IN SUPPORT OF THE ICCAT ECOSYSTEM REPORT CARD: INDICATORS FOR MARINE DEBRIS

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SUMMARY

This document proposes to include "Marine debris" as an ecosystem component into the ICCAT Ecosystem Report Card. The addition of this pressure component will allow to highlight the importance of identifying marine debris produced by the fishing activities of the major ICCAT fisheries and its potential impact on the marine ecosystem in the Atlantic Ocean. Specifically this contribution provides the following four elements: (1) we describe what marine debris ecosystem component means in the context of ICCAT fisheries and the importance of monitoring as well as we make a proposal of a conceptual and an operational objective to measure progress towards the management of this component; (2) we present a list of candidate indicators, which are shared by all fishing gears, that could be measured to monitor the extent of marine debris both on the open ocean and coastal ecosystems produced by ICCAT fisheries; (3) we identify the potential sources of marine debris associated to different fishery activities, and we examine data availability and sources to support indicator development; and (4) we draft a work plan to guide future work.

RÉSUMÉ

Ce document propose d'inclure les "débris marins" en tant que composante écosystémique dans la fiche informative sur les écosystèmes de l'ICCAT. L'ajout de cette composante de pression permettra de souligner l'importance d'identifier les débris marins produits par les activités de pêche des principales pêcheries de l'ICCAT et leur impact potentiel sur l'écosystème marin dans l'océan Atlantique. Plus précisément, cette contribution fournit les quatre éléments suivants : (1) nous décrivons ce que signifie la composante écosystémique des débris marins dans le contexte des pêcheries de l'ICCAT et l'importance du suivi, et nous proposons un objectif conceptuel et opérationnel pour mesurer les progrès réalisés dans la gestion de cette composante ; (2) nous présentons une liste de possibles indicateurs, communs à tous les engins de pêche, qui pourraient être mesurés pour surveiller l'étendue des débris marins produits par les pêcheries de l'ICCAT, tant en haute mer que dans les écosystèmes côtiers ; (3) nous identifions les sources potentielles de débris marins associés aux différentes activités de pêche, et nous examinons la disponibilité et les sources de données pour soutenir le développement d'indicateurs ; et (4) nous élaborons un plan de travail pour orienter les travaux futurs.

RESUMEN

En este documento se propone incluir los "desechos marinos" como un componente del ecosistema en la ficha informativa sobre ecosistemas de ICCAT. La adición de este componente de presión permitirá poner de relieve la importancia de identificar los desechos marinos producidos por las actividades pesqueras de las principales pesquerías de ICCAT y su posible impacto en el ecosistema marino del océano Atlántico. Específicamente esta contribución proporciona los siguientes cuatro elementos: 1) describimos lo que significa el componente del ecosistema de desechos marinos en el contexto de las pesquerías de ICCAT y la importancia del seguimiento, y hacemos una propuesta de un objetivo conceptual y operativo para medir el progreso hacia la ordenación de este componente; (2) presentamos una lista de posibles indicadores, que son compartidos por todos los artes de pesca, que podrían medirse para hacer un seguimiento de la envergadura de los desechos marinos tanto en el océano abierto como en

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los ecosistemas costeros producidos por las pesquerías de ICCAT; (3) identificamos las posibles fuentes de desechos marinos asociados a las diferentes actividades pesqueras, y examinamos la disponibilidad de datos y las fuentes de datos para apoyar la elaboración de indicadores; y (4) elaboramos un plan de trabajo para orientar la labor futura.

KEYWORDS

Marine debris, Fish Aggregating Devices, Abandoned Lost Discarded Fishing Gear

1. Introduction

Since 2017 the Sub-Committee on Ecosystems is working on developing an Ecosystem Report Card as a tool to facilitate the implementation of an Ecosystem-Based Fisheries Management (EBFM) in the ICCAT convention area. The main purpose of the ICCAT ecosystem report card is to provide stronger links between the ecosystem science presented in ICCAT and the fisheries management advice produced to inform the implementation of EBFM. The Ecosystem Report Card intends to be used as a tool to report on the sustainability of species and stocks under ICCAT management responsibilities and the impact of their fisheries, and changes in the environment, on the overall health of the ecosystem of the ICCAT species to the Commission (Juan-Jordá *et al*., 2017). Potentially, it could be an effective communication tool to increase the awareness, communication and reporting of the state, and main pressures on, of the marine ecosystem to the Commission. The ecosystem report card can be used to synthesize a large and often complex amount of information into a concise and visual product.

The development of the indicator-based ecosystem report card requires of a long-term strategy to build ecosystem knowledge and increase capacity and collaborations in the ICCAT community. As a first step, the Sub-Committee on Ecosystems defined broad operational components of the ecosystem that would be required for monitoring the overall health of the ecosystem of the ICCAT species. These include:

- retained species (including assessed and non-assessed species),
- non-retained species (including seabirds, marine turtles, marine mammals and sharks),
- food-webs/trophic relationships,
- habitats,
- socio economic,
- fishing pressure,
- environmental pressure.

In 2018 and 2019 a series of indicator-based assessments were produced for some of these operational ecosystem components. The Sub-Committee on Ecosystems reviewed them annually and produced a pilot Ecosystem Report Card. The second pilot Ecosystem Report Card was produced in 2019. The indicator-based assessments for each ecosystem component are at different stages of development, from the initial stage of proposing a candidate list of indicators that could potentially be used to monitor that particular ecosystem component, to the stage of presenting the indicators for formal adoption to the Group. Noting the preliminary nature of the second pilot ICCAT ecosystem report card and the understanding that multiple iterations are needed to move towards a more scientifically mature based product, the Sub-Committee on Ecosystems recommended to update and review the card in 2020.

This document proposes to create an additional ecosystem component called “Marine debris” in the ICCAT Ecosystem Report Card. Although the marine debris component was included originally in the habitat component, we believe that the ICCAT ecosystem report card would benefit from including a “Marine debris” component and maintaining the existing “Habitat” component with its initial purpose. The original "Habitat” component in the ICCAT ecosystem report card was initially proposed with the purpose of incentivizing work to identify and better understand habitats of special concern of ICCAT species and their habitat utilization (Juan-Jordá *et al*., 2017). These would include the identification and mapping of spawning and feeding grounds, migration routes of species, species habitat ranges and distributions, and understanding the potential impact of multiple pressures (fishing, environment and marine debris) on these ecological processes. On the other hand, the “Marine debris” component differentiated from habitats would have the purpose of advancing the work to identify and monitor the marine debris problematic produced by the fishing activities in all ICCAT fisheries. This would be considered a “pressure component”, similarly to the “Fishing pressure” and “Environmental pressure” components, as these are the major pressures identified impacting the health of ICCAT species and associated marine ecosystems. The existing “Habitat” component would be considered a “state component”, similar to “Retained species”, “Non-retained species”, “Food webs and trophic relationships” component as it was originally proposed (Juan-Jordá *et al*., 2017).

Thus, the overall objective of the present document is to point out the importance of identifying marine debris in terms as abandoned, lost or otherwise discarded fishing gear (ALDFG) as one of the ecosystem components covered in the ICCAT ecosystem report card. As first step to reach this goal, this document identifies the marine debris produced by the fishing activities of the major ICCAT fisheries and its potential impact on the marine ecosystem in the Atlantic Ocean. When assessing this component, it is important to examine the contribution of marine debris across the multiple gear types and fisheries managed by ICCAT and their relative contributions.
This document addresses the "Marine debris" ecosystem component and specifically it contributes towards developing the following elements:

1. We describe what the "Marine debris" ecosystem component means in the context of ICCAT fisheries, highlighting its importance and the need of monitoring it. We also make a proposal of a conceptual and an operational objective to measure progress towards the management of this component as it has been done in the rest of ecosystem components.

2. We propose candidate indicators, which are shared by all fishing gears, that could be measured to monitor the extent of marine debris both on the open ocean and coastal ecosystems produced by ICCAT fisheries.

3. We chose to initiate our work by identifying the potential sources of the different fishery activities to marine debris and examine data availability and sources to support the development of the indicators identified.

4. Finally, we draft a work plan to guide future work.

2. The "Marine debris" component and objectives towards the management of this component.

Marine debris, according to UNEP and NOAA (2012) is "any anthropogenic, manufactured, or processed solid material (regardless of size) discarded, disposed of, or abandoned in the environment, including all materials discarded into the sea, on the shore, or brought indirectly to the sea by rivers, sewage, storm water, waves, or winds". It is long-recognized the indiscriminate disposal of plastic and other synthetic materials into the ocean as an international problem (Gregory, 2009). Recently, it was estimated that between 4.8 and 12.7 million tonnes of plastic enter the marine environment every year, and according to Jambeck *et al*. (2015), this problem could increase in the coming years without appropriate waste management strategies. Plastics are the major source of marine debris with approximately 60 to 90% of litter made up of one or a combination of plastic polymers, while the other 10 to 40% of the litter could be paper, wood, textiles, metal, glass, ceramics, and rubber (Butterworth *et al*., 2012; UNEP and GRID-Arendal, 2016).

There are two main sources of marine debris to the ocean i) land-based inputs and ii) sea-based inputs. It is widely assumed that land-based sources contribute with approximately 80% to the total marine debris and rivers seem to represent a key entry point to the ocean (González *et al*., 2016). Sea-based inputs can contribute approximately with 20% but this percentage varies regionally (EEA 2015, UNEP 2016). The origin of sea-based sources could be classified in three main groups i) *fishery activity*, mainly by accidently or purposely released garbage and the Abandoned Lost or otherwise Discarded Fishing Gears (ALDFG), ii) *shipping activities*, waste derived for example from cargos and iii) other vessels activity, for example litter derived from recreational activities. These three groups also contribute to marine debris with unmanaged disposal of garbage generated onboard. In particular, ALDFG has become a serious concern as fishing effort in the world's oceans and the durability of fishing gears increased (Macfadyen *et al*., 2009; Bilkovic *et al*., 2014). ALDFG can cause ecological problems for marine species when floating gears continue catching and killing organisms (known as ghost fishing). It can also have an impact on sensitive habitats (e.g. coral reefs) when stranded offshore as well as cause socio-economic problems for the fishing fleets by increasing costs. The replacement of the gear lost at sea and the reduction of the potential harvestable catch are two of the key economic effects of lost or abandoned fishing gear (Butler *et al*. 2013; Arthur *et al*. 2014; Bilkovic 2014). In addition, due to the breakdown of plastic materials, microplastics are generated and the toxic substances contained are introduced throughout the food chain supposing a threat to the human health and the ecosystem (Rochman, 2015). In response to these impacts, research has been conducted around the world on ALDFG, particularly in the last year. However, there are still significant data gaps mainly because fishing gears are diverse and specific for the target species and region, and research actions have been focused on localized regions (Richardson *et al*., 2019).

In the ICCAT convention area the fishing activity is conducted by different fisheries, such as purse seine, drifting longlines, pole and line, trawls, and set gillnets. All of them contribute to the increase of marine debris mainly through poor management of garbage generated onboard and ALDFG. The impacts of ALDFG have been related with increased mortality of sensitive non-target species such as seabirds, turtles and sharks, through entanglement of these species on ALDFG (known as ghost fishing) and by ingestion of litter (Gilman *et al*., 2016; Ryan *et al*., 2016). In this sense, the ICCAT has made recommendations to prevent ALDFG related impacts, such as requiring gear marking to identify ownership (Recommendation 03-12; Recommendation 19-11 (not yet active)), banning the use of driftnets for fisheries of large pelagic in the Mediterranean (Recommendation 03-04), and recommending to include information of FAD marking and identifiers; the use of non-entangling materials in sub-surface components and a minimum risk of entangling materials in surface components and promote research on biodegradable materials in the FAD management plan (Recommendation 19-02) (Gilman, 2015). However, the rate and magnitude of ALDFG in the Atlantic Ocean, as other regions in other oceans, is still largely unknown (Macfadyen *et al*., 2009). It is well documented that ALDFG being part of the marine debris, like other pollutants, can also affect the ecological function and the health of organisms of the ecosystems where it is accumulated, including sensitive habitats (UNEP and GRID-Arendal, 2016). This indicates a direct impact for the welfare of sensitive species routinely entangled or by species ingesting lost or discarded fishing gears' components (Butterworth *et al*., 2012). However, it is still poorly understood how this litter could affect other large pelagic species under ICCAT management responsibility (Romeo *et al*., 2015).

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international instrument covering prevention of pollution of the marine environment by ships from operational or accidental causes, which includes a specific Annex V for the prevention of pollution by garbage from ships (IMO, 1973). This convention establishes the manner at which different types of garbage need to be managed specifying the distances from land and how they may be disposed. Annex V also includes a complete ban imposed on the disposal into the sea of all forms of plastics. For vessels ≥400 GT or certified to carry ≥15 persons, the convention includes the obligation to provide a Garbage Record Book (GRB), and the provision of adequate reception facilities at ports without causing undue delay to ships. The GRB includes the record of each discharge made at sea or a reception facility, or a completed incineration, including date, time, ship position, category of the garbage (i.e. plastics, food waste, domestic wastes, cooking oil, incinerator ashes, operational wastes, animal carcasses, fishing gear, e-waste) and the estimated amount (i.e. cubic meters) discharged or incinerated. The implementation of Annex V has been recently reinforced by the new action plan adopted for ships and members to encourage vessels of reporting the loss of fishing gear and facilitating the delivery of retrieved fishing gear to shore facilities (IMO, 2018). Additionally, regional instruments as the EU Marine Strategy Framework Directive (EU-MSFD) also addressed marine debris prevention as an integral policy instrument for the protection of the marine environment for the European Community, following an ecosystem-based approach (EU, 2008). In the EU-MSFD, EU Member States should achieve or maintain the Good Environmental Status including the marine litter as one of the descriptors (i.e. descriptor 10). In this framework, the indicators defined to monitor the marine litter are trends in the amount, distribution, and composition of marine litter in beaches, in the water column and on the seafloor, including microplastics (Galgani *et al*., 2015). Additional criteria are the impacts on the marine fauna and includes as indicators the rate of entangled fauna and the amount of debris in gut contents (EU, 2010). Other instruments at international and regional level and guidelines that have been elaborated for managing and monitoring marine litter can be found in Chen (2015).

At t-RFMO level, specific forms were adopted to collect information on marine debris through the observer programs as is the case for the SPC/FFA (i.e. Form GEN-6 designated in 2000 to Monitor violations of MARPOL annex I and annex V), which records quantity by type of the waste dumped to the sea (Richardson *et al*., 2016). At the IATTC Resolution C-04-05 REV 2[3], prohibits vessels from disposing of plastic containers and other debris at sea, and instructs the Director to study and formulate recommendations regarding the design of FADs, particularly the use of netting attached underwater. The IOTC has also been working on minimizing impacts generated by fisheries activity, especially those related with ALDFG in the ecosystem. For example, IOTC Resolution 12/12 prohibits the use of large-scale driftnets on the high seas to prevent potential detrimental effects by these nets on species of concern and the marine environment if lost or discarded (e.g., ghost fishing). In the same way, ICCAT has banned the use of driftnets for fisheries of large pelagic in the Mediterranean (Recommendation 03-04). These steps to prevent ALDFG impacts are further developed at ICCAT through Recommendation 19-11 not yet active. In IOTC and ICCAT the Resolution 19/02 (Indian Ocean) and Recommendation 19-02 (Atlantic Ocean) also define the procedures on FADs Management Plans, prohibiting the deployment of FADs without operational buoys in the IOTC Convention Area, use of netting material in FAD construction (in the case of the Indian Ocean) and promoting the use of biodegradable materials to phase synthetic

[3] https://www.iattc.org/PDFFiles/Resolutions/IATTC/_Spanish/C-04-05-REV-Jun-2006-Active_Resolucion%20consolidada%20sobre%20captura%20incidental.pdf

material out. In the Indian Ocean, in the same resolution (Res 19/02, para. 19) is also noted the obligation to remove from the water, retain onboard and only dispose in port, of all traditional FADs encountered from 2022 onwards. ICCAT's Recommendation 19-02 para. 39 also requests CPCs reporting average numbers of lost FADs with active buoy on a monthly basis.

The "Marine debris" ecosystem component of the ICCAT ecosystem report card should focus on examining the magnitude and extent of the ALDFG and addresses contributions of garbage discharged from vessels generated by the fishery activity of ICCAT fleets in the Atlantic Ocean. Currently the magnitude and extent of the marine debris impacts derived by ICCAT fleets are poorly known, and the actual data gap prevents the quantification, monitoring and assessment of this ecosystem component. Not accounting for the ALDFG-derived mortality due to entanglement and ingestion of debris in population models has the potential to undermine the effectiveness of mitigation measures. This is especially important for the most vulnerable species' populations (e.g. sea turtles, marine mammals, seabirds and some sharks), which can significantly impact on their status (Coggins *et al*., 2007; Gilman *et al*., 2013). Accumulation of marine debris produced by fisheries along the coast can also impact the health of coastal ecosystems and their utilization by coastal communities.

In order to measure progress towards managing the "Marine debris" ecosystem component of the ICCAT ecosystem report card, we propose the following conceptual and operational objective:

Conceptual objective: "Monitor, prevent, and reduce marine debris generated by ICCAT fisheries"

Operational objective: "Determine the extent of marine debris generated by ICCAT fisheries and its trend over time"

3. A proposal of candidate ecological indicators to monitor the "Marine debris" component of the ICCAT ecosystem report card

To better understand fisheries activity contribution to marine debris and its impacts on species and broader ecosystems, quantitative and qualitative information of the source and amount of marine debris is needed. This requires to quantitatively estimate the magnitude of the inputs, i.e., number of items, size and weight of introduced debris by fishing gear, and to qualitatively characterize the type of materials disposed into the sea. The estimation of these parameters is critical to produce a baseline for management decisions and to inform about decisions required to prevent, reduce, and control the impacts caused by marine debris. Thus, we propose three potential indicators for all fisheries operating in the ICCAT convention area:

1. **Number of debris items** disposed and/or discharge events into the ocean.
2. **Weight and volume of debris items** disposed into the ocean, provided in kilograms and cubic meters, respectively (if possible).
3. **Type of debris items** description; when items are composed by different components/parts specify each component material.

These three indicators should be estimated for all fisheries operating in the ICCAT Area. Each fishery should be considered separately to identify the source of debris generated by each of them and properly estimate relative contribution to the total input. This will also allow to assess fishery-specific input impacts for the ecosystem and inhabiting species. Temporal and spatial scale information should be also provided to improve our understanding of marine debris pathways and its spatial temporal variability within the ICCAT Convention Area.

Presence of microplastics (i.e., solid particles < 5 mm in diameter) in different ecosystem habitats, both primary microplastics (i.e., purposefully manufactured to carry out a specific function) and secondary microplastics (i.e., resulting from wear and tear or fragmentation of larger objects), is also an important aspect to consider as a potential indicator for monitoring the overall health of the ecosystem (GESAMP, 2019). It has been documented that microplastics can be ingested by biota, such as marine mammals, birds, turtles and several commercial fish species (UNEP, 2016). Consumption of microplastics has associated physical and chemical impacts that potentially affect the health and biological traits of these species (UNEP, 2016) and thus, the whole food chain. However, according to UNEP (2016) little is known about the impact of their consumption and the possible transfer of chemicals associated with microplastics into organisms' tissues, which could end transferring these contaminants to the fish flesh, and hence be made available to predators, including humans. Monitoring of microplastics requires specific sampling protocols to ensure correct measurement in different ecosystem habitats (JRC, 2013; GESAMP, 2019). Similarly, the need for harmonization of sampling methods and data collection

protocols to facilitate comparations between regions is widely recommended, so that the observation of trends allows decision-makers adopt corrective management measurements if necessary. Nowadays, ICCAT fisheries' contribution to the production of secondary microplastics generated from marine debris disposed to the ocean could be hardly estimated. Therefore, future works should be devoted to the exploration of monitoring options for this component of the marine debris.

4. Indicator-based assessment for the Marine debris component

We conducted a preliminary revision on how marine debris indicators could be estimated for various fishing methods catching tropical tunas in the Atlantic Ocean, including the revision of the data source, available data (e.g. collected by observers and CPCs: FAD logbooks; and submitted by CPCs to the ICCAT: ST08-FadsDep), and data gaps (**Table 1**). This will allow determining data requirements by fishery to assess potential contributions by each fishery to marine debris and monitor their trend. This exercise provides us a better perspective on the feasibility to develop proposed indicators supported by the available data.

We highlight that fishery impacts need to be investigated by major fisheries and gears as well as their cumulative impacts at a regional basis, since only cumulative impacts can provide a true understanding of the extent of the fishing impacts on species, communities and the broader marine ecosystems, including sensitive habitats. This first preliminary assessment shows that the purse seiner fishery could be considered a data rich fishery, which has a 100% observer coverage (Goujon *et al*. 2018; Lopez *et al*., 2017), and collects information on activities with FADs and specific FAD tracking data (i.e. buoy transmission data). FAD tracking data is shared to conduct specific research actions (Katara *et al*., 2018; Zudaire *et al*., 2018; Grande *et al*., 2019). This information could be potentially used in the future to estimate FAD beaching events or proportion of FADs lost and abandoned (Maufroy *et al*., 2015; Zudaire *et al*., 2019). In addition, the vessels should all record their garbage discharge in GRB following MARPOL requirements. However, regarding ICCAT fisheries, and in support of MARPOL data collection on ALDFG and garbage discharge, substantial effort should be done to quantify the amount of marine debris in the ICCAT Area of Competence.

5. Discussion and future work

The main challenge for marine debris monitoring through the development of the proposed indicators for all fisheries operating in the ICCAT convention area is the availability and access to the data. This will require the engagement and cooperation of industry. The development of specific guidelines, and data collection forms following the recommendation posed by international organisms' experts in the field will also be necessary. This will entail the establishment of a standardized methodology for data collection and exchange to ensure harmonization with existing programs, allowing comparison of datasets and enabling detection of significant changes in spatial or temporal distributions (JRC, 2013).

Below we summarize some recommendations for future work to advance towards monitoring the "Marine debris" ecosystem component of the ICCAT ecosystem report card. This document should be considered as the first step towards addressing this component, and it will be in progress with the aim of updating it annually at the Sub-Committee on Ecosystems meetings. To ensure the correct identification and estimation of indicators for monitoring marine debris the collaboration of multiple experts with experience in the multiple gears operating in the ICCAT convention area and in the marine debris problematic will be necessary. We invite the ICCAT community to contribute towards the development of the "Marine debris" component to support the ICCAT ecosystem report card.

Recommendations for future work are:

- In order to improve knowledge on this ecosystem component, the exchange of data collection protocols and of already available data between the scientific community is promoted as a first important step towards the monitoring of marine debris.
- The review of specific protocols in place and available data will allow to further identifying data and knowledge gaps and design the methodological approach to quantity and monitor trends in marine debris.
- Marine debris monitoring protocols to collect data for the assessment of marine debris indicators, should be defined considering existing master lists of categories of litter items (for example, Annex 8.1 at JRC, 2013) to ensure harmonization between programs. Data collected as per Rec. 19-11 should follow these protocols and categories to the extent possible.

- Data on marine debris disposal should include temporal and spatial scale information to enable mapping of occurring events and to improve our understanding of marine debris pathways and variability in litter transport, and final fate within the ICCAT convention area.
- Data collection on marine debris could be supported by observer programs, either human observers or electronic monitoring systems.
- Development of a risk matrix, considering the category of probability or likelihood of an item disposal against severity of consequences of that disposal, can be promoted as future work. This will allow Sub-Committee on Ecosystems to assess all fishing gears jointly by a simple mechanism and increase visibility of each gears' risks and assist management by proposing best approaches according to these risk levels.

All those points would allow the Sub-Committee on Ecosystems to better understand the impact of marine debris on the overall health of the ecosystem of ICCAT species.

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Table 1. Description of fishery contribution to marine debris, data available, existing data sources, data gaps and future data collection requirements to assess proposed indicator candidates. The FAD information is analyzed in a specific section, as specific data collection protocols are already in place for the assessment of the number of FADs and activities, which could be potentially used for accounting marine debris in the future.

Contribution to marine debris	Candidate Indicators	Data source	Data available	Data gaps and requirements
Abandoned and Lost FADs	Number of debris items	- FAD logbook - ST08-FadsDep - Buoy transmission on FADs - Observer Data (100% coverage)	- FAD Abandoned and lost by vessel*	- Number of FAD abandoned or lost and never recovered**.
	Weight and size of debris items	- FAD logbook - Observer Data (100% coverage)	- Depth of the submerged structure and size of the floating structure	
	Type of debris items	- FAD logbook - Observer Data (100% coverage)	- Entangling character and nature of materials	
Abandoned Lost or Discarded Fishing Gears ALDFG for other fisheries at ICCAT area	Number of debris items	-GRB of MARPOL*** - Rec. 19-11	- Gear lost - Nº of abandoned and lost by vessel if recorded in GRB of MARPOL	- Number of Fishing Gear abandoned or lost
	Weight and size of debris items	- GRB of MARPOL***	- size of abandoned and lost gear by vessel if recorded in GRB of MARPOL	- Gear weight and size for vessels without GRB.
	Type of debris items	- Rec. 19-11		- Type of gear and its component
Discharge of garbage from vessel	Number of debris items or discharge events	- GRB of MARPOL	- N of events if recorded in GRB of MARPOL	- Number of events for vessels without GRB
	Weight and size of debris items	- GRB of MARPOL	- Weigh and volume by garbage type for each discharge if recorded in GRB of MARPOL	- Weigh and volume of by garbage type for vessel without GRB of MARPOL
	Type of debris items	- GRB of MARPOL	- Type of garbage as defined in MARPOL if recorded in GRB of MARPOL	- Type of garbage for vessel without GRB of MARPOL

*The individual contribution of each case is not available
**The specific strategy of FAD fisheries includes recovering and reusing FADs found at sea (any FAD abandoned or lost by any purse seiner). Therefore, the specific component of those FADs that are lost or abandoned and never reused is unknown
***For vessels ≥400 GT or certified to carry ≥15 persons