# ICCAT Transhipment Business Ecosystem Study

September 2020

MRAG asia pacific

**About MRAG Asia Pacific**

MRAG Asia Pacific is an independent fisheries and aquatic resource consulting company dedicated to the sustainable use of natural resources through sound, integrated management practices and policies. We are part of the global MRAG group with sister companies in Europe, North America and the Asia Pacific.

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# Acronyms

| | |
|---|---|
| AIS | Automatic Identification System |
| ALB | Albacore tuna |
| ART | Alpha Reefer Transport |
| BET | Bigeye tuna |
| BFT | Northern bluefin tuna |
| CA | Competent authority |
| COPER | Comercial Pernas S.L. |
| COVID-19 | Coronavirus Disease 2019 |
| CPC | ICCAT Contracting Party |
| DWFN | Distant water fishing nation |
| EEZ | Exclusive economic zone |
| EU | European Union |
| FSC | Frigoship Chartering |
| GFW | Global Fishing Watch |
| GRT | Gross Register Tonnage |
| GSC | GreenSea Chartering |
| GT | Gross Tonnage |
| ICCAT | International Commission for the Conservation of Atlantic Tunas |
| INPESCA | Compañia Internacional De Pesca Y Derivados, S.A |
| IOTC | Indian Ocean Tuna Commission |
| ISSF | International Seafood Sustainability Foundation |
| LSPLV | Large scale pelagic longline vessel |
| OPAGAC | Organisation of Associated Producers of Large Tuna Freezers |
| PEVASA | Pesqueria Vasco Montañesa, SA |
| RFMO | Regional Fisheries Management Organisation |
| ROP | Regional Observer Program |
| RoV | ICCAT Record of Vessels |
| SBT | Southern bluefin tuna |
| SWO | Swordfish |
| TKK | Taiseimaru Kaiun Kaisha |
| TRL | Toei Reefer Line |
| ULT | Ultra-low temperature |
| WCPFC | Western and Central Pacific Fisheries Commission |
| WCPO | Western and Central Pacific Ocean |
| YFT | Yellowfin tuna |

# Executive Summary

## Background and context

In the context of fisheries, the practice of transhipment is generally defined as something along the lines of "*the unloading of all or any fishery products on board a fishing vessel to another fishing vessel*". While the practice of transhipment has been a longstanding part of the global tuna fisheries landscape, relatively little is known about the 'business' of transhipment outside of the main players involved. In order to improve understanding of the sector in the ICCAT area, The Pew Charitable Trusts commissioned MRAG Asia Pacific to undertake a study of the 'business ecosystem' of transhipment. The study serves as a complement to a similar study completed for the Western and Central Pacific Ocean in 2019.

The main aims of the study were to provide an overview of the key fleets, companies and processes involved in transhipment in the ICCAT area, across all main sectors, together with their inter-relationships. Importantly, it was not the aim of the study to review or critically assess the effectiveness of the current management and monitoring regimes governing transhipment activities at national or international levels.

Information to support this report was drawn from four main sources:

- interviews with key stakeholders (including fishing companies/associations, carrier operators, government representatives, observer service providers);
- corporate database searches (using the Orbis database);
- Global Fishing Watch vessel tracking information; and
- other publicly available information (e.g. the ICCAT Record of Vessels, ICCAT reports, public websites, etc).

Importantly, most interviews were conducted between March and July 2020 during the COVID-19 pandemic, which meant that all communication was undertaken remotely.

## History of transhipment

'Conventional' reefer vessels became the standard for transporting frozen goods, including fisheries products, at sea in the 1960s. Since 1980, around 786 conventional reefer ships have been built, of which around 520 are still in service. The number and total volume of the conventional carrier fleet has been in decline for the past two decades, with demolitions exceeding newbuilds in all years since 1998. At current rates of building and scrapping, the total volume of the conventional reefer fleet is projected to reduce by more than half by 2030.

In recent years, reefer containers have eaten into the market share of the conventional carrier sector. In 2018, conventional reefer carriers were estimated to have transported only around 18% of the total seaborne trade of refrigerated foods, down from 47% in 2000.

The history of transhipment in global tuna fisheries does not appear to be well documented to date. Interviewees recalled that the practice became widespread in the mid-1980s, at least partially fuelled by very high value of tuna at the peak of the Japanese economy. For fishing companies, transhipment was a way of allowing fishing vessels to remain on fishing grounds to maximise profits in a bull market, while for trading companies transhipment was an efficient way of securing supply, and ideally beating the competition to fish at the source.

## Overview of the ICCAT carrier fleet

As of June 2020, there were 180 carrier vessels authorised on the ICCAT RoV. Panama has by far the largest fleet (111 vessels), accounting for 62% of all carrier vessels. Bahamas (23 vessels) and Liberia (14 vessels) flag the next highest number of carriers, with 13 other flag States registering a total of 32 vessels between them. A total of 84% of carriers are flagged to CPCs, 3% are flagged to a Cooperating Non-Contracting Party (Chinese Taipei), while 13% are flagged to non-CPCs (Bahamas and Singapore).

The average age of the carrier fleet on the ICCAT RoV is close to 26 years, meaning that many vessels are approaching an age where they may be considered for scrapping. Fewer

than 20% of carriers on the RoV have been built since 2001. Of the 180 carrier vessels on the RoV, 25 have authorisation to receive transhipments at sea from at least some large scale pelagic longline vessels (LSPLVs).

While there are a large number of carriers authorised on the ICCAT RoV, not all of them are active in any one year. Many carriers are involved in multiple ocean basins or multiple sectors (e.g. fruit, vegetables, other seafood sectors), with companies registering them to provide the flexibility to carry tuna within the ICCAT region if the commercial opportunity arises.

Broadly, transhipment activity in the ICCAT area can be divided into three main sectors: (i) transhipments supporting the purse seine fleet; (ii) transhipments involving LSPLVs and (iii) 'transhipments' from BFT farms. In the purse seine sector, based on the available information we estimate that around 20 carriers were involved in transhipments in 2019. In the longline sector, observer records show that the number of carriers receiving LSPLVs transhipments has remained stable at 9-10 during the 2015-16 to 2018-19 period. In the BFT farm sector, observer records show a total of 12 carriers were involved in processing activity on BFT farms in the period from July 2017 to October 2019, three of which were also involved in LSPLV transhipments.

### TRANSHIPMENT IN THE PURSE SEINE SECTOR

Broadly, purse seine vessels in the Atlantic have three main options for the marketing of fish – (i) landing to local processing facilities (mainly in Abidjan, Dakar and Tema); (ii) offloading fish into containers for distribution to a range of markets internationally; and (iii) transhipping fish to carriers for direct delivery to processing facilities in Europe, West Africa and South America. Each of the options has its pros and cons and ultimately the most commercially attractive option will be chosen based on the circumstances at the time.

Based on available CPC reports, in port purse seine transhipment volume has ranged from roughly 148,000mt to 194,000mt over the 2016-2018 period. Skipjack is the main species transhipped, accounting for 61% of total volume in 2018, with yellowfin and bigeye tuna making up 29% and 9% of transhipment volume respectively.

Discussions with industry indicated that the main fleets involved in transhipment are the EU fleet (Spain and France), the Latin American and West African fleets linked to EU-based companies and the Ghanaian fleet. No specific information is collected through ICCAT processes on the number and volume of transhipments in each port, although industry interviews confirmed that the main ports used for transhipment by the purse seine fleet are Abidjan, Takoradi, Dakar and Mindelo.

Given most carriers on the ICCAT RoV are flagged to countries operating open registries (primarily Panama and Bahamas), there is little fidelity between purse seiners offloading to carriers flagged to the same State.

Most carrier operators in the ICCAT are supporting the purse seine fleet can be categorised as one of two types: (i) 'integrated fisher-carrier' companies or (ii) logistics service providers. Integrated fishing-carrier companies (e.g. Albacora group, Calvo Group, Panofi Co. Ltd) operate both fishing fleets and carriers as part of an integrated supply chain. Logistics service providers' (e.g. Greensea Chartering, Alpha Reefer Transport GmbH/FSC Frigoship Chartering) primary expertise is in shipping and logistics; their main interest is in providing a commercial service to transport fish from the fishing grounds to processing facilities or to market.

### TRANSHIPMENT IN THE LONGLINE SECTOR

Eight ICCAT CPCs authorise at least some of their LSPLVs to tranship catch at sea. Of these, the four main distant water fishing nations (DWFNs) - Japan, Chinese Taipei, China and Korea – account for around 97% of authorised vessels. Overall at sea annual transhipment volumes have remained relatively stable in the recent years, ranging between 29,763t and 31,706t in the 2016 to 2018 period. The Japanese and Chinese Taipei fleets tranship the highest volumes, collectively accounting for 72% of total transhipment volume during this

period. Collectively the four main DWFNs accounted for >95% of volumes transhipped at sea in each of the years 2016 to 2018.

Bigeye tuna is the dominant species by volume transferred in at sea transhipments, accounting for 70% or more of total volume in each of the 2016, 2017 and 2018 years. Yellowfin is the next most transferred species making up 9-11% of overall volume in the same period. Albacore, southern bluefin tuna and swordfish accounted for 5%, 5% and 4% respectively. The volume of bigeye tuna transhipped at sea in 2018 represented around 69% of the total estimated longline landings of BET in the ICCAT area (although it should be noted that all fish are transhipped in the calendar year they are caught).

Although a smaller number of transhipments occur at higher southern latitudes, the significant majorty of at sea transhipments in the ICCAT area occur in tropical waters between 12ºN and 12ºS, mirroring the catch distribution of bigeye and yellowfin tuna. The actual location of transhipment is largely determined by the pattern of fishing activity – if a large number of vessels are concentrated in one area, the carrier will go to them; if the boats are more dispersed, the vessels will come to the carrier. Carrier companies have a clear commercial incentive to avoid steaming large distances picking up small volumes at a time – as one carrier company representative put it 'operating a taxi service costs money'.

Transhipment times in the longline sector are considerably shorter than the purse seine sector. In the 2018-19 reporting period, the vast majority of transhipments lasted between one and six hours. The volume transferred per transhipment also varies markedly from <10t to >200t, but is most frequently in the range of 40t to 70t. In addition to transferring fish, carriers supply bait, provisions, fuel and other supplies to fishing vessels as part of an integrated service. Anecdotal information indicates the number of non-fish/supply transfers at sea between carriers and LSPLVs can equal or exceed the number of transhipments.

The majority of fish transhipped from LSPLVs at sea in the ICCAT area is destined for Asian sashimi markets, principally Japan. One carrier operator advised that, given the remoteness of the Atlantic from the major markets, freight costs are typically higher than other ocean basins (~20% higher than the WCPO). The number of LSPLVs from which catch is received during each trip varies markedly according to a range of factors including demand from offloading vessels, the capacity of the carrier, whether the carrier has (or will) tranship in the IOTC area during the same trip and the risk/reward considerations of the carrier remaining on the fishing grounds. In the period July 2015 to July 2019, the number of at sea LSPLV transhipments per trip reported by ROP observers ranged from two to 64, with an average of 33.

Vessels may also undertake transhipment from LSPLVs in port in the ICCAT area. Key ports used for in port transhipments include Cape Town, South Africa, Mindelo, Cape Verde, and Walvis Bay, Namibia. Vessels typically undertake transhipments in port in conjunction with scheduled port visits for crew rest and exchange, reprovisioning and basic maintenance, and to tranship BFT which is prohibited at sea. One carrier company representative advised that the number of in port transhipments would be <20% per trip.

Interviewees involved in longline fisheries indicated there are substantial efficiencies associated with transhipment at sea, most notably the reduced fuel costs and avoiding the loss of fishing time associated with steaming to port. Chinese fleet operators advised that a typical round trip from the fishing grounds to port, unloading, then returning to the fishing grounds takes around one month in the Atlantic. If the vessel were to unload in port four times per year, the vessel loses up to four months' fishing time, plus the associated fuel, labour and port costs. Other benefits include cheaper provisions, no port or stevedoring fees and less administrative paperwork and agent's fees.

The carrier sector supporting at sea transhipment from LSPLVs in the ICCAT area is dominated by three Japanese controlled companies - Toei Reefer Line, Mitsubishi/MRS and Taiseimaru Kaiun Kaisha. In the period July 2015 to July 2019, ROP observers made 62 trips on carrier vessels: 24 trips were undertaken on carriers controlled by TRL, 20 trips were

undertaken on carriers controlled by Mitsubishi, and 18 trips were undertaken on carriers controlled by TKK.

### 'TRANSHIPMENT' IN THE BLUEFIN TUNA FARMING SECTOR

'Transhipment' in the BFT sector is less traditional transfer of fish from one vessel to another and more processing of fish harvested from BFT farms in the Mediterranean and transport of the catch by carrier to market, principally in Japan and Europe.

The bulk of harvesting happens in winter when water temperatures are colder and fish have a higher fat content. Once agreement has been reached on the details of the sale from farm to buyer, it is typically the responsibility of the buyer to arrange for the transport of the fish from the farm to market, including arranging a carrier (if required) and paying the transport fee. A farm may sell fish to multiple buyers through a single harvesting period (each of whom may contract a different carrier company) such that multiple carriers may be involved.

Carriers will typically process fish from multiple farms during a single trip, with voyages lasting up to 10 months. With an average year of build of 2006, carriers involved in BFT processing are some of the younger vessels in the ICCAT carrier fleet.

Twelve carrier vessels have been active in BFT processing/transport in the 2017-2019 period, controlled by five companies: Mitsubishi, Toei Reefer Line, the Ricardo Fuentes group, Kanetomo and Tokyo Seafoods. One respondent advised that Mitsubishi and TRL vessels tend to transport fish to market in conventional carriers, whereas other companies operate smaller carriers and frequently transferred fish to containers for transport. This seems broadly consistent with the size profile of each fleet, with the average size of Mitsubishi/TRL BFT processing carriers being 4,990 GRT, whereas average size of the remaining companies' vessels is 1,621 GRT.

### OTHER BUSINESS CONSIDERATIONS

The ownership and registration arrangements for carrier vessels are often deliberately opaque, with beneficial ownership is often hidden behind one or more shell companies, registered in States that 'value discretion'. Of the 180 fish carriers registered on the RoV in June 2020, 151 (84%) were registered to states that operate open registries (mainly Panama, Bahamas and Liberia). Benefits to shipping companies of using open registries claimed by registration agents in at least one State include tax advantages, anonymity, competitive registration fees and administrative ease (e.g. no minimum tonnage requirements, no age restrictions). In recent years, the presence of an approved EU Competent Authority (CA) has also emerged as an important consideration in the choice of flag State.

For carrier companies, the dominant driver of profitability is the time taken to fill up and unload – trips in which the vessel steamed directly the point of loading, filled up quickly and returned to market to unload had the best chance of making money; trips in which the vessel was required to steam to multiple destinations to fill up and/or remain in port for lengthy periods, had a higher chance of losing money. As one carrier operator interviewed for a previous study noted, the 'economics of the whole operation depends on loading and unloading times'.

A key question for the overall shape of the transhipment 'business ecosystem' in the Atlantic (as well as other ocean basins) in coming years is the extent to which improving container technology and services will eat into the market share of conventional carriers.

While the practice of transhipment is widespread in the tuna sector, and is central to supporting the economics of many fleets, at sea transhipment in particular has been implicated in a range fisheries and labour rights violations, with associated calls for reform. While it was not the aim of this study to examine the effectiveness of existing transhipment regulatory arrangements, continuing to ensure 'best practice' management and monitoring arrangements are in place in the sector is a key challenge for both management authorities and industry.

# 1 Introduction

In the context of fisheries, the practice of transhipment is generally defined as something along the lines of "*the unloading of all or any fishery products on board a fishing vessel to another fishing vessel"*[1]. The origins of transhipment in global tuna fisheries are not well documented, however one study indicated that in longline fisheries the practice likely started with the consolidation of catches amongst multiple vessels within a fleet, with a single (often larger) vessel transferring catches to port and returning with provisions (McCoy, 2012). Catch consolidation meant that fishing vessels could stay on the fishing grounds longer, with less time spent steaming and fewer fuel costs. With the advent of the conventional reefer carrier in the 1960s and the growth in the reefer fleet, the economic advantages associated with transhipment led to the practice becoming widespread across much of the global tuna purse seine and high seas longline fleet since around the mid-1980s. In the International Convention for the Conservation of Atlantic Tunas Convention Area (ICCAT-CA) we estimate around 43% of purse seine product and over 40% of the main species harvested by tropical longliners was transhipped on or near the fishing grounds in 2018[2].

While the practice of transhipment is a longstanding part of the global tuna fisheries landscape, relatively little is known about the 'business' of transhipment outside of the main players involved. This includes the key companies involved at all stages, the main factors influencing profitability, the extent of vertical integration and the economic impacts of transhipment regulation. In order to improve understanding of the sector in the ICCAT area (Figure 1), The Pew Charitable Trusts commissioned MRAG Asia Pacific to undertake a study of the 'business ecosystem' of transhipment. The study serves as a complement to a similar study completed for the Western and Central Pacific Ocean in 2019 (MRAG Asia Pacific, 2019).

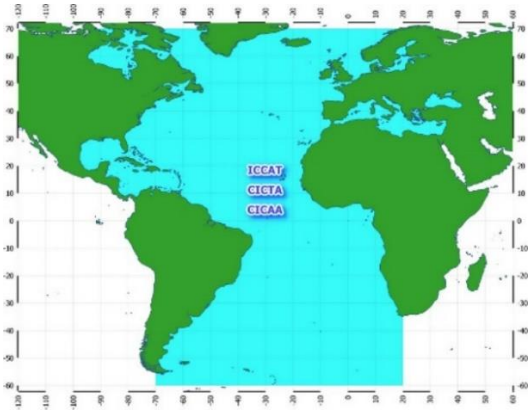



*Figure 1: ICCAT Convention Area (Source: ICCAT)*

[1]Neither the ICCAT Basic Texts nor Recommendation 16-15 (Recommendation by ICCAT On Transhipment) contain a formal definition of transhipment. The definition quoted here is that used in the EU IUU Regulation (Council Regulation (EC) No 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing). Similar definitions are given by a number of RFMOs (e.g. WCPFC: "*the unloading of all or any of the fish on board a fishing vessel to another fishing vessel either at sea or in port" [WCPFC Convention];* CCAMLR: "*the transfer of harvested marine living resources and any other goods or materials to or from fishing vessels"* [Conservation Measure 10-09 (2019) Notification system for transhipments within the Convention Area]).

[2] Purse seine figures estimated based on CPC reports of volumes transhipped in port (e.g. ICCAT, 2019b) as a proportion of total reported purse seine catch (ICCAT, 2019c); longline figures estimated based on CPC reports of volumes transhipped at sea (ICCAT, 2019c) and in port (ICCAT, 2019b) for bigeye, yellowfin, albacore and swordfish vs total longline catch for the same species (ICCAT, 2020). Note that precise estimates are difficult because transhipment weights for longline species are reported by different product type (e.g. gilled and gutted, dressed weight, etc) rather than whole weight.

The main aims of the study were to:

- Examine the history of transhipment and the circumstances which led to its growth;
- Provide an overview of the authorised ICCAT carrier fleet involved in transhipments;
- Examine transhipment dynamics (e.g. volumes/species involved, key transhipment areas/ports, main fleets, logistical/coordination arrangements between fishing vessels and carriers, main companies) across each of the purse seine, longline and bluefin tuna farming sectors; and
- Examine some of the key business considerations which influence the operation of the sector (e.g. factors influencing profitability, flagging preferences, impacts of the growing container trade).

Importantly, it was not the aim of the study to examine the effectiveness of the current management and monitoring regimes governing transhipment activities at national or international levels within the ICCAT area.

Following this introduction, the report is structured in eight main parts. Part 2 provides an overview of the main information sources used for the study and the key stakeholders consulted. Part 3 documents the history of transhipment, while Part 4 provides an overview of current carrier fleet listed on the ICCAT Record of Vessels (RoV). Parts 5, 6 and 7 respectively examine transhipment dynamics in the purse seine, large scale pelagic longline vessel (LSPLV) and bluefin tuna (BFT) farming sectors respectively. These sections provide an overview of the sector, the dynamics of 'typical' transhipments and the key companies involved, their interests and level of integration. Finally, Part 8 discusses some of the key factors affecting the 'business' of transhipment and Part 9 sets out some broad conclusions and areas for future work.

# 2 Information sources

Information to support this report was drawn from four main sources:

- **Interviews with key stakeholders** – much of the information on the key companies involved in the business of transhipment, carrier vessel operations and fleet dynamics was drawn from interviews with key stakeholders with an active interest in transhipment. Interviews were held with:
    - fishing companies involved in both purse seine and longline transhipments;
    - fishing industry associations;
    - carrier companies involved in high seas longline and in port purse seine transhipments;
    - processing companies involved in sourcing raw material through carriers;
    - national level government agencies involved in transhipment, particularly in West Africa (e.g. fisheries agencies, ports authorities);
    - the ICCAT Secretariat; and
    - transhipment observer service providers.

  Interviews were conducted between March and July 2020. A full list of people and organisations contacted is included at Annex 1. Importantly, interviews were conducted during the COVID-19 pandemic during which travel was heavily restricted, hence all communication was undertaken remotely.

  It should be noted that many of the industry representatives participated in interviews on the basis that, although the information they provided could be used, statements they made would not be specifically attributed to either them or their companies. To that end, information generated from interviews has been anonymised where required.

- **Corporate database searches** – information on the corporate structure, ownership and control of companies involved in transhipment activities was obtained from the commercially available corporate database, Orbis, maintained by Bureau van Dijk (BvD)[3], a Moody's Analytics company.
- **Global Fishing Watch** – information on carrier vessel activities was obtained from the Global Fishing Watch (GFW) website[4]. GFW uses Automatic Identification System (AIS) (and available Vessel Monitoring System – VMS) data to track the movements and activities of fishing vessels.
- **Other publicly available information** – information was drawn from a range of other publicly available sources, including:
    - **ICCAT Record of Vessels (RoV) –** information on the registered carrier and fishing fleets[5];
    - **ICCAT Meeting and Scientific Reports –** information on the fleets and activities of individual ICCAT members;
    - **Independent research –** independent studies conducted by academic and other researchers; and
    - **Public websites –** for example, information on the corporate structure and carrier/fishing fleets of individual companies was drawn from publicly available websites where possible.

# 3 History of transhipment

**Key points:**

- 'Conventional' reefer vessels became the standard for transporting frozen goods, including fisheries products, at sea in the 1960s. Since 1980, around 786 conventional reefer ships have been built, of which around 520 are still in service.
- The number and total volume of the conventional carrier fleet has been in decline for the past two decades, with demolitions exceeding newbuilds in all years since 1998. At current rates of building and scrapping, the total volume of the conventional reefer fleet is projected to reduce by more than half by 2030.
- In recent years, reefer containers have eaten into the market share of the conventional carrier sector. In 2018, conventional reefer carriers were estimated to have transported only around 18% of the total seaborne trade of refrigerated foods, down from 47% in 2000.
- The history of transhipment in global tuna fisheries does not appear to be well documented to date. Interviewees recalled that the practice became widespread in the mid-1980s, at least partially fuelled by very high value of tuna at the peak of the Japanese economy. For fishing companies, transhipment was a way of allowing fishing vessels to remain on fishing grounds to maximise profits in a bull market, while for trading companies transhipment was an efficient way of securing supply, and ideally beating the competition to fish at the source.

[3] https://www.bvdinfo.com/en-gb

[4] https://globalfishingwatch.org/

[5] https://www.iccat.int/en/vesselsrecord.asp

## 3.1 The development of the conventional reefer fleet

The dynamics of the global carrier fleet is tracked by shipping industry analysts Dynamar. The following summary of the history of the development of the conventional carrier fleet and its current state is largely drawn from their most recent analysis (Dynamar, 2019):

Up until the mid-1800s, the only way to preserve food was naturally occurring ice or salt. Limitations in transport and insulation capacity meant that most fresh food was eaten locally. In the 1870s, chilled beef was first shipped from the US to London using an insulated cargo space cooled by ice loaded on departure, while in the 1870s the first shipment of frozen meat using an 'ammonia compression machine' was made from South America to Europe[6]. The relative success of these early ventures led to an expansion of the refrigerated vessel fleet, such that by 1902 the fleet numbered around 460 ships. While most were exclusively focused on the transport of meat products until that point, from the early 1900s vessels began to experiment with carrying other products such as bananas.

In the 1960s, the 'conventional' reefer ship became the standard. The design of conventional reefer carriers allows for different types of products to be transported simultaneously. Fruit requires a variety of temperature settings, chilled meats and seafood need to be stored at around 0°C, while deep frozen products require temperatures below -25°C. The capacity to transport different products at different temperatures substantially improved the flexibility and profitability of conventional reefers.

Since 1980, around 786 conventional reefer ships have been built, of which around 520 are still in service (Figure 2). Most vessels currently in service were built between 1988 and 1994, with another peak in 1998. Very few conventional reefers have been built since 2000, albeit there was a minor peak in 2018 when 11 new vessels were launched.

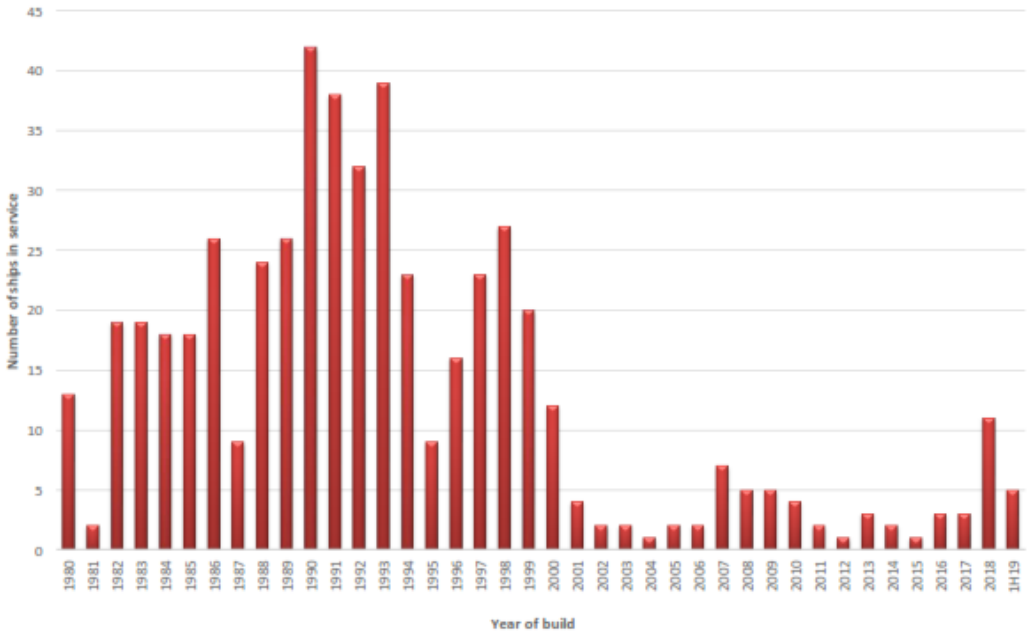



*Figure 2: Number of reefers in service globally, by year of build. (Source: Dynamar, 2019)*

While the building of new vessels has slowed considerably since 2000, the number of demolitions has exceeded newbuilds each year since 1998, such that the overall capacity of the conventional reefer fleet is declining (Figure 3). Of the vessels built between 1980 and 1990, close to half have

[6] https://www.shippingwondersoftheworld.com/refrigerated_ships.html

been scrapped. The average age of scrapped vessels in 2018 was 34 years (youngest vessel 25 years; oldest vessel 49 years), meaning that many of the remaining vessels built in the 1980s are also likely to be considered for scrapping shortly. For context, the median age of 'fish carriers' listed on the ICCAT Vessel List is 28 years, suggesting that at least half the current fleet is moving towards a 'scrapable' age, depending on market conditions.

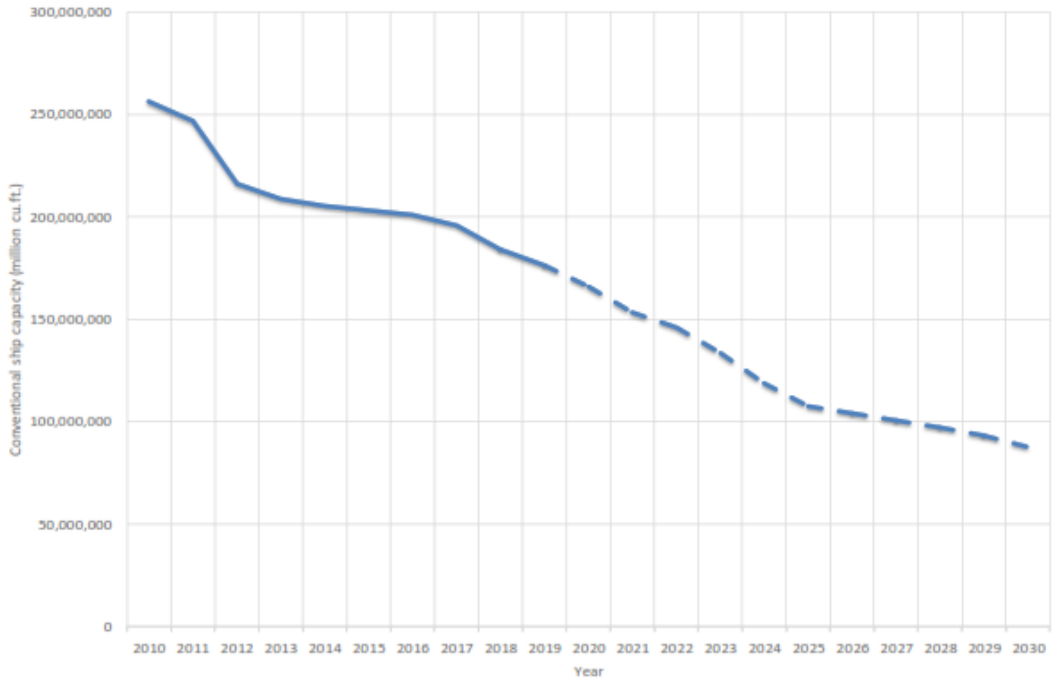



*Figure 3: Total volume of the conventional reefer fleet, including projections to 2030. (Source: Dynamar, 2019)*

As of mid-2019, 566 conventional reefer ships larger than 100,000 cubic feet (cu.ft.)[7] remain in service globally. Around 338 of these were smaller ships (under 300,000 cu.ft.) of the type typically used for carrying fish or meat[8]. At current rates of building and scrapping, the total volume of the conventional reefer fleet is projected to reduce by more than half by 2030 (to 87.5 million cu.ft.) (Figure 3). Nevertheless, Dynamar (2019) report that a small number of new vessels continue to be built.

In recent years, a key impact on the conventional reefer vessel market has been the rise in the use of reefer container technology. Originally developed in the 1950s, reefer containers are equipped with their own cooling unit, with newer integral containers able to be plugged into the dockside or on-board power supply system. Advances in technology and reduced freight costs compared to conventional reefers has seen the container sector increase its market share considerably since the turn of the century – initially picking up additional growth in volume, but since 2008 eating into the volumes of the conventional reefer sector (Figure 4). In 2018, conventional reefer carriers were estimated to have transported only around 18% of the total seaborne trade of refrigerated foods, down from 47% in 2000.

[7] Dynamar (2019) use cubic feet as their measure of ship volume. 100 cu.ft. = 1 gross registered ton (GRT). GRT has been superseded by gross tonnage (GT).

[8] Vessels of over 300,000 cu.ft. are primarily deployed for fruit and vegetables.

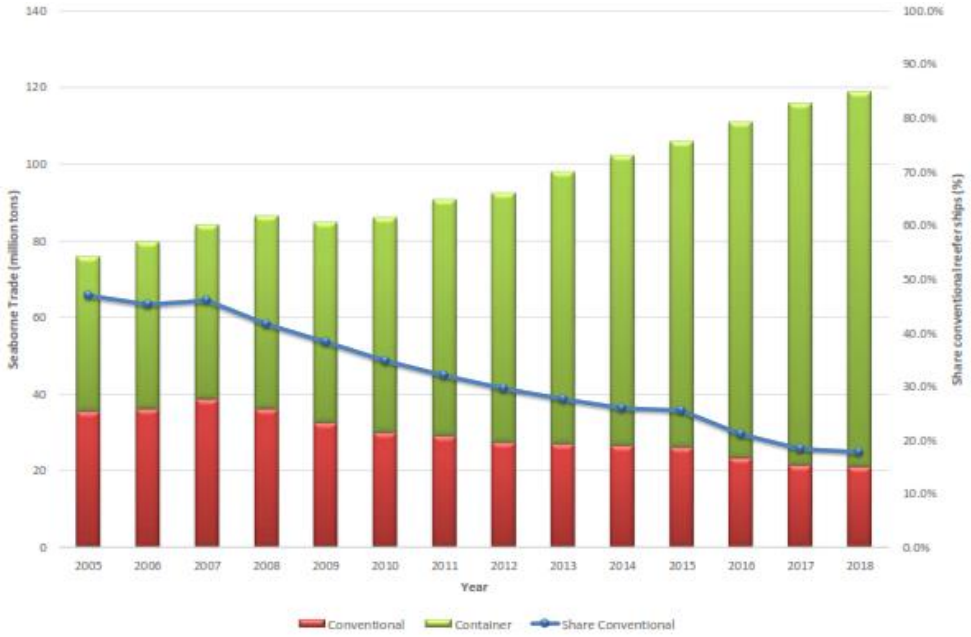



*Figure 4: Volumes and market share of conventional vs container reefer transport, 2005 – 2018. (Source: Dynamar, 2019)*

## 3.2 History of transhipment in the tuna sector

The history of transhipment in global tuna fisheries does not appear to be well documented to date. In the Western Pacific, McCoy (2012) reports that 'transhipment' initially commenced with catch consolidation amongst longliners on a rotational basis. One vessel at a time would receive product from others within a fleet at sea, deliver the product to market and return with bait and other provisions for all. This allowed the bulk of the fleet to continue fishing, maximising fishing days and minimising fuel costs. He notes that the practice evolved into the employment of a vessel as a dedicated carrier, servicing '7 or 8 longliners or more during one collection trip'. One operator involved in these early operations noted that transhipment between longline vessels was undertaken twice weekly to coordinate with scheduled air freight services (M. Brownjohn, pers. comm.). All transhipment was done close to the coast, typically after gear was set for the day.

The common recollection amongst most fishing and carrier companies interviewed for this (and the related WCPO) project indicated that transhipment at the industrial scale commenced in the mid-1980s. Interviewees recalled that the practice of transhipment commenced in the Pacific Ocean, before spreading to the Indian and Atlantic Oceans.

Several interviewees made the point that the rapid adoption of transhipment was influenced by the very high value of tuna in the 1980s, at the peak of the Japanese economy. The market 'wanted fish from anywhere' - for fishing companies, transhipment was a way of allowing fishing vessels to remain on fishing grounds to maximise profits in a bull market, while for trading companies transhipment was an efficient way of securing supply, and ideally beating the competition to fish at the source.

A number of companies who reported being in the transhipment business from the start (e.g. Toei Reefer Line - TRL) indicated that, apart from regulatory changes (e.g. banning of at sea transhipment for some fleets/species), the basic practice of transhipment hasn't changed substantially over time. Many of the carrier vessels built in the early years of transhipment continue to be active, with the median year of build amongst vessels on the ICCAT Record of Vessels (RoV) being 1992. Although newer fishing vessels have been designed to maximise efficiencies associated with transhipment (McCoy, 2012), the basic process of conventional carrier transhipping has not been subject to major evolution.

# 4 Overview of the ICCAT Carrier Fleet

**Key points:**

- As of June 2020, there were 180 carrier vessels authorised on the ICCAT RoV. Panama has by far the largest fleet (111 vessels), accounting for 62% of all carrier vessels.
- The average age of the fleet is close to 26 years, meaning that many vessels are approaching an age where they may be considered for scrapping. Fewer than 20% of carriers on the RoV have been built since 2001.
- Of the 180 carrier vessels on the RoV, 25 have authorisation to receive transhipments at sea from at least some large scale pelagic longline vessels (LSPLVs) while 23 are authorised to carry northern bluefin tuna (BFT).
- While there are a large number of carriers authorised on the ICCAT RoV, not all of them are active in any one year. Many carriers are involved in multiple ocean basins or multiple sectors (e.g. fruit, vegetables, other seafood sectors), with companies registering them to provide the flexibility to carry tuna within the ICCAT region if the commercial opportunity arises.
- Broadly, transhipment activity in the ICCAT area can be divided into three main sectors: (i) transhipments supporting the purse seine fleet; (ii) transhipments involving LSPLVs and (iii) 'transhipments' from BFT farms. In the purse seine sector, based on the available information we estimate that around 20 carriers were involved in transhipments in 2019. In the longline sector, observer records show that the number of carriers receiving LSPLV transhipments has remained stable at 9-10 during the 2015-16 to 2018-19 period. In the BFT farm sector, observer records show a total of 12 carriers were involved in processing activity on BFT farms in the period from July 2017 to October 2019, three of which were also involved in LSPLV transhipments.

## 4.1 Overview of the carrier fleet

### 4.1.1 Authorised carriers

As of June 2020, there were 180 carrier vessels authorised on the ICCAT RoV[9]. Panama has by far the largest fleet of flagged carriers (111 vessels), accounting for 62% of all carrier vessels (Figure 5). Bahamas (23 vessels) and Liberia (14 vessels) flag the next highest number of carriers, with 13 other flag States registering a total of 32 vessels between them. A total of 84% of carriers are flagged to CPCs, 3% are flagged to a Cooperating Non-Contracting Party (Chinese Taipei), while 13% are flagged to non-CPCs (Bahamas and Singapore)[10].

[9] https://www.iccat.int/en/VesselsRecord.asp. Note this includes 'carrier vessels' (174) plus 'support vessels' with authorisation to act as carriers (6).

[10] Note that ICCAT allows carrier vessels to be flagged to non-CPCs, unlike the WCPFC which requires carrier vessels to be flagged to members or cooperating non-members.

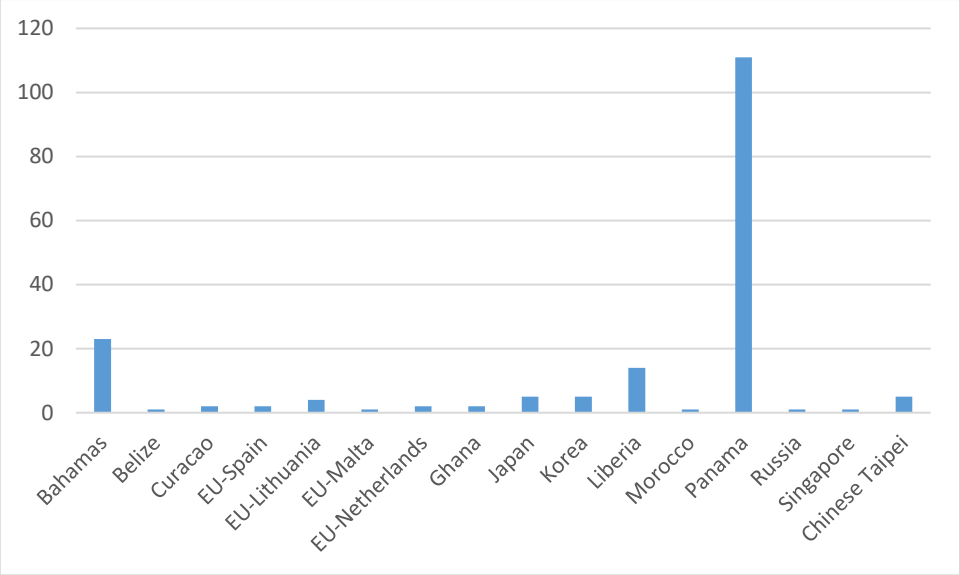



*Figure 5: Number of authorised fish carrier vessels on the ICCAT RoV as at June 2020, by flag state.*

The average age of all registered carriers is close to 26 years, with the average year of build being around 1995[11]. The oldest authorised carrier (the Chinese Taipei flagged carrier Yong Man Shun) was built in 1972, while the newest is the 6,655 GRT carrier Boyang Capella completed in 2020. Around two thirds of the current fleet (65%) were built between 1982 and 1996, with fewer than 20% of carriers built since 2001 (Figure 6). Amongst the fleets with five or more vessels, Japan's fleet is the newest with an average build year of 2002 (Figure 7). This is influenced by two of its five vessels (the Toei Reefer Line operated Gouta Maru and Kenta Maru) being constructed in 2015 and 2017 respectively. Chinese Taipei has the oldest fleet, with an average year of build at 1977. Amongst all flag States, Curacao has the most modern fleet, with both of its flagged carriers built in 2019.

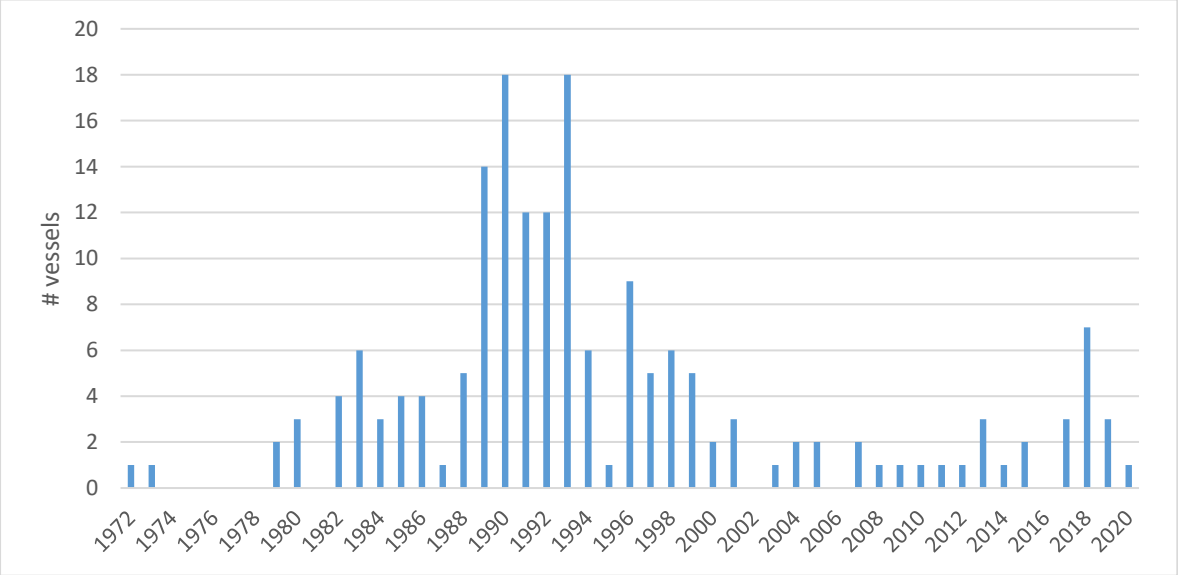



*Figure 6: Number of fish carriers on the ICCAT RoV by year of build.*

[11] https://www.iccat.int/en/VesselsRecord.asp (as at June 2020). Note the *median* year of build is earlier at 1992. That is, half the authorised carrier fleet was built (as at June 2020) was built in 1992 or earlier.

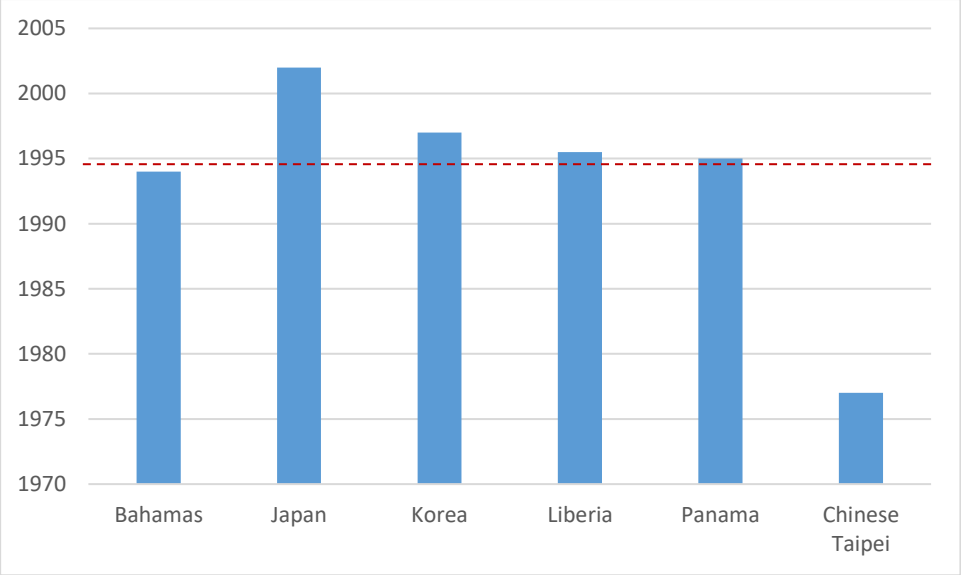



*Figure 7: Average year of build for carrier vessels on the ICCAT RoV, by flag State (with five or more carriers). The dotted red line shows average year of build across the full fleet.*

Notwithstanding a minor upswing of newer vessel construction since around 2013, the overall aging of the carrier fleet servicing the tuna sector globally is well-recognised. For example, representatives from a number of major fishing and carrier companies interviewed by MRAG Asia Pacific (2019) referred to tuna transhipment as the 'end of the line' for reefer carriers, with the pipeline of available carrier vessels getting old. Carrier operators observed that the conventional reefer business was being 'squeezed' by the growing reefer container trade, with most of the new port-to-port global reefer business being captured by containers. The decline in conventional reefer freight demand and increased competition from containers meant that the economics weren't sufficiently attractive to justify building new conventional reefers for most general shipping companies. With around half the fleet either at, or approaching, the age where they will be considered for scrapping, and limited new constructions, the availability of conventional reefer volumes appears far less certain over the coming decade than the previous one.

Amongst the registered carriers in the RoV, size varies markedly from the 125.5 GRT Moroccan-registered Rabat-2 to the 17,164 GRT Panamanian-registered Star Courage (Figure 8). Around 58% of the fleet is between 4,000 and 8,000 GRT, with the average being 5,969 GRT. There is limited overall correlation between the size of the carrier and year of build (Figure 9), although there are some general trends. Most of the vessels built since 2010 have been at the smaller end of the spectrum, with only one (the Star Courage) over 10,000 GRT.

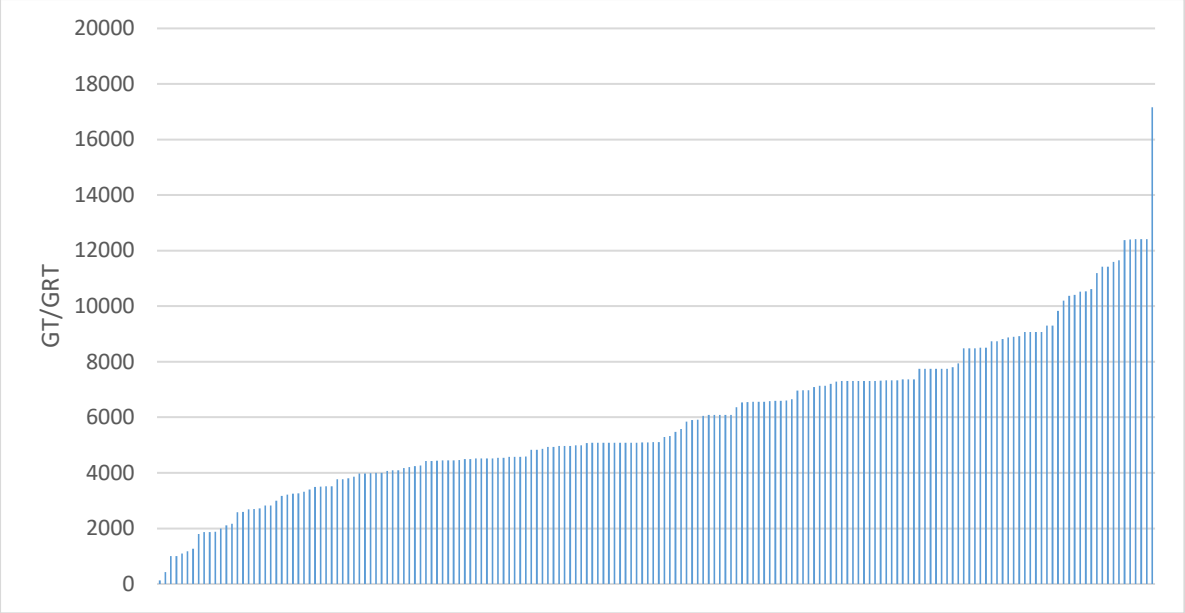



*Figure 8: Size profile of authorised carriers on the ICCAT RoV (n = 180).*

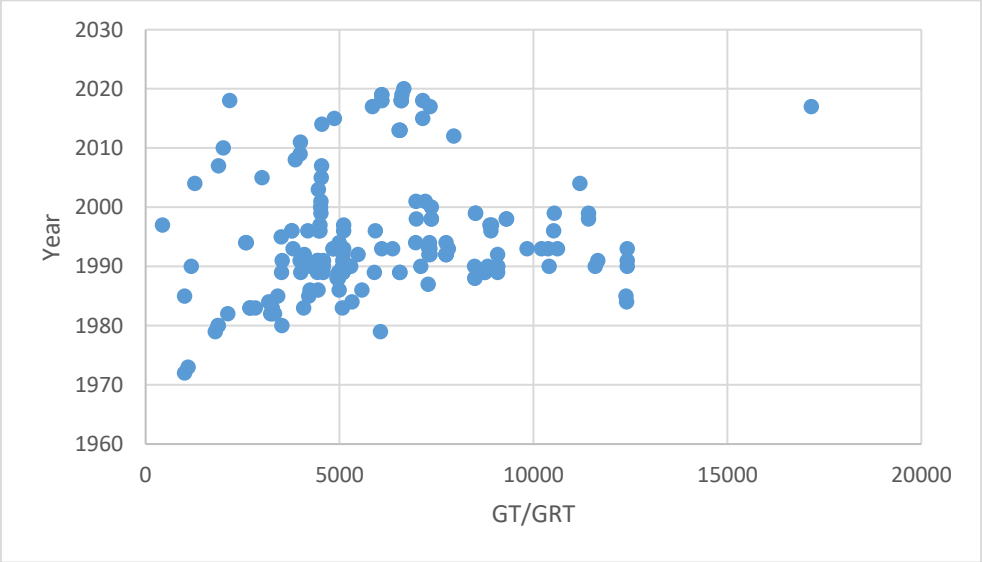



*Figure 9: Year of build vs vessel size (in GT/GRT) for carriers on the ICCAT RoV.*

Amongst the main flag State carrier fleets (>5 vessels), average size varies (Figure 10). Chinese Taipei has the smallest sized fleet, with an average tonnage (GRT) of 1,526. These vessels are authorised to tranship from the Chinese Taipei LSPLV fleet (56 vessels) although none have been active in the ICCAT area in recent years (e.g. ICCAT, 2017a, 2018a, 2019a), with most operating in the WCPO and Indian Ocean. At the other end of the spectrum, Liberia and Panama have the largest average sized vessels, with all 36 vessels >7,800 GRT flagged to either Panama or Liberia. These vessels, along with Korean, Chinese and Chinese Taipei vessels, tend to be conventional reefer carriers of the type involved in in-port purse seine and at sea longline transhipments in the ICCAT area.

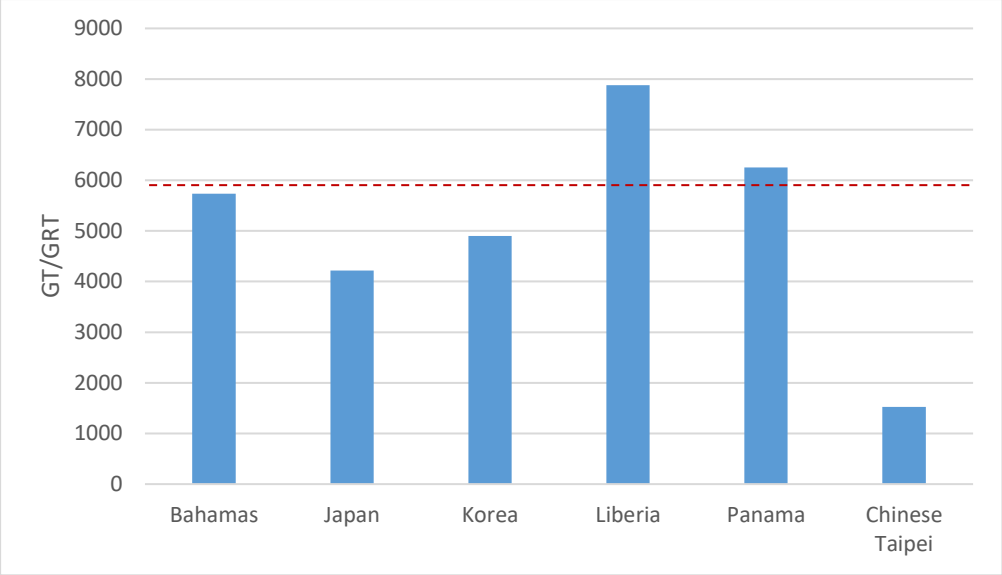



*Figure 10: Average size (in GT/GRT) of carrier vessels on the ICCAT RoV, for the main flag States[12]. The dotted red line shows average size across the full fleet.*

Of the 180 carrier vessels on the ICCAT RoV as at 30 June 2020, 25 have authorisation to receive transhipments at sea from at least some LSPLVs (Table 1). Panama accounts for close to half of these vessels (12), with Japan (5), Chinese Taipei (5), Liberia (2) and Singapore (1) accounting for the remainder. No carriers flagged to Bahamas, Belize, Curacao, EU-Spain, EU-Lithuania, EU-Malta, EU-Netherlands, Ghana, Korea, Morocco and Russia are authorised to tranship at sea from LSPLVs. Most carriers are authorised to receive catch from multiple fleets, with the exception of Chinese Taipei carriers, who are only authorised to tranship from Chinese Taipei-flagged LSPLVs. Four other carrier vessels are authorised to receive fish from one fleet only.

[12] Note that comparing the sizes of vessels on the RoV is complicated by the use of both gross tonnage (GT) and gross registered tonnage (GRT). Because of the way they are measured, GT is always smaller than GRT for the same vessel. GRT was replaced as a measure by GT in 1982 under the *International Convention on Tonnage Measurement of Ships, 1969* (London-Rules).

*Table 1: LSPLV transhipment authorisations by carrier vessel (as at June 2020).*

| Carrier | Flag | LSPLV Flag | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | JPN | TWN | CHN | KOR | NAM | BLZ | CIV | VCT |
| TAISEI MARU No.15 | JPN | 190 | 56 | 37 | | 2 | 1 | | |
| TAISEI MARU No.24 | JPN | 190 | 56 | 37 | | 2 | 1 | | |
| SHOSHIN MARU No. 83 | JPN | 1 | | | | | | | |
| GOUTA MARU | JPN | 190 | 56 | 37 | 8 | | | | |
| KENTA MARU | JPN | 190 | | | 7 | | | | |
| MEITA MARU | LBR | 190 | 56 | 37 | 11 | 2 | 1 | | |
| CHIKUMA | LBR | 190 | 56 | 37 | 7 | | 1 | 2 | 3 |
| FUTAGAMI | PAN | | | 32 | | | | | |
| KURIKOMA | PAN | 190 | 56 | 37 | 8 | | | | |
| RYOMA | PAN | 187 | | | | | | | |
| TUNA QUEEN | PAN | 190 | 56 | 37 | 11 | 2 | 1 | | |
| TUNA PRINCESS | PAN | 190 | 56 | 37 | 7 | | | | |
| LADY TUNA | PAN | 190 | 56 | 37 | 7 | | | 2 | |
| GENTA MARU | PAN | 190 | 54 | | 10 | | | | |
| IBUKI | PAN | 190 | 56 | 37 | 12 | 2 | 1 | 2 | 3 |
| HSIANG HAO | PAN | 190 | 53 | 34 | 10 | 2 | | | |
| HARIMA | PAN | 190 | 53 | | 6 | | | | |
| YACHIYO | PAN | 190 | 56 | | 6 | 2 | 1 | 2 | 2 |
| TENHO MARU | PAN | | 53 | | | | | | |
| CHITOSE | SGP | 190 | 56 | 37 | 7 | | 1 | | 3 |
| YONG MAN SHUN | TAI | | 56 | | | | | | |
| SHUN TIAN FA NO.168 | TAI | | 56 | | | | | | |
| YUAN TAI NO.806 | TAI | | 56 | | | | | | |
| CHEN YU NO.7 | TAI | | 56 | | | | | | |
| SHENG HONG | TAI | | 56 | | | | | | |

Of the 180 carriers on the ICCAT RoV, 23 are authorised to carry northern bluefin tuna (BFT). The majority of these vessels are flagged to Panama (14), with the remainder flagged to Japan (5), Liberia (3) and Singapore (1). While there is considerable overlap between vessels authorised to undertake at sea transhipment from LSPLVs and carry BFT, seven vessels are authorised to carry BFT without being authorised to undertake at sea transhipment from LSPLVs. The majority of BFT authorised vessels (18) are controlled by Japanese companies (e.g. Mitsubishi, TRL), with the remaining vessels controlled by Spanish (e.g. Ricardo Fuentes Group), Chinese and Chinese Taipei interests.

As at June 2020, two carriers on the RoV – the Morocco-flagged Rabat-2 and the Malta-flagged Sierra Medoc – had no listed VMS system[13].

### 4.1.2 Active vessels

While there are a large number of carriers authorised on the ICCAT RoV, not all of them are active in any one year. Many companies operating carriers are involved in multiple ocean basins or multiple sectors (e.g. fruit, vegetables, other seafood sectors). They register their carriers to give themselves the flexibility to tranship in the ICCAT region if the commercial opportunity arises, but in practice their vessels may be engaged elsewhere. For example, the shipping pool GreenSea N.V. (GS), one of

[13] Clause 11 of ICCAT Recommendation 16-15 requires authorised carrier vessels to install and operate a VMS in accordance with all applicable ICCAT recommendations. The absence of an operating VMS would be a non-compliance with Recommendation 16-15, although it's possible the absence of VMS details on the RoV is simply an administrative oversight.

the world's largest conventional reefer fleet operators who offer transport logistics services to the purse seine fleet, has around 34 carrier vessels listed on the RoV, but in practice the full time equivalent of only 5-6 vessels are likely to be actively engaged in ICCAT tuna transhipment in any one year (Hans Mol, pers. comm.). Similarly, the Korean company Boyang Ltd has eight authorised vessels, but none appear to be actively involved in tuna transhipments in the ICCAT area in 2019-20 (the majority appear to be involved in the 'Alaska run' from Korea to Alaskan ports, or elsewhere in the Pacific Ocean).

Broadly, transhipment activity in the ICCAT area can be divided into three main sectors:

- **Transhipments supporting the purse seine fleet** – these are generally transhipments of tropical tunas (mainly skipjack, yellowfin and bigeye) made in West African ports by large scale purse seiners, with fish destined for canning/loining at European, South American or West African processing facilities;
- **Transhipments involving LSPLVs** – these are generally made at sea by LSPLVs to specialised ultra-low temperature (ULT) carriers capable of maintaining fish at <-50oC. Transhipments typically occur in the tropical or sub-tropical Atlantic, with catch destined for the main Asian sashimi markets (Japan, Korea, China). A smaller proportion of LSPLV transhipments happen in port (around 18% by volume in 2018; ICCAT, 2019b,c); and
- **'Transhipments' from bluefin tuna (BFT) farms** – these are not strictly 'transhipments' from one vessel to another, but processing/transport of fish from BFT farms in the Mediterranean. Fish are typically transported by ULT carrier to the main Asian sashimi markets (Japan, Korea), but may also be landed in European markets (e.g. Spain) or transferred to refrigerated containers for transport.

Publicly available information on the number of carriers active in transhipping catch from purse seiners in the ICCAT area is patchy. While Recommendation 16-15 (ICCAT, 2016a) requires CPCs to report annually on all in port transhipment activity by its fishing vessels[14] (transhipment at sea by vessels other than LSPLVs is prohibited), there appears to be little consistency in reporting format or completeness based on the reports available. While some CPCs (e.g. France) have reported both the offloading and receiving vessel involved in transhipments, most report only on the offloading vessels flying their flag (e.g. Belize, Curacao, El Salvador, Ghana). Liberia reports on the in-port activity of its flagged carriers, while Cote d'Ivoire reports on activity occurring in its ports (i.e. offloading and receiving vessels, irrespective of flag). In the most recent iteration of in port transhipment data (ICCAT, 2019b), no information appears to have been submitted by some key flag States (e.g. Spain, Panama). Similarly, no information is available for the two non-CPC flag States, Bahamas and Singapore. Of these, Bahamas-flagged vessels are likely to be involved in purse seine transhipments.

Nevertheless, piecing together information from the available CPC reports, interviews with some of the key carrier operators and public information on carrier vessel activity available through Global Fishing Watch[15] (which uses Automatic Identification System [AIS] data to track fishing vessels

[14] See Appendix 3, clause 6. Recommendation 16-15 is the main ICCAT management measure regulating transhipment. The Recommendation prohibits at sea transhipment by vessels other than LSPLVs (>24m) operating under a program to monitor transhipment at sea. The program sets out flag CPC authorisation arrangements, as well as notification/reporting arrangements for LSPLVs and receiving carrier vessels. The program also requires that CPCs ensure that all carrier vessels transhipping at sea have on board an ICCAT observer in accordance with the ICCAT regional observer program (ROP). In addition, the Recommendation establishes a record of carrier vessels authorised to receive transhipments in the ICCAT area, requires each carrier to install and operate a vessel monitoring system VMS) and sets out the validation/reporting obligations of CPCs for transhipments undertaken by their vessels. The Recommendation does not apply to harpoon vessels engaged in the transhipment of fresh swordfish at sea.

[15] https://globalfishingwatch.org

activity[16]) it is possible to make some rough calculations of the number of carrier vessels likely to be involved in purse seine transhipments in the ICCAT area. In 2019, we estimate that somewhere in the order of 20 carrier vessels received purse seine catches. This number would vary annually, based on catches, demand from different customers (e.g. whether the fish were sold to local West African processors or sent to remote processors – e.g. Spain) and competition from other transport options (mainly containers). Anecdotal information from some of the main carrier companies indicates that the number of active vessels has been relatively stable in recent years.

Information on carrier vessels involved in at sea LSPLV transhipments each year is much better, with detailed information on each transhipment reported both by CPCs and published in annual reports of the Regional Observer Program (e.g. ICCAT, 2018a; ICCAT, 2019a). In the reporting periods 2015-16 to 2018-19[17], the number of vessels actively involved in LSPLV transhipments at sea has been stable at 9-10, with a total of 13 to 21 trips between them (Table 2). The actual vessels involved in transhipments has also remained relatively stable, with several vessels (the Mitsubishi-controlled Chikuma and Ibuki, the Taiseimaru Kaiun Kaisha (TKK)-controlled Taisei Maru No. 15 and Taisei Maru No. 24 and the TRL-controlled Genta Maru) actively transhipping each year. Only 13 vessels in total have been involved in LSPLV transhipping across the four-year reporting period. Despite 25 carriers on the RoV being authorised to tranship from at least some LSPLVs (as at June 2020), only nine were active in the most recent reporting period (2018-19).

*Table 2: Number of trips taken by each carrier vessels active in LSPLV transhipments, 2015-16 to 2018-19 (ICCAT, 2016b, 2017a, 2018a, 2019a).*

| Vessel | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|---|
| CHIKUMA | 2 | 1 | 3 | 1 |
| IBUKI | 1 | 2 | 2 | 2 |
| MEITA MARU | | | 2 | 2 |
| SHOTA MARU | 1 | | 1 | 2 |
| TAISEI MARU No.15 | 3 | 2 | 3 | 2 |
| TAISEI MARU NO.24 | 2 | 2 | 3 | 2 |
| TUNA QUEEN | | | | 1 |
| YACHIYO | | | | 1 |
| GENTA MARU | 2 | 1 | 3 | 1 |
| LADY TUNA | | 1 | 1 | |
| VICTORIA II | 2 | 1 | 2 | |
| FUTAGAMI | 2 | 2 | 1 | |
| CHITOSE | 1 | 1 | | |
| # trips | 16 | 13 | 21 | 14 |
| # active vessels | 9 | 9 | 10 | 9 |

Similar to information on LSPLV transhipments, information on vessels involved in BFT farming 'transhipments' is reported publicly through BFT ROP reports (e.g. ICCAT, 2018b, 2019d). In the period from July 2017 to October 2019, a total of 12 carriers were involved in processing activity on

[16] Note that tracking in port tuna transhipment activity using AIS data is slightly more complicated in the ICCAT area than other ocean basins. In the WCPO for example, Pacific Island ports are typically only used for tuna transhipments. Conventional carrier vessels visiting these ports can reasonably be assumed to be transhipping tuna. However, many of the West African ports used by the purse seine fleet – e.g. Abidjan, Dakar, Takoradi – are also used by ICCAT authorised carriers to pick up other commodities (e.g. bananas, mangoes, vegetables, Dynamar, 2019).

[17] Currently the reporting periods run from September to August to coincide with the annual meetings.

BFT farms (Table 3). Three of these vessels (Tuna Queen, Lady Tuna and Chitose) were also actively involved in LSPLV transhipments during 2015-16 to 2018-19.

Nine of the vessels involved in BFT farming 'transhipments' are flagged to Panama, with two flagged to Japan and one to Singapore. Eleven of those vessels remain listed on the RoV, with Astraea 102 no longer listed. The twelve vessels are effectively controlled by five separate companies/groups – Mitsubishi/MRS, Toei Reefer Line, Ricardo Fuentes group, Kanetomo and Tokyo Seafoods – two of which (Mitsubishi/MRS and TRL) are also involved in LSPLV transhipments.

*Table 3: Carrier vessels active in harvesting activities from BFT farms, July 2017 to October 2019 (ICCAT 2018c; 2019e).*

| Vessel | Flag | Controlling Company | Farm State serviced |
|---|---|---|---|
| Paloma Reefer | PAN | Ricardo Fuentes | Spain, Morocco, Malta, Tunisia |
| Princesa Guasimara | PAN | Ricardo Fuentes | Spain, Malta, Tunisia |
| Lady Tuna | PAN | Mitsubushi/MRS | Spain, Morocco, Malta |
| Tuna Princess | PAN | Mitsubushi/MRS | Spain, Malta, Croatia, Turkey |
| Tuna Queen | PAN | Mitsubushi/MRS | Turkey, Croatia, Malta |
| Chitose | SGP | Mitsubushi/MRS | Malta |
| Kurikoma | PAN | Toei Reefer Line | Spain, Malta |
| Gouta Maru | JPN | Toei Reefer Line | Spain, Malta, Croatia, Turkey |
| Kenta Maru | JPN | Toei Reefer Line | Malta, Turkey |
| Astraea 102 | PAN | Kanetomo | Malta, Turkey, Spain, Morocco |
| Astraea | PAN | Kanetomo | Malta, Spain |
| Reina Cristina | PAN | Tokyo Seafoods | Spain, Malta, Croatia, Turkey |

The main features of transhipment in each of the main sectors is set out below.

# 5 Purse seine

**Key points:**

- Broadly, purse seine vessels in the Atlantic have three main options for the marketing of fish – (i) landing to local processing facilities (mainly in Abidjan, Dakar and Tema); (ii) offloading fish into containers for distribution to a range of markets internationally; and (iii) transhipping fish to carriers for direct delivery to processing facilities in Europe, South America and West Africa. Each of the options has its pros and cons and ultimately the most commercially attractive option will be chosen based on the circumstances at the time.
- Publicly available data on in port transhipments amongst the purse seine fleet appear to be patchy. Based on the available data, in port purse seine transhipment volume has ranged from roughly 148,000mt to 194,000mt over the 2016-2018 period. This represents between 43% and 59% of purse seine catches in the ICCAT area of the three main target species (SKJ, YFT, BET).
- Skipjack is the main species transhipped, accounting for 61% of total volume in 2018, with yellowfin and bigeye tuna making up 29% and 9% of transhipment volume respectively.
- Discussions with industry indicated that the main fleets involved in transhipment are the EU fleet (Spain and France), the Latin American and West African fleets linked to EU-based companies and the Ghanaian fleet.
- No specific information is collected through ICCAT processes on the number and volume of transhipments in each port, although industry interviews confirmed that the main ports used for transhipment by the purse seine fleet are Abidjan, Takoradi, Dakar and Mindelo.
- The organisation of carrier fleets is a complex logistical exercise requiring very close coordination between carrier operators and fishing companies. At the carrier company end, the primary

motivation is to minimise operational costs for each tonne of fish sourced. In practice, this means maximising the volume of fish sourced in the minimum possible time.

- Given most carriers on the ICCAT RoV are flagged to countries operating open registries (primarily Panama and Bahamas), there is little fidelity between purse seiners offloading to carriers flagged to the same State.
- Most carrier operators in the ICCAT are supporting the purse seine fleet can be categorised as one of two types: (i) 'integrated fisher-carrier' companies or (ii) logistics service providers. Integrated fishing-carrier companies (e.g. Albacora group, Calvo Group, Panofi Co. Ltd) operate both fishing fleets and carriers as part of an integrated supply chain. Logistics service providers' (e.g. Greensea Chartering, Alpha Reefer Transport GmbH/FSC Frigoship Chartering) primary expertise is in shipping and logistics; their main interest is in providing a commercial service to transport fish from the fishing grounds to processing facilities or to market.

## 5.1 Overview

The available information on in port purse seine transhipments by ICCAT CPCs appears to be somewhat patchy. Data for some CPCs whose purse seiners are thought to tranship in port do not appear in public reports of in port transhipment for some or all recent years (e.g. Spain, Panama, Cape Verde) (e.g. ICCAT, 2018d, 2019b), while data for some CPCs are aggregated across species making transhipment volumes across individual species difficult to analyse (ICCAT, 2018d). Nevertheless, it is possible to pick up some broad trends in purse seine transhipment volumes by combining data from those CPCs for which in port transhipment data is available (Belize, Curacao, El Salvador, Ghana, France) with the data on individual vessel transhipments from key port States (most notably Cote d'Ivoire). These figures should be interpreted with a high degree of caution, however, given the possibility of important missing data[18].

Based on available reports, the total in port purse seine transhipment volume has ranged from roughly 148,000mt to 194,000mt over the 2016-2018 period (Figure 11)[19]. Based on catches reported in ICCAT (2019c), the amounts transhipped in port in 2016, 2017 and 2018 represent 43%, 59% and 43% respectively of purse seine catches in the ICCAT area of the three main target species (SKJ, YFT, BET) (ICCAT, 2017b, 2018d, 2019b). Notwithstanding the uncertainty around total in port transhipments, these proportions are broadly consistent with estimates from one large carrier operator interviewed who estimated that around 40% of fish were transhipped in port, with the remainder being unloaded, either into containers (40%) or directly to processing facilities (20%).

[18] In particular, transhipment figures for some flag States have been able to be estimated only through in port transhipment data provided by Cote d'Ivoire for transhipments presumably in Abidjan. Nevertheless, it is possible these data are not comprehensive. For example, for 2018, Cote d'Ivoire reported only two French purse seiners transhipping in its ports. However, the EU-France data for the same period indicates that six French purse seiners transhipped in Abidjan (ICCAT, 2019b).

[19] For context, purse seine transhipments in the WCPO in 2017 totalled 952,151t (MRAG Asia Pacific, 2019). All purse seine transhipments in the WCPO are in port.

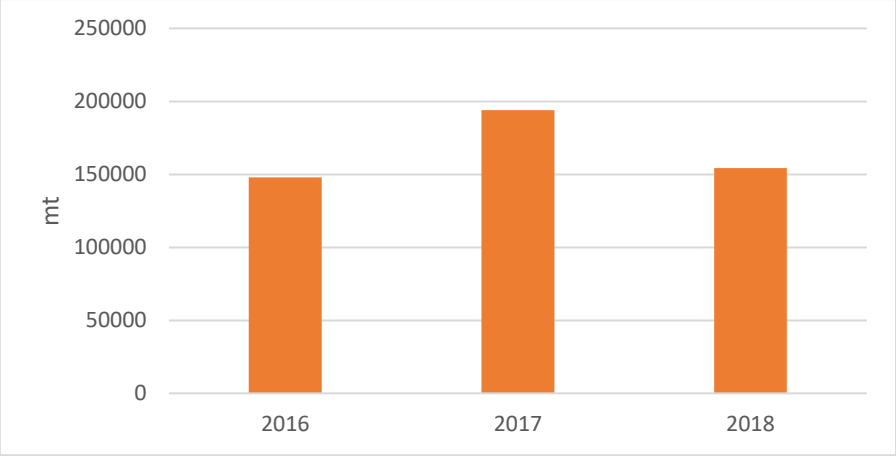



*Figure 11: Total reported volume of purse seine in port transhipments by ICCAT CPCs, 2016 to 2018.*

Not surprisingly given the nature of the purse seine fishery targeting tropical tunas, SKJ contributes the majority of reported in port transhipment volume, accounting for 61% of total volume in 2018 (Figure 12). YFT accounts for the next highest proportion at 29%, with BET and other species at 9% and 1% respectively. These species compositions are broadly consistent with a tropical purse seine fishery focused largely on sets associated with floating objects (e.g. FADs).

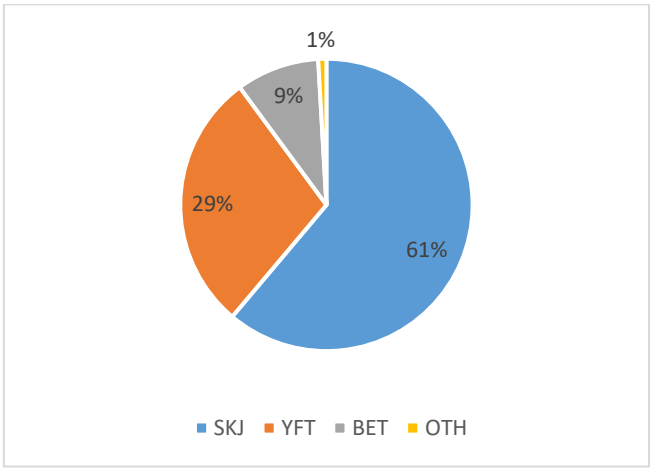



*Figure 12: Species composition of in port transhipments by purse seine vessels, 2018. (ICCAT, 2019b)*

Discussions with industry indicated that the main fleets involved in transhipment are the EU fleet (Spain and France), the Latin American and West African fleets linked to EU-based companies and the Ghanaian fleet. Notwithstanding the possibility of missing data, this is broadly consistent with reported in port transhipments between 2016 and 2018 (Figure 13). Of these:

- the Ghanaian fleet accounted for the highest volume of in port transhipments during this period at 28%. Ghanaian purse seine transhipments are exclusively undertaken by the Panofi fleet. Reported transhipment volumes have increased over the 2016 to 2018 period (Figure 14);
- Curacao flagged vessels accounted for 18% of total transhipment volume. Three of the four purse seiners currently flagged to Curacao are controlled by the Albacora Group[20], based in Spain. In port transhipments by Curacao vessels in Abidjan increased over the 2016 to 2018 period (Figure 14);

[20] http://www.albacora.es/en/

- the El Salvador fleet accounted for 13% of transhipment volume. Each of the four vessels currently flagged to El Salvador are registered to Calvopesca De El Salvador SA, part of the Spanish-based Calvo Group[21]. Transhipment activity by El Salvador flagged vessels in Abidjan remained relatively stable over 2016 to 2018 (Figure 14);
- Spanish-registered purse seiners accounted for 10% of reported in port transhipment volume[22]. Eight vessels were reported to tranship in Cote d'Ivoire (likely Abidjan), the majority of which were linked to the Albacora, Pevasa[23] and Atunsa[24] groups;
- Cape Verde flagged vessels accounted for 8% of reported transhipment volume[25]. This was largely from one vessel, Egalabur, part of the Atunsa fleet, as well as a number of Calvo group vessels previously flagged to Cape Verde;
- Panama flagged purse seine vessels also accounted for 8% of transhipment volume[26]. This was largely from vessels within the Albacora and Pevasa groups;
- French flagged purse seiners accounted for 5% of transhipment volume. Detailed information for French vessels was only available for 2018. Data for 2016 and 2017 was taken from Cote d'Ivoire reports. In 2018, France provided information on individual transhipments in port. French-flagged purse seiners reported eight in port transhipments, six in Abidjan, two in Dakar. Four vessels undertook one transhipment only, while two vessels completed two each. All transhipments were made to carriers in the Greensea shipping pool.
- Guatemalan flagged vessels accounted for 5% of transhipment volume. This was largely from vessels within the Jealsa group.
- The remaining fleets – Belize and Senegal – accounted for 4% and 1% of total transhipment volume respectively, based on available reports.

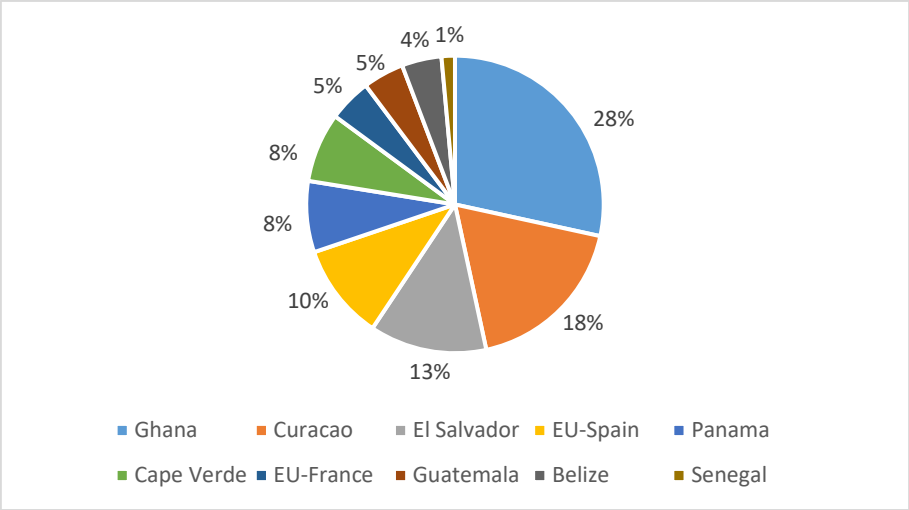



*Figure 13: Proportion of total reported in port purse seine tranship volume by flag CPC, average of 2016-2018. (ICCAT, 2017b, 2018d, 2019b)*

[21] http://www.grupocalvo.com/en/
[22] noting that reports of Spanish-flagged vessel transhipment volumes were taken from the Cote d'Ivoire reporting of transhipments undertaken in its ports, so this is likely to be an under-estimate; no fleet-wide information was available for Spain
[23] https://www.pevasa.es/en/
[24] http://www.atunsa.com/
[25] Although, like Spain, transhipment volumes for Cape Verde vessels were available only from Cote d'Ivoire figures.
[26] Like Spain and Cape Verde, transhipment volumes for Panama vessels were available only from Cote d'Ivoire figures.

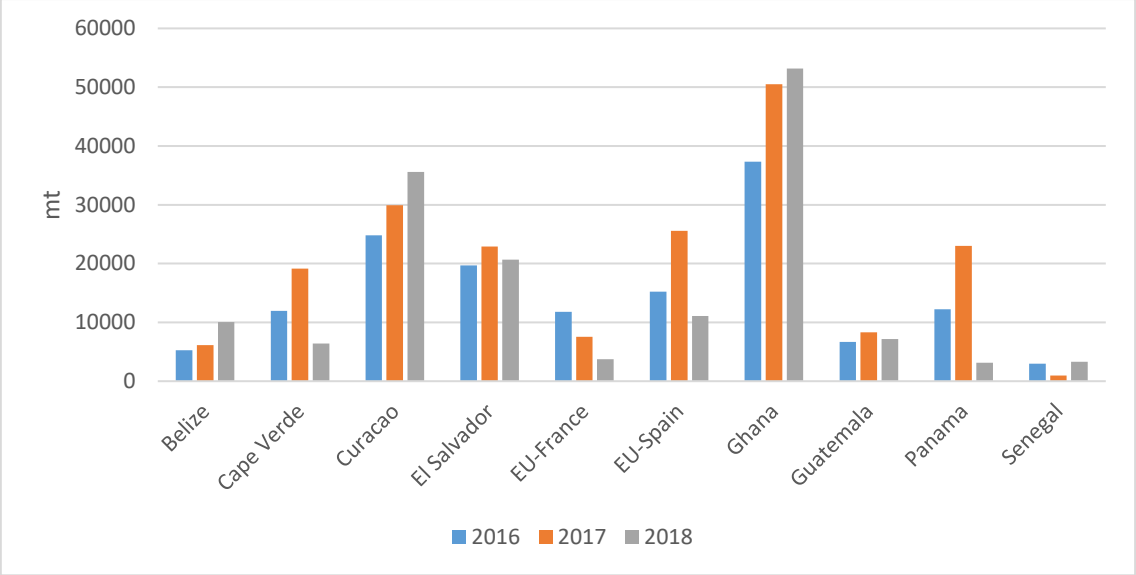



*Figure 14: Trends in reported transhipment volume by purse seiners in port, 2016 to 2018. (ICCAT, 2017b, 2018d, 2019b)*

## 5.2 Main ports

No specific information is collected through ICCAT processes on the number and volume of transhipments in each port (ICCAT Secretariat pers. comm.), although information from industry interviews and in port transhipment data submitted by some port States provide a broad understanding of the main ports for each fleet.

Abidjan was widely acknowledged as the main transhipment port used by the purse seine fleet, with transhipments also made in Dakar, Takoradi and Mindelo.

Abidjan is the main local base in West Africa for the EU fishing fleet, as well as being used by EU-linked vessels flagged to other ICCAT CPCs. The Abidjan Fishing Port was upgraded in the mid-2010s and now supports over 1,500 meters of dock space, cold storage capacity of 70,000t, net repair facilities and modern support services[27]. Tuna are transhipped to carriers in the harbour, as well as being landed to the three local canneries and also unloaded to containers for distribution to different markets. Volumes of in port tuna transhipments reported by Cote d'Ivoire varied substantially in recent years, from slightly more than 50,000t in 2018 to over 110,000t in 2017 (Figure 15). Interestingly, these figures are lower than the frozen tuna import (177,773t – 208,492t), export (123,730t – 159,000t) and export transhipment (118,198t to 142,588t) figures provided by the Abidjan Port Authority for the 2017 – 2019 period[28], but the source of any discrepancy is unknown. Brulhet (2015) indicated that, at least in 2012, roughly the same proportion of tuna is transhipped in Abidjan as is landed onshore for local processing and consumption.

[27] https://www.ecofinagency.com/agriculture/2409-32296-cote-divoire-completes-first-phase-of-modernisation-of-fishing-port-in-abidjan; http://www.portabidjan.ci/en/service-offers/fishing-terminal

[28] http://www.portabidjan.ci/en/le-port-dabidjan/statistiques-portuaires

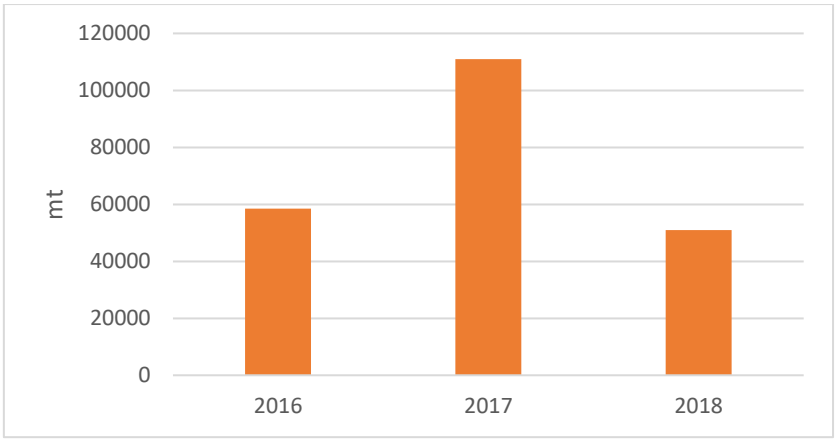



*Figure 15: Reported in port transhipment volumes in Cote d'Ivoire (assumed to all be in Abidjan), 2016-2018. (ICCAT, 2017b, 2018d, 2019b)*

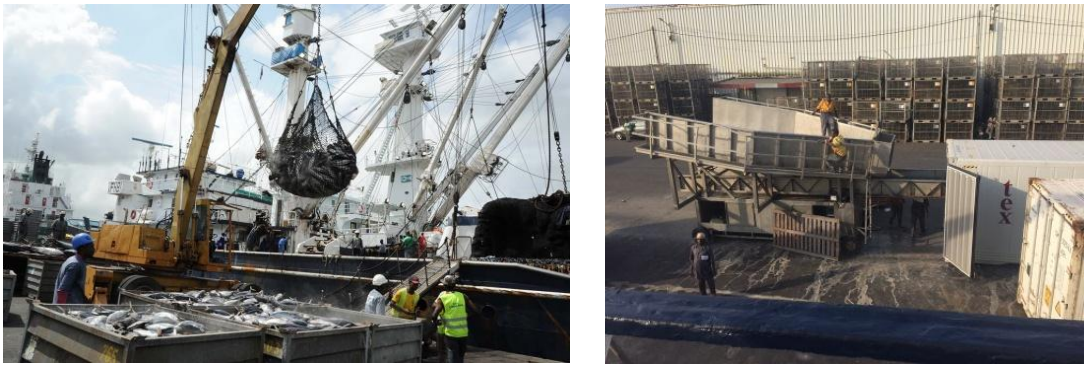


*Figure 16: Landing tuna at Abidjan port (Source: Abidjan Port Authority; CMA CGM Group[29])*

Takoradi is likely to be the second most important transhipment port by volume. Ghanaian authorities confirmed that all purse seine transhipment in Ghana happens in Takoradi, with none in Tema, the country's main fishing port (E. Dovlo, pers. comm.). Around 60 transhipments happen annually. All transhipments in Takoradi are undertaken by the Panofi purse seine fleet to Panofi carriers, Volta Victory and Volta Glory. Under Ghanaian regulations, Ghanaian flagged purse seiners and carriers are able to export product, but must first call to Ghanaian ports for inspection and export approval (including for transhipments) (Panofi reps. pers. comm.). In practice, fish sold by Panofi to customers outside of Ghana is transferred to carriers in Takoradi before transport to other destinations in West Africa (Abidjan, Dakar). The volume of tuna transhipped in Takoradi has increased in recent years, from 37,336t in 2016 to 53,198t in 2018 (ICCAT, 2017b, 2018d, 2019b). Ghanaian flagged vessels also land fish in Tema to the two local processing factories (Pioneer Food Cannery Ltd and Cosmo Seafoods Company Ltd), as well as offloading fish into containers for export.

Ghanaian authorities confirmed that 'saiko' canoes, reportedly involved in transhipping fish from trawlers off Ghana (e.g. EJF and Hen Mpoano, 2019), were not involved in transhipments from tuna vessels (E. Dovlo, pers. comm.).

Limited information is available on transhipment volumes in Dakar, although both fishing sector and carrier sector representatives interviewed confirmed purse seine transhipment occurs in the port. In the most recent reporting year (2018), Senegal's report on in port transhipments listed

[29] https://www.portabidjan.ci/en/service-offers/fishing-terminal; https://www.cma-cgm.com/local/ivory-coast/news/2/process-of-tuna-stuffing-in-a-bulk-container-at-the-fishing-dock-in-abidjan

transhipments only from longline vessels (ICCAT, 2019b). Nevertheless, in 2017 Senegal reported that 28 foreign flagged vessels (19 EU, 3 Curacao, 6 China) either transhipped or landed product in Senegal (ICCAT, 2019f). Approximately 29,160 tonnes of tuna were either transhipped or landed by foreign flagged purse seiners.

Similar to Dakar, information on transhipment volumes for Mindelo is limited, although Cape Verde reported that transhipment activity has increased in recent years with improvements in storage and logistics infrastructure (ICCAT, 2019f).

## 5.3 Fleet dynamics

### 5.3.1 Fleet organisation

The organisation of carrier fleets is a complex logistical exercise with multiple 'moving parts'. At the carrier company end, the primary motivation is to minimise operational costs for each tonne of fish sourced. In practice, this means maximising the volume of fish sourced in the minimum possible time. Quick trips mean fewer operational costs (e.g. fuel, port charges) need to be deducted from the revenue from the sales of the trip and also have the advantage of maintaining cash flow for the operator. By contrast, trips in which the carrier is required to steam greater distances, visit multiple transhipment ports (i.e. higher fuel and operational costs) and stay in port longer (i.e. higher port fees) have a substantially higher chance of losing money. These circumstances around what makes a 'good' trip versus a 'bad' trip were universal across all carrier operators interviewed for this and the previous WCPO project (MRAG AP, 2019).

With that in mind, each of the carrier companies coordinates very closely (on a daily basis) with prospective fishing vessels in planning carrier voyages. Carrier company operational staff will arrange for a carrier to be in a port after talking with purse seine skippers/companies, and after a careful evaluation of the risks and rewards. Key considerations in planning voyages include the location and dynamics of current fishing activity, how many fishing vessels are in the area, how full they are, when they're likely to come to port/unload, whether competing carrier companies have vessels in the area and whether they're likely to beat them to the fish. Interviews with representatives from integrated fishing/carrier companies indicated that their carriers will preferentially tranship from their own vessels, but will also fill up from other companies' vessels to minimise the length of the trip. Similarly, the purse seiners of integrated fishing/carrier companies will preferentially tranship to their own carriers, but will also unload to other carriers where there is good commercial logic (e.g. their own carrier/s may not be in a convenient location; other companies' carriers are used to get fish off the boat and maximise fishing time). The actual carrier used by fishing companies will be based on convenience and overall costs and returns.

The location of the transhipment port is primarily chosen based on a mix of proximity to fishing grounds, carrier availability and other operational and regulatory considerations. For example, Spanish, French and other EU-linked fleets use Abidjan as a base and preferentially tranship there to also take advantage of associated services (e.g. bunkering, reprovisioning, net repair, crew exchange, etc). As described above, Ghanaian flagged purse seiners are required to call into Ghanaian ports for inspection and export approval before transhipping product. Accordingly, all transhipment by the Ghanaian fleet happens in Takoradi.

Given most carriers on the ICCAT RoV are flagged to countries operating open registries (primarily Panama and Bahamas), there is little fidelity between purse seiners offloading to carriers flagged to the same State. Nevertheless, there are some exceptions – for example, the Albacora Group carrier Salica Frigo remains flagged to Spain and is likely to tranship catch from Spanish-flagged Albacora Group (and other Spanish-flagged) purse seiners.

### 5.3.2 A typical transhipment

Broadly, purse seine vessels in the Atlantic have three main options for the marketing of fish – (i) landing to local processing facilities (mainly in Abidjan, Dakar and Tema); (ii) offloading fish into containers for distribution to a range of markets internationally; and (iii) transhipping fish to carriers for direct delivery to processing facilities in Europe, South America and West Africa[30]. Landing at local processing facilities has the advantage of saving on freight costs and offers more immediate payment, which assists in cash flow. However, West African processing facilities don't have the capacity to absorb all fish harvested locally and prices in other markets may be higher. Unloading into containers allows the fish to be transported to a wider range of markets and also allows fish to be sorted/graded, with some markets paying more for some categories (e.g. large YFT). Nevertheless, unloading into containers typically takes longer than unloading to carriers (5-6 days vs 3-4 days), meaning less overall fishing time. Unloading into carriers allows fish to be delivered directly to a wider range of markets, some of which may pay higher prices than local processors, allows fish unable to be processed locally to be processed elsewhere and allows for quicker turnaround times than containers. Nevertheless, fish remain ungraded and markets are generally limited to options with the Atlantic (or western South America) due to travel time and expense (unlike containers). Each of the options has its pros and cons and ultimately the most commercially attractive option will be chosen based on the circumstances at the time.

For catch to be transhipped, typically the process would commence with a negotiation/agreement between the fishing company and prospective buyer/s around the purchase of the fish. Once the details of the sale are agreed, the fishing company would make contact with carrier company, noting that for integrated fishing/carrier companies these are, in effect, the same people. The details of the transhipment and logistics arrangements are then negotiated and agreed between the fishing company and the carrier company – e.g. details of transhipment port, fee, timing etc.

At the carrier company end, this is a dynamic process, with coordination happening across multiple companies/vessels at any one time. As described above, carrier companies stay in very close contact with fishing companies during fishing operations to coordinate the timing and location of transhipments for maximum efficiency.

Once the decision has been made to send a carrier to a port, the carrier company will typically inform a local agent who handles local administrative and logistical arrangements. Where necessary, the agent will also source provisions and other supplies for the vessel. Transhipment in port by foreign flagged vessels must be undertaken in accordance with the ICCAT Recommendation 18-09 (*Recommendation by ICCAT on port State measures to prevent, deter and eliminate illegal, unreported and unregulated fishing*). Moreover, under Recommendation 16-15, which prohibits transhipment at sea by vessels other than LSPLVs, the captain of the fishing vessel must notify Port State authorities at least 48 hours in advance of transhipment operations of the name of the carrier vessel and date/time of transhipment. The captain must also inform the flag CPC of the details of the transhipment at the time of transhipment.

Once both carrier and fishing vessel are ready to tranship, the fishing vessel comes alongside and secures itself to the carrier (Figure 17). Fish are then loaded into 'slings' and transferred by crane into the hold of the carrier vessel. The process of transhipping usually takes 3-4 days per purse seiner, depending on the size of the vessel and the loading capacity of staff.

[30] Noting that fish may also be initially loaded from purse seiner to carrier and then into containers for further distribution.

*Figure 17: Purse seine transhipment in West Africa. (Source: West Africa Task Force)*

Where fish from multiple vessels is loaded within the same hold on the carrier, netting is used to separate the catch from different vessels. Netting may also be used to separate fish from individual sets or for other traceability/segregation purposes. The location of fish from each purse seine vessel is recorded on a well plan maintained by the carrier. Logistics carriers reported that they would typically tranship from four to six purse seine vessels per trip.

The carrier may be in port for up to eight weeks – shorter if the fishing is good; longer if the fishing is poor. Fishing vessels are typically in port for around five days – 3-4 days of transhipping, plus an additional day of logistics/R&R. Vessels would offload/tranship 7-10 times per year on average, although not all catch is transhipped to carriers.

Under Recommendation 16-15, the master of the receiving carrier vessel must inform the port State authorities of the quantities of catches of tuna and tuna-like species to be transhipped to his vessel not later than 24 hours before the beginning of the transhipment. At the end of the transhipment, they must complete and transmit an ICCAT transhipment declaration to the competent authorities within 24 hours. In addition, the captain of the fishing vessel must submit an ICCAT transhipment declaration to their flag CPC within 15 days of completing the transhipment.

In the purse seine sector, fish from the supplying vessel are usually provided on either a 'free on board' (FOB) or 'cost and freight' (CFR) basis. Under FOB arrangements, the receiving company is responsible for arranging and paying for the actual shipping cost from the port of origin to the destination port. The supplying vessels are free of responsibility for shipping costs once the fish are loaded onto the receiving vessel. Under CFR arrangements, the supplying company is responsible for arranging and paying for transportation all the way to the destination port specified by the receiving vessel.

Carrier companies advised they occasionally supplied provisions to vessels, but it wasn't a large part of the business. A number of fishing companies have their own carriers – in these cases, the carrier will carry salt and other provisions for the fishing vessels, but in most cases reprovisioning is reportedly done at fishing bases or through agents in port.

Bunkering of carrier vessels is typically done at the unloading port or in ports en route (Las Palmas on Gran Canaria).

## 5.4 Key companies

For companies operating carriers undertaking transhipment from purse seiners, ownership and operational control arrangements are dynamic and varied, but can broadly be categorised into three main types:

- **the 'charterer' model** - under this model a chartering company leases a carrier vessel, owned and crewed by an independent owner. Two basic modes of charter are available – a time charter, under which the charterer leases the full carrier for a defined period of time (e.g. one year) and a voyage/space (or 'spot') charter, under which the charterer 'buys' space on a carrier for one voyage at a time. Both types of charter are typically arranged through a shipping broker, usually independent of both the charterer and ship owner. The chartering model is favoured by major tuna traders operating in other ocean basins (e.g. FCF, Tri Marine, Itochu in the WCPO), but is less prevalent in the ICCAT area where there is less involvement from tuna traders in the supply chain;
- **'integrated fisher-carrier' companies** - a number of fishing companies own and operate their own carriers as part of an integrated supply chain. These companies tend to be larger, with a sufficient critical mass of catching vessels to justify their own carrier. Many also have interests in post-harvest processing facilities and use carriers as component of an integrated supply chain. Under this model, most interviewees noted that carriers would source from their own company's fishing boats preferentially, but not exclusively. Both carriers and fishing vessels would ultimately act to optimise profits based on the circumstances at the time – e.g. fishing vessels will preferentially unload to their own company's carriers vessels, but will also use other carriers/unload locally if it makes greater commercial sense (e.g. their own company's carrier is not in a convenient location); carriers will preferentially source from their own company's fishing vessels, but would also source from other company's vessels (if, for example, their own vessels were not ready to unload); and
- **Logistics service providers** - under the logistics service provider model, carriers are typically owned and operated by companies whose primary expertise is in shipping and logistics and their main interest is in providing a commercial service to transport fish from the fishing grounds to processing facilities or to market. These companies tend to have no interest in fishing vessels – they've come into the tuna transhipment business from the 'shipping end', not the 'fishing end'[31]. The commercial arrangements under this model are usually relatively straightforward, with a fee for service charged for the transportation of fish. The fee is paid by the owner of the fish, usually the fishing company who has arranged for the carrier to deliver their fish to market. The fee is typically determined by a combination of the volume of fish and the distance to the destination – the greater the volume of fish and further the destination, the higher the price. Logistics service providers may assist in delivering provisions to fishing vessels at sea (e.g. bait, salt, gear, food), but are rarely involved in the trading of the fish themselves. In the Atlantic, the main logistics service providers are also involved in the transport of a range of commodities – e.g. fruit and vegetables, other fisheries products, etc. Trips involving tuna transport may be a small part of a complex network of logistical arrangements and the logistics of planning voyages and carrier availability must be coordinated with these other services.

Key companies operating carriers servicing the ICCAT purse seine fleet are set out below, according to operational model.

### 5.4.1 Integrated carrier/fishers

**Albacora SA**

Founded in 1974 with the establishment of Albacora S.A., the Spanish-based Albacora Group comprises 24 related companies with interests operating throughout the tuna supply chain

[31] Although there are exceptions – e.g. the Laskaridis group whose carriers operate through FSC Frigoship Chartering GmbH (Lennefors and Birch, 2019)

(Albacora Group, 2019)[32]. The group operates a fleet of 18 purse seiners in the Atlantic, Pacific and Indian Oceans, as well as three processing plants: Salica Industria Alimentaria (located in Bermeo-Bizkaia, Spain, which produces canned tuna), Salica Alimentos Congelados (located in La Puebla del Caramiñal, Spain, which produces frozen tuna products and fish-based pre-packaged and ready meals) and Salica del Ecuador (based in Parroquia Posorja-Guayas, Ecuador, which produces frozen cooked tuna loins and canned fish)[33] (Albacora Group, 2019).

The Group's catches in 2018 reportedly totalled 189,000t, with product primarily delivered to Ecuador (34%), Spain (22%), Seychelles/Mauritius (21%) and Bangkok (15%) (Albacora Group, 2019). Sales from its three processing plants total around €277m, with key markets including Spain, Germany, Ecuador, Italy and Argentina (Albacora Group, 2019). The Group has a number of offices in mainland Spain as well as Las Palmas Gran Canaria[34].

In the ICCAT area, the Albacora Group operates a fleet of 11 registered purse seiners: four Spanish-flagged vessels through Albacora S.A.; four Panama-flagged vessels through the Panama-based Integral Fishing Services and Tunamol Corporation; and three Curacao-flagged vessels through Curacao-based Overseas Tuna Company N.V. and Intertuna N.V. The Group also operates the Spanish-flagged carrier vessel, Salica Frigo, registered to Albacora S.A (Figure 18).


*Figure 18: Albacora Group Spanish-flagged carrier, Salica Frigo (Source: Wikimedia Commons)*

The extent to which the operation of the Group's purse seiners and carrier are coordinated are unknown, although tracks from Salica Frigo indicate the vessel plays an important logistics role between the main transhipment ports in West Africa and the Group's processing facilities in Spain (Figure 19). Discussions through OPAGAC indicate that the carrier is likely to operate consistent with the approach taken by other integrated harvester/carrier companies – i.e. the carrier will preferentially tranship from its own purse seiners, but will also source from others to minimise time taken to fill up.

Albacora is an active member of the International Seafood Sustainability Foundation (ISSF).

[32] Note that company searches indicate the Albacora Group has interests in 46 companies globally, including Inpesca.

[33] http://www.albacora.es/en/about-us/presence-around-the-globe/

[34] http://www.albacora.es/en/about-us/presence-around-the-globe/


*Figure 19: Vessel track for Salica Frigo, showing return trip from Galicia, Spain to Abidjan, Cote d'Ivoire, across 6 weeks in November-December, 2019. (Source: Global Fishing Watch)*

**INPESCA**

Founded in 1972, Compañia Internacional De Pesca Y Derivados, S.A (INPESCA) specialises in the harvest and transport of tropical tunas in the Atlantic and Indian Oceans[35]. The company operates a fleet of purse seiners across both oceans. In the Atlantic, INPESCA operates two purse seiners – the Spanish-flagged Itsas Txori through Inpesca and the Belize-flagged Txori Berri through majority-owned subsidiary Inpesca Fishing Belize Limited. The company also operates the Spanish-flagged carrier, Izar Argia, through its 100% owned subsidiary Naviera Galdar S.A (Figure 20).


*Figure 20: INPESCA group Spanish-flagged carrier, Izar Argia (Source: Vessel Finder)*

INPESCA doesn't operate any processing facilities directly, although it has a 33% stake in Spanish-based processing company Atunes Y Lomos SL, or Atunlo. Incorporated in 2007, Atunlo is a joint venture between INPESCA, large Spanish fishing company Pesquería Vasco Montañesa, SA (PEVASA) and Comercial Pernas S.L. (COPER)[36]. The company operates five processing plants – three in Spain at O Grove, Cambados, Santoña, one in Portugal at Vilanova de Cerveira and one in Mindelo, Cape Verde, opened in 2015[37]. The Mindelo plant also serves as logistics base for vessel unloading,

[35] http://www.inpesca.com/inpesca/dm/presentation.asp?nombre=2086&hoja=0&sesion=1347

[36] http://atunlo.com/en/company/

[37] http://atunlo.com/en/factories/

grading and reshipment. The company reportedly processes around 130,000t of whole tuna each year[38].

Like Albacora, the operational relationships between Inpesca's purse seiners and carrier are unknown, but the carrier is likely to form an important part of an integrated supply chain amongst the INPESCA and Atunlo businesses in both the Atlantic and Indian Oceans. Figure 21 shows the track of one of a number of trips in 2019-20 between the Atlantic and Indian Oceans calling into key transhipment/processing ports including the Seychelles, Mauritius, Mindelo and ports in Galicia, Spain.


*Figure 21: Four month track of the vessel Izar Argia, between October 2019 and January 2020 commencing in Galicia, Spain, before steaming around Africa to the Seychelles. The vessel remained there for a few days before steaming to Antisiranana, Madagascar, then on to Mindelo, Las Palmas de Gran Canaria and Agadir, Morocco, before returning to Marin, Spain. (Source: Global Fishing Watch)*

**Calvo Group**

Originally founded with a small canning factory in 1940, the Spanish-based Calvo Group is now a large global food company with sales in excess of €580m, and over 4,600 employees worldwide[39]. The group specialises in tuna and other seafood, operating processing plants in Spain, El Salvador and Brazil and marketing its product through its three main brands: Gomes da Costa, Calvo and Nostromo. The Italian-based Bolton Group S.R.L. has a 40% stake in Luis Calvo Sanz S.A., which serves as the parent company for much of the Group. The Bolton Group also has linkages to other major players in global tuna supply chains including Tri Marine.

The Calvo Group participates in "*the entire product value chain, from the sea to the table, through the horizontal integration of the activities involving supply of raw materials, transformation into finished product and distribution thereof for marketing*"[40]. The Group operates a fleet of seven purse seine vessels across both the Atlantic and eastern Pacific Oceans[41]. In the Atlantic, the Group operate four El Salvador-flagged purse seine vessels through the El Salvador-registered Calvopesca El Salvador, S.A. De C.V. According to company searches, Calvopesca El Salvador, S.A. De C.V. is

[38] http://atunlo.com/en/

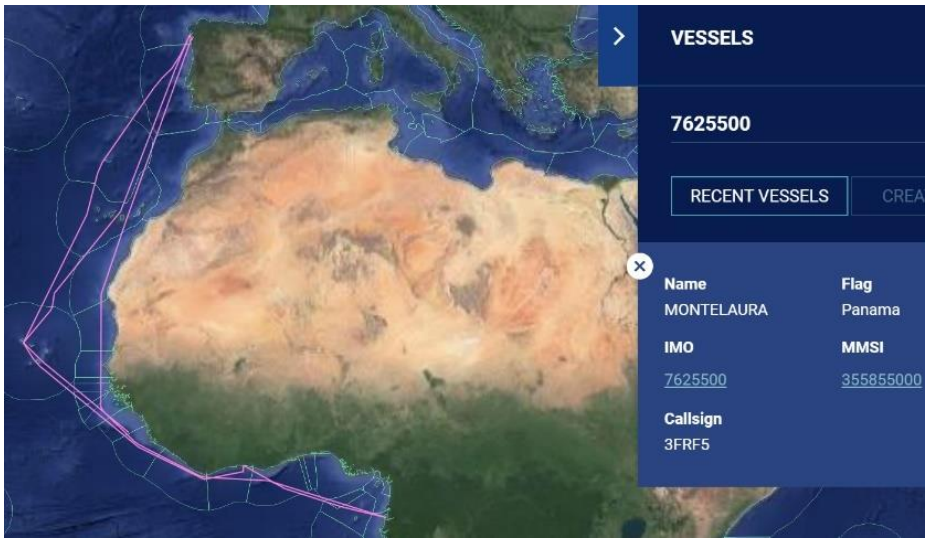
[39] http://www.grupocalvo.com/en/

[40] http://www.grupocalvo.com/en/value-chain/

[41] http://www.grupocalvo.com/en/value-chain/

majority owned by Spanish-registered Calvopesca S.A., which is in turn 100% owned by Luis Calvo Sanz S.A[42].

In addition to its purse seiners, the Calvo Group also operates two carrier vessels: the Panamanian-flagged Montelaura and Montecruz. Both vessels are owned by the Panamanian-registered Gestra Corporation S.A. which, according to company searches, is 100% owned by Calvopesca S.A. Vessel tracks indicate that the carriers form an important logistics link between fishing ports in West Africa and processing facilities in Spain (Figure 22). Similar to the Albacora Group, discussions with OPAGAC indicate that the carriers are operated in the same way as other integrated fishing/carrier companies, preferentially sourcing from their own company purse seiners, but taking other companies' fish to minimise voyage times and costs.




*(a)*


*(b)*

*Figure 22: (a) Five month track for the vessel Montelaura between April and September 2019 commencing in Abidjan, Cote d'Ivoire with port calls in Mindelo, Cape Verde, Ribeira/Vigo, Spain, Libraville, Gabon, Abidjan, Cote d'Ivoire, Mindelo, Cape Verde and finishing in A Pobra do Caramiñal, Spain (b) Montelaura. (Source: Global Fishing Watch; Calvo Group)*

**Panofi**

Panofi Co. Ltd is a Ghanaian-based joint venture, majority owned by the Korean company Silla Co. Ltd which have investments in fishing and a range of other industries[43]. Panofi currently operates a fleet of seven Ghanaian-flagged purse seine vessels fishing in the tropical Atlantic from its base in Tema, Ghana. The company also operates two Ghanaian-flagged carriers, Volta Victory and Volta Glory (Figure 23).

[42] Orbis database

[43] http://www.sla.co.kr/eng/index_eng.htm

*Figure 23: Panofi carriers Volta Victory (left) and Volta Glory (right). (Source: Silla Group)*

The Panofi fleet is the only purse seine fleet reported to tranship in Ghana in recent years (ICCAT, 2018d, 2019b). All transhipments take place in Takoradi.

Panofi representatives advised that the dynamics of West African ports means that it is not always possible to secure berths for purse seiners, so operating your own carrier can reduce losses in operational time. Carriers can also provide ancillary services to fishing vessels including crew transfers, reprovisioning and responding in emergency situations. Panofi representatives noted that as a result of travel restrictions associated with the COVID-19 epidemic, carriers were performing other tasks in support of fishing vessels including transporting technicians to vessels for maintenance.

At present, Panofi's carriers source only from their own fleet, although this is largely by regulation rather than design. Panofi advised that Ghanaian regulations only allow fish from a Ghanaian-flagged vessel to be landed in a foreign port if an export permit is granted. The process to apply for a permit requires an inspection in a Ghanaian port. To that end, it is often operationally more efficient to tranship in Takoradi and send fish by carrier to the customer (Panofi's carriers typically land fish in either Abidjan or Tema – see for example Figure 24 and Figure 25 showing multiple trips by each vessel between Takoradi and Abidjan/Tema). Panofi advised that the regulation requiring inspection in a Ghanaian port limited their capacity to operate their carriers in the most efficient manner. Interestingly, Ghanaian officials advised that there is no direct benefit to the local community from transhipment in Takoradi (local businesses do not supply the fleet).

Where fish needs to be sent to customers outside of Abidjan or Tema, containers are used (fish will be first transhipped to the company's carriers, then unloaded to container for transport).

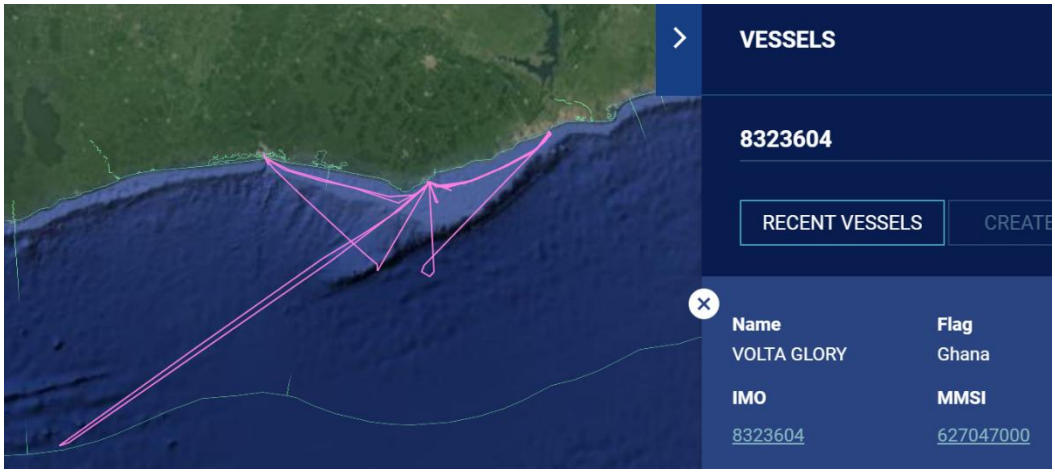



*Figure 24: Six-month track for vessel Volta Glory between March and September 2019 showing multiple journeys between Takoradi, Ghana and Tema, Ghana/Abidjan, Cote d'Ivoire. (Source: Global Fishing Watch)*

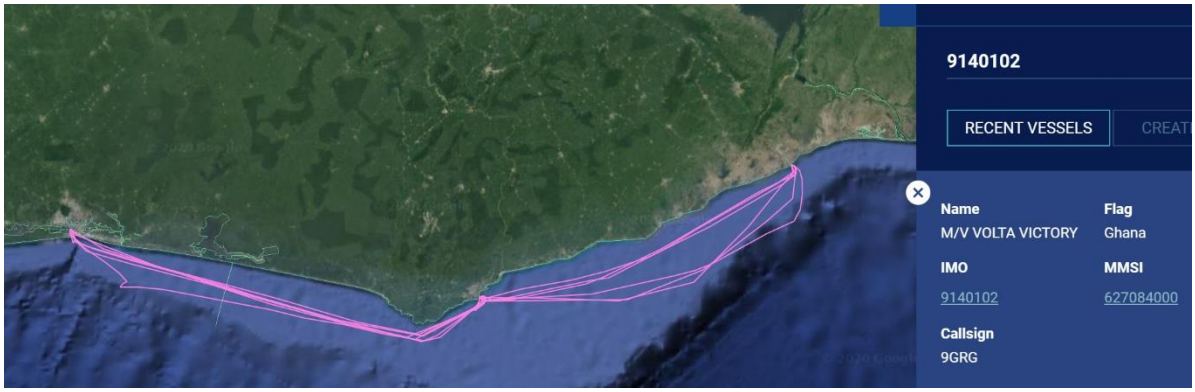



*Figure 25: Six-month track for vessel Volta Victory between October 2019 and April 2020 showing multiple journeys between Takoradi, Ghana and Tema, Ghana/Abidjan, Cote d'Ivoire. (Source: Global Fishing Watch)*

### 5.4.2 Logistics providers

The other main group of carrier companies operating in the ICCAT area are transport logistics providers. As a general rule, these companies have no interests in fishing vessels or processing facilities – their business is in simply getting the fish from the catching vessel to the customer (usually a processing facility or distribution hub) in the most efficient possible way.

Many of the transport logistics carriers on the ICCAT RoV are members of two chartering or shipping 'pools': Greensea N.V. (GS) and the Alpha Reefer Transport GMBH Pool (ART). These companies coordinate the operation of large numbers of vessels, contributed to the pool often by multiple owners (e.g. GSC provide ship management services to a fleet of around 40 reefer carriers owned by Green Shipping AS and the Seatrade group[44]). Shipping pools are often engaged in providing logistics services across multiple commodities – e.g. fruit and vegetables, other seafoods – in multiple oceans, with varying seasonality, so the management of carrier operations and availability is a dynamic and complex task.

Individual carriers are often owned through subsidiary companies, registered in countries such as Panama, with actual beneficial ownership sometimes difficult to determine without detailed forensic work.

The main logistics service providers operating in support of the purse seine sector include:

**GreenSea NV**

Greensea NV (GS) operates out of Belgium through their exclusive agent Greensea Chartering BV (GSC) and is perhaps the largest and most active of the logistics service providers operating in the ICCAT area. GS is a 'shipping pool' with two members – Green Shipping AS and the Seatrade Group of companies[45] – exclusively contributing vessels to the pool (Hans Mol, pers. comm.). The pool commenced operations in 2012 as a vehicle to operate the two members' small conventional reefer ships (Dynamar, 2019).

GSC is responsible for the commercial operation of the vessels, including cargo contracting and chartering where necessary. GS currently controls a pool of around 40 reefer carriers[46], with 34 listed on the RoV. Notwithstanding that, Greensea advise that their vessels are involved in logistics for multiple commodities (fruit and vegetables, other seafood including herring, mackerel, etc), so

[44] http://www.greensea.be/upload/Fleet%20List%20update%20200204%20-%20Portrait.pdf

[45] a subsidiary of Seatrade Holding B.V., according to Orbis company searches

[46] http://www.greensea.be/upload/Fleet%20List%20update%20200204%20-%20Portrait.pdf ; GS representatives advised that Sierra Medoc is no longer part of the pool.

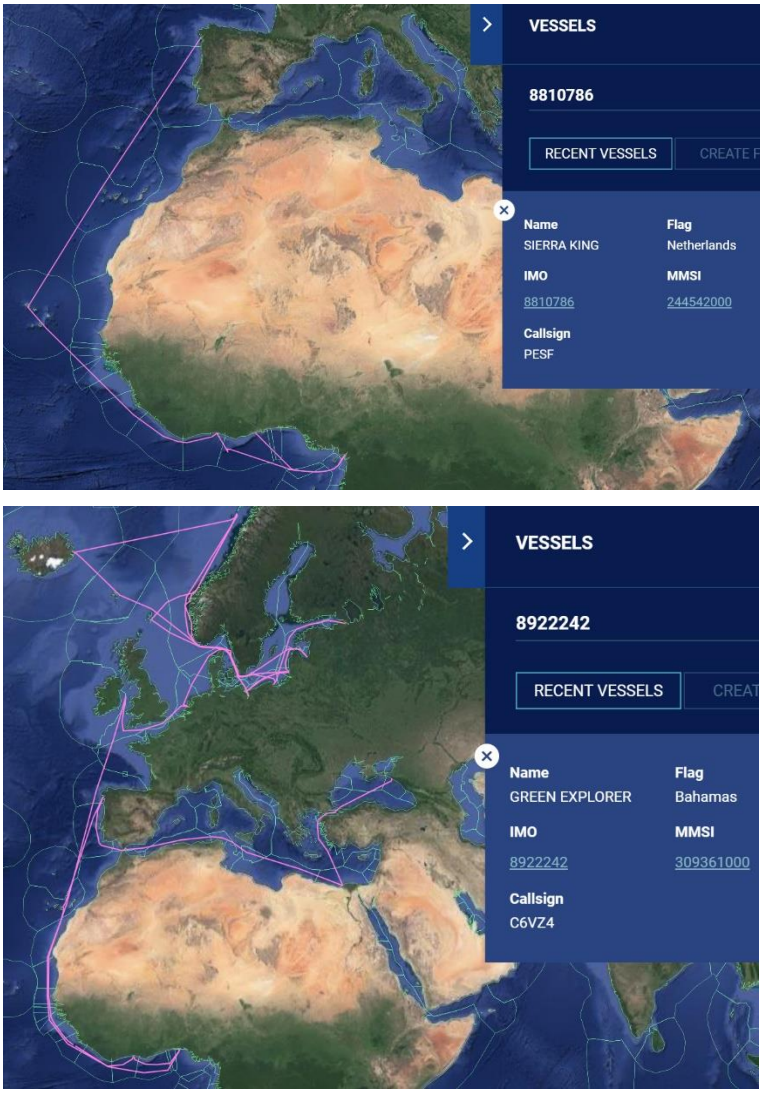
not all vessels would be active in any one year. On average, they advise that the equivalent of around 5-6 vessels for 365 days each would actively carry tuna.


*Figure 26: Greensea pool carriers Green Freezer (left panel) and Prince of Seas (right panel). (Source: www.greenreefers.no; http://www.greensea.be/fleet)*

GSC advised that around 10% of their overall business would be tuna-related, with tuna comprising around 30% of their seafood logistics business. Dynamar (2019) reports that the Seatrade group has recently completed four 300,000 cu.ft. conventional reefer ships which are now part of the GS pool. GSC advise that the advantages of newer ships are primarily fuel efficiency and optimal temperature control.

GSC operates a 'parcel service', usually loading from around 4-6 purse seiners (full or part loads) with direct delivery to customers (Hans Mol, pers. comm.). Fees are charged based on commercial considerations including steaming time at sea, days in port, bunker prices, etc. Abidjan and Dakar are the main transhipment ports used by the GS fleet, with fish primarily transhipped from the EU (Spain/France) fleet and EU-linked fleets of other ICCAT CPCs. Fish are mainly offloaded in ports in Galicia, Spain (see for example Figure 27a).

The multi-sectoral nature of the Greensea fleet is evident in the vessel track of Green Explorer in Figure 27b, which incorporates a six week port call in Abidjan before steaming to Ribeira, Spain amongst port calls throughout northern Europe, Iceland, the Mediterranean and Black Sea.




*(a)*

*(b)*

*Figure 27: (a) Two month vessel track for Sierra King between July to September, 2019, showing a voyage commencing in Tema, Ghana, before making port calls at Douala, Cameroon, Abidjan and Mindelo and finishing in A Pobra do Caramiñal, Spain; (b) Six month track for Greensea vessel Green Explorer from October 2019 to April 2020 incorporating a six week port call in Abidjan before steaming to Ribeira, Spain amongst port calls in Egypt, the Russian Black Sea, Poland, Lithuania, UK, Norway and Iceland. (Source: Global Fishing Watch)*

The GS fleet range from around 237,000 cf carrying capacity to over 400,000 cf, although most vessels are in the 260,000 – 310,000 cf range. Of the vessels listed on the ICCAT RoV, a total of 23 vessels are flagged to the Bahamas, four to Liberia, two each to Curacao, Panama and the Netherlands and one to Russia (Table 4). The differences in flagging broadly reflect the ownership structure of individual vessels.

*Table 4: Ownership and flagging arrangements for the Greensea fleet on the ICCAT RoV. Blue shaded rows are vessels contributed to the Greensea fleet by Seatrade[47].*

| Vessel Name | Flag | Owner Name | Owner country |
|---|---|---|---|
| Green Karmøy | BHS | Green Shipping AS | Norway |
| Green Selje | BHS | Green Shipping AS | Norway |
| Green Bodø | BHS | Green Shipping AS | Norway |
| Green Cooler | BHS | Green Shipping AS | Norway |
| Green Egersund | BHS | Green Shipping AS | Norway |
| Green Måløy | BHS | Green Shipping AS | Norway |
| Green Austevoll | BHS | Green Shipping AS | Norway |
| Green Explorer | BHS | Green Shipping AS | Norway |
| Green Freezer | BHS | Green Shipping AS | Norway |
| Green Klipper | BHS | Green Shipping AS | Norway |
| Green Chile | BHS | Green Chile Shipping Company N.V. | Curaçao |
| Green Costa Rica | BHS | Green Shipping AS | Norway |
| Green Crystal | BHS | Green Shipping AS | Norway |
| Green Guatemala | BHS | Green Shipping AS | Norway |
| Green Honduras | BHS | Green Shipping AS | Norway |
| Green Italia | BHS | Caiano Shipping AS | Norway |
| Green Ocean | BHS | Green Shipping AS | Norway |
| Green Maveric | BHS | Green Shipping AS | Norway |
| Green Brazil | BHS | Caiano Shipping AS | Norway |
| Sierra Lara | BHS | Sierra Lara Shipping Company N.V. | EU.Netherlands |
| Sierra Leyre | BHS | Sierra Leyre Shipping Company N.V. | EU.Netherlands |
| Orange Sea | BHS | Orange Sea Shipping Co N.V. | Curaçao |
| Orange Spirit | BHS | Orange Sun Shipping Co N.V. | Curaçao |
| Orange Strait | CUW | Orange Storm Shipping Company N.V | Curaçao |
| Orange Stream | CUW | Orange Stream Shipping Company N.V | Curaçao |
| Sierra King | EU.NLD | Holland Klipper Shipping Company BV | EU.Netherlands |
| Cool Expreso | EU.NLD | Cool Expreso Shipping Company NV | EU.Netherlands |
| Water Phoenix | LBR | Magenta Shipping Co./Seatrade Groningen B.V. | EU.Netherlands |
| Lagoon Phoenix | LBR | Yellow Shipping Co. / Seatrade Groningen B.V. | EU.Netherlands |
| Prince of Seas | LBR | Violet Shipping Co. Ltd | EU.Netherlands |
| Sierra Queen | LBR | B.V. Beheermaatschappij Pacific / Seatrade Groningen B.V. | EU.Netherlands |
| New Takatsuki | PAN | New Power Ship, S.A | Panama |
| Yun Der | PAN | Ryoma International Transport Corp | Panama |
| Nova Zeelandia | RUS | Nova Shipping LLC | Russian Fed. |

GreenSea uses CCTV cameras on their vessels to register loading and discharge[48].

A key issue raised by GSC in consultations was the difference in compliance regime and costs applying to conventional reefer vessels – which are considered fishing vessels for the purposes of ICCAT – and container vessels – which aren't. In addition to the annual cost associated with compliance (estimated by GSC to be around US$40,000/yr for each vessel), GSC noted that the absence of any obligation on container vessels to check and report on fish being carried meant that there was a higher risk of IUU fish entering into container supply chains (unless there is a very strong monitoring/control regime at the port State).

[47] https://www.seatrade.com/fleet/fleetsOperator/0/fleetsType/specialised-reefer-vessel/controllerFleets/list/Fleet/fleetsFilter/type/

[48] http://www.greensea.be/why-greensea

**Seatrade Group**

With a history dating back to 1951, Dyanmar (2019) report that Seatrade is "*the undisputed leader of the conventional reefer segment*". In total, Seatrade is involved with 51 conventional reefer ships (including those employed by the GreenSea Pool or chartered out long term)[49]. Seatrade Reefer Chartering N.V. (operating from Belgium) effectively handles the day-to-day operations of the reefer pool (Dynamar, 2019).

Of the 51 vessels, 19 are listed on the ICCAT RoV – four controlled by Seatrade (Table 5) and 15 controlled by the Greensea Chartering (see above) in which it has a 50% stake (Dynamar, 2019). The four standalone Seatrade vessels are all Liberian-flagged. It is unclear from vessel tracks whether the vessels carried tuna or other commodities (although few visits were made to key tuna transhipment ports in the Atlantic). With sizes ranging from 8,739 GRT to 9,074 GRT, the Seatrade vessels are some of the largest in the ICCAT registered carrier fleet.

*Table 5: Seatrade group fleet listed on the ICCAT RoV, with nominated owners.*

| Vessel Name | Flag | Owner Name | Owner country |
|---|---|---|---|
| ACONCAGUA BAY | Liberia | Aconcagua Bay Shipping Company B.V./Seatrade Groningen B.V. | EU.Netherlands |
| EVEREST BAY | Liberia | Seatrade Groningen B.V. | EU.Netherlands |
| FUJI BAY | Liberia | Fuji Bay Shipping Co. /Seatrade Groningen B.V. | EU.Netherlands |
| WHITNEY BAY | Liberia | Whitney Bay Shipping Co. B.V./Seatrade Groningen B.V. | EU.Netherlands |

Dynamar (2019) reports that in 2014, the company embarked upon a container ship building program, with the ultimate aim to bring their container ship fleet to around 20 vessels.

**Frigoship Chartering/ART**

Another large group providing transport logistics services to the purse seine sector in the Atlantic is the Alpha Reefer Transport GmbH (ART) Pool. FSC Frigoship Chartering GmbH (FSC) is the exclusive chartering arm for all vessels in the ART Pool as well as for the other reefer vessels controlled by Laskaridis Shipping which are not part of the ART Pool.

Dynamar (2019) report that "*Hamburg-based Frigoship Chartering is controlled by Lavinia Corporation, the leading entity in the Greek Laskaridis group, established in 1984. Frigoship is used for exclusive chartering purposes and to employ the tonnage of the Alpha Reefer Transport (ART) pool. The pool is administered by Alpha Reefer Transport GmbH, Hamburg, majority controlled by Lavinia Corporation. In addition to its commercial management of the ART Pool, Frigoship is also responsible for the chartering of the fleet managed by Laskaridis Shipping.*

The ART Pool consists of six members: Laskaridis Shipping Company Co. Ltd., Athens, also acting as a major cargo provider; Limarko Shipping Co, Klaipeda; JSC Ships Service Agency, Klaipeda; Marine Reefer Transport, St. Petersburg and Norfoss Shipping, Tallinn[50].

Unlike many other companies in the logistics provider space, Frigoship's owners have a long history in the seafood sector. Laskaridis started out as a fishing company (fishing off the coast of West Africa since the late 1950s) but expanded to be a reefer operator focused on fish transports in the 1970s (Lennefors and Birch, 2019).

[49] http://www.seatrade.com/fleet/

[50] The ART Pool website (https://www.frigoship.de/alpha.html) lists seven members, although representatives from Frigoship advised that a previous member, Fairport Shipping Ltd, had sold all of their reefers.


*Figure 28: ART pool vessels Frio Las Palmas (left panel) and Capella (right panel). (Source: Vessel Finder; Shipspotting.com)*

The FSC website notes that "*a considerable number of the Laskaridis ships are employed independently under various long term contracts with the firm's customers in the fishing industry, a clientele which forms the backbone of the company since several years*"[51]. It also notes that *"numerous vessels are employed in high sea transhipments, and this has indeed become a speciality of the shipowners of the Pool. Not only ship design, availability of large ocean fenders, stevedoring by experienced crews, as well as fuel supplies and provisions and spares for trawlers at sea, has become part of the services rendered with reefer carriers and tankers where ever it is required*."

As at July 2020, 29 carrier vessels managed under the ART/FSC group were listed on the ICCAT RoV[52]. Another three vessels on the RoV were owned by the Lavinia Corporation but not listed as part of the ART/FSC fleet (Jason, Iris Reefer, Skyfrost). One other vessel – San Elpidio – is listed on both the FSC website and the ICCAT RoV, although FSC representatives advised it was longer part of the ART pool.

Despite the large number of vessels on the ICCAT RoV, FSC representatives advised that none of their vessels had been active in tuna transhipments since 2018. They noted that ART/FSC carriers continued to be registered on the ICCAT RoV in order to keep their commercial options open.

An examination of the ownership details listed on the RoV provides an insight into ownership structures within the group (Table 6). Of the 29 vessels on the RoV, each (apart from the three Lithuanian-registered vessels) were listed as being owned by separate companies registered in Panama, Vanuatu, Liberia, Belize and Greece. Despite that, the 26 separate companies were registered to only 9 different addresses, with as many as seven companies registered to the same or very similar address.

[51] http://www.frigoship.de/fsc.html

[52] http://www.frigoship.de/fleet1.html

*Table 6: Carrier vessels on the ICCAT RoV within the Frigoship Chartering group of vessels. Rows shaded the same colour indicate the same or similar owner address.*

| Vessel Name | Flag | Owner Name | Owner address/ country |
|---|---|---|---|
| LIBRA | EU.LTU | SC "LIMARKO SHIPPING COMPANY | Naujoji uosto str. 8, Klaipeda, LT 92105, Lithuania |
| CAPELLA | EU.LTU | SC "LIMARKO SHIPPING COMPANY | Naujoji uosto str. 8, Klaipeda, LT 92105, Lithuania |
| CASSIOPEA | EU.LTU | SC "LIMARKO SHIPPING COMPANY | Naujoji uosto str. 8, Klaipeda, LT 92105, Lithuania |
| FRIO OCEANIC | PAN | SEABORN EAGLE S. A. | Paseo Del Mar and Pacific Avenue, Costa Del Este, MMG Tower, 23rd Floor, Panama, Panama |
| FRIO OLYMPIC | PAN | MARESOL NAVIGATION S.A. | 80 Broad Street, Monrovia, Liberia |
| FRIO POSEIDON | PAN | DREAM FAITH, S. A. | Via España 122, Delta Tower, Floor 14, Panama, Panama |
| FRIO LAS PALMAS | PAN | SEABORN HONOR S.A | VIA ESPAÑA 122, DELTA TOWER, FLOOR 14, Panama City, Panama |
| FRIO MARATHON | PAN | SUNNY SKIES CORPORATION | Sunny Skies Corporation,(Liberia) C/O Laskaridis Shipping Co,Ltd 5 Xenias Street, 14625, Athens, Greece |
| ZEFYROS REEFER | PAN | OLYMPUS MARINE LTD | C/O European Trust Company Limited 1st Floor, International Building, Kumul Highway, Port Vila, Vanuatu |
| NESTOS REEFER | PAN | NAVIGATION SHIELD S.A. | Samuel Lewis Avenue, Comosa Building, First Floor, Panama City, Republic of Panama |
| DON REEFER | PAN | SEACAPE MARINE, S.A. | Samuel Lewis Avenue, Comosa Building, First Floor, Panama City, Republic of Panama |
| FRIO ANTWERP | PAN | NAUTILIUS SHIPPING AND TRADING S.A | Via España 122, Delta Tower, Floor 14, Panama City, Panama |
| FRIO SHINANO | PAN | SPRING GLOBAL MARINE LTD., S.A. | Via España 122, Torre Delta, Piso 14, Panama, Panama |
| NOR CAPE | PAN | ADMIRAL CORPORATION | Suite 102, Ground Floor, Blake Building, Corner Eyre& Hutson Street, Belize City, Belize |
| AVUNDA REEFER | PAN | LILIUM SHIPPING CO., S.A. | Samuel Lewis Avenue, Comosa Building, First Floor, Panama, Panama |
| ANGARA | PAN | ANGARA SHIPPING LTD. | 1st Floor, International Building, Lini Highway, Port Vila, Vanuatu |
| SALGIR | PAN | SALGIR SHIPPING LTD | 1st Floor, International, Building, Lini Highway, Port Vila, Vanuatu |
| FRIO GALICIA | PAN | AXELIA MARITIME S.A | Samuel Lewis Avenue, Comosa Building, First Floor, Panama, Panama |
| MARTA REEFER | PAN | FARO NAVIGATION CORP. | MMG Tower 23 Rd Floor, Avenida Paseo Del Mar, Costa Del Este, Panama |
| TAGANROGSKIY ZALIV | PAN | DELIA NAVIGATION CORP. | 80, Broad Street Monrovia, Liberia |
| FRIO AEGEAN | PAN | ROSSE OCEANWAY S.A | 80 Broad Street Monrovia, Liberia |
| FRIO CHIKUMA | PAN | SKY GLOBAL MARITIME S.A | Via España 122, Delta Tower, Floor 14, Panama City, Panama |
| FRIO IONIAN | PAN | SEA SWAN MARITIME S.A. | Samuel Lewis Avenue, Comosa Building 1st fl, Panama City, Panama |
| FRIO MOGAMI | PAN | STAR GLOBAL SHIPPING, S.A | Baltmed Reefer Services Ltd, 5 Xenas Str, & Ch. Trikoupi Kifissia 145 62, Athens, Greece |
| FRIO STAR | PAN | SOLMAR SHIPPING S.A. | Avenida Samuel Lewis, Edificio Comosa, Primer Piso, Ciudad De Panamá, República De Panamá |
| COOL GIRL | PAN | DAYLIGHT SHIPPING S.A | Samuel Lewis Avenue, Comosa Building 1st fl, Panama City, Panama |
| INVINCIBLE | PAN | SPRINGWAVE SHIPPING S.A. | Delta Edificio Ofc. 122 Piso 14 Via España, Panama, Panama |
| KANO REEFER | PAN | MARINE GROWTH S.A. | Via España 122, Delta Tower, Floor 14, Panama City, Panama |
| FRIO NAGATO | PAN | STARFIRE MARINE S. A. | Baltmed Reefer Services Ltd, 5 Xenia Street & Charilaou, Trikoupi, Kifisia, Greece |

# 6 Longline

**Key points:**

- Eight ICCAT CPCs authorise at least some of their LSPLVs to tranship catch at sea. Of these, the four main distant water fishing nations (DWFNs) - Japan, Chinese Taipei, China and Korea – account for around 97% of authorised vessels.
- Overall at sea annual transhipment volumes have remained relatively stable in the recent years, ranging between 29,763t and 31,706t in the 2016 to 2018 period. The Japanese and Chinese Taipei fleets tranship the highest volumes, collectively accounting for 72% of total transhipment volume during this period. Collectively the four main DWFNs accounted for >95% of volumes transhipped at sea in each of the years 2016 to 2018.
- Bigeye tuna is the dominant species by volume transferred in at sea transhipments, accounting for 70% or more of total volume in each of the 2016, 2017 and 2018 years. Yellowfin is the next most transferred species making up 9-11% of overall volume in the same period. Albacore, southern bluefin tuna and swordfish accounted for 5%, 5% and 4% respectively. The volume of bigeye tuna transhipped at sea in 2018 represented around 69% of the total estimated longline landings of BET in the ICCAT area in 2018, although it should be noted that not all fish are transhipped in the same calendar year as they are caught.
- Although a smaller number of transhipments occur at higher southern latitudes, the significant majorty of at sea transhipments in the ICCAT area occur in tropical waters between 12°N and 12°S, mirroring the catch distribution of bigeye and yellowfin tuna.
- Carrier companies work closely with fishing companies to plan voyages and determine transhipment locations. For the carrier company, the motivation is to fill up and return to the offloading port in the fastest possible time, at the least possible cost. For the fishing vessel, the motivation is to steam the shortest distance and lose the least possible fishing time.
- The actual location of transhipment is largely determined by the pattern of fishing activity – if a large number of vessels are concentrated in one area, the carrier will go to them; if the boats are more dispersed, the vessels will come to the carrier. Carrier companies have a clear commercial incentive to avoid steaming large distances picking up small volumes at a time – as one carrier company representative put it 'operating a taxi service costs money'.
- Transhipment times in the longline sector are considerably shorter than the purse seine sector. In the 2018-19 reporting period, the vast majority of transhipments lasted between one and six hours. The volume transferred per transhipment also varies markedly from <10t to >200t, but is most frequently in the range of 40t to 70t.
- In addition to transferring fish, carriers supply bait, provisions, fuel and other supplies to fishing vessels as part of an integrated service. Anecdotal information indicates the number of non-fish/supply transfers at sea between carriers and LSPLVs can equal or exceed the number of transhipments.
- The majority of fish transhipped from LSPLVs at sea in the ICCAT area is destined for Asian sashimi markets, principally Japan. A fee is charged for the service of transferring fish to market, with the size of the fee primarily a function of the volume and distance to market, but also taking into account factors such as fuel price, demurrage and other port costs. One carrier operator advised that, given the remoteness of the Atlantic from the major markets, freight costs are typically higher than other ocean basins (~20% higher than the WCPO).
- The number of LSPLVs from which catch is received during each trip varies markedly according to a range of factors including demand from offloading vessels, the capacity of the carrier, whether the carrier has (or will) tranship in the IOTC area during the same trip and the risk/reward considerations of the carrier remaining on the fishing grounds. In the period July 2015 to July

2019, the number of at sea LSPLV transhipments per trip reported by ROP observers ranged from two to 64, with an average of 33.

- Vessels may also undertake transhipment from LSPLVs in port in the ICCAT area. Key ports used for in port transhipments include Cape Town, South Africa, Mindelo, Cape Verde, and Walvis Bay, Namibia. Vessels typically undertake transhipments in port in conjunction with scheduled port visits for crew rest and exchange, reprovisioning and basic maintenance, and to tranship BFT which is prohibited at sea. One carrier company representative advised that the number of in port transhipments would be <20% per trip.
- Anecdotal information from carrier companies indicates that there is little exclusivity (e.g. carriers specialising in sourcing fish from only one flag State's LSPLVs) or flag State fidelity (e.g. Japanese carriers sourcing only from Japanese LSPLVs). Interviewed companies indicated that they maintained customer bases across multiple flag States which provided flexibility to both carrier companies and fishing companies in arranging for the most efficient transhipment option.
- Stakeholders in the longline sector indicated there are substantial efficiencies associated with transhipment at sea, most notably the reduced fuel costs and avoiding the loss of fishing time associated with steaming to port. For example, Chinese fleet operators advised that a typical round trip from the fishing grounds to port, unloading, then returning to the fishing grounds takes around one month in the Atlantic. If the vessel were to unload in port four times per year, the vessel loses up to four months' fishing time, plus the associated fuel, labour and port costs. Other benefits include cheaper provisions, no port or stevedoring fees and less administrative paperwork and agent's fees.
- The carrier sector supporting at sea transhipment from LSPLVs in the ICCAT area is dominated by three Japanese controlled companies - Toei Reefer Line, Mitsubishi/MRS and Taiseimaru Kaiun Kaisha. In the period July 2015 to July 2019, ROP observers made 62 trips on carrier vessels: 24 trips were undertaken on carriers controlled by TRL, with 20 trips and 18 trips on carriers controlled by Mitsubishi/MRS and TKK respectively.

## 6.1 Overview of activity

### 6.1.1 Number and volume of transhipments

A total of eight CPCs currently authorise at least some of their LSPLVs to tranship catch at sea, accounting for 303 vessels (Table 1)[53]. Of these, the four main distant water fishing nations (DWFNs) – Japan, Chinese Taipei, China and Korea – account for 295 of the 303 vessels (97%). The remaining vessels are flagged to Belize, Namibia, Cote d'Ivoire and St Vincent and Grenadines.

In the three most recent years for which the numbers of transhipments by flag State is available (2015-2017), the total number of transhipments reported across all LSPLVs remained relatively consistent between 493 in 2015 and 541 in 2017 (Table 7). The Chinese Taipei fleet accounted for close to half of all reported transhipments (47%), with the Japanese fleet (29%) and the Chinese fleet (19%) the other major contributors to overall at sea transhipment activity. The remaining fleets (Korea, Belize, Cote d'Ivoire, Senegal and St Vincent and Grenadines) accounted for 5% of all transhipments.

[53] Noting that some LSPLVs which appear on the list of vessels authorised to tranship to some carriers no longer appeared on the RoV, as at June 2020 – see for example, footnote 60 below.

*Table 7: Number of transhipments reported by observers on ROP trips by flag State, 2015 to 2017 (Data source: ROP provider[54]).*

| Flag | 2015 | 2016 | 2017 | Total | % |
|---|---|---|---|---|---|
| Belize | 5 | 8 | 8 | 21 | 1% |
| China | 72 | 93 | 124 | 289 | 19% |
| Chinese Taipei | 249 | 251 | 223 | 723 | 47% |
| Cote d'Ivoire | 0 | 6 | 4 | 10 | 1% |
| Japan | 154 | 128 | 163 | 445 | 29% |
| Korea | 6 | 13 | 9 | 28 | 2% |
| Senegal | 0 | 1 | 5 | 6 | 0% |
| St Vinc. Gren. | 7 | 6 | 5 | 18 | 1% |
| **Total** | **493** | **506** | **541** | **1540** | |

Overall at sea annual transhipment volumes have remained relatively stable in the recent years, ranging between 29,763t and 31,706t in the 2016 to 2018 period. Volumes have been dominated by the Japanese and Chinese Taipei fleets, each accounting for 36% of total at sea transhipment volumes on average across the 2016 to 2018 period (Figure 29) (ICCAT, 2018e, 2019c). The Chinese fleet accounted for the next highest at sea transhipment volumes, representing 20% of total volumes transhipped in the 2016 to 2018 period. Korea had the smallest at sea transhipment volume of the main DWFN fleets, contributing 3% of total transhipment volume between 2016 and 2018. Nevertheless, collectively the four main DWFNs accounted for >95% of volumes transhipped at sea in each of the years 2016 to 2018. Remaining volumes have been transhipped by LSPLV fleets from Belize, Cote d'Ivoire, St Vincent and Grenadines, Senegal, Namibia and Spain.

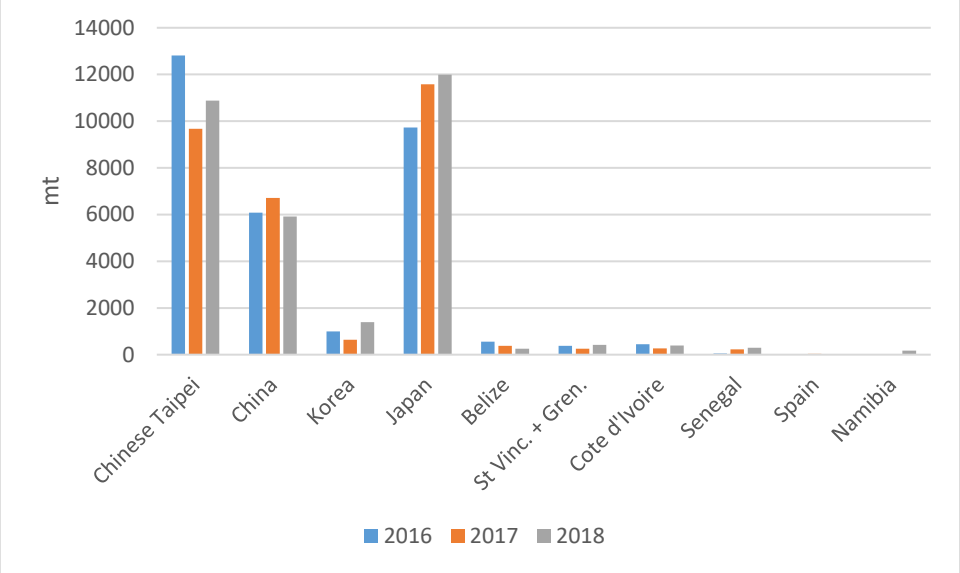



*Figure 29: Total at sea transhipment volume by LSPLV fleet, 2016 – 2018 (Data source: ICCAT, 2018e, 2019c).*

[54] Data to be published. Note that data for 2015 and 2017 differs slightly from published figures in ROP annual reports for these years (ICCAT, 2016b; 2018a). The number of transhipments in 2016 differs markedly in some cases from those reported in ICCAT by the Member State (2017a), but is more closely aligned to the total number of transhipments reported in Annex 1 to ICCAT (2016b and 2017a). The figures published cover September from the previous year through to August, in line with the annual ICCAT meetings.

### 6.1.2 Species composition and seasonality

Bigeye tuna is the dominant species by volume transferred in at sea transhipments, accounting for 70% or more of total volume in each of the 2016, 2017 and 2018 years (Figure 30). Yellowfin is the next most transferred species making up 9-11% of overall volume in the same period. Collectively, these two species represented 84% of total transhipment volumes across the 2016-2018 period, reflecting the fact that most LSPLVs involved in at sea transhipment typically target tropical tunas for east Asian sashimi markets. Albacore, southern bluefin tuna and swordfish accounted for the next highest volumes at 5%, 5% and 4% respectively. Volumes of southern bluefin tuna transhipped will vary according to inter-annual availability and the targeting behaviour of Japanese, Chinese Taipei and Korean fleets who are the main ICCAT LSPLV fleets with national quotas allocated by CCSBT[55].

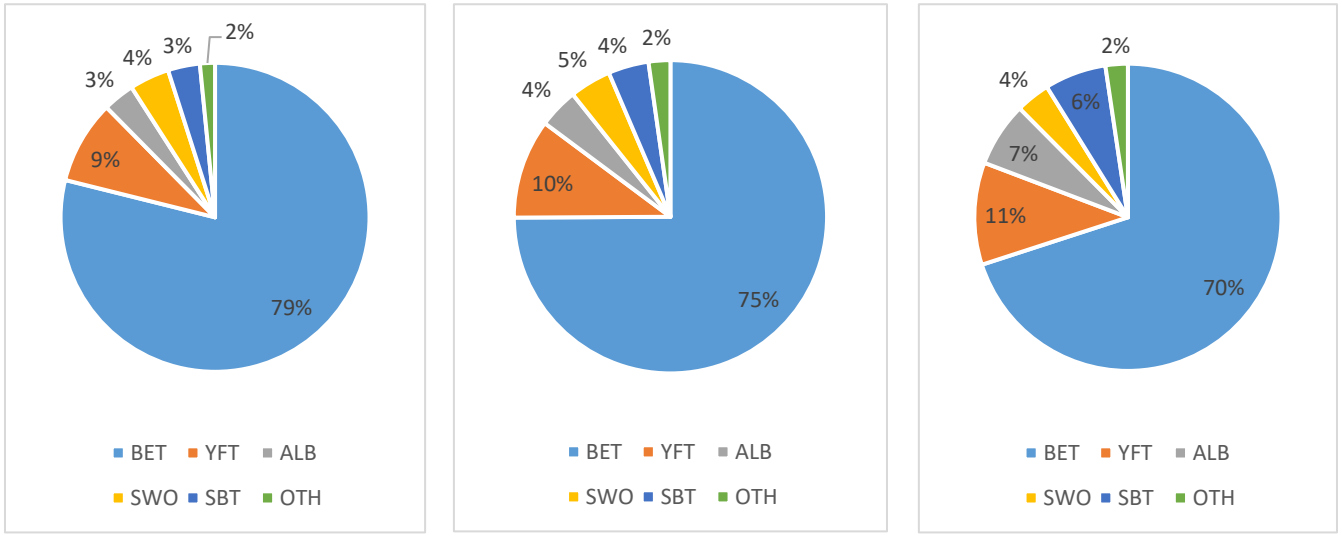
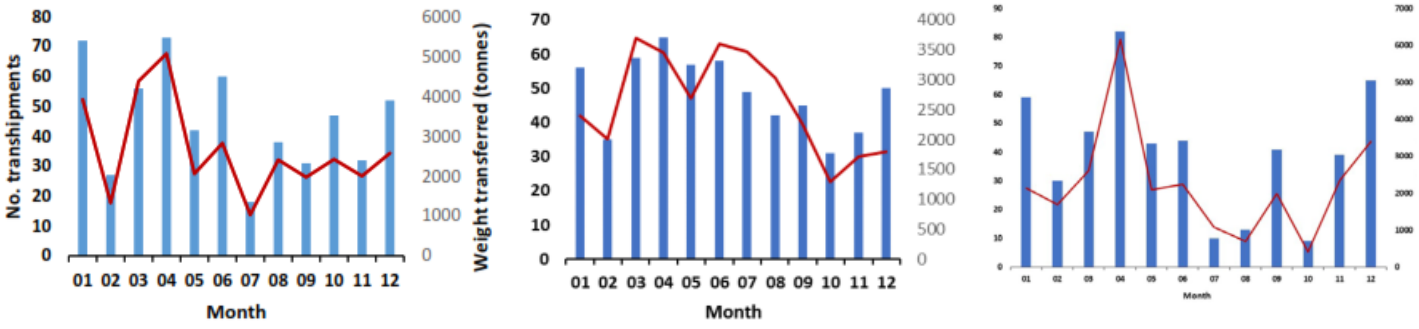



*Figure 30: Composition of transhipped species across all LSPLVs in (a) 2016, (b) 2017 and (c) 2018. (Data source: ICCAT, 2018e, 2019c).*

The total volume of BET reported by CPCs as being transhipped at sea in 2018 was 22,195t (ICCAT, 2019c). This represented around 69% of the total estimated longline landings of BET in the ICCAT area reported in the 2019 BET stock assessment (ICCAT, 2019h), although it should be noted that not all fish are transhipped in the same calendar year they are caught. The total at sea transhipment volume of 3,416t for YFT represents around 23% of the total estimated ICCAT area longline landings of YFT (ICCAT, 2019h).

Transhipment activity and weights of fish transferred throughout the year show a broad seasonality, with generally a higher number of transhipments and larger volumes transhipped in the first half of the year (Figure 31). Although activity varies generally between years, the most recent three years have all seen peaks in activity around April.

[55] https://www.ccsbt.org/en/content/total-allowable-catch



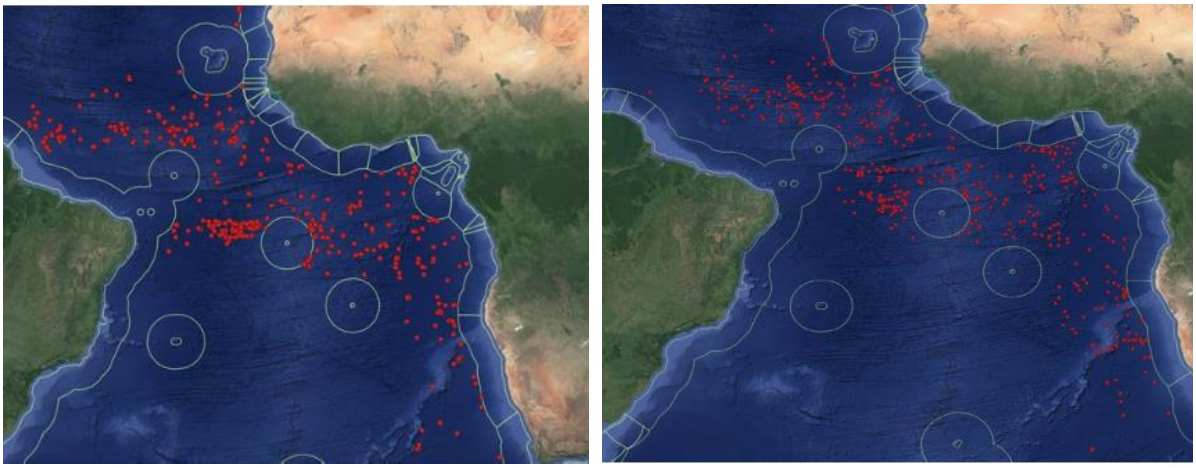

*(a)* *(b)* *(c)*

*Figure 31: Number of transhipments and weights transferred by month, as reported by ROP observers for trips in (a) 2016, (b) 2017 and (c) 2018. (ICCAT, 2017a, 2018a, 2019a)*

### 6.1.3 Location of at sea transhipments

Although a smaller number of transhipments occur at higher southern latitudes, the significant majorty of at sea transhipments in the ICCAT area occur in tropical waters between 12°N and 12°S (Figure 32). Transhipments in tropical waters tend to be relatively evenly spread, with high numbers of transhipments occuring in both the eastern and western equatorial Atlantic. In higher southern latitudes, transhipments are confined to the eastern Atlantic with very few transhipments reported west of 0° longitude. Very few at sea transhipments occur north of the Cape Verde EEZ.

The distribution of transhipments broadly mirrors the catch distribution of BET and to a lesser extent YFT (Figure 33). Higher proportions of southern bluefin tuna and albacore are likely at higher southern latitudes.



*(a)* *(b)*

*Figure 32: Location of transhipments on ROP deployments during (a) September 2018 and August 2019 and (b) September 2017 and August 2018 (ICCAT, 2018a; ICCAT, 2019a).*

While the flag State of LSPLVs is not reported in observer reports, based on AIS data GFW (2019) reported that Japanese vessels were involved in transhipments throughout the ICCAT Convention area, whereas transhipments involving Chinese Taipei, Chinese and Korean LSPLVs were only recorded between 20°N and 20°S. This is likely to be broadly consistent with the targeting activity of each fleet, with the Chinese Taipei, Chinese and Korean fleets in the ICCAT area targeting tropical species (mainly bigeye and yellowfin), whereas the Japanese fleet (and some Korean vessels) may also target SBT and albacore at higher latitudes (ICCAT, 2019f).

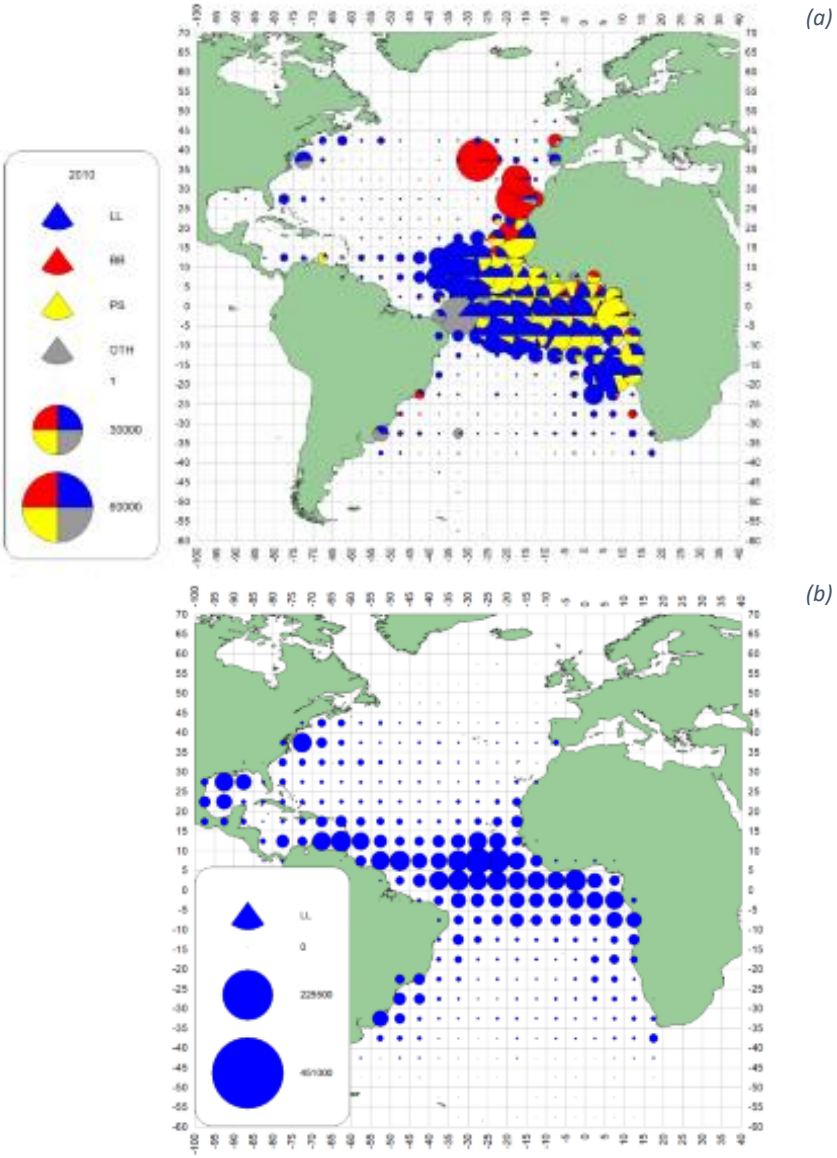



*Figure 33: Catch distribution for (a) BET by gear type, 2010-2017 and (b) YFT for longline, 1960-2017. (ICCAT, 2019h)*

## 6.2 Main fleets involved in transhipment

The majority of vessels involved in at sea transhipment tend to be large scale freezer vessels (>250GRT) which undertake long voyages over large areas. Vessels typically have refrigeration equipment capable of freezing to -50°C to -60°C and target tuna for east Asian frozen sashimi markets.

### 6.2.1 Japan

Japan currently authorises 182 LSPLVs to fish in ICCAT waters, all of which are authorised to transhipment at sea[56]. All Japanese flagged LSPLVs are authorised to take tropical tunas, northern and southern albacore, northern and southern swordfish. Thirty-six vessels are also authorised to harvest bluefin tuna. A total of 83 LSPLVs were reportedly active in 2017 (ICCAT, 2019f).

[56] ICCAT RoV, as at June 2020

The fleet primarily targets BET and YFT in tropical waters between 20°N and 30°S, with some vessels also targeting BFT in waters north of 40°N and SBT in waters south of 35°S (Figure 34). All vessels are fitted with ULT freezing capability, with fish primarily marketed to east Asian sashimi markets (Japan, Korea, China). Japanese vessels tend to stay in the ICCAT area for long periods, with some fishing vessels continue to operate in the ICCAT area for more than a year. Some vessels operate in multiple oceans, moving between the Atlantic, Indian and Eastern Pacific Oceans as catch rates and other commercial factors dictate.

Transhipment at sea is a key part of the operation, both to offload catches and take on supplies, gear and bait. Japanese interviewees noted that there are a limited number of ports in the Atlantic Ocean capable of providing foreign fishing vessels with adequate services (fuel/bait supply, repairing fishing gear) as well as capacity to accept large carrier vessels (e.g. Cape Town, Las Palmas). They noted that moving back and forth between fishing grounds and these ports would result in considerable costs.

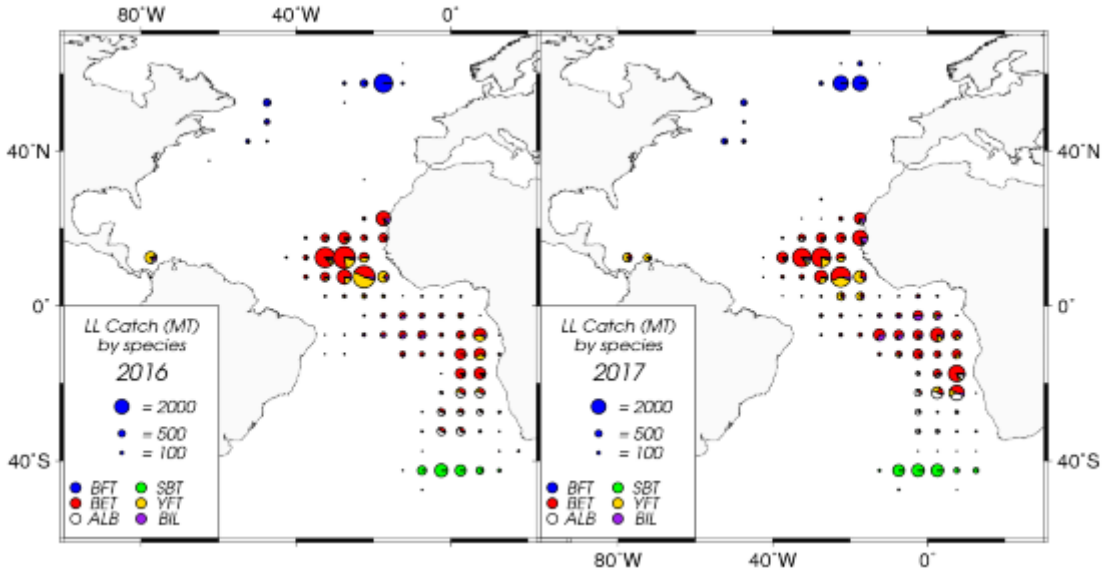
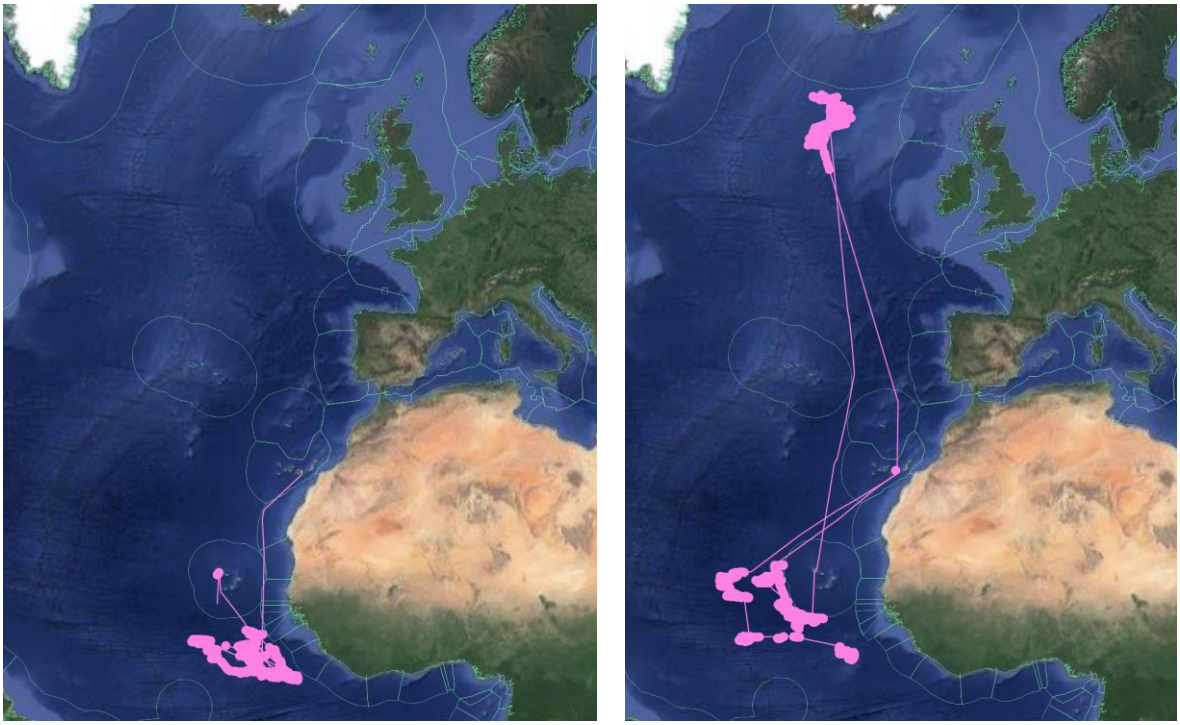



*Figure 34: Distribution of Japanese LSPLV catch in 2016 (left panel) and 2017 (right panel). (ICCAT, 2019f)*

An example of the seasonal targeting behaviour of many Japanese LSPLVs is illustrated in the vessel track for one vessel in 2019 (Figure 35). The vessel commences the 2019 year in Mindelo, Cape Verde, before steaming south to fish in tropical waters outside the Sierra Leone, Guinea and Guinea Bissau EEZs, presumably targeting BET. The vessel remains there until mid-April before steaming to Gran Canaria, where it remains until early August (possibly to undertake repairs and maintenance). The vessel then steams south to fish to the west and south of the Cape Verde EEZ from early August until mid-September. The vessel then steams north, arriving at the BFT fishing grounds south of the Iceland EEZ at the start of October, fishing until late October. The vessel then steams south, calling port briefly in Gran Canaria (possibly to refuel and unload BFT), before finishing the year fishing in tropical waters to the west and south of the Cape Verde EEZ.



(a) (b)

*Figure 35: Annual track for one Japanese flagged LPSV, 2019 - (a) January to June, (b) July to December. (Source: Global Fishing Watch)*

The size of the Japanese fleet in the ICCAT region has reduced substantially over time, dropping from 320 active vessels in 1981 to 83 in 2017 (ICCAT, 2019f). Similarly, levels of effort have dropped from around 120 million hooks in the mid-1990s to less than 50 million hooks in recent years, but have stabilised at between 40 – 50 million hooks since 2014. Effort north of 20°N has seen the highest reduction since the mid-1990s, with the substantial majority of Japanese LSPLV effort concentrating in the tropical fishery since 2009.

In its current form, Japan effectively has the 'smallest (by vessel size) and newest' of the four main fleets involved in at sea transhipment in the ICCAT region (Figure 36 and Figure 37). Unlike other CPC fleets, none of the Japanese fleet is larger than 499 GRT (albeit 24 vessels are between 495 and 499 GRT), while Japan has 18 of the 19 LSPLVs <300 GRT in the ICCAT region authorised to tranship at sea[57]. The average vessel size of the Japanese fleet (409 GRT) is around 100 GRT smaller than the next smallest fleet (Chinese Taipei, 504 GRT). Although the year of build is available on the RoV for only 78 of the 182 LSPLVs authorised to tranship at sea, the available information indicates the average year of build (2002) is later than other fleets, with considerable recent investment. The Japanese fleet contains 27 of the 39 LSPLVs on the ROV built since 2010 which are authorised to tranship at sea, with eight vessels built in 2019 alone.

[57] ICCAT RoV, as at June 2020

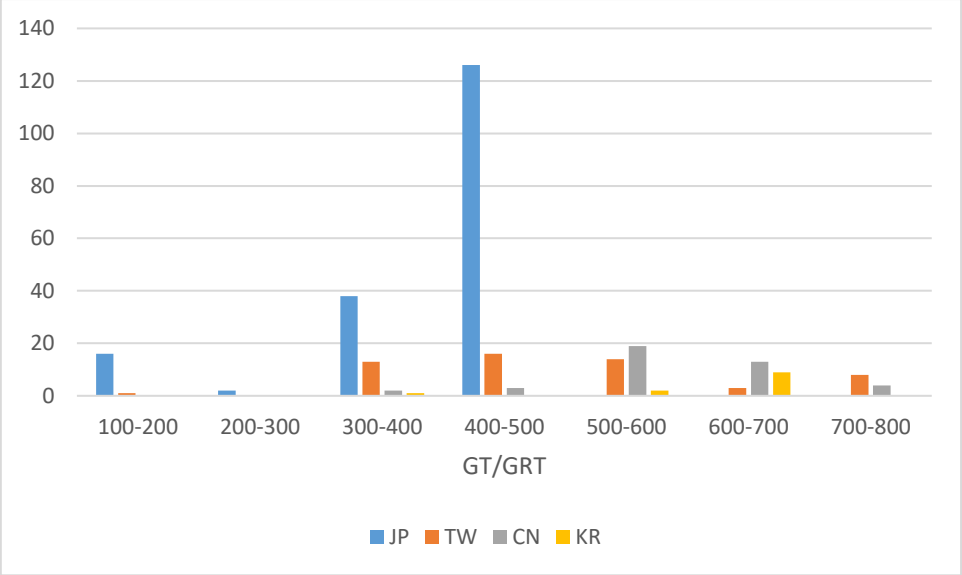



*Figure 36: Size profile of the four main fleets LSPLV authorised to tranship at sea in the ICCAT area[58].*

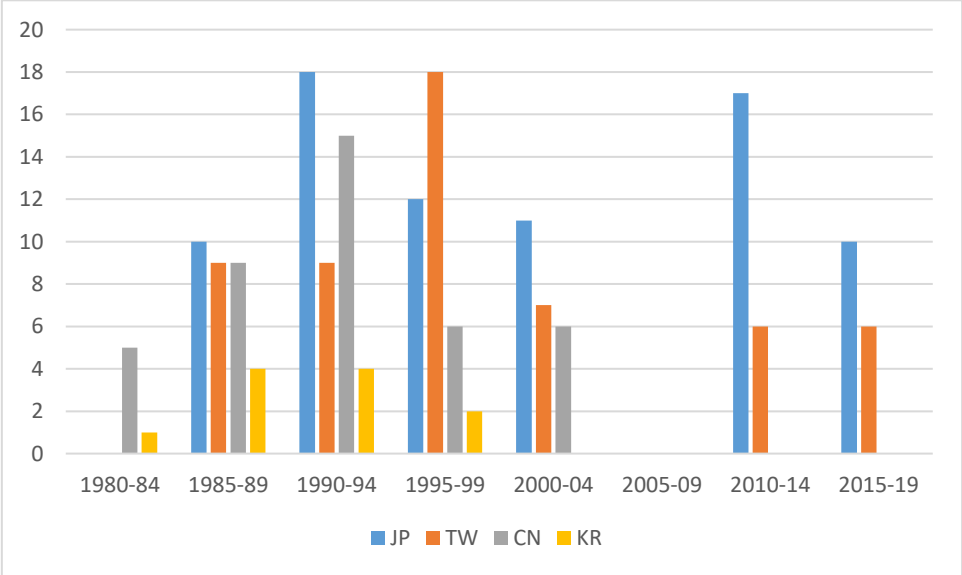



*Figure 37: Age profile of the four main LSPLV fleets authorised to tranship at sea in the ICCAT area[59].*

Of the 182 Japanese LSPLVs authorised to tranship at sea, 67 were reported to have actively transhipped at sea in 2018 (ICCAT, 2019g). Most vessels undertook one to four transhipments during the year, but some undertook up to seven. Reported at sea transhipments totalled 11,990t, with BET the main species transhipped accounting for 47% of total volume (ICCAT, 2019c). YFT, ALB and SBT accounted for 15%, 15% and 14% respectively of total transhipment volume, with remaining species accounting for 9%.

[58] Assuming all vessels currently authorised to fish in tropical waters are authorised to tranship at sea.

[59] Noting that year of build was available for only 78 Japanese vessels, as at June 2020.

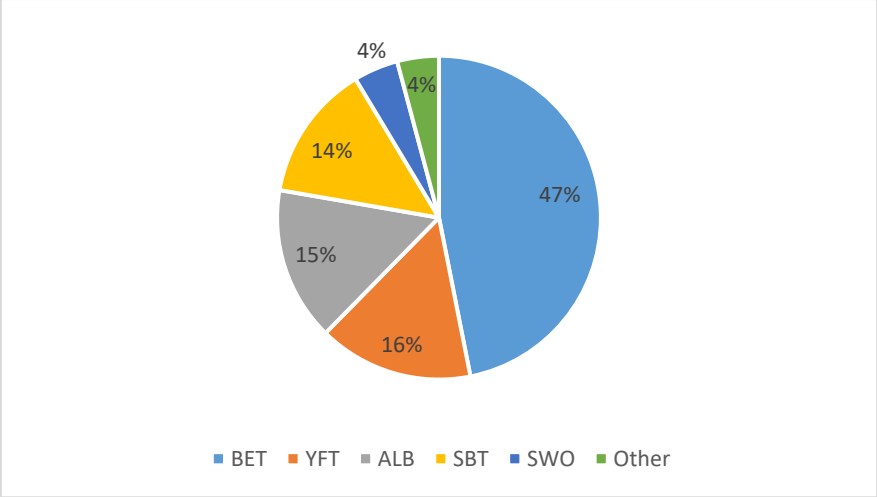



*Figure 38: Composition of species transhipped at sea by Japanese LSPLVs during 2018. 'OTH' includes billfish, opah and other species.*

Eighteen carriers are authorised to tranship from Japanese vessels, with 16 of these authorised to tranship from all Japanese vessels (Table 1)[60]. One carrier is authorised to tranship from 187 vessels, while one smaller LSPLV is authorised to tranship from a single sister LSPLV. Of the 18 carriers authorised to receive product from Japanese-flagged LSPLVs, 10 are flagged to Panama, five to Japan, two to Liberia and one to Singapore. The majority of are operated by Japanese companies, Mitsubishi/MRS, TRL and Taiseimaru Kaiun Kaisha (TKK).

ICCAT (2019f) report that prior authorization from the Fisheries Agency of Japan (FAJ) is required for Japanese LSPLVs to tranship to carriers at foreign ports or at sea. FAJ reportedly monitors "*the weight by species, the time and place of transhipments, and conducts random inspections of landings at Japanese ports when longline vessels or carriers return to Japanese ports*" (ICCAT, 2019f).

In addition to transhipments at sea, the Japanese fleet also undertake transhipments in port, particularly for BFT for which transhipment at sea is prohibited, and where the vessels call to port for repairs and other reasons. In 2018, transhipment volumes in port represented around 34% of the volume transhipped at sea (ICCAT, 2019b,c). The main species transhipped were BFT and BET, accounting for 80% of in port transhipment volume (Figure 39).

[60] ICCAT RoV, as at June 2020. Note that 16 of 18 carriers are currently authorised to tranship from 190 Japanese-flagged vessels – in our review of the vessels authorised to tranship to one vessel, Tuna Queen, 13 of the listed vessels were no longer found on the ICCAT RoV. Given almost all carriers authorised to tranship from Japanese-flagged LSPLVs are authorised to for 190 vessels, this may be similar for other carriers. A further six LSPLVs were currently registered to Japan (and may be involved in at sea transhipments) but were not found on the list of vessels authorised to tranship to Tuna Queen. Again, this may be an artefact of the timing of different registration and notification processes and may be the same for other carriers.

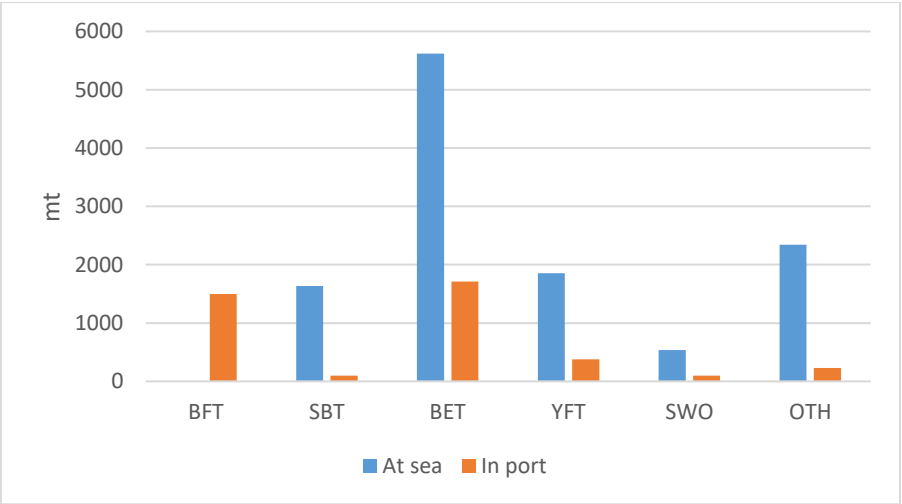



*Figure 39: Reported volumes of at sea vs in port transhipment of the Japanese LSPLV fleet in 2018. 'OTH' includes albacore.*

Japanese interviewees noted that the COVID-19 pandemic had hit the Japanese longline fleet and carrier companies hard. Since the onset of COVID-19 in January, restaurants, izakayas (Japanese taverns) and sushi bars in Japan have seen significant drops in the number of their customers, leading to contraction in demand and a price drop for sashimi tuna. Declining consumer demand for sashimi tuna has caused slower turnovers of tuna stock in cold storages. Transhipment vessels have reportedly been forced to stay at port for a longer period, waiting for cold storage spaces to become available. In addition to reduced prices for fish, fishing vessel owners are required to bear additional demurrage charges from carrier vessel companies.

### 6.2.2 China

The Chinese LSPLV fleet commenced fishing in the Atlantic in 1994, with China joining ICCAT in 1996[61]. China currently has 41 longline vessels authorised to take tuna in ICCAT waters, although the number active vessels in any one year is controlled in practice by the allocation of national quotas to individual vessels. In principle, all vessels are authorised to undertake at sea transhipment[62]. The fleet is largely owned and operated across five companies/groups: China National Fisheries Corporation (including Zhongyu Global Seafood Corp.), Shanghai Deepsea Fisheries Co. Ltd, Fujian Yaoxiang Marine Fisheries Co., Ltd, Dalian Ocean Fishing Co., Ltd. and Liaoning Kimliner Ocean Fishing Co., Ltd.

The fleet primarily targets BET in tropical areas, with YFT, ALB, SWO, sharks and other species taken as bycatch (Figure 40; ICCAT, 2019f). In 2017, 34 Chinese LSPLVs operated in tropical Atlantic waters, with two longliners seasonally shifting to the northern Atlantic Ocean to target Atlantic bluefin tuna (ICCAT, 2019f). The fleet is broadly 'larger in size and older' than average with an average size of 588 GRT and average age of 28 years (Figure 36; Figure 37). Unlike recent Chinese company investment in other ocean basins (e.g. the WCPO), no new Chinese-flagged LSPLVs have been built since 2003[63].

[61] https://www.iccat.int/en/contracting.html#

[62] Although, the maximum number of LSPLVs authorised to undertake transhipment to any one carrier is 37 (Table 1).

[63] By comparison, the average year of build for the Chinese longline fleet in the WCPO is 2007 (MRAG Asia Pacific, 2019). Anecdotal information indicated that the differences in fleet composition are driven by the different management measures adopted by different RFMOs. In the Atlantic, the number of Chinese flagged

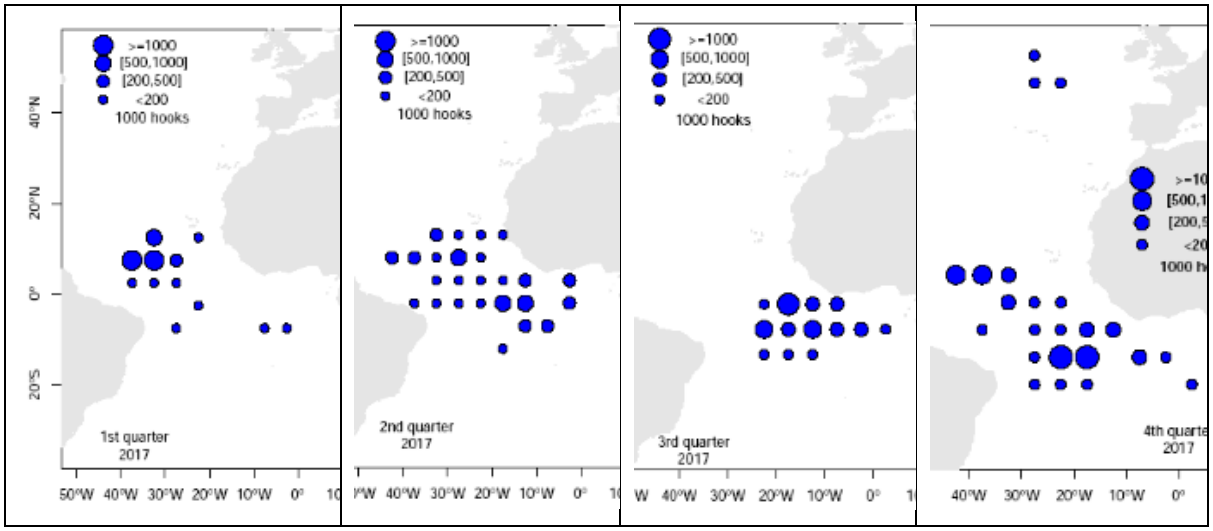



*Figure 40: Quarterly effort distribution of Chinese LSPLVs, 2017 (ICCAT, 2019f).*

Chinese interviewees confirmed that each of the vessels are of the 'deep frozen tuna longline vessels' type with capacity to freeze fish to >-60°C. Transhipment at sea is central to the fleet's operation, with fish sent by ULT carrier to east Asian sashimi markets (primarily Japan, Korea and China[64]). Unlike other ocean basins where some flagged vessels are based in coastal States adjacent to fishing ground (e.g. the WCPO), China has no vessels operating from local bases in the Atlantic.

Industry interviewees advised that vessels typically remain at sea for much of the year, calling into port mainly for compulsory technical inspections (e.g. all Chinese distant water fishing vessels must have an annual technical inspection by China Classification Society in port to ensure the vessel meets safety standards) and repair. While in port, vessels typically take the opportunity to unload catch into containers to be transported to China for processing and re-export to Japan or EU (the latter being mainly SWO and some YFT taken as bycatch). The main ports used by Chinese vessels include Cape Town, Dakar and Las Palmas. Industry interviews indicate that Chinese vessels do not frequently undertake transhipment in port. Vessels usually undertake a major refit every two years on average, but tend to do so in ports in the Atlantic (returning to China being too expensive).

Thirty-four LSPLVs were reported to tranship at sea in 2018 (ICCAT, 2019g), with catches transhipped totalling 5,452t. The number of transhipments each vessel undertook is unknown, but is thought to average around 2-3 (this is broadly consistent with the 96 reported transhipments by Chinese vessels in the period September 2018 to August 2019; ICCAT, 2019a). BET was by far the dominant species transhipped, accounting for 83% of the total transhipment volume (Figure 41). YFT accounted for 7%, while SWO, ALB and other species accounted for the remaining 10%. Industry interviewees advised that, generally, around 80% of the Chinese fleet catch would be transhipped at sea.

vessels and new investment is controlled by longstanding ICCAT measures limiting the number of vessels targeting each stock (Industry interviews).

[64] ALB bycatch is typically used for canning. This may be more so in 2020 given COVID-19 impacts on sashimi markets.

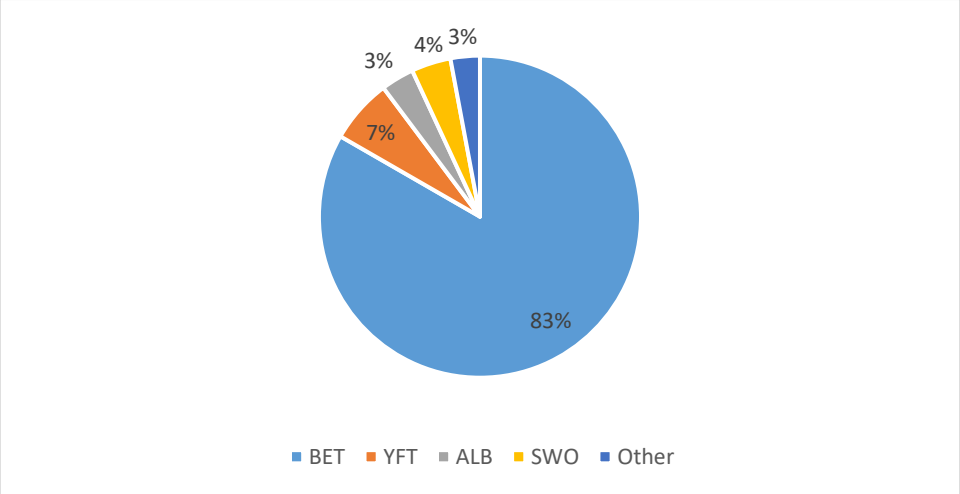



*Figure 41: Composition of species transhipped at sea by Chinese LSPLVs during 2018.*

Thirteen carriers are authorised to tranship from Chinese-flagged vessels (7 Panamanian, 3 Japan, 2 Liberia, 1 Singapore) (Table 1). The majority of carriers are authorised to tranship from 37 vessels, with two other vessels authorised to tranship from 34 and 32 vessels respectively. For one carrier, the Panamanian-flagged Futagami, the vessel is authorised only to tranship from 32 Chinese LSPLVs. Despite the minor differences in numbers, a broad policy exists to allow for transhipment at sea by all Chinese-flagged vessels targeting tropical species (we note that the authorisation dates for at least some Chinese-flagged vessels for some carriers expired – the differences in timing in registering vessels and authorising transhipments may account for the minor differences in numbers).

Industry interviews indicated that the Chinese fleet actively transhipps to all main carrier companies operating in the Atlantic, with the actual carrier used chosen on a mix of longstanding relationships and convenience.

ICCAT (2019f) reports that catch limits for key species (e.g. BET, ALB-S, ALB-N, SWO-S, SWO-N) are allocated to each LSPLV at the commencement of each year, with vessels required to report catches to the China Overseas Fisheries Association and Shanghai Oceans University each month. ICCAT (2019f) also notes that any transhipment is subject to pre-notification and the China Bureau of Fisheries will issue the authorization letter for each transhipment if all the requirements are met.

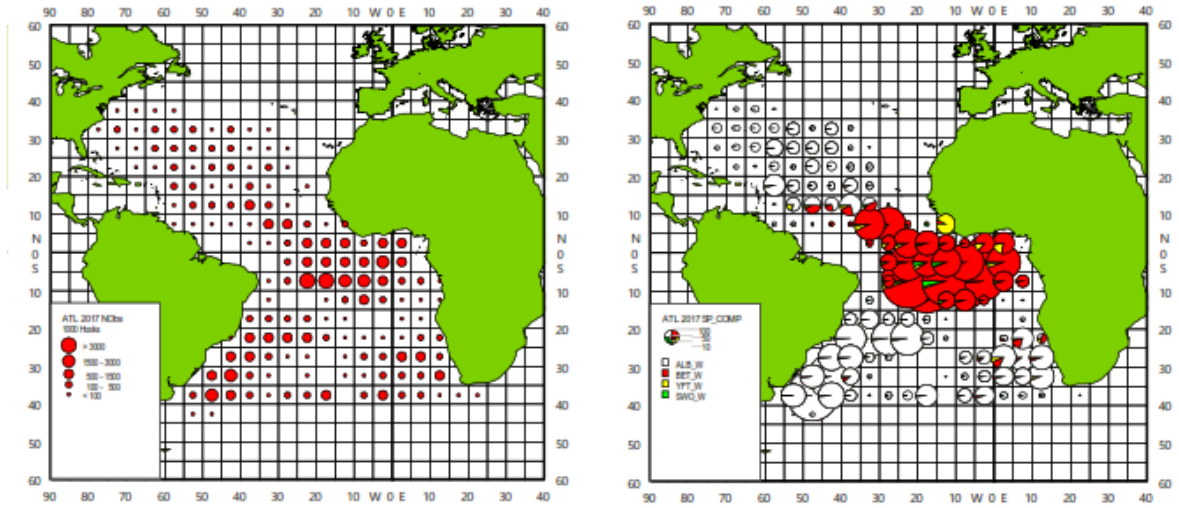
### 6.2.3 Chinese Taipei

Chinese Taipei currently authorises 85 LSPLVs to fish for tunas in the ICCAT area, 55 of which are authorised to tranship at sea[65]. Each of those LSPLVs authorised to tranship at sea are authorised to target tropical tunas (amongst others). LSPLVs not authorised to tranship at sea are typically authorised to target southern albacore and swordfish, not tropical tunas. This is unlike other ocean basins (e.g. the WCPO) where Chinese Taipei vessels may target albacore for canning and tranship to carriers on the high seas (e.g. Campling et al, 2017).

ICCAT (2019f) report that Chinese Taipei longliners "*commenced operating in the Atlantic Ocean in early 1960s to target albacore and yellowfin tuna. In late-1980s, newly built longliners equipped with deep-freezers started operating in tropical areas to target bigeye tuna*". The fleet is broadly divided into two types: one targeting BET in tropical waters (mainly between 15°N and 15°S) and one targeting ALB in both southern waters (off the southwest coast of Africa, as well as the waters off the southeast coast of South America) and a to lesser extent northern waters (around 15°N-40°N/30°W-75°W) (Figure 42). In 2017, 54 vessels targeted bigeye tuna while 30 targeted albacore.

[65] ICCAT RoV, as at June 2020

Catches by Chinese Taipei LSPLVs in 2018 were broadly equal, with 11,630t of BET reported and 12,153t of ALB (9,227t in southern waters; 2,926t in northern waters; ICCAT, 2019i). No Chinese Taipei vessels have targeted BFT since 2007 (ICCAT, 2019f).



(a) (b)

*Figure 42: Distribution of (a) fishing effort and (b) catches by species for the Chinese Taipei LSPLV fleet in 2017 (ICCAT, 2019f).*

The Chinese Taipei LSPLV fleet operating in the Atlantic appears to be of three basic types: a larger, older fleet (>700 GRT) built in 1990 or before; a mid-sized (350GRT – 650GRT) built mainly between 1993 and 2005; and a smaller, newer fleet (between 198GRT and 380GRT) built since 2013[66].

Fifty-two Chinese Taipei flagged LSPLVs were reported to have transhipped at sea during 2018, transferring a total of 8,508t (ICCAT, 2019g). BET was the dominant species transhipped, accounting for 92% of transhipment volume. YFT and SWO accounted for 5% and 2% respectively, with very small quantities of albacore and other species also transferred. There was a broad trend towards larger vessels transhipping higher volumes, but the relationship was not strong (Figure 44). Very few transhipments are made in northern waters or the south western Atlantic fished by Chinese Taipei vessels targeting ALB (Figure 32).

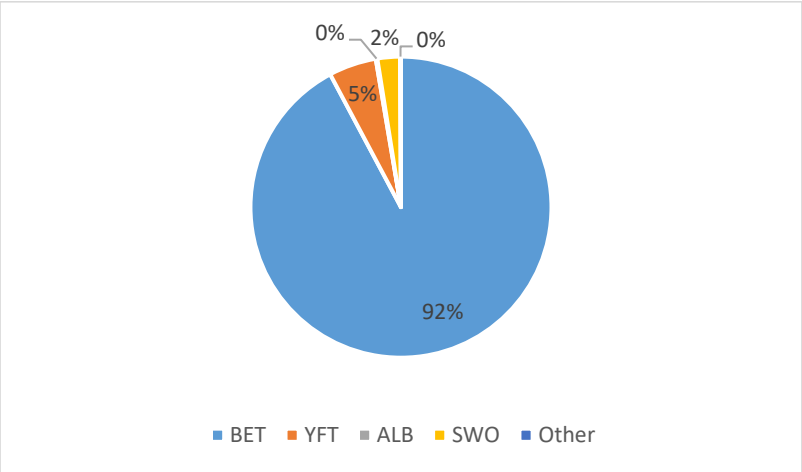



*Figure 43: Composition of species transhipped at sea by Chinese Taipei LSPLVs during 2018 (Data source: ICCAT, 2019g).*

[66] ICCAT RoV, as at June 2020

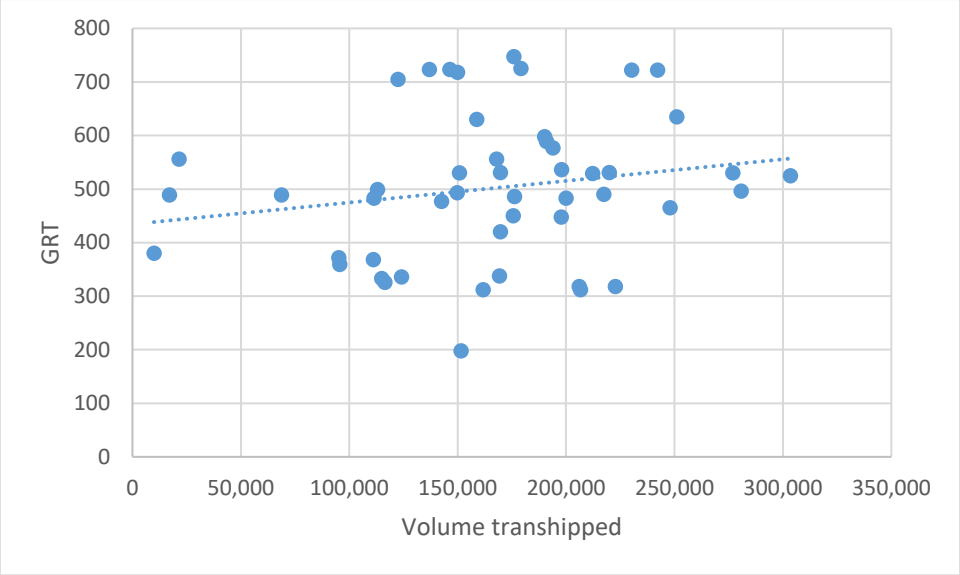



*Figure 44: Transhipment volume in 2018 vs vessel size amongst the Chinese Taipei LSPLV fleet (Data source: ICCAT, 2019g; ICCAT RoV, as at June 2020).*

A total of 20 carriers are authorised to receive product from Chinese Taipei-flagged LSPLVs, with all but three authorised to receive product from all vessels (the other three being authorised to tranship from 54, 53 and 53 vessels respectively) (Table 1)[67]. Of the 20 carriers, nine are flagged to Panama, five to Chinese Taipei, three to Japan, two to Liberia and one to Singapore. Apart from the Chinese Taipei flagged carriers, the remaining carriers are operated by Japanese companies, primarily Mitsubishi, TRL and Taiseimaru Kaiun Kaisha (TKK). For the five Chinese Taipei-flagged carriers, Chinese Taipei-registered LSPLVs are the only vessels from which carriers can receive fish.

In addition to transhipping at sea, the Chinese Taipei fleet also undertakes some transhipment in port (ICCAT, 2019b). Data for the 2018 year indicated that the volume transhipped in port (2,641t) was roughly 24% of the volume transhipped at sea (10,875t) (ICCAT, 2019b,c). The substantial majority (83%) of total tonnage transhipped in port was ALB, with only relatively minor quantities of BET, YFT and SWO transhipped (Figure 45). In practice, this may reflect the different destination market for the product with ALB also used for canning.

[67] Note that all but two of the 20 carriers authorised to receive fish from Chinese Taipei LSPLVs are authorised to receive fish from 56 vessels. One vessel – Chin Cheng Ming – no longer appears on the ICCAT RoV (as at June 2020) and may account for the difference between the number of currently registered vessels (55) and those authorised to tranship (56).

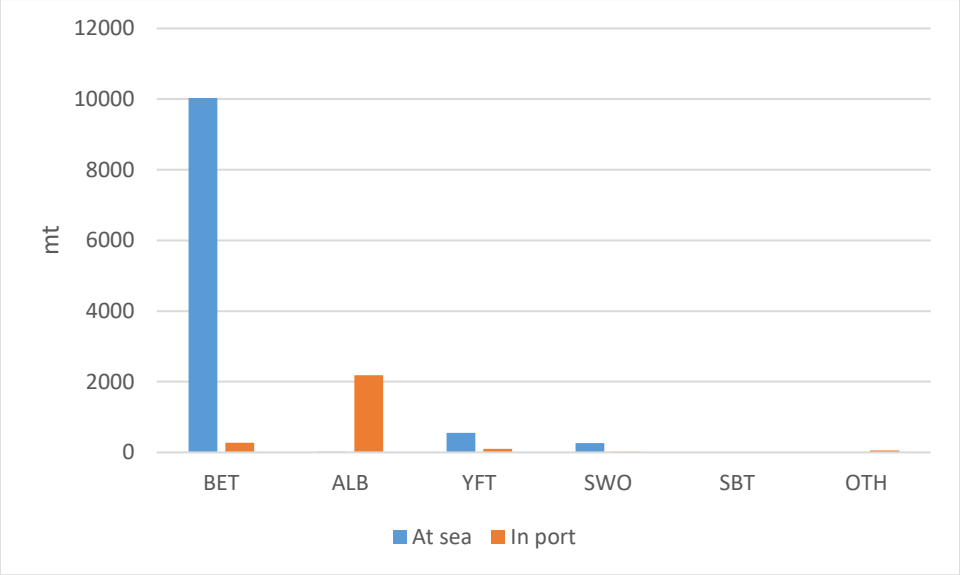



*Figure 45: Reported volumes of at sea vs in port transhipment of the Chinese Taipei LSPLV fleet in 2018 (Data source: ICCAT, 2019b,c).*

### 6.2.4 Korea

Korea currently authorises 34 LSPLVs to target tunas in ICCAT waters, with 12 authorised to target tropical species[68]. Eleven and 12 vessels were active in 2016 and 2017 respectively (ICCAT, 2019f). The fleet has a broadly similar pattern of effort/catch to the Japanese fleet, with catches across a wide range of latitudes (Figure 46). ICCAT (2019f) reports that the targeting changes seasonally, with BET and YFT targeted in tropical waters during the first quarter of the year, SBT targeted in southern waters in the second and third quarters and BET/YFT in tropical waters and BFT at high northern latitudes targeted in the fourth quarter.

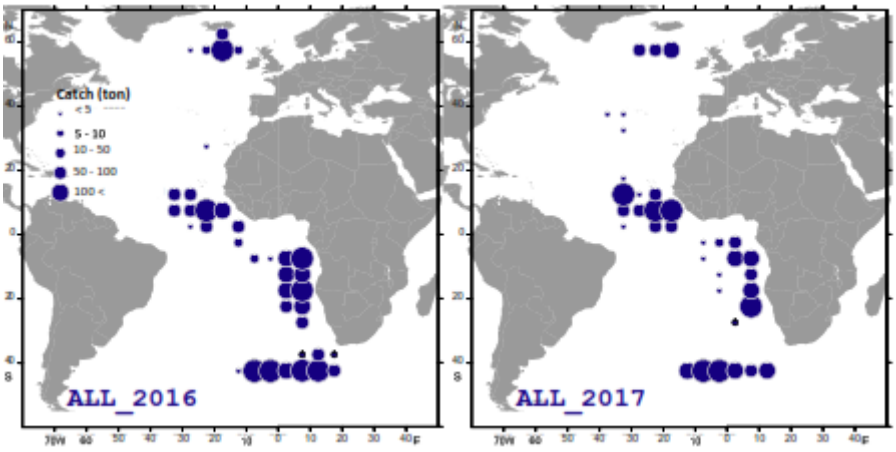
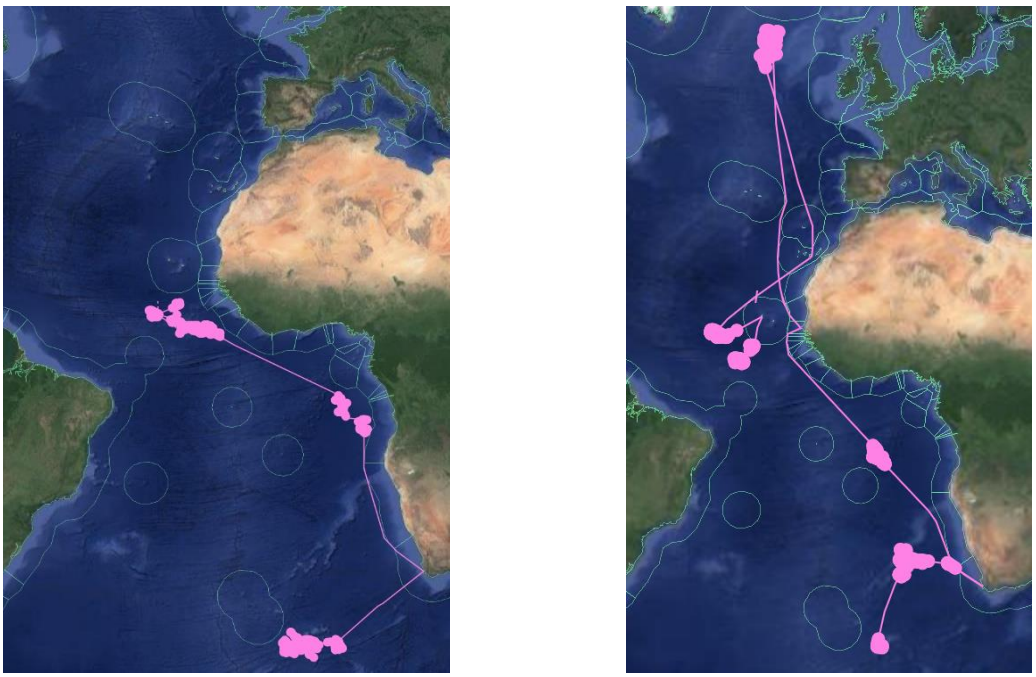



*Figure 46: Distribution of catch by Korean flagged LSPLVs in the ICCAT area, 2016 (left panel) and 2017 (right panel) (ICCAT, 2019f).*

The seasonal nature of the Korean fleet is illustrated by the vessel track for one Korean LSPLV in Figure 47. The vessel commences the year in tropical waters off the west African coast before fishing for a period in the high seas adjacent to the Gabon and Angola EEZ. The vessel then calls into Cape Town before targeting SBT south east of Tristan Da Cunha. The vessel then moves north to fish

[68] ICCAT RoV, as at June 2020

for a period outside of the Namibian EEZ and briefly in equatorial waters, before steaming north to target BFT south of the Iceland EEZ. The vessel then returns to tropical waters in November/December.



(a) (b)

*Figure 47: Annual vessel track of one Korean LSPLV for 2018, January to June (left panel), July to December (right panel). (Source: Global Fishing Watch)*

Of the vessels authorised to target tropical tunas, Korea has the largest average vessel size of the four main LSPLV fleets authorised for at sea transhipment (611GRT)[69]. The average age of the feet is 30 years[70], although Campling et al (2017) reported that, for similar Korean vessels operating in the WCPO, with diligent maintenance one view was there was considerable working life left in the fleet. Korean flagged LSPLVs operating in the ICCAT area have slurry, blast and freezing capacity to -60°C.

The majority of the Korean fleet in the ICCAT area are owned and operated by two companies: Dongwon and Sajo Industries. Dongwon is a leading processor of ULT tuna, undertaken at its processing facilities in Busan[71]. Fish are sourced from its own longline vessels, as well as others, across all major oceans. Tuna are processed into various forms (raw, loin, block, steaks) before being exported to Japan, the US and Europe, or sold domestically through its own brands. Dongwon also operate a comprehensive international and domestic cold chain logistics network through its distribution brand Loex[72].

[69] ICCAT RoV, as at June 2020

[68] Ibid.

[71] http://www.dwml.co.kr/eng/contents/distribution/processing

[72] http://www.dwml.co.kr/eng/contents/logistics/tploverview


*Figure 48: Dongwon cold storage in Busan, Korea (Source: Dongwon)[73].*

Founded in 1971 as a small tuna fishing business, the Sajo group has grown to become a diverse, integrated group comprising over 25 companies with interests across fishing, seafood processing and distribution, farming, food products, golf and IT logistics[74]. Campling et al (2017) note that the collective Sajo fleet, which also operates across all major oceans, is reportedly the 'world's largest (sashimi) tuna longline fleet'. The Sajo group is a key processor of longline tuna products in Korea, with processing and cold storage facilities in Busan[75].

In 2018, six Korean LSPLVs were reported to tranship catch at sea (ICCAT, 2019g), each of which was authorised to take tropical species[76]. Vessels undertook a total of 14 transhipments (ICCAT, 2019g), with each vessel undertaking between one and four transhipments. Individual transhipment volumes ranged from 26.7t to 157.6t, with the total volume transhipped 1,367t. Transhipments were dominated by BET, SBT and YFT, accounting for 32%, 30% and 27% total at sea transhipment volume respectively (Figure 49). Only small quantities of ALB (6%) and other species (5%) were transhipped.

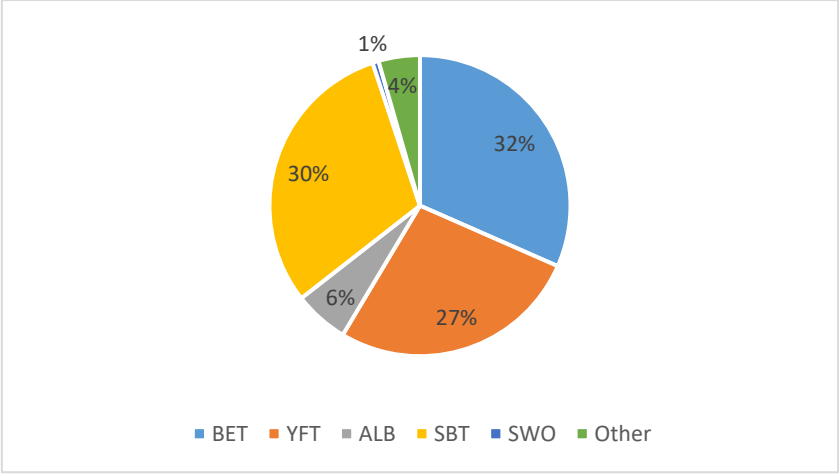



*Figure 49: Composition of species transhipped by Korean LSPLVs during 2018 (Data source: ICCAT, 2019g).*

Fourteen carriers are currently authorised to receive fish from Korean vessels (Table 1). Unlike other main fleets which effectively authorise all LSPLVs to tranship to each authorised carrier, the number of Korean LSPLVs authorised to tranship to each carrier varies between six and 12. The Korean Overseas Fisheries Association (KOFA) advised that a list of carriers to receive fish from Korean LSPLVs is submitted by industry to the Government of Korea at the beginning of the year to fulfil the

[73] http://www.dwml.co.kr/eng/contents/distribution/processing

[74] http://www.sajo.co.kr/en/group/introduce.asp

[75] http://sf.sajo.co.kr/eng/business/foodBusiness.asp; http://sf.sajo.co.kr/eng/business/freezeStorage.asp

[76] ICCAT RoV, as at 2020

ICCAT transhipment requirement. All carriers authorised to receive fish from Korean LSPLVs are operated by Japanese companies.

### 6.2.5 Other fleets

Namibia authorises three LSPLVs to target tropical species, with two (Shang Fu and Nata 2) authorised to tranship to seven carriers, all operated by Japanese companies[77].

One previously Belize-flagged vessel, Tai 1, remains listed as being authorised to tranship to a number of carrier vessels, although it is no longer flagged by Belize.

Cote d'Ivoire authorises a total of 27 LSPLVs to target tropical species, but only two (Everrich 1 and Everrich 636) are authorised to tranship at sea. The vessels are authorised to tranship to four carriers, all operated by Mitsubishi/MRS.

St Vincent and Grenadines authorises four LSPLVs in tropical ICCAT waters, with three (Dae Young 112, Dae Sung 216, Dae Sung 226) authorised to tranship at sea. These vessels are authorised to tranship to four carriers, each operated by Mitsubishi/MRS.

## 6.3 Fleet dynamics

### 6.3.1 Fleet organisation

A number of companies made the point that coordinating transhipments in the longline sector is less stable and predictable than the purse seine sector. Some also noted that planning and logistical coordination of longline trips is more challenging than purse seine because the volumes are much smaller, hence there is a need to coordinate with more vessels to fill up.

Carrier companies must first decide whether it's worth making the trip – interviewees for this and the previous WCPO project (MRAG Asia Pacific, 2019) advised trips can be a big risk and many made the point it's easy to lose money if the judgement isn't right or circumstances change for the worse. Nevertheless, some interviewees noted that sometimes carriers are sent even if there's not demand for the full volume, in order to beat the competition.

As in purse seine, the motivation for the carrier is to fill up and return to the offloading port in the fastest possible time, at the least possible cost. For the fishing vessel, the motivation is to steam the shortest distance and lose the least possible fishing time. To that end, longline carrier companies work closely with fishing companies to plan voyages and determine transhipment locations. Carrier companies typically start with a voyage plan, although arrangements are flexible.

The actual location of transhipment is largely determined by the pattern of fishing activity – if a large number of vessels are concentrated in one area, the carrier will go to them; if the boats are more dispersed, the vessels will come to the carrier. If the fishing vessel is in transit between fishing ground, sometimes the carrier will meet them mid-transit if convenient. Carrier companies have a clear commercial incentive to avoid steaming large distances around the ocean picking up small volumes at a time – as one carrier company representative put it 'operating a taxi service costs money'.

Perhaps more so than in the purse seine fishery, transhipments in the longline sector are pre-arranged between the fishing and carrier companies. Because carriers also provide an important reprovisioning service to long-range longline vessels - with provisions (e.g. food, bait, gear, etc) loaded on the carrier by the fishing company before it leaves port – it is not necessarily the case that vessels can simply offload to the nearest carrier. The carrier to which a vessel will offload is often

[77] All information in this section drawn from ICCAT RoV, as at June 2020

pre-determined – the only thing to be negotiated is the meeting point (albeit the carrier will often meet up with the fishing vessels to supply provisions without transhipping).

Similar to the purse seine fishery, there is limited fidelity in longline vessels offloading fish only to carriers flagged to the same State. One large carrier operator advised that they worked with all flag States to maximise commercial flexibility.

### 6.3.2 A typical transhipment

Because of the logistical (vessel reprovisioning) components, planning for a transhipment in the longline sector often starts earlier than in purse seine, and well before the carrier has left the wharf. Where reprovisioning is required, the fishing company will coordinate with the carrier company to arrange space for the provisions (e.g. bait, food, gear, etc). If necessary, the carrier will stop briefly at the home ports of the fishing company to pick up provisions (it is not unusual for example, for a Japanese carrier to stop briefly in Korea and Chinese Taipei before heading to the fishing grounds). The carrier will also stop en route to embark an ICCAT ROP observer, most frequently in Cape Town[78].

During the carrier's steam to the fishing grounds, the carrier company is in constant communication with prospective fishing vessels. Once the broad details of the transhipment have been agreed (primarily time, location and volume to be transhipped), both the carrier and fishing companies will notify their relevant flag State authorities that a transhipment will take place. In the case of LSPLVs, the master/owner of the vessel must notify it's CPC of the details of the transhipment at least 24 hours in advance of the intended transhipment, consistent with ICCAT Recommendation 16-15.

At the agreed time of transhipment, the longline vessel will secure itself to the carrier, with large fenders preventing impact between vessel hulls[79]. Fish from the longline vessel are typically transferred to the carrier on 'strings' using a crane from the carrier vessel[80] (Figure 50), but nets and sacks are also occasionally used depending on the product. The fishing vessel's estimate of weight is typically used for reporting, although crane scales are sometimes used. Transfer of each string is done as quickly as possible to minimise cold chain risks. Transfer of a string from hold to hold can be completed in less than 30 seconds. The temperature of fish is often checked during the transfer process. Normally a hole is drilled in a fish from the first string and a thermometer inserted. If it is above a threshold temperature (normally around -45°C), the transhipment will be stopped.

[78] https://www.iccat.int/Documents/Comply/transhipmentreports_current.pdf

[79] For footage, see https://www.youtube.com/watch?v=uLNp61i0-ac

[80] For footage of the process of moving frozen tuna via strings and loading holds see: https://www.youtube.com/watch?v=wlL4KbJ7nB0; https://www.youtube.com/watch?v=Nez9Sjh-b5M

*Figure 50: (a) 'Strings' used to transfer fish from the longline vessel to the carrier and (b) crane scales used to verify weights (Source: MRAG Americas[81]; ICCAT, undated a[82]).*

Transhipment times in the longline sector are considerably shorter than the purse seine sector. In the 2018-19 reporting period, the vast majority of transhipments lasted between one and six hours (Figure 51). Transhipment rates vary between 2t and 40t per hour depending on circumstances (carrier, LSPLV, transfer technique, weather, sea state), but most transhipments achieve between 16t and 30t transferred per hour (Figure 52a). The volume transferred per transhipment also varies markedly from <10t to >200t, but is most frequently in the range of 40t to 70t. Transhipment volumes can be influenced by a range of factors including the size of the vessel, cash flow needs of the business, proximity of an available carrier and market conditions amongst others.

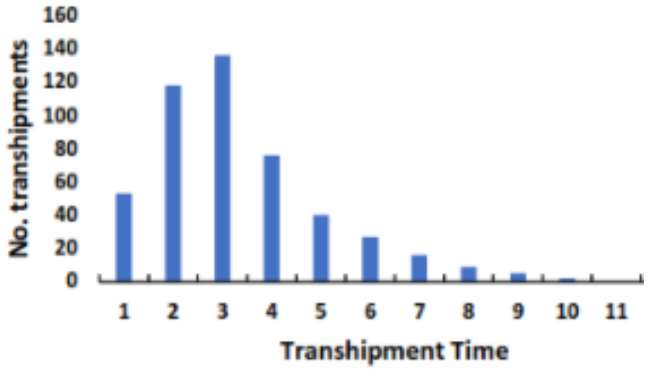
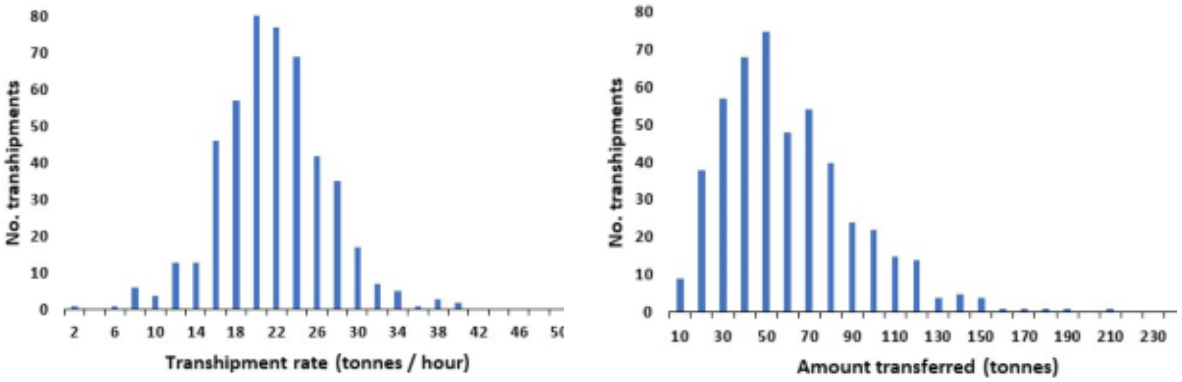



*Figure 51: Transhipment times for LSPLV at sea transhipments under the ROP during the 2018-19 reporting period (ICCAT, 2019a)*

[81] https://www.mragamericas.com/fisheries-monitoring-division/

[82] https://www.iccat.int/Documents/Comply/transhipmentreports.pdf




*(a)* *(b)*

*Figure 52: Transhipment rate and amounts transferred per transhipment event by LSPLVs during the 2018-19 reporting period (ICCAT, 2019a).*

Any provisions arranged by the fishing company will also be loaded onto the longliner as part of the transhipment, although this may also be done separate to a transhipment event. Anecdotal information from transhipment programs indicates that the number of non-fish/supply transfers at sea between carriers and longliners can equal or exceed the number of transhipments (MRAG Ltd, pers. comm.)[83]. A number of carrier companies advised that the number of people who can go on board carriers is limited. To that end, crew exchanges occur during transhipment only when really needed. Carriers operating in the same fleet may coordinate supply activities – e.g. by transferring bait/supplies between vessels[84].

Once transhipment is completed, the master of the receiving carrier vessel is required to submit an ICCAT transhipment declaration to the ICCAT Secretariat and the flag CPC of the LSPLV within 24hrs of the completion of transhipment (see clause 17 of Recommendation 16-15). LSPLVs are required to submit a transhipment declaration to their flag CPC within 15 days of the completion of transhipment.

The majority of fish transhipped from LSPLVs at sea in the ICCAT area is destined for Asian sashimi markets, principally Japan. For fish destined for the sashimi market, many carriers simply provide a logistics service. A fee is charged for the service of transferring fish to market, with the size of the fee primarily a function of the volume and distance to market, but also taking into account factors such as fuel price, demurrage and other port costs. Because of the distance of the Atlantic from the main east Asian markets, the cost of freight is typically higher than other ocean basins (one carrier operator estimated a ~20% price difference between the Atlantic and the WCPO). The price for the fish themselves is ultimately negotiated between the fishing company and the buyer in the market State (e.g. a Japanese sashimi trader), based on quality etc.

Payment terms for companies providing a logistics service only vary between companies and customer. One Japanese carrier company advised they typically got paid within 14 days of the fish being landed, but for some customers with a poor track record of payment, they will ask for some of the fee upfront (with the balance adjusted as necessary after the completion of the trip). Several other carrier companies noted they got paid after the fish was landed at port and weighed.

The number of LSPLVs from which catch is received during each trip varies markedly according to a range of factors including demand from offloading vessels, the carrying capacity and load status of

[83] For footage of bait and supplies in the hold of a LSPLV carrier see: https://www.youtube.com/watch?v=b_shg-FLOXU and https://www.youtube.com/watch?v=EMAfDWT2BGk

[84] See for example, the transfer of cargo, bait and fuel between Mitsubishi/MRS vessels Tuna Queen and Yachiyo on observer deployments 231/232.

offloading vessels, the capacity of the carrier, whether the carrier transhipps in the IOTC area during the same trip and the risk/reward considerations of the carrier remaining on the fishing grounds. In the period July 2015 to July 2019, the number of at sea LSPLV transhipments per trip reported by ROP observers ranged from two to 64, with an average of 33 (Figure 53: Numbers of LSPLV transhipments in the ICCAT area per trip, July 2015 to July 2019 (covering ROP deployments 172 to 235). (Data source: ICCAT, 2016b, 2017a, 2018a, 2019a, undated a) [85]. Around 68% of trips transhipped from between 20 and 50 LSPLVs per trip.

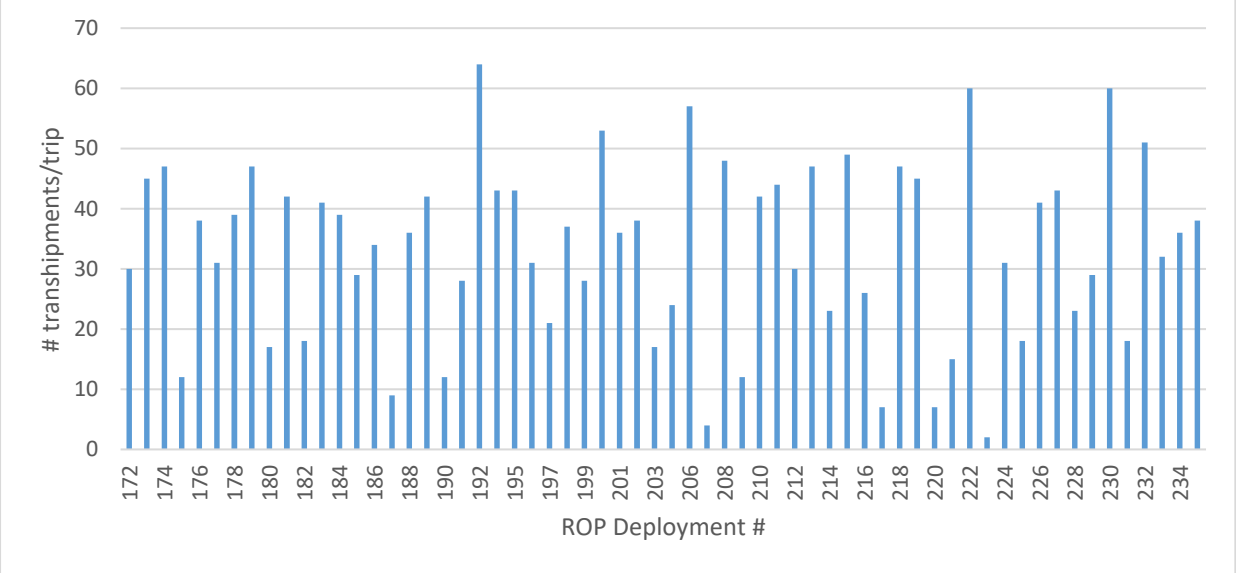



*Figure 53: Numbers of LSPLV transhipments in the ICCAT area per trip, July 2015 to July 2019 (covering ROP deployments 172 to 235). (Data source: ICCAT, 2016b, 2017a, 2018a, 2019a, undated a)*

Vessels may also undertake transhipment from LSPLVs in port in the ICCAT area, which may influence the number of at sea transhipments made. Key ports used for in port transhipments include Cape Town, South Africa, Mindelo, Cape Verde, Walvis Bay, Namibia and Dakar, Senegal. Vessels typically undertake transhipments in port in conjunction with scheduled port visits for crew rest and exchange, reprovisioning and basic maintenance. Carriers also call into port to tranship BFT from LSPLVs which is prohibited at sea under Recommendation 19-04[86]. One carrier company representative advised that this is the reason many carriers often call into Mindelo, Cape Verde before returning to Japan.

Data on in port transhipments are less well documented than at sea transhipments within the scope of the ROP. Although not required under Recommendation 16-15, ROP observers informally report in port transhipments made by their host carriers, but are often disembarked prior to transhipments or placed in onshore accommodation while the vessel is in port and are not witness to all transhipments. To that end, the number of in port transhipments reported by ROP observers should be seen as a minimum. One carrier company representative estimated the number of in port transhipments would be <20% per trip.

The total volume of fish transhipped from LSPLVs per trip varies markedly according to a similar range of factors influencing the number of transhipments. In the period July 2015 to July 2019, total

[85] https://www.iccat.int/Documents/Comply/transhipmentreports_current.pdf; https://www.iccat.int/Documents/Comply/transhipmentreports.pdf

[86] https://www.iccat.int/Documents/Recs/compendiopdf-e/2019-04-e.pdf

transhipment volume varied between 132t and 3857t, with an average of 1925t (Figure 54). Around 73% of trips transhipped between 1000t and 3000t.

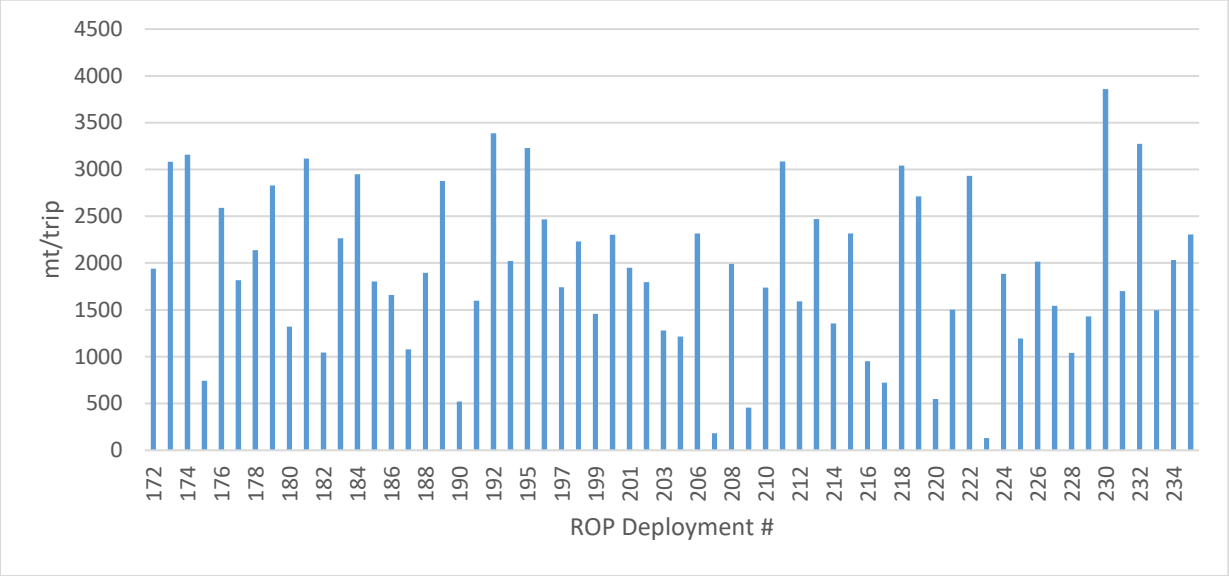



*Figure 54: Total volume of fish transhipped from LSPLVs in the ICCAT area per trip, July 2015 to July 2019 (covering ROP deployments 172 to 235). (Data source: ICCAT, 2016b, 2017a, 2018a, 2019a, undated a)*

Once the final transhipment has been completed, the carrier will steam to the market destination - typically Japan for sashimi grade fish, where fish are often sold through one of the main sashimi traders (e.g. Torei, Try Sangyou; Campling et al, 2017). Sashimi grade fish delivered to Korea are often further processed (e.g. by Dongwon, Sajo) before re-export to Japan or sale domestically (Korean industry reps, pers. comm.).

Carriers will typically reprovision themselves from the last offloading port.

### 6.3.3 Flag state fidelity

While the flag State of LSPLVs transhipping to individual carriers is not publicly available, anecdotal information from carrier companies indicates that there is little exclusivity (e.g. carriers specialising in sourcing fish from only one flag State's LSPLVs) or flag State fidelity (e.g. Japanese carriers sourcing only from Japanese LSPLVs). Of the observer deployments reported in the 2018-19 period for which the observer report is available, carriers sourced from a minimum of two and maximum of six flag State LSPLVs (Figure 55). Interviewed companies indicated that they maintained customer bases across multiple flag States which provided flexibility to both carrier companies and fishing companies in arranging for the most efficient transhipment option. Nevertheless, the identity of each flag State is not reported in public observer reports, so there is limited capacity to analyse detailed trends (for example, even if Japanese carriers source from multiple flag States, whether they transhipment more from Japanese vessels). The only real 'distinction' of note from the publicly available data is that Mitsubishi/MRS carriers are the only ones authorised to transhipment from Cote d'Ivoire and St Vincent and Grenadines-flagged LSPLVs (Table 1).

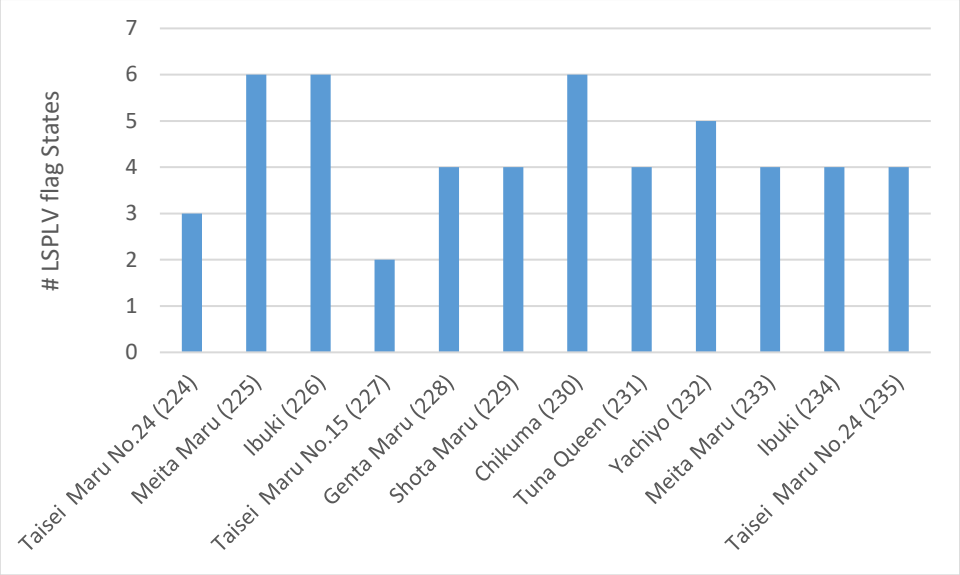



*Figure 55: Number of LSPLV flag States from which carrier transhipped (observer deployments 224 to 235, 2018-19) (ICCAT, undated b)[87].*

### 6.3.4 Why tranship at sea?

Stakeholders involved in the longline sector indicated there are substantial efficiencies associated with transhipment at sea – although they are not the only reasons companies tranship.

The key benefit all companies cited was the operational efficiency in reduced fuel costs and avoiding the loss of fishing time associated with steaming to port. This was particularly the case for smaller vessels who have limited fish and fuel holding capacity and would spend proportionally more time steaming to and from port. Chinese fleet operators advised that a typical round trip from the fishing grounds to port, unloading, then returning to the fishing grounds takes around one month in the Atlantic. If the vessel were to unload in port four times per year, the vessel loses up to four months' fishing time, plus the associated fuel, labour and port costs.

In addition to the fuel/fishing time savings, DWFN longline fishing companies also highlighted a number of other financial and administrative benefits from transhipment at sea:

- **Cheaper provisions** – all companies/associations noted that the key provisions involved in longline fishing (bait, gear, food, salt) could often be acquired cheaper in their home port (or the, usually east Asian, port of carrier unloading) than in ports in the ICCAT area;
- **No port and stevedoring fees** – transhipment at sea avoids vessels paying fees associated with port calls. Fees are typically dependent on the size of the vessel, services used and the length of stay. Transhipping at sea also avoids paying stevedoring fees where the use of local staff is required in port;
- **Less administrative paperwork/agent's fees** – transhipment at sea avoids the need to go through customs, immigration and other administrative checks undertaken by foreign ports. Many of these checks are handled by local agents, for which a fee is paid.

It is noteworthy that the price differential between at sea and in port bunkering is reportedly less pronounced in African ports than it is in some other fishing grounds (e.g. WCPO). Accordingly, access to cheaper fuel on the high seas is less of an incentive for high seas transhipment in the Atlantic than it may be elsewhere.

[87] https://www.iccat.int/Documents/Comply/transhipmentreports_current.pdf

A number of studies have also highlighted avoidance of in port MCS measures may be a key driver for at sea transhipment (e.g. FAO, 2018; MRAG Asia Pacific, 2019), although COVID-related travel restrictions prevented exploring this issue in any depth with interviewees for this project.

## 6.4 Key companies

The carrier sector supporting at sea transhipment from LSPLVs in the ICCAT area is dominated by three companies – Toei Reefer Line, Mitsubishi/MRS and Taiseimaru Kaiun Kaisha. In the period July 2015 to July 2019, ROP observers made 62 trips on carrier vessels: 24 trips were undertaken on carriers controlled by TRL, while 20 trips and 18 trips were undertaken on Mitsubishi/MRS-controlled and TKK-controlled carriers respectively (Annex 2).

**Mitsubishi/MRS**

The Mitsubishi Corporation is Japan's largest *sogo shosa*[88], or general trading company, whose business incorporates interests in 40,000+ subsidiary companies[89]. Mitsubishi, through its subsidiary Toyo Reizo Co. Ltd. (or TOREI) is the leading sashimi trader in Japan. With sales of around US$1.5b in 2016, Campling et al (2017) estimated TOREI's turnover more than doubled its next largest trading competitor (Try Sangyou).

Interviews with Mitsubishi staff indicated the company entered the transhipment business around 30 years ago and currently manages a fleet of seven carrier vessels, coordinated through its subsidiary MRS Corporation. These vessels form part of an integrated logistics/cold chain from fishing grounds/farms to the customer, which includes an extensive network of cold stores and processing facilities in Japan[90]. Both TOREI and MRS operate within Mitsubishi's Marine Products Department, which is in turn part of the wider Fresh Food Products Division[91].

Three of the carrier vessels – Lady Tuna, Tuna Queen and Tuna Princess – are primarily 'processing' vessels, which source product from tuna farms in the Mediterranean, Australia and Mexico and have specialised crew on board to undertake processing (although they may source from longline vessels – see Figure 56b). Each of these vessels is relatively large, at around 4,500 GRT, with product sourced suppling TOREI's 'Tuna Queen' brand[92].

The remaining four carriers – Chikuma, Ibuki, Chitose and Yachiyo (Figure 56a) – are focused on sourcing longline caught fish. These vessels are the largest active carriers undertaking at sea transhipments from the LSPLV fleet at 6,500+ GRT. All of Mitsubishi's seven carriers are listed on the ICCAT RoV.

[88] https://www.statista.com/statistics/719481/japan-largest-trading-companies-by-market-value/

[89] According to Orbis database company searches

[90] http://www.toyoreizo.com/index.php

[91] https://www.mitsubishicorp.com/jp/en/ir/library/meetings/pdf/180413/20180413_02e.pdf

[92] http://www.tunaqueen.com/index.html


(a)

(b)

*Figure 56: (a) The most recent addition to Mitsubishi carrier fleet, the 6,607 GRT Yachiyo, launched in 2019 and (b) a five month track for the MRS vessel Ibuki between March and August 2019 showing a journey from Shimizu, Japan with an initial port call in Dalian, China before transhipments in the Atlantic and Indian Oceans and return to Shimizu, Japan. (Source: WCPFC; Global Fishing Watch).*

Overall, Mitsubishi advised that they sourced more wild caught fish than farmed fish, although the exact proportions were not available. Of the wild caught fish, they estimated roughly equal amounts were sourced from each of the Atlantic, Indian and Pacific Oceans. Bigeye tuna is the most important species by volume, followed by yellowfin and albacore. Bigeye and yellowfin are mainly landed in Japan, but sometimes Korea and China. Mitsubishi haven't historically supplied fish into the EU market, but they advised the tax regime is becoming more favourable so it may be an option in future.

Mitsubishi reported that MRS operated independently of TOREI (MRS carried fish for other companies, TOREI purchased fish from other carriers, etc), but the two did coordinate. TOREI buy fish at the Japanese end after the fish are landed; MRS operate like a normal shipping company, charging a fee to the fishing company for the service of transporting the fish. MRS carriers specialise only in fisheries products.

The ownership/chartering arrangements for Mitsubishi's carriers were not entirely clear from our research. Mitsubishi reported that MRS typically charters vessels on a time charter basis, which provides flexibility to end the lease if necessary and means issues such as crew management are outsourced. Of Mitsubishi's seven vessels, four (Ibuki, Yachiyo, Tuna Queen, Tuna Princess) are listed as being owned by Star Navigation S.A. (alternatively listed as being based in Panama City and c/o Shinko Kaiun Co., Ltd in Tokyo) and flagged to Panama. Two - Lady Tuna and Chitose - are listed as being owned by Wang Tat Corporation, based in Singapore. Lady Tuna is flagged to Panama, while Chitose is flagged to Singapore. The remaining vessel – Chikuma – is flagged to Liberia and is listed as being owned by Oceanwide Shipping/MRS Corp.

Nevertheless, it is possible that Mitsubishi has a closer than normal charterer/owner relationship with at least some of the companies. For example, Star Navigation S.A. is listed as the owner of four

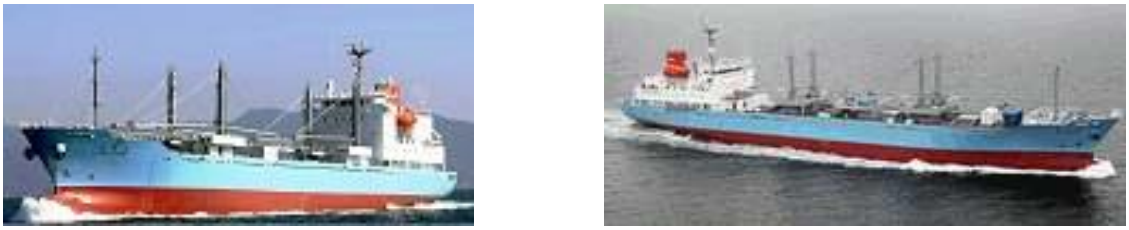
vessels controlled by Mitsubishi, and is not listed as the owner of any vessel other than those controlled by Mitsubishi, while MRS is listed as a co-owner of Chikuma with Oceanwide Shipping.

**Toei Reefer Line**

Toei Reefer Line Ltd (TRL) is a specialist marine transport and shipping services company, headquartered in Tokyo, Japan[93]. Founded in 1959, the company offers a broad range of shipping logistics services and is a leading operator in the ULT frozen tuna logistics industry. The company operates a fleet of five ULT carrier vessels - two directly owned Japanese flagged reefer carriers (Gouta Maru and Kenta Maru[94]) as well as a further three carriers through its Panamanian registered subsidiary Panama TRL SA:

- Genta Maru (Panama[95]);
- Kurikoma (Panama); and
- Meita Maru (Liberia).

All vessels are currently listed on the ICCAT Vessel List[96].



*(a)* *(b)*

*Figure 57: Toei Reefer Line ULT carriers Gouta Maru and Kenta Maru[97]*

In addition to its own fleet of vessels, TRL occasionally time charters third-party carriers (e.g. Futagami, Hsiang Hao) where demand outstrips its own carrying capacity.

Like Mitsubishi/MRS, TRL's carrier vessels are broadly of two types: transhipment carriers, focused on receiving sashimi grade fish from longline vessels at sea, and processors, focused on processing and transporting harvests directly from tuna farms in the Mediterranean, Australia and Mexico. At present they have three processors and two transhipment carriers although they are, to a large extent, interchangeable – the main difference being processing vessels carry a specialist crew to process farmed tuna. Company representatives confirmed that, on average, TRL's business is 50% farmed tuna, 50% wild caught tuna.

Although TRL operates across each of the three main oceans (Atlantic, Indian and Pacific), its main transhipment areas are the Atlantic and Indian Oceans. TRL tends to source from the main distant water fleets – those from Japan, Chinese Taipei, Korea and China. Very occasionally they will pick up purse seine caught fish, although the majority is bigeye and yellowfin carried at <-50°C. Sashimi grade fish is mainly delivered to Japan.

Each of its five ICCAT registered vessels is authorised to undertake at sea transhipments, as well as receive fish from BFT farms. According to company representatives, in 2018-20, three of its current vessels (Kurikoma, Meita Maru, Genta Maru) were involved in at sea transhipments from longline vessels, while two vessels (Gouta Maru and Kenta Maru) were involved in processing fish from BFT

[93] http://www.toeireefer.co.jp/index_e.html
[94] See footnote 34.

[95] Recently reflagged from Liberia to Panama

[96] Note that Souta Maru appears in the extract of carrier vessels undertaken in May 2020, but has recently been sold and no longer operated by TRL. The company has also recently sold vessel Houta Maru.
[97] http://www.toeireefer.co.jp/tanker/index.html

farms. An additional vessel previously operated by TRL, Shota Maru, was also involved in high seas transhipments during this period, but has since been sold (to Korean based Ji Sung Shipping and now operates under the name Lake Aurora[98]).

TRL was a pioneer of the seafood transhipment business, starting with shrimp but quickly moving into tuna around 35 years ago. The company now specialises in tuna transhipment, with few other types of products transported. The company also runs fish trading, bunkering and ship agency services, although tuna logistics is the core of the business.

Of the non-Japanese options for flagging its carriers, TRL advised that Panama is the preference because they have an EU Competent Authority (CA) which allows for the fish to be sold into the EU market[99]. Originally, several of its carriers were flagged to Vanuatu, but had subsequently been changed to Liberia. More recently, they've flagged to Panama because of the CA.

Examples of the company's two types of transhipping activity in the ICCAT area are illustrated in Figure 58 and Figure 59. Figure 58 shows a five-month track for the high seas transhipment vessel Meita Maru between February and July 2019. The vessel leaves from Shimizu, Japan, making brief stops in Busan, Korea and Kaohsiung, Chinese Taipei before proceeding to the southern Indian Ocean to make what appears to be transhipments south west of the Madagascar EEZ. The vessel then calls into Cape Town before steaming west to make transhipments west of the South African EEZ, then steams north to make transhipments near the Brazilian and French Guyana EEZs. The vessel then steams to Mindelo, Cape Verde before returning to Cape Town and then through the Indian Ocean to Shimizu, Japan, making a brief call at Zhejiang Province, China en route.


*Figure 58: Five month track for vessel Meita Maru between February and July 2019 showing a return trip from Japan to the Atlantic, with ports calls in China and Korea on the return. (Source: Global Fishing Watch)*

Figure 59 shows a six-month vessel track for the processing vessel Gouta Maru. The track commences at BFT farms in Croatia, Malta and Greece before returning via the Suez Canal to

[98] https://www.wcpfc.int/node/17175

[99] Broadly speaking, seafood imported into the EU is required to comply with regulations ensuring the safety and legality of the products (see for example: https://ec.europa.eu/food/sites/food/files/safety/docs/ia_trade_import-cond-fish_en.pdf; https://ec.europa.eu/fisheries/cfp/illegal_fishing/info_en). Imports are subject to official certification, which is based on the recognition of the competent authority of the non-EU country by the European Commission. Competent authorities are responsible for performing official controls throughout the production chain. Carriers wishing to be eligible to eligible to have fish on board sold into EU markets must be approved by their flag State competent authority.

Shimizu and Tokyo, Japan. The vessel then visits Busan, Korea, before returning to Shimizu. The vessel then makes stops at Puwan, China and Kaohsiung, Chinese Taipei before returning via the Suez Canal to the Mediterranean, making an initial stop at Tangier, Morocco. The vessel remained in the Mediterranean for a further six months making stops in Spain, Malta and Greece before returning to Japan in May, 2020.

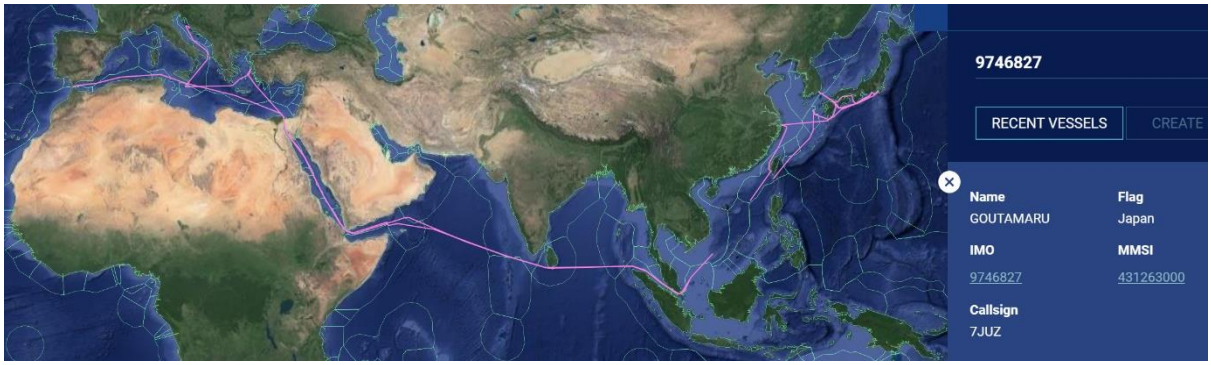



*Figure 59: Six month track for the vessel Gouta Maru between February and August 2019 commencing in the Mediterranean at BFT farms in Croatia, Malta and Greece before returning to Shimizu and Tokyo, Japan and Busan, Korea. The vessel then returned to the Mediterranean, making stops in China and Chinese Taipei en route. (Source: Global Fishing Watch)*

**Taiseimaru Kaiun Kaisha**

Established in 1960, Taiseimaru Kaiun Kaisha (TKK) is a specialist tuna longline carrier company based in Ise City, Mie Prefecture, Japan[100]. The company owns and operates two Japanese-flagged ULT capable carriers – the 4,969 GRT Taisei Maru No. 15 and the 4,992 GRT Taisei Maru No. 24 (Figure 60). The company has a broad history of transporting commodities across a range of fisheries and other sectors – chestnuts, live fish, shrimp – and entered the tuna transportation business around 1980. In recent years, the company has recently specialised in servicing tuna LSPLVs in the Atlantic and Indian Oceans[101] (Figure 61).

*Figure 60: Taiseimaru Kaiun Kaisha owned operated carrier Taisei Maru No. 24[102].*

[100] http://www.taiseimaru.co.jp/company/history/

[101] http://www.taiseimaru.co.jp/company/greeting/

[102] http://www.taiseimaru.co.jp/; for a video of Taisei Maru No. 24 at sea with LSPLV alongside, see https://www.youtube.com/watch?v=0XvjQSF8FNQ


*Figure 61: Five month track for vessel Taisei Maru No. 15 between June and November 2019 showing a journey originating in Shimizu, Japan before transhipping in the Atlantic and Indian Oceans before returning first to Tokyo, then Shimizu[103]. (Source: Global Fishing Watch)*

TKK list their main operating route commencing in Shimizu, Japan before making calls in Kushikino (Japan), Kaohsiung, Singapore and Cape Town en route to the Atlantic. After transhipping, vessels call into Cape Verde then return to Shimizu via Cape Town and Singapore[104]. Like other carrier companies, TKK transports ULT frozen tuna from fishing ground to markets in Japan, delivering supplies to fishing vessels including bait, food, fuel and gear.

The company lists Seishin Frozen Product Co Ltd[105], which operates a seafood processing, sales and cold store business, Taiseimarusuisan Kaiun Kaisha[106] and the Panama-based Ocho Dorado Shipping S.A. as affiliates on its website[107].

Both of TKK's current carriers are flagged to Japan, though Taisei Maru No. 15 was flagged to Vanuatu from 2013 to 2015[108].

# 7 BFT Harvesting

Key points:

- 'Transhipment' in the BFT sector is less traditional transfer of fish from one vessel to another and more processing of fish harvested from BFT farms in the Mediterranean and transport of the catch by carrier to market, principally in Japan and Europe.
- The bulk of harvesting happens in winter when water temperatures are colder and fish have a higher fat content. Once agreement has been reached on the details of the sale from farm to buyer, it is the responsibility of the buyer to arrange for the transport of the fish from the farm to market, including paying the transport fee. The buyer will typically contact one of the main BFT

[103] For a video of Taisei Maru No. 15 at sea, see https://www.youtube.com/watch?v=8A_SVX-8QAw

[104] http://www.taiseimaru.co.jp/business/

[105] Google translates the Japanese characters as "Sorishin Freezer Co. Ltd" on their website, but company searches indicate is more likely to be Seishin Frozen Product Co Ltd.

[106] Google translates as "Daimori Maru Fisheries Co. Ltd", but company searches indicate is more likely to be Taiseimarusuisan Kaiun Kaisha.

[107] http://www.taiseimaru.co.jp/company/group/

[108] http://www.taiseimaru.co.jp/company/history/

carrier companies to arrange for processing of the fish and logistics. A farm may sell fish to multiple buyers through a single harvesting period (each of whom may contract a different carrier company) such that multiple carriers may be involved.

- Carriers involved in BFT harvesting are similar in nature to those involved in at sea transhipment, except they carry specially trained processing staff.
- Carriers will typically process fish from multiple farms during a single trip, with voyages lasting up to 10 months. With an average year of build of 2006, carriers involved in BFT processing are some of the younger vessels in the ICCAT carrier fleet.
- Twelve carrier vessels have been active in BFT processing/transport in the 2017-2019 period, controlled by five companies: Mitsubishi, Toei Reefer Line, the Ricardo Fuentes group, Kanetomo and Tokyo Seafoods. One respondent advised that Mitsubishi and TRL vessels tend to transport fish to market in conventional carriers, whereas other companies operate smaller carriers and frequently transferred fish to containers for transport. This seems broadly consistent with the size profile of each fleet, with the average size of Mitsubishi/TRL BFT processing carriers being 4,990 GRT, whereas average size of the remaining companies' vessels is 1,621 GRT.

The third main sector of the 'transhipment business' in the ICCAT area is less traditional transhipment and more processing of fish harvested from BFT farms in the Mediterranean and transport of the catch by carrier to market, principally in Japan and Europe. All BFT farmed in the Mediterranean is harvested from the eastern BFT stock.

## 7.1 Fleet dynamics

BFT farming takes place on an annual cycle, with fish harvested by purse seine seiners mainly in June, consistent with Recommendation 19-04[109]. Fish are transferred into towing cages and transferred very slowly back to the farming location, an operation which can take months. Once there, fish are transferred from the towing cage to the farm cages for growout. Fish numbers and weights are estimated during the cage transfer for the purposes of monitoring compliance with national and individual company quotas. Fish are then retained in the farm cages for several months of feeding/growout until harvesting.

The bulk of harvesting happens in winter when water temperatures are colder and fish have a higher fat content. Fish with a higher fat content achieve higher prices at market, and considerable money can be lost if fish are left in cages too long and the water temperature warms up[110].

There are two basic types of harvesting: 'bulk' harvests in which fish is processed on board a ULT-capable freezer carrier ('a processing vessel') for later transfer to market, and 'fresh' harvests in which smaller numbers of fish (typically <100) are harvested and marketed fresh to selected markets. Fresh harvests are often undertaken in advance of the main 'bulk' harvesting period in winter to take advantage of lower supply and higher prices in niche markets, as well as to generate cash flow for farms. Fresh fish are typically transferred to market using smaller support vessels/airfreight and do not involve transport by carrier. The timing of harvesting is a critical commercial decision for farm operators who need to weigh up a range of considerations including market prices and volumes, water temperature and condition of fish, ongoing costs of feeding (the sooner you pull the fish out of cages, the less money spent on feed etc), etc.

Prior to harvesting, farm operators will typically negotiate with multiple buyers over the sale of the fish. The majority of fish is reportedly sold in the Japanese market through sashimi traders such as

[109] https://www.iccat.int/Documents/Recs/compendiopdf-e/2019-04-e.pdf

[110] Discussions with ex-industry participants indicate that fish tend to grow 'long and skinny' when the water temperature warms up, whereas the market prefers them 'short and fat'.

Toyo Reizo, Try Sangyou, Marubeni, Itochu, Kyochu, Maruha Nichiro (see Campling et al, 2017 for summary of main Japanese sashimi trading companies), although smaller quantities are sold in local European markets such as Spain. Once agreement has been reached on the details of the sale, it is typically the responsibility of the buyer to arrange for the transport of the fish from the farm to market, including paying the transport fee[111]. The buyer will typically contact one of the main BFT carrier companies to arrange for processing of the fish and logistics.

Once the details of the sale and transport have been agreed, the carrier company will coordinate with the farm operator on the details of harvesting (dates/times/access etc). A farm may sell fish to multiple buyers through a single harvesting period (each of whom may contract a different carrier company) such that multiple carriers may be involved. At the time of harvesting, fish are removed from cages by divers, killed and dressed (typically gilled and gutted) by specially trained staff on board the carrier and frozen to -60°C on board.

Processing vessels may then transport the fish back to market on board the carrier – mainly undertaken by the larger processing vessels operated by Mitsubishi/MRS and TRL – or transfer the fish to containers for transport to customers. This is approach is particularly used by smaller processing vessels with lower carrying capacity. The main ports used for container transfer of farmed BFT include Malta, Cartagena and Algeciras in Spain and Sfax in Tunisia.

BFT are farmed throughout the Mediterranean, with the majority of farms in Malta, Spain, Turkey, Croatia. Carriers will typically process fish from multiple farms during a single trip, with voyages lasting up to 10 months (Figure 62). With an average year of build of 2006[112], carriers involved in BFT processing are some of the younger vessels in the ICCAT carrier fleet.

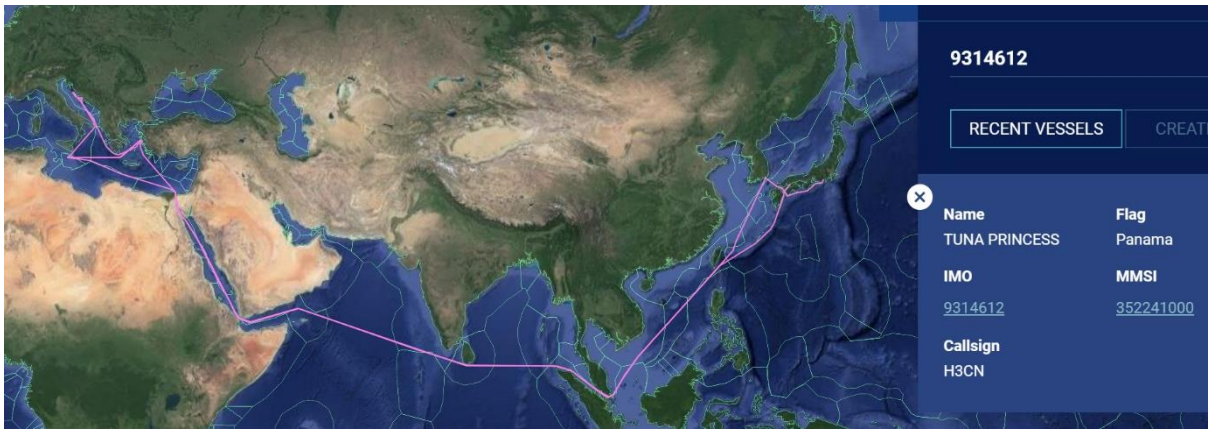



*Figure 62: Five month track for the vessel Tuna Princess from November 2019 to April 2020 showing a return journey from near Mihara, Japan to a number of bluefin tuna farms in the Mediterranean and returning to Shimizu, Japan. (Source: Global Fishing Watch)*

## 7.2 Key companies

In the BFT sector, it is common for companies with involvement in processing/marketing (e.g. Mitsubishi, Tokyo Seafoods, Kanetomo) to own and operate carriers presumably as a means of securing supply and transporting purchased fish to market. Many of these companies also purchase fish from other bluefin farming locations (e.g. Australia, Mexico). Some of these companies (e.g. the

[111] Noting that in some cases, the buyer and carrier operator may be related companies (e.g. Toyo Reizo/MRS, within the Mitsubishi group).

[112] ICCAT RoV, as at June 2020

Fuentes Group) may also have involvement in farming fish, with carriers likely used as a key component of a 'farm to plate' supply chain.

Twelve carrier vessels have been active in BFT processing/transport in the 2017-2019 period (ICCAT, 2019e), controlled by five companies: Mitsubishi/MRS, Toei Reefer Line, Ricardo Fuentes, Kanetomo and Tokyo Seafoods (Table 3). Mitsubishi/MRS and TRL collectively contribute seven of the active vessels and have been described above. The remaining three companies involved in BFT harvesting activities are described below.

One respondent advised that Mitsubishi/MRS and TRL vessels tend to transport fish to market in conventional carriers, whereas other companies operate smaller carriers and frequently transferred fish to containers for transport. This seems broadly consistent with the size profile of each fleet, with the average size of Mitsubishi/TRL BFT processing carriers being 4,990 GRT, whereas average size of the remaining companies' vessels is 1,621 GRT.

**Ricardo Fuentes e Hijos Group**

Based in Cartagena, Spain, the Ricardo Fuentes e Hijos Group ('the Fuentes Group') is a large, vertically integrated group with interests across all stages of the bluefin tuna supply chain including catching, farming, land and sea transport, processing, marketing and retail[113]. Originally established in the 1950s as a company focused on the manufacture of salted fish and the sale of fresh and frozen fish, the group now has interests in over 30+ companies[114].

The Group has interests in BFT farms in Spain through a number of companies (e.g. Caladeros del Mediterráneo, SL, Atunes del Levante, SA, Tunagraso, SAU) as well as Malta through Mare Blu Tuna Farm Ltd[115]. The Group also has interests in farms aquaculturing sea bass and sea bream.

The Group operates two Panamanian-flagged carriers – Paloma Reefer, through group company Waterline Trading and Princesa Guasimara, through another group company Golden Sea Trading, both based in Malta (at the same address). The company's website indicates the vessels are involved in the transport of frozen BFT as well as other support services for farms (e.g. supply of bait) [116]. At 1,267 GRT and 1,877 GRT respectively, Paloma Reefer and Princesa Gusimara are smaller than the carriers operated by Mitsubishi/TRL.

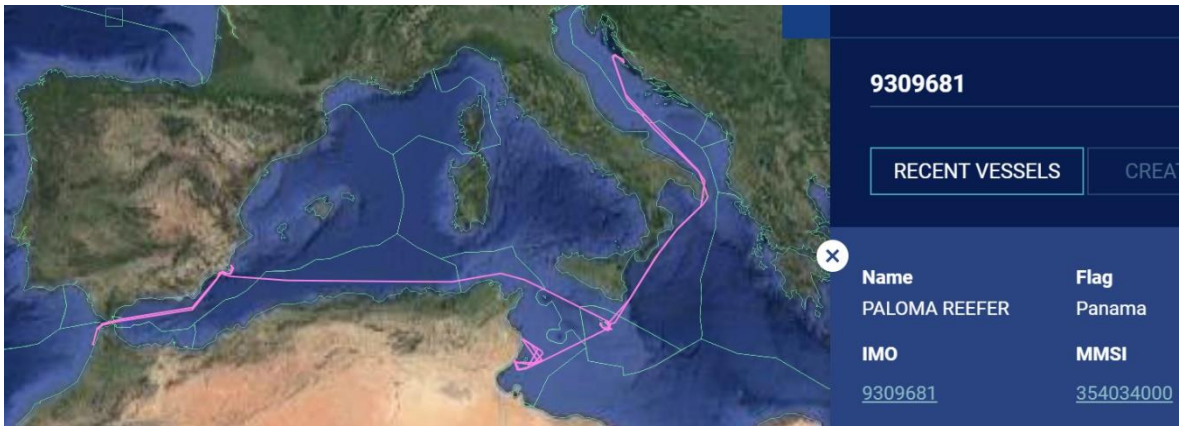



*Figure 63: Six month track for vessel Paloma Reefer through the main BFT harvesting period from October 2019 to March 2020, showing visits to multiple BFT farm locations and Richard Fuentes' base in Cartagena, Spain. (Source: Global Fishing Watch)*

[113] https://www.ricardofuentes.com/
[114] https://www.ricardofuentes.com/
[115] Ibid.
[116] https://www.ricardofuentes.com/project/golden-sea-trading-ltd/

**Kanetomo**

Founded in 1948, Kanetomo Co. Ltd is a specialist tuna trading company based in Fujieda City, Shizuoka Prefecture, Japan[117]. The company is involved in wholesaling of fresh and frozen tuna, transportation, cold storage and processing and retail.

The company operates the Panamanian-flagged 2,164 GRT carrier Astraea through KFC Shipping S.A., registered in Panama (Figure 64), but who's address is listed on the RoV as c/- Kanetomo[118]. Built in 2018, Astraea is one of the newest carrier vessels on the RoV.

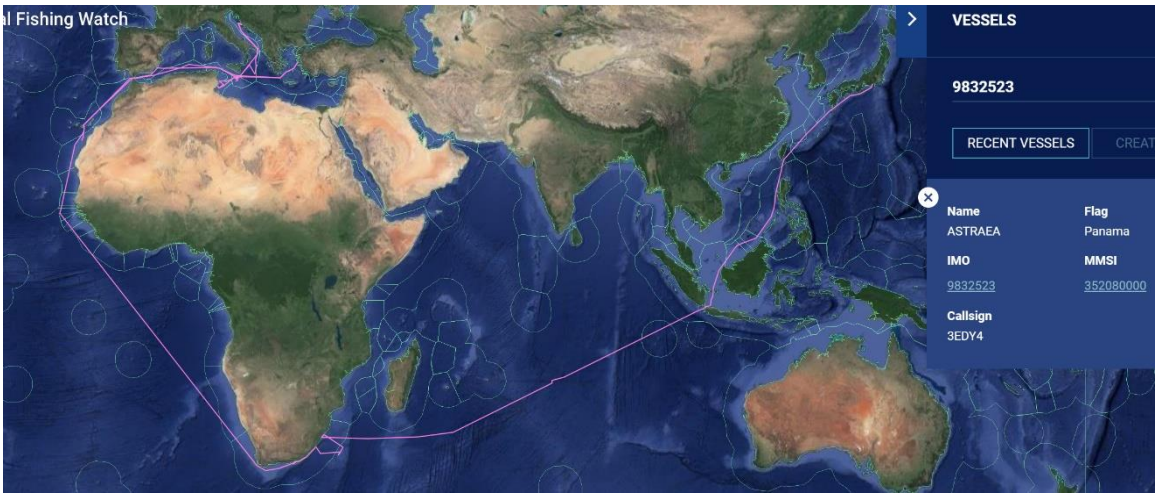



*Figure 64: Six month vessel track for the vessel Astraea between November 2019 and May 2020, showing port calls at key bluefin tuna farming locations before returning to Shimizu, Japan. The total length of the journey from commencement in Ishinomaki, Japan to returning to Shizuoka was around 10 months. (Source: Global Fishing Watch)*

**Tokyo Seafoods**

Incorporated in 1988[119], Tokyo Seafoods Ltd. is a Tokyo-based company specialising in the import, export and distribution of seafood and other foods (e.g. meat, dairy, poultry). The seafoods component of the business is structured into five main groups, one of which handles the sourcing and marketing of tuna[120].

Industry interviews indicated the company operates the Panamanian-flagged ULT carrier, Reina Cristina, through its Panamanian subsidiary, Tokyo Seafoods Panama[121]. The Reina Cristina mainly sources product from bluefin tuna farms in the Mediterranean and Australia, assisting with processing and logistics (Figure 65)[122]. Built in 1990 and at 1176 GRT, the Reina Cristina is the smallest and oldest of the carriers actively involved in processing BFT from the Mediterranean in recent years. Tokyo Seafoods also distributes seafood through its Seattle-based subsidiary, Tokyo Seafoods USA Inc.

[117] https://www.kanetomo.com/kaisha/gaiyou.html

[118] KFC Shipping S.A. is not listed as a subsidiary in company searches, but has common representatives.

[119] According to Orbis company searches

[120] http://www.tsf.co.jp/english/fisheries.html

[121] Orbis company searches indicate that Tokyo Seafoods Panama is majority owned by Tokyo Seafoods Ltd.

[122] Ibid

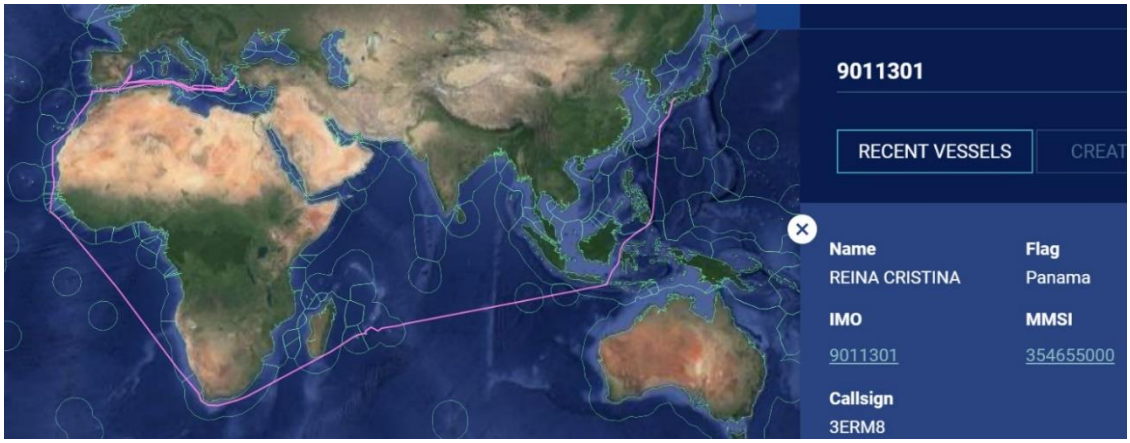



*Figure 65: Six month track for the vessel Reina Christina from August 2019 to March 2020 showing a trip originating in Japan transiting to the Mediterranean to service bluefin tuna farms. The vessel remained in the Mediterranean at the time of writing (May, 2020). (Source: Global Fishing Watch)*

# 8 Other key business considerations

**Key points:**

- The ownership and registration arrangements for carrier vessels are often deliberately opaque, with beneficial ownership is often hidden behind one or more shell companies, registered in States that 'value discretion'.
- Of the 180 fish carriers registered on the RoV in June 2020, 151 (84%) were registered to States that operate open registries (mainly Panama, Bahamas and Liberia).
- Benefits to shipping companies of using open registries claimed by registration agents in at least one State include tax advantages, anonymity, competitive registration fees and administrative ease (e.g. no minimum tonnage requirements, no age restrictions).
- In recent years, the presence of an approved EU Competent Authority (CA) has also emerged as an important consideration in the choice of flag State.
- In the purse seine sector, the nature of the transhipment business 'opportunity' differs from other ocean basins (e.g. the WCPO) in that supply chains are typically shorter with higher proportions of fish landed directly at local processing facilities and transported in containers.
- In the longline sector, the operation of high seas DWFN fleets and supporting carriers is largely similar across ocean basins, with many of the same fishing and carrier companies involved. Companies operating carriers supporting LSPLV fleets in the Indian Ocean are largely the same as those operating in the Atlantic, with transhipments in both ocean basins often made by carriers in the same trip.
- For carrier companies, the dominant driver of profitability is the time taken to fill up and unload – trips in which the vessel steams directly the point of loading, fills up quickly and returns to market to unload have the best chance of making money; trips in which the vessel is required to steam to multiple destinations to fill up and/or remain in port for lengthy periods, have a higher chance of losing money. As one carrier operator interviewed for a previous study noted, the 'economics of the whole operation depends on loading and unloading times'.
- A key question for the overall shape of the transhipment 'business ecosystem' in the Atlantic (as well as other ocean basins) in coming years is the extent to which improving container technology and services will eat into the market share of conventional carriers.

## 8.1 Why are carrier vessels flagged to the States they are?

The ownership and registration arrangements for carrier vessels are often deliberately opaque, particularly for companies who charter their carriers on the open market. True beneficial ownership is often hidden behind one or more shell companies, registered in States that 'value discretion'. Examining the issues around ownership and control of shipping, the OECD, for example, found that "*it is very easy, and comparatively cheap, to establish a complex web of corporate entities to provide very effective cover to the identities of beneficial owners who do not want to be known*" (OECD, 2003).

Over time, there has been an increasing movement towards registering reefer carriers (and other ships) with flag States operating open registries, or so called 'flag of convenience' (FOC) states[123]. Of the 180 fish carriers registered on the RoV in June 2020, 151 (84%) were registered to states that operate open registries (mainly Panama, Bahamas and Liberia).

While COVID-19 related travel restrictions precluded detailed discussions with carrier operators in the ICCAT area around flagging preferences and corporate ownership arrangements, the purported advantages of using open registries are often publicly advertised by registration agents in those countries. For example, some of the main advantages of registering vessels in Panama (to which 111 of the 180 carriers on the RoV are registered) advertised by registration agents include:

- Tax advantages – one agent advises that "*Panama corporations can be created to own Panama registered vessels in order to protect their assets and profits resulting from the business made from merchant shipping outside of Panama by paying no income taxes*"[124];
- Anonymity – another agent advertises that "*The panama ship register allows the registration under a Panamanian corporation. This will give protection to the vessel and anonymous ownership. You will be able to use a bulletproof asset protection structure (corporation + foundation) to register and ensure that your vessel's income and ownership will always be safe and anonymously protected*"[125];
- Competitive registration costs, including discounted registration fees for fleets;
- No minimum tonnage – vessels of all sizes are allowed[126];
- No age restrictions – pre-registration surveys are not required for vessels under 20 years old[127]; and
- Dual registry – one agent advises that "*The Panama Ship registry accepts bare boat chartered for a period of two years. The Dual Registry System is mostly used by European ship owners that seek cost reduction and flexibility among other considerations*"[128].

These factors are consistent with the key factors driving the trend towards FOC states reported by MRAG Asia Pacific (2019) including favourable tax arrangements, discretion around company ownership and low compliance costs. Many interviewees for that study made the point that many reefers are getting older and less efficient – as a result, there is economic pressure to re-flag to lower cost countries to be able to maintain viability and maximise profits.

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[123] See https://www.itfglobal.org/en/sector/seafarers/flags-of-convenience for one list of flags of convenience.

[124] http://www.panama-offshore-services.com/benefits_and_advantages_of_ship_registry_in_panama.htm

[125] http://www.pmacertification.com/advantages-of-registering-a-ship-in-panama/

[126] https://marosv.com/ship-registration/

[127] http://www.pmacertification.com/advantages-of-registering-a-ship-in-panama/

[128] https://www.globaloffshoreservices.org/ship-registration-panama

In recent years, the presence of an approved EU Competent Authority (CA) has also emerged as an important consideration in the choice of flag State, at least in the canning grade transhipment sector. Given the importance of the EU market for canned tuna, particularly for purse seine caught tuna from the Atlantic, ensuring the fish is able to be marketed in the EU is an important economic consideration. This in turn requires EU approval for the carrier and makes States with EU Competent Authorities (CA) (e.g. Panama) more attractive than those that don't (e.g. Liberia, Vanuatu)[129]. It is perhaps noteworthy that of the 18 carrier vessels on the ICCAT RoV with a previous flag State listed as country without a CA (all Liberia/Vanuatu), 16 have been reflagged to States with CAs (mainly to Panama).

Importantly, the incentives for flagging carriers to States with EU CAs are likely to be weaker in the ULT sashimi grade carrier sector where the main market is Japan (or elsewhere in east Asia/US).

For carrier owners whose vessels are involved in the transhipment of seafood products, particularly those operating on the high seas, ensuring the flag State is a member of relevant RFMOs is another key driver of flagging options (albeit flagging to a CPC is not a requirement for ICCAT). Flagging to FOCs that are not members of the key RFMOs would limit the capacity to operate in some areas (e.g. the WCPFC requires carriers be flagged to CCMs or Cooperating non-Members).

In addition, flag State crewing and broader maritime regulations may influence some flagging decisions. For example, one large Japanese company involved in transhipments of sashimi grade fish advised that all officers on Japanese flagged vessels must have relevant Japanese accreditations. Because they can't source enough officers with the relevant accreditations, it is easier to flag vessels to States operating open registries. Similarly, another Japanese company advised that Japanese flagged carrier vessels require at least six Japanese crew on board – this was often hard to achieve, so vessel owners preferred to flag to States operating open registries.

## 8.2 How does the transhipment 'business' in the Atlantic compare to other ocean basins?

The extent to which the transhipment 'business' in the Atlantic is the same as other ocean basins varies between sectors. In the purse seine sector, the supply chain is typically shorter in the Atlantic than some other ocean basins which influences how carriers are used and the operating models involved. In the WCPO for example, the main fishing grounds are physically distant from the majority of processing facilities, with around 80% of purse seine catch transhipped (from key transhipment hubs such as Majuro, Pohnpei, Rabaul and Tarawa to processing countries such as Thailand, Philippines, Vietnam and Ecuador) (MRAG Asia Pacific, 2019). There is a heavy involvement of tuna traders (primarily FCF, Tri Marine and Itochu) who purchase fish from fishing vessels and charter carriers to transport the fish to market. Given the majority of purse seine fish in the WCPO is sold through the tuna traders, and each of the traders prefers to charter rather than own carriers (MRAG Asia Pacific, 2019), the charterer model[130] is likely to be, at least by number of active carriers, the dominant operational model in the WCPO. Collectively, tuna traders are likely to charter in the order of 30-36 carriers on either annual or spot charters. Some larger companies with sufficient critical mass (e.g. Dongwon, Shanghai Kaichuang, China National Fisheries Corp., Fairwell) also operate their own carrier to support their purse seine fleets. There is (comparatively) limited

[129] https://webgate.ec.europa.eu/sanco/traces/output/non_eu_listsPerActivity_en.htm#

[130] Defined here as the chartering of a vessel by one operator from an independent ship owner (usually through a ship broker), where the ship owner provides the vessel and crew but the charterer makes the operational decisions about where the vessel goes etc. This is different to the model used by some of the logistics service providers in the ICCAT area (e.g. GreenSea, ART/Frigoship), where vessels are contributed by independent ship owners to a shipping pool and managed on a day-to-day basis by the 'chartering' company.

involvement in the purse seine sector of purely logistics service providers (although these companies may charter carriers to tuna traders).

By contrast, in the Atlantic overall purse seine catches are smaller than the WCPO and there is a higher proportion of catch processed at local plants in West Africa (three processing facilities in Abidjan, two each in Dakar and Tema). This means a higher proportion of fish landed directly to local facilities, with less need for transhipping[131]. Moreover, infrastructure for container transport is better developed in West African ports than in the Pacific, so a higher proportion of the fish is transported to market via container (which, although growing, remains very limited in the Pacific)[132]. The nature of the carrier business 'opportunity' in the Atlantic is then largely limited to transport of a relatively smaller volume of catch from key West African ports to processing facilities in Europe (mainly Spain) and to a lesser extent South America and elsewhere in West Africa. There is very limited if any involvement of tuna traders (at least in the transhipment of fish) and less need for a 'charterer' type model. The main businesses then predominating are the logistics service providers (e.g. Greensea) who operate their own fleet of carriers running a 'parcel' type service and integrated fishing/carrier companies (often with interests in processing facilities) using carriers as part of a 'joined up' supply chain. The nature of the sector in the Indian ocean (with much of the catch landed directly to processing facilities in the Seychelles and Mauritius) and the EPO (with much of the catch landed in Ecuador) is more similar to the Atlantic than the WCPO.

In the longline sector, the operation of high seas DWFN fleets and supporting carriers is largely similar across ocean basins (TRL, pers. comm.), with many of the same fishing and carrier companies involved. In the WCPO, Mitsubishi and TRL carriers play an important role in high seas transhipments, although given the size of the fleet and catch (longline catch in the ICCAT area was roughly one-third of the catch in the WCPFC area in 2018; ICCAT, 2020; Williams and Reid, 2019), the fishery supports a larger number of players (e.g. Japanese company Hayama Shipping; Korean companies Green World and SEoIL Agency; Chinese Taipei companies Lung Soon Group, Tunago Shipping Co. Ltd, Hon Shun Fishery Co. Ltd and the large tuna trader FCF; Chinese company Ping Tai Rong Ocean Fishery Group Co. Ltd) (MRAG Asia Pacific, 2019). Many of these companies (e.g. Hayama, Green World, SEoIL, Tunago) operate similarly to the TRL/TKK type model, offering a logistics service only to get fish from fishing grounds to market, while others (e.g. Ping Tai Rong Ocean Fishery Group) provide support to their own fleet of fishing vessels (main targeting albacore). Given the proximity of the main EPO longline fishing grounds in the tropical eastern Pacific, many of the companies operating in the WCPO also operate into the EPO. In the Indian Ocean, companies operating carriers supporting longline fleets are largely the same as those operating in the Atlantic. Indeed, transhipments in both ocean basins are often made by carriers in the same trip (see for example vessel tracks in Figure 56; Figure 58; Figure 61), with observers cross-endorsed for both ICCAT/IOTC ROPs. Unlike the WCPO, in which at least some companies operate integrated longline/carrier fleets (e.g. Ping Tai Rong Ocean Fishery Group), there are no integrated LSPLV/carrier fleets in the Atlantic.

[131] Interestingly, a representative from one of the Ghanaian processing facilities indicated that they very rarely source raw material through carriers, but the recent shortage of containers as a result of the COVID pandemic meant that they were, at the time we communicated in May, 2020, unloading their first carrier in 3-4 years. The same representative advised that they would normally source around 80% of their raw material through direct unloading by purse seiners.

[132] Although the proportion of catch being shipped in containers is not reported, one carrier operator estimated the proportion of catch being transhipped vs containerised vs landed directly at local processing facilities at 40:40:20.

## 8.3 What are the key factors influencing profitability of carrier trips?

The factors affecting the profitability of a carrier trip were broadly the same across both longline and purse seine sectors, as well as between operators. The dominant driver of profitability across both sectors was the time taken to fill up and unload – trips in which the vessel steamed directly the point of loading, filled up quickly and returned to market to unload had the best chance of making money (because operational costs associated with the trip – fuel, port fees etc are minimised); trips in which the vessel was required to steam to multiple destinations to fill up and/or remain in port for lengthy periods, had a higher chance of losing money (because operational costs are higher).

Previous studies of transhipment in the purse seine sector have indicated that the 'economics of the whole operation depends on loading and unloading times' (MRAG Asia Pacific, 2019). Time can be lost at the loading end - e.g. if competition amongst carrier operators is high or the fishing slows down – or the unloading end – e.g. if offloading is slow and the carrier operator has to bear the cost of demurrage. To that end, carrier operators work in very close cooperation with prospective fishing vessels in the planning of trips (see 'fleet organisation' above) and must make careful judgements about whether sending a carrier is economically justified.

In addition to the basic need to minimise loading and unloading times as well as fuel usage, a number of other factors potentially influence the economics of carrier trips:

- fluctuations in fuel price – short term fluctuations may not be able to be fully accommodated in freight charges;
- competition from other carrier operators – other companies may beat you to the fish;
- transhipment location – all other things being equal, transhipments closer to the port of destination/unloading will require fewer operational costs. Where these are not able to be passed on to customers, location can influence margins; and
- competition from containers – a number of carrier operators indicated that increased competition from cheaper container freight rates had squeezed margins.

## 8.4 Ownership vs chartering?

Although the chartering model is used less for ICCAT carriers than other oceans basins (e.g. the WCPO), chartering of vessels is still used regularly by some companies where additional capacity is required in the short term.

For companies chartering carriers, the key benefit is flexibility. Chartering (as opposed to owning) involves no upfront and ongoing capital investment and the number of carriers chartered can be increased or decreased relatively flexibly with changes in demand. A number of companies favouring chartering internationally (e.g. tuna traders) note that they aren't 'shipping companies' – they're primary expertise was in tuna trading or fishing and they wanted to stick to their core business. Chartering vessels on a voyage by voyage basis also means that there is no need to coordinate back-loading opportunities (i.e. to arrange cargo to be transported in the reverse direction) if carriers are discharged at ports distant from fishing grounds.

Companies owning carriers tend to fit into one of the operational models described above – either they're a specialist shipping company who has chartered their carrier on the open market or contributed the vessels to a shipping pool, or they're an integrated fishing-carrier business who see commercial logic in having access to a dedicated carrier. Many of the latter group are larger businesses with interest in post-harvest processing facilities (e.g. Albacora Group, Calvo Group), so owning a carrier is likely to be a way of controlling supply of raw material.

## 8.5 The impact of containers

A key question for the overall shape of the transhipment 'business ecosystem' in the Atlantic (as well as other ocean basins) in coming years is the extent to which improving container technology and services will eat into the market share of conventional carriers.

In the purse seine sector, statistics on the fate of catch are not well reported, although one large carrier company interviewed estimated that around 40% of the catch was transhipped, 40% loaded into containers and 20% landed directly to local processing facilities. All interviewees in the purse seine sector acknowledged the importance of containers had grown over the last decade, facilitated in part by improvements in infrastructure at key ports - for example, Abidjan boasts a modern, mechanised container wharf[133], reporting over 670,000 twenty foot equivalent container unit (TEU) movements in 2018 (Abidjan Port Authority, 2019).

The main advantages to the use of containers cited by interviewees was the capacity to send product to markets that may be paying a higher price, and/or to be able to sort and grade fish to maximise value (from a mixed purse seine catch, larger yellowfin could be graded out and sent to Korea/US, larger skipjack could be sent to Bangkok, while smaller skipjack could be sent to Vietnam and rejects discarded). A number of interviewees also advised that container transport was typically cheaper than conventional reefer transport – often in the order of US$20-40/mt depending on location – but this was not universal across all interviewees (some advised that containers were more expensive).

Nevertheless, despite the growth in container market share over time, a number of interviewees in the purse seine sector still reported considerable advantages of conventional reefer carriers over containers. These included:

- conventional carriers allow for direct 'door to door' delivery of fish to customers, allowing for more control over the timing of delivery, meaning faster payments and better cash flows;
- loading of containers was too 'fiddly' and time consuming – in the purse seine sector, unloading to conventional carrier typically takes 3-4 days, while unloading to container typically takes 5-6 days. The additional loading time means longer turnarounds, and ultimately less fishing time; and
- the slower nature of loading containers also presented risks to the cold chain and some companies reported having problems with reliability of containers, leading to rejection of fish at market (although container technology and loading facilities were improving continuously [e.g. 'pre-cooled' containers; 'star' loaders], meaning faster loading and better mitigating cold chain risks[134]).

In the longline sector, companies involved in providing high seas longline carrier services said containers had had little impact on the high seas transhipment business to date. In the case of the Chinese LSPLV fleet, one interview estimated around 80% of the catch continued to be transhipped at sea with the remaining 20% loaded into containers for further processing in China when vessels came to port for annual survey inspections. Despite relative savings on container transport – one interviewee advised the current price for transport by carrier is around ¥110,000/mt (~US$1,020/mt), whereas container cost is around US$800/mt from Cape Town/Dakar to Dalian –

[133] http://www.portabidjan.ci/en/service-offers/container-terminal

[134] See Yang and Lin (2017) for an interesting analysis of the benefits of containers vs carriers for Chinese Taipei longline vessels in the Indian Ocean

vessels preferred transhipping to carriers for all of the advantages of transhipment at sea listed above.

On the future of containers vs the conventional reefer business generally, Lennefors and Birch (2019) quote a representative from one of the larger conventional reefer shipowners, the Laskaridis group, as saying "*we have a view, which we have consistently held for the last 20 years, that eventually everything that can be containerised will be containerised*". Nevertheless, they also noted that "*you could call [the reefer trade] a business in a run-off mode, but it is a slow, profitable run-off, and as things seem today we may have to re-invest in a few ships to continue servicing very specific trades*".

A key influence on the balance of conventional carriers vs containers in coming years may be the recent introduction of new regulations limiting sulphur content in marine fuels. In 2016, the IMO adopted a new global standard of 0.5% sulphur content (down from the current 3.5%), to be implemented from 1 January 2020[135]. While there are multiple ways to comply with the new regulation (e.g. installing 'scrubbers' which remove sulphur from emissions; converting to LNG), most are likely to be far too expensive or impractical for older conventional reefer ships (Dynamar, 2019). On that basis, the only way to comply is to use lower sulphur fuels (e.g. Marine Diesel Oil Vs Heavy Fuel Oil), which are more expensive (although the price difference has narrowed from around US$220/t to around $60/t). While both conventional carriers and container vessels are required to comply with the new regulation, container ships are typically more fuel efficient than carriers, with fuel making up a smaller proportion of overall running costs (Dyanmar, 2019). Although the historic drops in fuel price associated with the COVID pandemic has at least temporarily shielded conventional reefer operators from these impacts, given the already fragile economics of aging conventional carriers, increased costs associated with low sulphur fuel may result in many being sold for scrap. Those that remain may need to recover increased fuel costs through higher freight and other charges, making containers even more price competitive.

# 9 Conclusion

Likely commencing with small-scale catch consolidation amongst vessels within a fleet, the practice of transhipment to conventional carriers in the tuna sector grew in the mid-1980s, at least partially fuelled by a buoyant Japanese economy that 'wanted fish from anywhere'. The practice has since become a key component of the global tuna supply chain.

In the ICCAT longline sector, at sea transhipment is an integral part of the operation of each of the four main DWFN LSPLV fleets who account for the overwhelming majority of transhipments by both number and volume. At sea transhipment not only provides an efficient means of getting fish to market with minimal downtime, but also provides a means of sourcing other supplies essential to the operation (e.g. bait, fuel, provisions, gear). With the main fishing grounds often geographically distant from West African ports offering the types of services sought by LSPLVs (e.g. harbour capable of accommodating transhipment by carrier vessels, repairs and maintenance, crew R&R), the cost savings associated with at sea transhipment (e.g. fuel, lost fishing time) are a key factor supporting the economics of DWFN LSPLV operations.

While transhipment in port occurs, it is typically only when required (e.g. to offload BFT), or when otherwise timed around essential port visits (e.g. compulsory survey inspections, essential repairs and maintenance). Similarly, while containers are used to transport fish to market, the cost savings in freight (compared to conventional carriers) are not sufficient to outweigh the efficiencies

[135] http://www.imo.org/en/MediaCentre/HotTopics/Pages/Sulphur-2020.aspx

associated with at sea transhipment. Accordingly, containers have reportedly achieved only a limited market share amongst DWFN LSPLV fleets in the ICCAT area to date.

In the purse seine sector, transhipment at sea is prohibited, meaning carrier operators must compete with containers and direct landings as a means of getting fish to market. The carrier fleet is dominated by integrated fishing/carrier companies (e.g. Albacora Group, Calvo Group, Panofi), who often also have interests in processing facilities and use carriers as a key logistics service in an integrated supply chain, and logistics service providers (e.g. GreenSea), who provide a transport solution on a simple fee-for-service basis. There is far less involvement of tuna traders who are key charterers of carriers in some other ocean basins (e.g. WCPO). Containers have reportedly eaten into the market share of conventional carriers over time, supported by improvements in infrastructure in West African ports, however they are still considered 'fiddly' by many operators and take longer to unload. If these issues can be addressed over time, the cost savings associated with container freight and capacity to flexibly send different components of the catch to different markets (together with the overall aging and capacity reduction in the conventional carrier fleet) may see containers eat further into conventional reefer market share.

In the BFT farm sector, carrier vessels are used to assist with processing and transport of harvested fish to market. Carrier operators include companies also involved in LSPLV at sea transhipments (e.g. Mitsubishi/MRS, TRL), as well as companies sourcing only from BFT farms (e.g. Fuentes Group, Tokyo Seafoods, Kanetomo). The relatively young average age of the carrier fleet (2006) authorised to carry BFT suggests there is a relative level of confidence about the future of the sector.

While the practice of transhipment is widespread in the tuna sector, and is central to supporting the economics of many fleets, at sea transhipment in particular has been implicated in a range fisheries and labour rights violations (e.g. FAO, 2018), with associated calls for reform (e.g. Ewell et al, 2017). While it was not the aim of this study to examine the effectiveness of existing transhipment regulatory arrangements, continuing to ensure 'best practice' management and monitoring arrangements are in place in the sector is a key challenge for both management authorities and industry. Moreover, a number of interviewees for this study highlighted differences in the monitoring framework for conventional carriers, which are considered fishing vessels for the purposes of ICCAT regulation, and container vessels, which aren't. If the seemingly inexorable trend towards containerisation of goods transported by sea continues, ensuring effective arrangements are in place to monitor container supply chains will be important in achieving fisheries management objectives as well as preventing and deterring IUU fish from entering supply chains.

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## Annex 1: List of persons/organisations contacted

### *Carrier Companies*

**Toei Reefer Line**

- Tomokazu Namai, General Manager, Shipping and Trading Division
- Hideki Mori, Deputy General Manager, Shipping and Trading Division
- Kazuhiro Tsuruta, Assistant Manager, Shipping and Trading Division
- T. Shibusawa, Assistant Manager, Shipping and Trading Division
- T. Umezawa, Assistant Manager, Shipping and Trading Division
- Momoe Sakuma, Assistant Manager, Shipping and Trading Division

**Mitsubishi Corporation**

- Kenichi Ito, Team Leader, Tuna Team, Marine Products Dept
- Yusuke Kishida, Manager, Tuna Team, Marine Products Dept

**GreenSea Chartering**

- Hans Mol, Managing Director

**Frigoship Chartering**

- Axel Höveler

### *Fishing Companies/Associations*

**OPAGAC**

- Miguel Angel Herrera

**ORTHONGEL**

- Michel Goujon

**Silla**

- KS (Tuna) Lee, President, Silla Co. Ltd
- Kwang Hwi Park
- Sancho Kim

**Korean Overseas Fisheries Association (KOFA)**

- Hyun-Ai Shin, General Manager, International Affairs Dept
- Ho-Jeong Jin, Deputy General Manager, International Affairs Dept
- Bong Jun Choi, Assistant Manager, International Affairs Dept
- Sang-Jin Baek, International Affairs Dept

**Ghana Tuna Association**

- John Augustus Farmer, President

### *Processors*

**Pioneer Food Cannery**

- Tony Lazazzara

**Thai Union**

- Narin Niruttinanon

### *Government Agencies*

**Cote d'Ivoire**

- Shep Helguile, Directeur de l'Aquaculture et des Pêches, Ministère des Ressources Animales et Halieutiques de Côte d'Ivoire

**Cape Verde**

- Vera Gominho, Directrice Générale des Ressources Marines, Ministério da Economia Marítima, Direçao Geral dos Recursos Marinhos
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**Japan**

- Hiroyuki Morita, Assistant Director, International Affairs Division, Fisheries Agency of Japan
- Takeshi Miwa, Assistant Director, International Affairs Division, Fisheries Agency of Japan
- Shingo Ota, Fisheries Agency of Japan
- Hiro Matsushima, Fisheries Agency of Japan
- Yuki Morita, Fisheries Agency of Japan
- Takumi Fukuda, Fisheries Agency of Japan

### *Regional Secretariats*

**ICCAT Secretariat**

- Miguel Neves dos Santos, Assistant Executive Secretary
- Carlos Palma, Biostatistician

### *Transhipment Observer Services Providers*

**MRAG Ltd (Observer provider for ICCAT Transhipment and BFT ROPs)**

- James Moir-Clark
- Patrick Nugent
- Nick French

### *Others*

- Xiaobing Liu, Professor, Shanghai Ocean University, China Overseas Fisheries Association

## Annex 2: ROP Transhipment Carrier Trips (July 2015 – July 2019)

| ICCAT Request Number | Carrier Vessel | ICCAT Vessel ID | Boarded | Disembarked | Observer departure date | Observer arrival date | # transhipments | Total tonnes transhipped |
|---|---|---|---|---|---|---|---|---|
| 172 | TAISEI MARU NO.15 | AT000JPN00651 | Cape Town | Cape Town | 3/07/2015 | 29/08/2015 | **30** | 1940.98 |
| 173 | TAISEI MARU NO.24 | AT000JPN00571 | Cape Town | Cape Town | 19/08/2015 | 20/10/2015 | **45** | 3081.39 |
| 174 | IBUKI | AT000JPN00163 | Port Louis | Port of Spain | 31/10/2015 | 06/01/2016 | **47** | 3158.96 |
| 175 | FUTAGAMI | AT000VUT00027 | Cape Town | Sao Vicente | 19/10/2015 | 25/11/2015 | **12** | 743.46 |
| 176 | CHIKUMA | AT000LBR00003 | Port Louis | Port of Spain | 05/12/2016 | 10/02/2016 | **38** | 2589.58 |
| 177 | GENTA MARU | AT000LBR00006 | Cape Town | Singapore | 04/12/2015 | 23/02/2016 | **31** | 1818.28 |
| 178 | TAISEI MARU NO.15 | AT000VUT00019 | Cape Town | Cape Town | 16/12/2015 | 14/02/2016 | **39** | 2139.34 |
| 179 | CHITOSE | AT000SGP00001 | Walvis Bay | Colon/Panama | 27/01/2016 | 26/03/2016 | **47** | 2829.07 |
| 180 | VICTORIA II | AT000LBR00008 | Cape Town | Singapore | 07/02/2016 | 03/05/2016 | **17** | 1320.37 |
| 181 | TAISEI MARU NO.24 | AT000JPN00571 | Cape Town | Cape Town | 23/02/2016 | 09/05/2016 | **42** | 3116.04 |
| 182 | FUTAGAMI | AT000LBR00016 | Cape Town | Cape Town | 08/04/2016 | 30/05/2016 | **18** | 1045.78 |
| 183 | GENTA MARU | AT000LBR00006 | Cape Town | Cape Town | 05/05/2016 | 29/06/2016 | **41** | 2265.64 |
| 184 | CHIKUMA | AT000LBR00003 | Panama City | Singapore | 24/05/2016 | 25/07/2016 | **39** | 2949.47 |
| 185 | TAISEI MARU NO.15 | AT000JPN00651 | Cape Town | Cape Town | 09/06/2016 | 06/08/2016 | **29** | 1803.86 |
| 186 | VICTORIA II | AT000LBR00008 | Singapore | Cape Town | 29/07/2016 | 16/09/2016 | 34 | 1658.67 |
| 187 | SHOTA MARU | AT000LBR00022 | Cape Town | Singapore | 11/08/2016 | 27/09/2016 | 9 | 1077.26 |
| 188 | IBUKI | AT000PAN00163 | Cape Town | Dakar | 3/09/2016 | 21/10/2016 | 36 | 1894.17 |
| 189 | TAISEI MARU NO.24 | AT000JPN00571 | Cape Town | Cape Town | 8/09/2016 | 14/11/2016 | 42 | 2876 |
| 190 | FUTAGAMI | AT000LBR00016 | Cape Town | Port Louis | 13/10/2016 | 12/12/2016 | 12 | 521.67 |
| 191 | GENTA MARU | AT000LBR00006 | Cape Town | Cape Town | 28/10/2016 | 19/12/2016 | 28 | 1596.9 |
| 192 | CHITOSE | AT000SGP00001 | Cape Town | Port Louis | 6/12/2016 | 21/02/2017 | 64 | 3386.6 |
| 193 | TAISEI MARU NO.15 | AT000JPN00651 | Cape Town | Cape Town | 25/11/2016 | 28/01/2017 | 43 | 2022.75 |
| 195 | CHIKUMA | AT000LBR00003 | Panama City | Cristobal | 8/02/2017 | 24/04/2017 | 43 | 3227.74 |
| 196 | LADY TUNA | AT000PAN00199 | Panama City | Cristobal | 5/03/2017 | 23/04/2017 | 31 | 2466.84 |
| 197 | VICTORIA II | AT000LBR00008 | Panama City | Singapore | 1/03/2017 | 25/03/2017 | 21 | 1742.4 |

| ICCAT Request Number | Carrier Vessel | ICCAT Vessel ID | Boarded | Disembarked | Observer departure date | Observer arrival date | # transhipments | Total tonnes transhipped |
|---|---|---|---|---|---|---|---|---|
| 198 | TAISEI MARU NO.24 | AT000JPN00571 | Cape Town | Cape Town | 24/03/2017 | 17/05/2017 | 37 | 2230.59 |
| 199 | FUTAGAMI | AT000LBR00016 | Cape Town | Singapore | 28/04/2017 | 29/06/2017 | 28 | 1458.87 |
| 200 | IBUKI | AT000PAN00163 | Cape Town | Singapore | 10/05/2017 | 7/08/2017 | 53 | 2302.22 |
| 201 | TAISEI MARU NO.15 | AT000JPN00651 | Cape Town | Singapore | 30/05/2017 | 23/08/2017 | 36 | 1951.35 |
| 202 | CHIKUMA | AT000LBR00003 | Cape Town | Port Louis | 08/08/2017 | 05/10/2017 | 38 | 1797.93 |
| 203 | GENTA MARU | AT000LBR00006 | Cape Town | Cape Town | 08/08/2017 | 19/09/2017 | 17 | 1279.29 |
| 205 | VICTORIA II | AT000LBR00008 | Cape Town | Singapore | 30/08/2017 | 18/10/2017 | 24 | 1215.16 |
| 206 | TAISEI MARU NO.24 | AT000JPN00651 | Cape Town | Cape Town | 05/10/2017 | 14/12/2017 | 57 | 2316.38 |
| 207 | FUTAGAMI | AT000LBR00016 | Cape Town | Port Louis | 28/10/2017 | 20/12/2018 | 4 | 182.23 |
| 208 | IBUKI | AT000PAN00163 | Cape Town | Walvis Bay | 15/11/2017 | 19/01/2018 | 48 | 1992.52 |
| 209 | MEITA MARU | AT000LBR00002 | Cape Town | Port Louis | 14/11/2017 | 21/12/2017 | 12 | 456.71 |
| 210 | TAISEI MARU NO.15 | AT000JPN00651 | Cape Town | Durban | 30/11/2017 | 10/02/2018 | 42 | 1737.33 |
| 211 | CHIKUMA | AT000LBR00003 | Panama | Walvis Bay | 29/01/2018 | 07/05/2018 | 44 | 3086.63 |
| 212 | GENTA MARU | AT000LBR00006 | Cape Town | Port Louis | 14/01/2018 | 13/03/2018 | 30 | 1590.46 |
| 213 | LADY TUNA | AT000PAN00199 | Cape Town | Walvis Bay | 19/02/2018 | 01/06/2018 | 47 | 2469.62 |
| 214 | SHOTA MARU | AT000LBR00022 | Cape Town | Port Louis | 08/03/2018 | 25/04/2018 | 23 | 1354.81 |
| 215 | TAISEI MARU NO.24 | AT000JPN00651 | Durban | Cape Town | 26/03/2018 | 12/06/2018 | 49 | 2315.25 |
| 216 | MEITA MARU | AT000LBR00002 | Cape Town | Singapore | 17/04/2018 | 09/06/2018 | 26 | 953.21 |
| 217 | VICTORIA II | AT000LBR00008 | Panama | Singapore | 20/04/2018 | 09/06/2018 | 7 | 721.46 |
| 218 | IBUKI | AT000PAN00163 | Cape Town | Port Louis | 27/05/2018 | 02/08/2018 | 47 | 3042.38 |
| 219 | TAISEI MARU NO.15 | AT000JPN00651 | Cape Town | Cape Town | 04/06/2018 | 02/08/2018 | 45 | 2713.33 |
| 220 | TAISEI MARU NO.24 | AT000JPN00651 | Cape Town | Singapore | 12/06/2018 | 23/07/2018 | 7 | 549.41 |
| 221 | GENTA MARU | AT000LBR00006 | Cape Town | Cape Town | 02/07/2018 | 07/08/2018 | 15 | 1503.38 |
| 222 | CHIKUMA | AT000LBR00003 | Cape Town | Singapore | 18-Aug-18 | 22-Oct-18 | 60 | 2933.21 |
| 223 | TAISEI MARU NO.15 | AT000JPN00651 | Cape Town | Singapore | 10-Aug-18 | 03-Sep-18 | 2 | 132.54 |
| 224 | TAISEI MARU NO.24 | AT000JPN00651 | Cape Town | Cape Town | 27-Oct-18 | 04-Jan-19 | 31 | 1885.45 |
| 225 | MEITA MARU | AT000LBR00002 | Cape Town | Port Louis | 15-Nov-18 | 09-Jan-19 | 18 | 1193.81 |
| 226 | IBUKI | AT000PAN00163 | Cape Town | Port Louis | 28-Nov-18 | 31-Jan-19 | 41 | 2014.92 |
| 227 | TAISEI MARU NO.15 | AT000JPN00651 | Cape Town | Cape Town | 03-Dec-18 | 03-Feb-19 | 43 | 1542.43 |
| 228 | GENTA MARU | AT000LBR00006 | Walvis Bay | Cape Town | 12-Dec-18 | 21-Jan-19 | 23 | 1041.04 |

| ICCAT Request Number | Carrier Vessel | ICCAT Vessel ID | Boarded | Disembarked | Observer departure date | Observer arrival date | # transhipments | Total tonnes transhipped |
|---|---|---|---|---|---|---|---|---|
| 229 | SHOTA MARU | AT000LBR00022 | Cape Town | Cape Town | 10-Jan-19 | 10-Mar-19 | 29 | 1430.36 |
| 230 | CHIKUMA | AT000LBR00003 | Panama | Cristobal | 08-Feb-19 | 21-Apr-19 | 60 | 3857.45 |
| 231 | TUNA QUEEN | AT000PAN00145 | Cape Town | Panama | 27-Mar-19 | 09-May-19 | 18 | 1699.57 |
| 232 | YACHIYO | AT000PAN00240 | Cape Town | Panama | 20-Mar-19 | 13-May-19 | 51 | 3273.64 |
| 233 | MEITA MARU | AT000LBR00002 | Cape Town | Cape Town | 06-Apr-19 | 28-May-19 | 32 | 1493.91 |
| 234 | IBUKI | AT000PAN00163 | Cape Town | Singapore | 15-May-19 | 05-Aug-19 | 36 | 2034.05 |
| 235 | TAISEI MARU NO.24 | AT000JPN00651 | Cape Town | Cape Town | 21-May-19 | 15-Jul-19 | 38 | 2304.64 |

| |
|---|
| Toei Reefer Line |
| Mitsubishi/MRS |
| Taiseimaru Kaiun Kaisha |