	PSFS	YFT	IOTC_WEST	FL	FI	LG	LS	FW	100	100	4,471.56	11,095.57	580.23	7.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	100	440.65	419.75	21.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ABC	
1	PS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	100	5,604.47	15,436.87	881.92	9.47	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.47	0.24	
4	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	
1	GILL	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	100	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.04	0.00	0.00	11.28	0.00	0.39	
2	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	100	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.00	0.03	0.00	0.00	4.18	0.00	1.04	
4	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	60	60	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43		
2	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	50	50	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43		
3	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	20	20	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43		
0	HLOF	SWO	IOTC_EAST	FL	PR	RS	AU	BO	10	10	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43		
4	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	10	10	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43		
1	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	10	10	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43		

Figure 11 Sample 'data' section of the form triggering the errors (offending cells are highlighted in red)

Continuing in the list of errors for the example in Figure 10, some of the messages refer to the metadata section of the form, and report that:

- the *organization name* is missing at column G, row #9 of the metadata worksheet (see Figure 12 below)
- the *focal point e-mail* is missing at column D, row #10 of the metadata worksheet (see Figure 12 below)

Figure 12 Sample 'metadata' section of the form triggering the errors (offending cells are highlighted in orange)

The presence of either *fatal* or *error* messages in the validation result will prevent the submission from being accepted, and therefore CPCs should take care of reviewing accurately messages of both types and take all necessary corrective actions to ensure the submission can validate successfully.

Examples of warning messages

Validation messages:

Download all messages

Fatal errors Errors Warnings Info messages

Show 10 entries Search:

Sheet	Column	Row	Message
Data			Data is not provided for all quarters within the strata in row(s) #10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
Data		7	1 aggregated species code(s) reported. Please refer to https://data.iotc.org/reference/latest/domain/legacy/#species for a list of valid species codes
Data	R	7	Aggregated species code 'MAK' reported in column R
Data			579 catch value(s) explicitly reported as zero: consider leaving the cells empty instead

Showing 1 to 4 of 4 entries Previous 1 Next

Figure 13 Details of messages of 'Warning' type extracted from a sample form 1-RC

Figure 13 above contains an example of *warning* messages, and namely:

- That data is not provided for all quarters for a number of rows
- That there is an aggregated species code reported in row #7 of the *data* worksheet (see Figure 14 below)
- That the aggregated species code appears in column R, row #7 of the *data* worksheet (see Figure 14 below)
- That 575 catch values are explicitly reported in the *data* worksheet as 0.0, and shall be replaced by empty cells instead

IOTC form 1-RC data																								
Quarter	Main stratum			Original data				Source coverage		Catch by species (live weight equivalent, t)														
	Fishery	Target species	IOTC area	Retain reason	Type	Source	Processing	Type	%	POCDYFT	SKU	BET	ALB	SBF	MAK	ALN	BAF	BAO	BAM	BTE	BUM	CFW	CNT	
1	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	6,794.68	326.53	696.94	4.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	7.25	12.66	2.52	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	4,061.40	8,787.55	1,522.52	14.11	13.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	PSFS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	2,645.84	453.38	243.33	11.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	2,983.42	7,312.67	1,092.93	12.82	24.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	1,562.92	639.04	115.05	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-10.00	0.00
3	PSFS	YFT	IOTC_WEST	FL	FI	LG	LS	FW	100	4,471.56	11,095.57	580.23	7.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	TROL	ALB	IOTC_WEST	FL	FI	LG	LS	FW	100	440.65	419.75	21.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	PS	YFT	IOTC_EAST	FL	FI	LG	LS	FW	100	5,604.47	15,436.67	881.92	9.47	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.47	0.24	0.00
4	BS	SKJ	IOTC_EAST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00
1	GILL	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.04	0.00	0.00	0.00	11.28	0.00	0.39
2	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.00	0.03	0.00	0.00	0.00	4.18	0.00	1.04
4	GIOF	KAW	IOTC_WEST	FL	FI	LG	LS	FW	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	60	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43	
2	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	50	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43	
3	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	20	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43	
0	HLOF	SWO	IOTC_EAST	FL	PR	RS	AU	BO	10	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.06	0.56	0.00	4.89	0.00	0.43	
4	HLOF	SWO	IOTC_WEST	FL	PR	RS	AU	BO	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
												881.92	9.47	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 14 Sample 'data' section of the form triggering the warnings (offending cells are highlighted in red)

The presence of *warning* messages in the validation output is not preventing the submission from being accepted, and data to be included in the IOTC databases. Nevertheless, warnings referring – for instance – to the provision of data for species or gear aggregates might trigger an assessment of *partial compliance* for the CPC with respect to the reporting requirements underpinning the provision of a specific dataset.

Conclusions

The IOTC Secretariat, building on top of the feedback received from CPCs in the past, and on the requirements and recommendations from the IOTC Working Parties and Scientific Committee, is progressing toward a fully automatized and more streamlined data reporting workflow, that would be finalized once all CPCs commit on using e-MARIS for the provision of statistical data to the IOTC.

In this regard, *interactive data validators* are one powerful tool to support the work of both CPCs and the Secretariat to implement the *ad interim* data reporting workflow, which still requires a fair amount of manual processing from both parties.

Nevertheless, the *ad interim* workflow represents a welcomed step forward to guarantee a more accurate and timely submission of information to support the work of the scientific bodies of the IOTC. It has been trialled by a selected number of CPCs and is now ready for adoption by all CPCs for the next data reporting cycle (2024).

The authors **strongly recommend** that:

- 1) CPCs and the WPDCS familiarize with the current state-of-the-art in terms of data reporting scenarios, and particularly with the proposed *ad interim* workflow
- 2) That CPCs **ACKNOWLEDGE** the semantics of the data reporting process described herein, and ensure that these are correctly taken into account by the national officers responsible for data collection and submission to the IOTC
- 3) That the SC **RECOMMEND** the *ad interim* data reporting workflow and the accompanying electronic tools and formats (interactive validators, IOTC *interim* forms) as **mandatory** for the submission of statistical fisheries data to the Secretariat starting with the 2024 data reporting cycle
- 4) That the IOTC Secretariat **SUPPORT** the correct implementation of the *ad interim* data reporting procedures by delivering specific workshops to CPCs from Q1 2024 onwards

Resources

- [IOTC reference data catalogue](#) (*HTML pages*)
- New IOTC forms and validators (*MS Excel files + web page*)
 - a) [Form 1-RC interim + validator](#)
 - b) [Form 1-DI interim + validator](#)
 - c) [Form 1-IN](#) [validator under development]
 - d) [Form 1-DR](#) [validator under development]
 - e) [Form 2-FC interim](#) [validator under development]
 - f) Form 3-CE *interim*
 - [Default + validator](#)
 - [Multiple + validator](#)
 - g) Form 3-BU
 - [Default + validator](#)
 - [Multiple](#) [validator under development]
 - h) Form 3-DA
 - [Default](#) [validator under development]
 - [Multiple](#) [validator under development]
 - i) Form 3-AA
 - [Default](#) [validator under development]
 - [Multiple](#) [validator under development]
 - j) Form 4-SF *interim*
 - [Default + validator](#)
 - [Multiple + validator](#)