

Risk Assessment for Sourcing Seafood (RASS) profiles; Atlantic skipjack tuna (*Katsuwonus pelamis*) caught by the Ghanaian fleets

Introduction

This document is a summary of information on Eastern Atlantic Skipjack tuna (*Katsuwonus pelamis*) targeted by industrial Ghanaian purse seine and pole and line (baitboat vessels) enrolled in Fisheries Improvement Projects (FIPs). Scoring covers fishing with and without Fish Aggregation Devices (FADs) both inside and outside the Ghanaian EEZ. Please see Annex 1 for the vessels included.

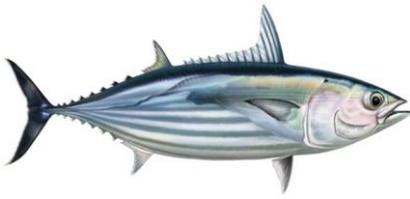
Fish populations are divided into fish stocks. A fish stock is a sub population of a fish species which inhabits a defined area of sea. Fish stocks are the units used by scientists and governments to assess and manage stock sustainability, so each RASS profile relates to a specific stock within a defined sea area.

RASS applies a framework (See [RASS Scoring Guidance version 2](#)) which scores risk levels for stocks and fisheries (as defined by gear type) on a five-point scale; from 1 very low risk to 5 very high risk, as indicated by the number of solid blue circles shown on the profiles below. Four aspects are assessed for this fishery:

1. The stock status as advised by the International Commission for the Conservation of Atlantic Tunas (ICCAT).¹
2. Stock management, using information from ICCAT, the Fisheries Commission of Ghana, Fishery Improvement Projects (FIPs) and other sources.²
3. Bycatch of vulnerable resource and Endangered, Threatened or Protected (ETP) species and mitigation measures using FIP documentation, scientific literature and other sources.
4. Habitat impacts of the fishery and mitigation measures using scientific literature and other sources.

¹ [ICCAT·CICTA·CICAA](#)

² [Ghana tuna - pole & line | Fishery Progress](#) , [Eastern Atlantic tuna - purse seine \(Ghanaian Fleet\) | Fishery Progress](#)



Scores should not be used in isolation to decide on a purchase of seafood from a stock. Profiles are designed to:

- Enable the main features of a stock and fishery to be examined within a structured format
- Inform buyers of questions they might ask about a stock and fishery and where sustainability improvements could be made

Inevitably there are several technical terms used. Please see the Glossary at the end of the document, where there are also links to further reading.

Overview of the Eastern Atlantic skipjack tuna stock

Skipjack tuna (*Katsuwonus pelamis*) broadly inhabits the tropical and warm-temperate areas of the Atlantic, Pacific and Indian oceans. It is the fastest growing of the tropical tunas,³ with a relatively short lifespan of around seven years. The species exhibits a strong tendency to school in surface waters with birds, drifting objects, sharks and whales. Skipjack tuna typically preys on small pelagic fishes, crustaceans, cephalopods and other tuna. Its reproductive potential is considered high, firstly since they breed opportunistically throughout the entire year over broad areas and secondly since sexual maturity is reached at around one year of age.³

Current assessments separate Atlantic skipjack tuna into an eastern and western stock (Figure 1). This is due to the Atlantic Ocean Tuna Tagging Programme's (AOTTP) data showing minimal exchange between the eastern and western Atlantic, however there is not a clear biological boundary between the two stocks.⁴

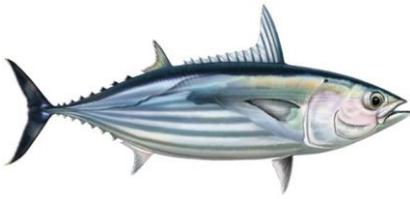
Skipjack tunas have been found to migrate north-west from the Gulf of Guinea from July to October, and from the Azores, Canary Islands and the Sierra Leone Rise to the Guinean shelf from November to January.⁵ This is likely in response to coastal upwelling and potentially the deposition of Saharan dust⁶ which supply nutrients that could increase the production of phytoplankton and zooplankton. Within the

³ Murua, H., Rodriguez-Marin, E., Neilson, J.D., Farley, J. H. & Juan-Jordá, M. J. (2017) Fast versus slow growing tuna species: age, growth, and implications for population dynamics and fisheries management. *Rev Fish Biol Fisheries* 27, 733–773.

⁴ ICCAT, 2023. Report for Biennial Period, 2022-23, Part II, Vol. 2, pp 59.

⁵ Arregui, I., Goñi, N. and Chifflet, M. (2020). Migration patterns of yellowfin, skipjack and bigeye tunas in the tropical Atlantic, based on recent tagging and recapture data. *Collect. Vol. Sci. Pap. ICCAT*, 76(6), pp.903–950. (https://www.iccat.int/Documents/CVSP/CV076_2019/n_6/CV076060903.pdf)

⁶ Rodríguez, S., Riera, R., Fonteneau, A., Alonso-Pérez, S. & López-Darias, J. (2023) African desert dust influences migrations and fisheries of the Atlantic skipjack-tuna. *Atmospheric Environment*. Volume 312 (<https://www.sciencedirect.com/science/article/pii/S135223102300448X>)



Ghanaian EEZ major upwelling occurs July to September and minor upwelling occurs December to February, which does coincide with the peak fishing seasons in Ghana although catches of skipjack are abundant throughout the year.⁷

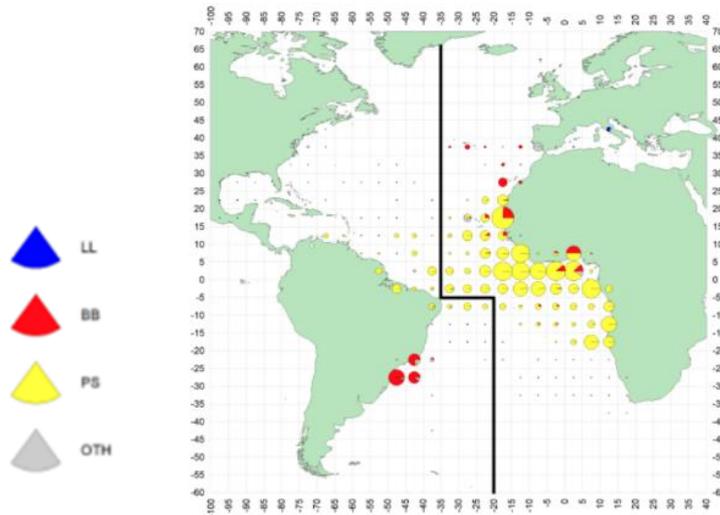


Figure 1. Geographical distribution of the skipjack catch 2020-2021 by major gears: Longline (LL), baitboat (BB), purse seine (PS) and other (OTH). The thick black line denotes the boundary used by ICCAT to separate the western and eastern stock.⁸

Overview of the Ghanaian tuna fishery

The main commercial tuna species exploited by the Ghanaian flagged industrial tuna fleet are skipjack (*Katsuwonus pelamis*), yellowfin (*Thunnus albacares*), and big eye (*Thunnus obesus*): catches were 76,751t, 29,550t and 3,672t respectively in 2022.⁹ All of the Ghanaian flagged industrial tuna vessels appear to be owned through the Ghana Tuna Association (GTA).

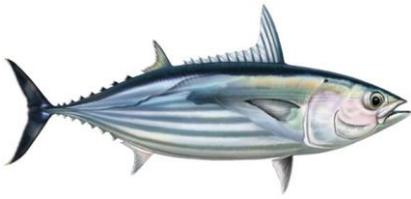
Both the [pole and line](#) (baitboat) and purse seine fleets are known to use Fish Aggregating Devices (FADs). It is generally believed that fish use floating objects for protection from predators, as a source of food availability, as a meeting location and to increase the survival of offspring.¹⁰ Fishers take advantage of this behaviour by setting floating rafts (either drifting or moored) which tuna and other species

⁷ Ministry of Fisheries and Aquaculture Development (2015). National Fisheries Management Plan 2015 - 2019, Government of Ghana.

⁸ ICCAT, 2023. Report for Biennial Period, 2022-23, Part II, Vol. 2, pp 73.

⁹ ICCAT, 2023. Report for Biennial Period, 2022-23, Part II, Vol. 2, pp 23, 45 & 65.

¹⁰ Iriarte, F., Takyi, R. & Bannerman, P. (2017). Improved data collection and management for Atlantic tuna vessels: A case study of TTV purse seine fleets, Ghana. Collective Volume of Scientific Papers. 73. 974-987.



effectively gather around, therefore reducing the fisher's time and energy spent at sea searching for shoals. Because of their effects of increasing catchability, their use is tightly regulated (see below), and are usually fitted with a satellite location device and instruments to monitor the fish biomass below the FAD.

Whilst it appears that all Ghanaian flagged purse seine vessels are involved in the FIP, only half of the pole and line vessels seem to remain enrolled in Fisheries Improvement Projects (FIPs).¹¹ Both FIPs' objectives included: greater collaboration between industry and government and address shortfalls in the stock health, ecosystem health and management of the fishery.

As with many fisheries, technological advancement has caused an increase in skipjack catchability and the proportion of biomass exploited (Figure 2). This has primarily been through the progressive use of fish aggregating devices (FADs), foreign investment in vessels and the geographical expansion of fishing areas. Ghanaian purse seine vessels which utilise FADs expanded into the North West and South East Atlantic from 2012 onwards, however these quantities remain minimal.¹⁴

Ghana's tropical tuna fishery is the only exception to the declining CPUE of all other fleets and the tuna fleet benefits from some added protection through regulations limiting foreign capital.¹² Whilst most tuna vessels are operated on a joint-venture basis, Ghanaian nationals have the right to 50% of the shares, whereas elsewhere in the industrial trawl sector they have been left open to exploitation by foreign companies.¹³

¹¹ Vessel numbers from the Ministry of Fisheries and Aquaculture Development, 2022 align with the amount in the FIP lists (Annex 1).

¹² Ministry of Fisheries and Aquaculture Development (2015). National Fisheries Management Plan 2015 - 2019, Government of Ghana.

¹³ European Justice Foundation (2018) China's hidden fleet in West Africa: A spotlight on illegal practices within Ghana's industrial trawl sector.

<https://ejfoundation.org/resources/downloads/China-hidden-fleet-West-Africa-final.pdf>

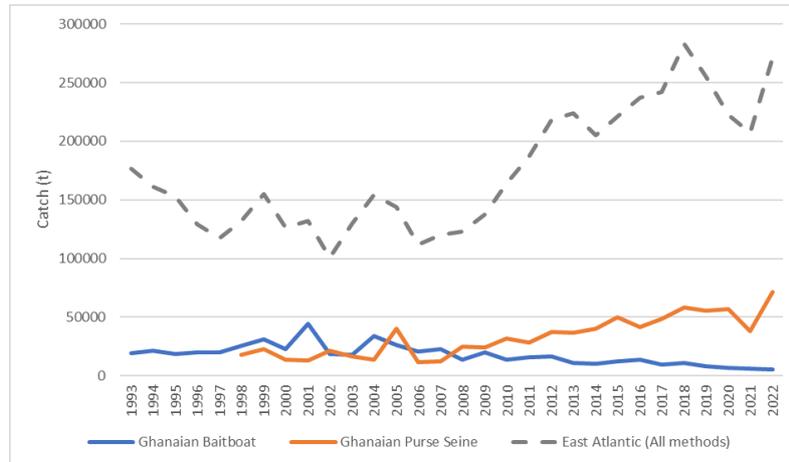
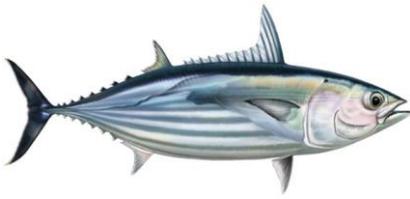


Figure 2. Historical skipjack catches (1993 – 2022) by Ghanaian flagged vessels by gear type¹⁴ alongside catches recorded for the entire East Atlantic stock for the same period.¹⁵

RASS Scoring

Stock status of Skipjack tuna (*Katsuwonus pelamis*) in the East Atlantic

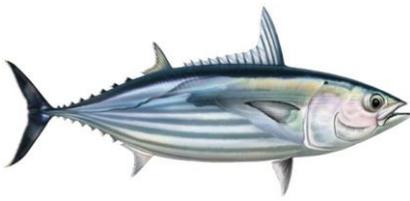
● ○ ○ ○ ○ Very low risk

The Eastern Atlantic skipjack stock was assessed in 2020 as not overfished (that is there is sufficient biomass to maintain the population) and is not subject to overfishing (that is the rate of exploitation is not excessive). There is some uncertainty as to whether increased harvest rates following the latest stock assessment could be leading to a decline in stock health in the long term.

The last full stock assessment for the Eastern Atlantic skipjack tuna stock was conducted in 2022 (ICCAT, 2022) using data up to 2020. The results of two models were combined to estimate stock status and develop management advice that captured all major uncertainties in the population dynamics. Based on this modelling, the 2020 East Atlantic skipjack tuna stock was not overfished (with 83%

¹⁴ [ICCAT-CICTA-CICAA](#) statistical database

¹⁵ ICCAT, 2023. Report for Biennial Period, 2022-23, Part II, Vol. 2, pp 65.



probability, median $B_{2020}/B_{MSY} = 1.60$) and was not undergoing overfishing (with 80% probability, median $F_{2020}/F_{MSY} = 0.63$).

It should be noted that uncertainties in the biomass estimates have implications on the ability to generate long term management advice – a future constant catch using the estimated MSY of 216,617 t per year will have about 55% probability of maintaining the stock in the green quadrant (not overfished, not subject to overfishing) of the Kobe plot through to 2028 (see large range extending into the orange quadrant of the Kobe plot, Figure 3).

Whilst the median MSY was advised as 216,617t per year, catches following this have been substantially higher (25%) at 271,371t in 2022. This score may therefore be subject to change following the next assessment, especially since the projections using the median MSY show that there is a significant risk (45%) of being overfished or experiencing overfishing in 2028.

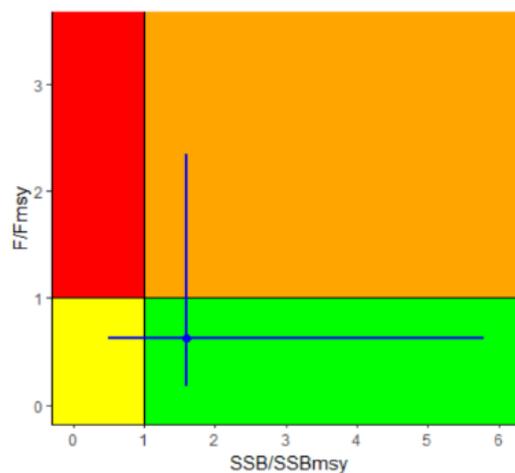
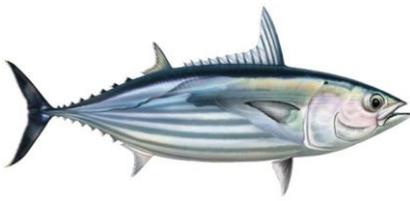


Figure 3.¹⁶ Kobe plot demonstrating the likelihood of the East Atlantic skipjack stock currently being in each of four categories.¹⁷ The dot indicates the current estimate, whilst the blue lines show the 95% confidence intervals of where that estimate could be.

¹⁶ ISSF. 2023. Status of the world fisheries for tuna. Nov. 2023. ISSF Technical Report 2023-12. International Seafood Sustainability Foundation, Pittsburgh, PA, USA.

¹⁷ The Kobe plot describes which of the following four categories a stock is identified as: over-fished and currently overfishing (red), underfished and currently overfishing (orange), stock depleted but fishing level low i.e. rebuilding stock (yellow), and underfished whilst currently underfishing (green). The X-axis of the plot shows stock abundance, while the Y-axis shows fishing mortality.



Overall stock management of Skipjack tuna (*Katsuwonus pelamis*) in the East Atlantic

●●●○○ Moderate risk

Whilst a healthy stock status has put less pressure on developing management measures, some management measures have been outlined at stock level. There is adequate surveillance and monitoring, but there may be limited capacity to effectively enforce measures at stock level. This could become an issue if the recent trend in catches exceeding the level estimated for MSY continues, with a 45% probability that the stock could be overfished and/or subject to overfishing by 2028.

Advised and agreed catches

The Eastern Atlantic skipjack stock status was considered to be above B_{MSY} and below F_{MSY} reference points. Due to this no management recommendations were made by the scientific committee, except that catches should remain around the MSY. Catches have since increased to ~125% of the advised MSY.¹⁸

Overall harvesting strategy

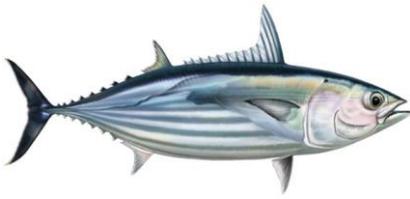
The use of FADs is limited by ICCAT in the form of a closed season (1st January to 13 March) throughout the convention area, in order to reduce the fishing mortality of juvenile bigeye and yellowfin tunas. There is also a limit of 300 active FADs per vessel, and an FAD management plan to improve management and address other sustainability concerns.¹⁹

ICCAT also requires Contracting Parties and Cooperating non-Contracting Parties, Entities, and Fishing Entities (CPCs) to issue specific authorizations to vessels 20 meters LOA or greater flying their flag allowed to fish bigeye, yellowfin and skipjack tunas in the Convention area. A record is kept of authorized vessels and their catches.¹⁹

In the absence of catch limits, catches of skipjack could possibly be constrained by catch limits set on bigeye and yellowfin tuna, as juveniles of these species are caught on FAD sets in association with skipjack.

¹⁸ ICCAT, 2023. Report for Biennial Period, 2022-23, Part II, Vol. 2, pp 63.

¹⁹ ICCAT, 2023. Report for Biennial Period, 2022-23, Part I, Vol. 1



Overall surveillance and enforcement

At an international level, monitoring control and surveillance mechanisms exist through ICCAT. This is in the form of catch reporting from authorized vessels and the requirement of 100% monitoring of purse seine vessels through the presence of an observer on board or through an approved electronic monitoring system.

ICCAT has no enforcement capacity of its own and relies on CPCs to implement management measures domestically and exercise control over their flagged vessels.

Management within Ghanaian jurisdiction



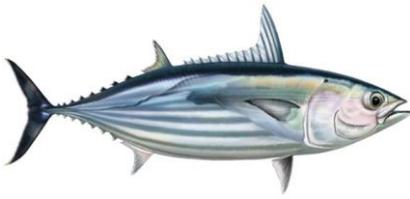
Whilst a healthy stock status has put less pressure on developing management measures, some management measures have been outlined at national level and within the fishery improvement projects. These measures are still yet to be fully implemented. In terms of surveillance and enforcement, there is a general issue with controlling illegal, unreported and unregulated (IUU) fishing within Ghana's jurisdiction. For those vessels enrolled in the FIPs, there is greater transparency in their fishing activities and so are less likely to take part in IUU fishing.

Harvesting strategy

The Ghanaian skipjack tuna fishery is under the management of ICCAT, Ghana's 2002 fisheries act and the 2022 – 2026 Fisheries Management Plan. Both the pole and line and purse seine tuna fleets are enrolled in national Fisheries Improvement Projects (FIPs). Both the Fisheries Management plan and the FIPs are at the stage where a workplan has been drawn out and improvements to fishing practices and fishery management should be reaching implementation. The Fisheries Management Plan does not provide any additional measures and focuses on achieving improved adherence to ICCAT tropical tuna fishery recommendations.²⁰

With regard to the FIPs, a harvest strategy is yet to be developed under both and this puts them behind schedule. A number of engagement activities have been developed by the FIPs in order to improve the development of harvest strategies and harvest control rules of the target species. Progress has however been slow due to the situation created by the Covid-19 pandemic and because of the difficulty of achieving agreement at an international (RFMO) level.

²⁰ [FINAL-DRAFT-2022-2026-MFMP-MFMD-28-APR.pdf \(chinaglobalsouth.com\)](#)



Surveillance and enforcement

The Monitoring, Control and Surveillance Division (MCS) of the Ghanaian fisheries commission oversees fishing operations, such as monitoring VMS (a requirement for all Ghanaian flagged vessels) and supervising transshipments at port.²¹ The 2015-2019 Fisheries Management Plan for Ghana saw the establishment of the Fisheries Enforcement Unit (FEU) to ensure fishing compliance. Whilst the tuna fleet is not specifically detailed within these sources, Ghana has been issued with a second yellow card from the EU regarding the issue of illegal, unreported and unregulated (IUU) fishing.^{22,23} A general lack of control over Ghanaian flag vessels is listed as a reason for concern.

All Ghana FIP vessels (pole and line and purse seine) are detailed on the International Seafood Sustainability Foundation (ISSF) Proactive Vessel Register (PVR).²⁴ This shows how each vessel is following practices that support sustainable tuna fisheries, and so will be subject to third party audits. Seven of the pole and line vessels have left the FIP and it is not clear if they are continuing to fish under the Ghanaian flag for skipjack tuna.

Bycatch in the Ghanaian Skipjack tuna (*Katsuwonus pelamis*) purse seine fishery

●●●○● Moderate risk

The majority of bycatch is resource species with management in place to the control harvest of, which is demonstrated to be effective. The incidental and occasionally fatal catch rates of vulnerable silky sharks on FAD sets raises concern. Mitigation measures are considered in the FIP's ETP management strategy.²⁶ Reducing the negative effects of FAD use and ensuring crews follow policies to achieve optimal rates of live releases should help minimise bycatch effects.

Gear effects

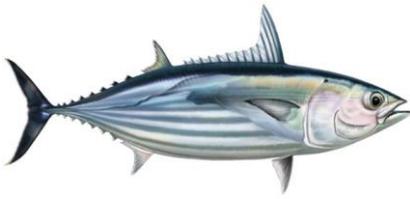
Purse seine fishing vessels have low selectivity due to the large, encircling net and small mesh size. The fishery also uses FADs to attract tuna, however alongside tuna they can also attract sharks, dolphins, turtles, and birds.

²¹ [Overview of Monitoring, Control and Surveillance Division \(Mcs\) of the Fisheries Commission \(mofa.gov.gh\)](https://mofa.gov.gh)

²² [IP_21_2745_EN.pdf \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:IP_21_2745_EN.pdf)

²³ [Illegal, Unreported and Unregulated fishing \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:IP_21_2745_EN.pdf)

²⁴ [ProActive Vessel Register \(PVR\) - International Seafood Sustainability Foundation \(iss-foundation.org\)](https://issf.foundation.org)



Evidence of risk - Secondary species

Within the purse seine fishery there is bycatch of juvenile yellowfin and bigeye tuna which school in association with skipjack on FADs. Whilst these are still resource species, mortality of juveniles impedes stock replenishment and furthermore bigeye tuna is assessed as overfished (the stock is not subject to current overfishing however).²⁵ As a result of bigeye tuna's stock status, this species is subject to catch limits, hence excessive bycatch by purse seine vessels is discouraged as fishers may rather return undersized/ juvenile tunas rather than retaining them as part of their catch.²⁶

Evidence of risk - ETP species

Observer data collected in 2018 – 2019 within the FIP notes incidental catch in the purse seine of : 992 silky sharks (*Carcharhinus falciformis*), 536 brown sharks (*Carcharhinus plubeus*), six hammerheads (*Sphyrna spp.*, *Sphyrna lewini*, *Sphyrna makarran*), four mantas (*Manta birostris*) and 2830 unidentified sharks. Of those catches, 308 elasmobranchs were dead when released including 138 silky sharks (CITES Appendix II).²⁶ In the Atlantic Ocean, the population of silky sharks has been estimated to have declined by 97% over three generations.²⁷

Turtles use flotsam in the ocean for respite,²⁸ which makes them at risk of becoming entangled in ropes and netting attached to the FADs in which case it will likely lead to mortality.²⁹ Catches of turtles occur and most are released alive, however the occurrence of FAD entanglements across ETP species including turtle for this fishery was not well documented.²⁶

Mitigation measures

The proactive vessel register shows that all but one Ghanaian purse seine vessel in the FIP are meeting the sustainability criteria, such as having a shark finning policy, an established and published policy on FAD management which includes the commitment to the use of non-entangling FADs.

FADs are the main cause of the interactions with juveniles of secondary species and with ETP species. ICCAT's measures to reduce the use of FADs through a closed season and a limit on the number per vessel for the rest of the year, and instead

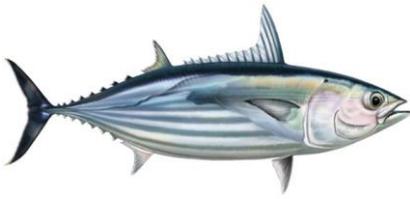
²⁵ [BET_SA_ENG.pdf \(iccat.int\)](#)

²⁶ [Revision Draft \(fisheryprogress.org\)](#)

²⁷ Rigby, C.L., Sherman, C.S., Chin, A. & Simpfendorfer, C. 2021. *Carcharhinus falciformis* (amended version of 2017 assessment). The IUCN Red List of Threatened Species 2021: e.T39370A205782570. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T39370A205782570.en>. Accessed on 25 March 2024.

²⁸ Casazza, T. L. & Ross, S. W., 2010. Sargassum: A complex 'island' community at sea. National Oceanic and Atmospheric Administration: Ocean Explorer, 25 August.

²⁹ Duncan, Emily & Botterell, Zara & Broderick, AC & Galloway, Tamara & Lindeque, Penelope & Nuno, Ana & Godley, Brendan. (2017). A global review of marine turtle entanglement in anthropogenic debris: A baseline for further action. *Endangered Species Research*. 34. 10.3354/esr00865.



shifting to targeting free schools using fish tracking and telemetry systems, will be reducing the aggregation of juvenile tuna, elasmobranchs, cetaceans and birds which could be incidentally caught in purse seines. Modifying FAD design as described in the FIP to make them non-entangling will prevent the mortality of turtles.

Bycatch in the Ghanaian Skipjack tuna (*Katsuwonus pelamis*) pole and line fishery



High risk

The pole and line fishery selectively captures additional resource species which are currently assessed as being within safe biological limits. The capture and trade of live baitfish is not well controlled, and two stocks of these species are not within safe biological limits, with other stocks likely to also decline now that fishing pressure has been redirected onto them. The FIP seeks to improve the management of the baitfish fishery and vessels already have shark finning and non-entangling FAD policies in place.

Gear effects

The pole and line method of fishing is highly selective and the volume of tuna unfit to canneries is marginal. Tuna unfit for canneries are sold to local markets, mostly through Tema.³⁰

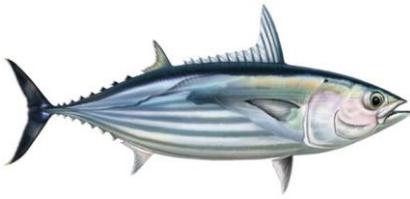
Evidence of bycatch; secondary species

The pole and line fleet mainly catches skipjack (2/3 of the catch) and yellowfin (1/3) as target species, with some additional catch of bigeye.³⁰ Free schools of yellowfin tend to be composed of large individuals whereas FAD sets tend to catch skipjack in association with smaller yellowfin. At stock level, yellowfin was not overfished or subject to overfishing in the last assessment in 2019. Catches of yellowfin have however exceeded the TAC every year since 2013 and the ICCAT committee recommends conducting a stock assessment in 2024.³¹

Pole and line vessels use live baitfish, which constitutes a considerable amount of bycatch. Live bait caught by the pole-and-line vessels along the Ghanaian coast is currently almost exclusively anchovy (*Engraulis encrasicolus*), as flat sardinella (*Sardinella maderensis*) and round sardinella (*Sardinella aurita*) stocks have been overexploited and almost exhausted. Around 530 tonnes of baitfish was used

³⁰ [Ghana tuna - pole & line \(fisheryprogress.org\)](https://fisheryprogress.org/)

³¹ ICCAT, 2023. Report for Biennial Period, 2022-23, Part II, Vol. 2, pp 21.



annually by the Ghanaian pole and line tuna fishery between 2019 and 2022.³² The recent decline in baitboat numbers and catches has been attributed to the struggle to source adequate live baitfish.

Small pelagics, includes the round sardinella, flat sardinella, European Anchovy and Atlantic Chub Mackerel (*Scomber colias*). Whilst these species are reserved for the artisanal fleet, they are also caught directly by the tuna baitboats and by industrial trawlers. No part of this harvest appears to be under control. Live baitfish from the artisanal fleet is paid for in tuna catches that have been recorded in logbooks, however the bait is moved from the canoes to the pole-and-line boats so is not landed and therefore is not monitored in the national catch statistics.³² Trawlers have been observed illegally catching small pelagics under the cover of the 'saiko' trade, where frozen blocks of fish are transhipped from the trawlers to canoes at sea for onward sale at markets. The most recent data estimates ~100,000 additional tonnes of small pelagics were caught and traded illegally through saiko in one year in Ghana.³³ Whilst it is unlikely that baitboats are sourcing from saiko since their catch is frozen, this harvest does make a large contribution to the instability of the baitfish stocks.

ETP species

It is noted in the FIP that there is little to no interaction with ETP species and no incidents of shark finning have been recorded by the observers present on board the vessels.³⁴

Mitigation measures

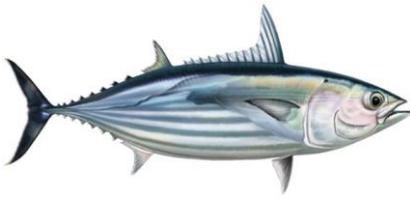
The issues surrounding the baitfish fishery have been considered in the FIP and recommendations have been made to improve recording and traceability of the take of small pelagics.³²

FAD-associated turtle interactions have not been considered explicitly in the pole and line FIP, however the Proactive Vessel Register indicates that all vessels still enrolled in the FIP have a non-entangling FAD policy.

³² [Borges, L \(2022\) Advice on the management of small pelagic fisheries in Ghana, in particular baitfish fisheries](#)

³³ EJP and Hen Mpoano (2019). Stolen at sea: How illegal 'saiko' fishing is fuelling the collapse of Ghana's fisheries.

³⁴ [Fishery Progress annual update for the Ghana tuna pole and line fishery improvement project](#)



Habitat



There is no serious or permanent habitat modification caused by Ghanaian skipjack fisheries, however issues relating to lost FADs need to be addressed as outlined in the FIPs’ objectives.

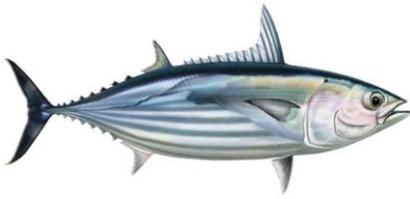
The pole and line, purse seine and baitfish fisheries use gear that rarely interacts with the sea floor, so these fisheries are highly unlikely to reduce the structure and function of vulnerable marine seabed habitats to a point where there would be serious or irreversible harm.

Lost FADs can cause issues such as marine litter and entanglement on a considerable scale.³⁵ Both FIPs are looking to transition to the use of non-entangling/biodegradable FADs to address this, however this has not yet been complete.

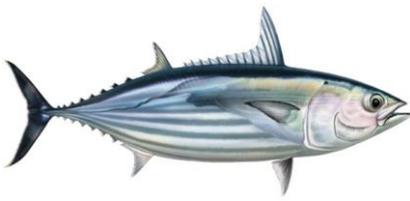
Glossary

Term	Definition
Baitboat	Another term for vessels fishing using pole and line gear due to the fishery using small pelagic fish as live bait.
CPC	Contracting Parties and Cooperating non-Contracting Parties, Entities, and Fishing Entities. Term used by ICCAT to describe the nations and organisations that it works with to deliver inter-governmental fisheries management.
ETP	Endangered, threatened and protected
FAD	Fish aggregating device
Fishing Mortality: F	The rate of mortality due to fishing which is often expressed as an instantaneous rate. In some texts it is referred to as “Fishing pressure”
GTA	Ghana Tuna Association
Harvest Control Rule: HCR	A Harvest Control Rule is a set of well-defined management actions that are taken in response to changes in stock status.

³⁵ [Recovery at sea of abandoned, lost or discarded drifting fish aggregating devices | Nature Sustainability](#)



Term	Definition
Maximum Sustainable Yield: MSY	Catching the maximum quantity that can safely be removed from the stock while maintaining its capacity to produce sustainable yields in the long term.
Safe Biological Limits: SBL	When a stock is inside safe biological limits there is considered to be sufficient reproductive capacity to support a fishery.
Total Allowable Catch: TAC	The Total Allowable Catch (TAC) is a catch limit (expressed in tonnes or numbers) set for a fishery generally for a year or a fishing season.



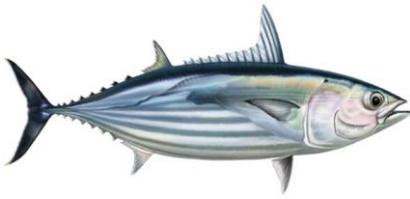
Annex 1 – Vessel list

Ghanaian flagged purse seine fleet included in the FIP. All 15 vessels are classified as large and/or fishing outside Ghana’s EEZ, and have remained in the FIP since January 2019 (Panofi Grace and Panofi Queen added in July 2022).

Vessel Name	Landing Site	Owner Name	Unique Vessel Identifier
Agnes 1	Tema	GTA	7467202
Atlantic Princess	Tema	GTA	8124412
Atlantic Queen	Tema	GTA	9223227
Iris J	Tema	GTA	8214310
Long Tai 1	Tema	GTA	8748660
Long Tai 2	Tema	GTA	8748555
Panofi Discoverer	Tema	GTA	9565352
Panofi Fore Runner	Tema	GTA	9568859
Panofi Grace	Tema	GTA	9517276
Panofi Master	Tema	GTA	8976815
Panofi Path Finder	Tema	GTA	9568861
Panofi Queen	Tema	GTA	9097329
African Star	Tema	GTA	8010386
Iris S	Tema	GTA	8210493
Panofi Commander	Tema	GTA	9097379

Ghanaian flagged pole and line fleet included in the FIP. All vessels are classified as large and/or fishing outside Ghana’s EEZ, however only six of the original 13 vessels which enrolled in the FIP in July 2019 remain.

Date removed from the FIP	Vessel Name	Landing site	Owner Name	Unique Vessel Identifier
N/A	AP 703	Unknown	GTA	7419731
N/A	Marine 707	Unknown	GTA	7419755
N/A	Marine 711	Unknown	GTA	7395870
N/A	Rico Siete	Unknown	GTA	7950632
N/A	Seaplus 87	Unknown	GTA	7410307
N/A	Seaplus 89	Unknown	GTA	7410321
44682	Trust 79	Unknown	GTA	7626956
44652	Trust 77	Unknown	GTA	7410266
44621	Lu Rong Yuan Yu 221	Unknown	GTA	8786076
44621	Lu Rong Yuan Yu 222	Unknown	GTA	8786088
44621	Rico Uno	Unknown	GTA	7950606
44440	Sankofa	Unknown	GTA	9078555
44409	Agnes 11	Unknown	GTA	7426435



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