



# Trade Flow Analysis of Pacific Tuna Fisheries

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## List of Acronyms and Abbreviations

BACI	Base pour l'Analyse du Commerce International (International Trade Database)
CIF	Cost, Insurance, and Freight
CMM	Conservation and Management Measure
DW	Distant Waters
DWFN	Distant Water Fishing Nation
EEZ	Exclusive Economic Zone
E.U.	European Union
EUMOFA	European Market Observatory for Fisheries and Aquaculture Products
FAD	Fish Aggregating Device
FCF	Fong Chun Formosa
FFA	Forum Fisheries Agency
FIP	Fisheries Improvement Project
FMA	Fishery Management Area
FSM	Federated States of Micronesia
GRT	Gross Registered Tons
GSP	Generalized Scheme/System of Preferences
HS	Harmonized System
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
IFC	International Finance Corporation
IOTC	Indian Ocean Tuna Commission
ISSF	International Seafood Sustainability Foundation
IUU	Illegal, Unreported, and Unregulated
LBFV	Locally Based Foreign Vessels
LTLL	Large-Scale Tuna Longline
mt	Metric Tons

MSC	Marine Stewardship Council
NFA	National Fisheries Authority (of Papua New Guinea)
NFDC	Nauru Fisheries Development Corporation
NMFS	National Marine Fisheries Service
OPRT	Organization for the Promotion of Responsible Tuna Fisheries
Pew	The Pew Charitable Trusts
PIC	Pacific Island Countries
PNA	Parties to the Nauru Agreement
PNG	Papua New Guinea
SPTC	South Pacific Tuna Corporation
SSTC	South Seas Tuna Corporation
STLL	Small-Scale Tuna Longline
TTIA	Thai Tuna Industry Association
ULT	Ultra Low Temperature
UN	United Nations
U.S.	United States
VDS	Vessel Day Scheme
WCPFC	Western & Central Pacific Fisheries Commission

## Executive Summary

This report documents the results of a year-long study to map the supply chains and trade flows from the primary tuna fisheries in the Pacific Ocean to meet the demand for tuna products in the world's major markets (the United States [U.S.], European Union [E.U.], and Japan). By providing detailed information on these trade flows and on the key companies involved at each step of the supply chains, the analysis is designed to allow stakeholders to target their efforts and tailor their messaging in ways that will educate consumers, engage market actors, and help to engender sustainable, effective management of the world's tuna fisheries.

This report focuses specifically on three fisheries occurring in the Pacific Ocean under the jurisdiction of the two regional fishery management organizations (RFMOs) that regulate commercial fishing for tuna in the Pacific Ocean, i.e., the Western and Central Pacific Fisheries Commission (WCPFC) and the Inter-American Tropical Tuna Commission (IATTC). The three Pacific fisheries analyzed are the purse seine fisheries that target tropical tuna (i.e., yellowfin, skipjack, and bigeye) and generally cater to the canned tuna markets, the longline tropical tuna fisheries that primarily supply the Japanese market and other emerging markets for sashimi grade and fresh tuna, and the longline fishery for albacore in both the northern and southern hemispheres, whose production is aimed mainly toward the canned albacore markets in the U.S. and Canada. The report also briefly addresses the fisheries using troll and pole-and-line gear to target albacore. Defining the scope of the analysis in this way includes approximately 62 percent of global tropical tuna and albacore catch, and 94 percent of the total tuna catch of the two RFMOs of interest.<sup>1</sup> Figure 1 shows the convention area for each of the five world RFMOs, centered on the WCPFC (shown in purple) and the IATTC (shown in orange), with the area of overlap in jurisdiction between these two identified in orange and purple crosshatch.

In general, the largest final export markets for tuna products of all types are the E.U., the U.S., and Japan, which together represented approximately 3.6 million metric tons (mt) or 70.8 percent of the 2018 global catch of 5.1 million mt.<sup>2</sup> Along the way to these and other important end markets, Pacific tuna is imported from and/or exported to many other countries for intermediate and final processing. Tuna may be sold fresh (i.e., whole, gutted, headed, in loins, as steaks, or in other fresh presentations), frozen whole or in other forms, semi-processed (i.e., cooked tuna loins for canning), or fully processed (i.e., finished canned or pouched products, katsubushi, sashimi-grade products, or fresh/previously frozen for grilling and similar uses). Raw, frozen tuna destined for canning may be processed in a single facility on the way to its end market, or it may first go to a country with low labor costs and/or a favorable tariff regime to be partially processed into pre-cooked loins that are later sent to another country to complete the rest of the canning process. Trading companies often facilitate the steps along the tuna supply chain. This study traces the primary routes of tuna caught in both the Western/Central and Eastern Pacific on its way to the final markets, and identifies the key actors engaged in this process at each step.

We employ a combination of public and proprietary data, insights of industry participants, and detailed professional knowledge of the industry to develop a best assessment of the supply chains and key actors. The

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<sup>1</sup> Based on 2019 RFMO catch data. It must be noted that other gears are also used to catch tuna, such as pole and line, handline and small net gears used by countries like Indonesia, the Philippines, and others whose tuna products also contribute to international tuna trade to major tuna markets. Although this report focuses only on the main fishing gears used in the Pacific, sound, comprehensive fisheries management decisions would need to also consider other gear types.

<sup>2</sup> GHA personal communication with Peter Trutanich, Tri-Marine International, June 2020.



goal of this analysis is not to account pound-for-pound for the flows of all fish harvested in the Pacific to their ultimate destinations. Rather, it is to establish the key trade flows supplying the primary markets, and to identify the actors with the greatest influence over these flows.

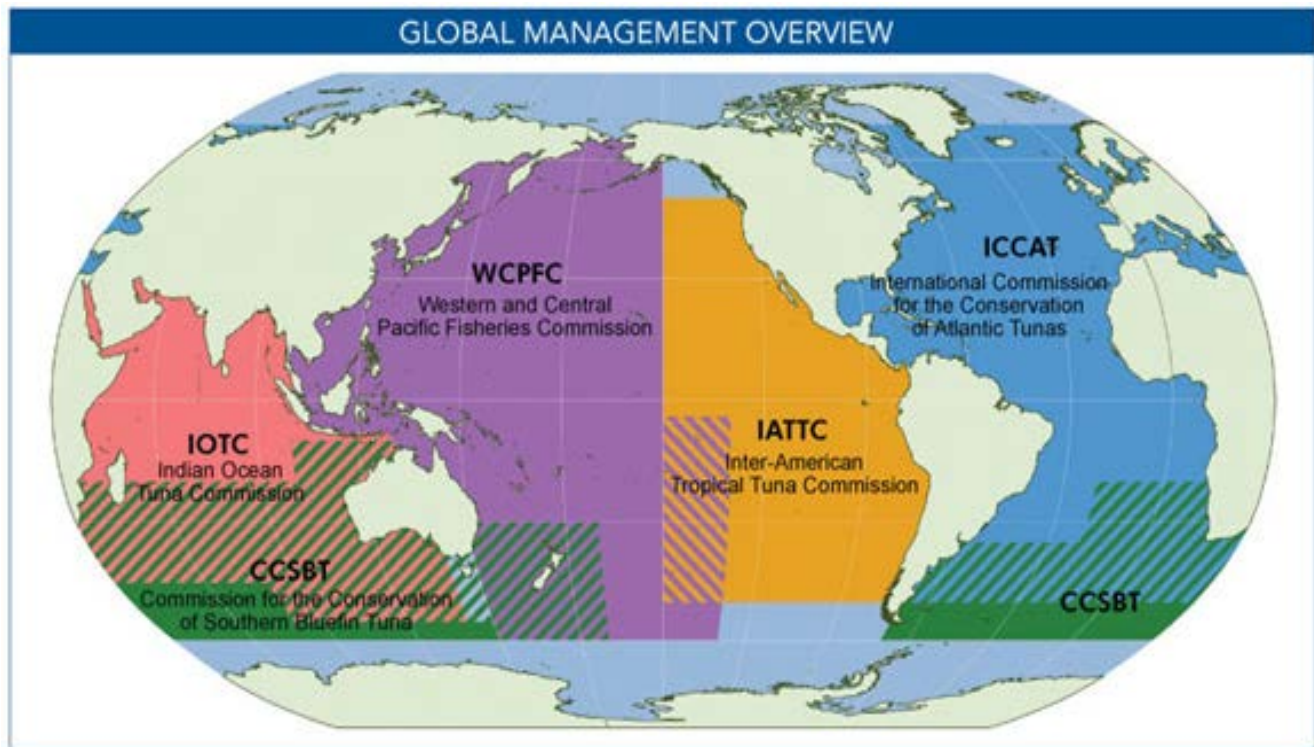


Figure 1. Regional Fishery Management Organization Convention Area

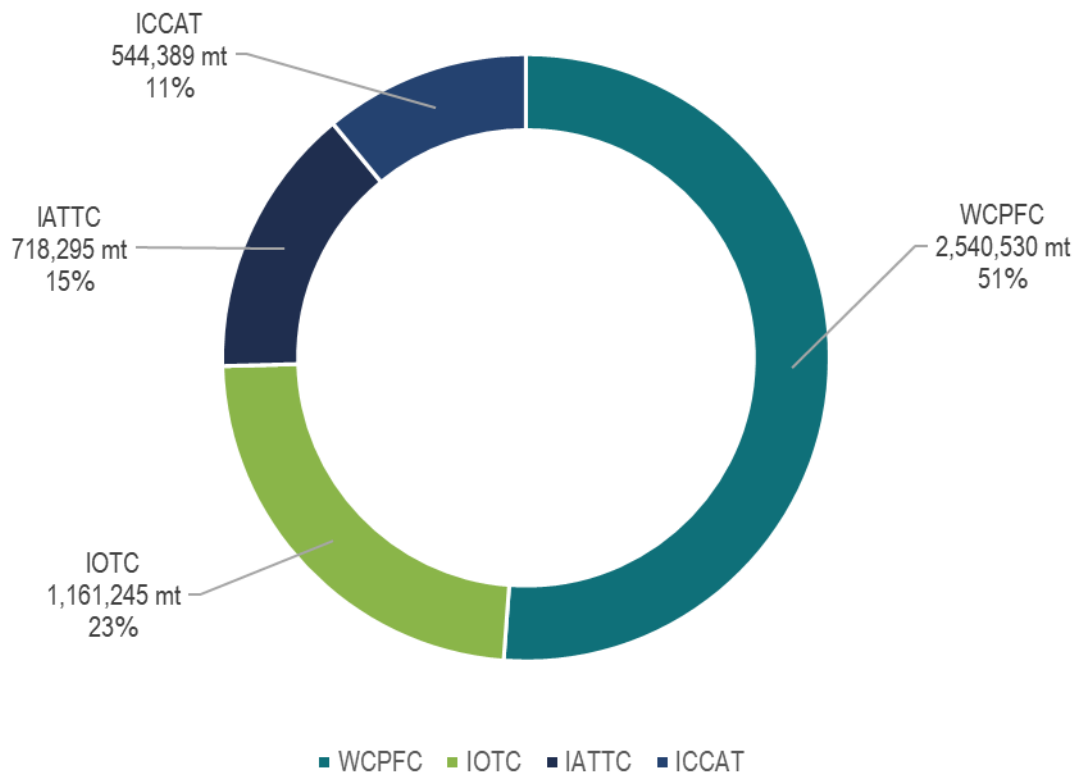
Source: The Pew Charitable Trusts. 2012. FAQ: What is a Regional Fishery Management Organization? Fact Sheet. February 23. Viewed at <https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2012/02/23/faq-what-is-a-regional-fishery-management-organization>, December 15, 2022.

## Overview of Pacific Tuna Fisheries

This analysis focuses on the following fisheries managed by the IATTC and WCPFC: 1) the purse seine fishery for tropical tuna (i.e., bigeye, yellowfin, and skipjack); 2) the longline fishery for tropical tuna; and 3) the longline fishery for albacore. Figure 2 shows the relative proportion of worldwide tropical tuna and albacore catch originating within the jurisdictional waters of the WCPFC and IATTC. Tropical tuna comprises the vast majority (96 percent in 2019) of the tuna harvest by volume worldwide. A substantial proportion (66 percent) of tropical tuna harvested globally originates from the Pacific Ocean. While tropical tuna caught by fishing methods and techniques other than longline and purse seine also enter the major world marketplaces (i.e., the E.U., U.S., and Japan), the vast majority of the Pacific Ocean's tropical tuna catch (approximately 94 percent) originates from the purse seine and longline fleets (Figure 3). By focusing this analysis on the purse seine and



longline fisheries for tropical tuna in the Pacific, we capture 62 percent of global tropical tuna harvest.<sup>3</sup> Our focus on the Pacific longline fishery for albacore captures 50 percent of worldwide albacore harvest.

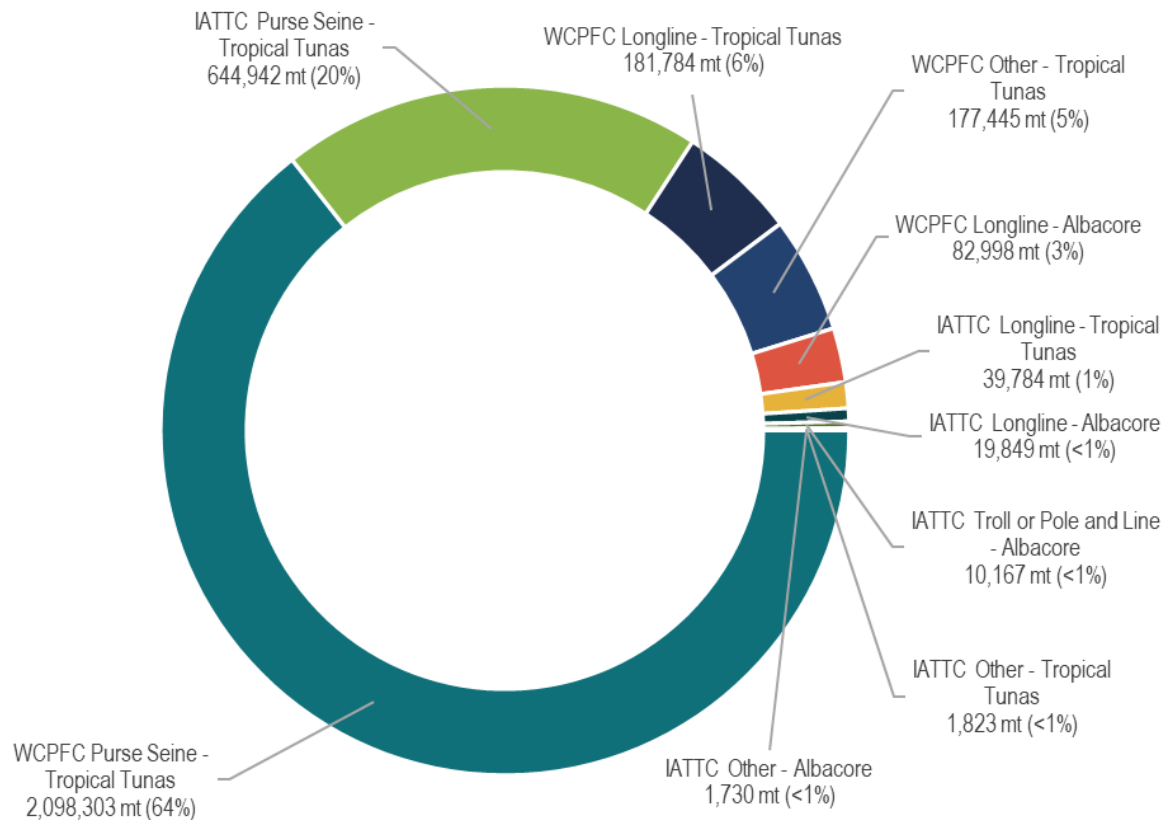


**Figure 2. Global Catch of Tropical Tuna and Albacore**

Source: WCPFC, IATTC, IOTC, and ICCAT Catch Data.<sup>4</sup>

<sup>3</sup> This analysis does not include the 38 percent of tropical tuna harvest that occurs in the Atlantic and Indian Oceans or is harvested in the Pacific Ocean by gears other than longline and purse seine gear (e.g., pole and line, gillnets, handlines). Volumes of tuna caught with such gear types may be significant and the fish may enter international trade chains in addition to being sold in local markets. For instance, tuna caught by pole and line in Philippine, Indonesian, or other waters may be exported to canned tuna markets in the U.K. and elsewhere, and yellowfin caught by handlines in these countries may be exported to the U.S.; these catches are included in the “Other” categories of trade flow data. Nevertheless, tuna harvested by gears other than purse seine and longline are not addressed in this report (apart from pole-and-line and troll-caught albacore).

<sup>4</sup> IOTC data: Indian Ocean Tuna Commission. 2023. Available Datasets “*Best scientific estimates of nominal retained catch data for IOTC species*” (used for stock assessment purposes and fully disaggregated by species and gear).” Downloaded from <https://iotc.org/data/datasets>, January 24. ICCAT data: ICCAT. 2023. “Access to ICCAT statistical databases,” “Nominal Catch Information: Task 1 Excel.” Downloaded from <https://www.iccat.int/en/accesingdb.html>, January 25.



**Figure 3. Pacific Catch of Tropical Tuna and Albacore**

Source: WCPFC and IATTC Catch Data.

### Tropical Tuna Purse Seine Fishery

The Pacific purse seine fisheries in the WCPFC and IATTC convention areas target yellowfin, bigeye, and skipjack tuna, and accounts for 58 percent of all tropical tuna caught globally and 87 percent of the tropical tuna caught in the Pacific. The WCPFC fishery is dominated by the presence of skipjack, while in the IATTC convention area, the catches of skipjack and yellowfin tunas are more balanced. Globally, there are approximately 650 tuna purse seine vessels that catch tropical tunas, with most vessels fishing in the West-Central Pacific and the Eastern Pacific regions. Together, there are approximately 550 purse seine vessels operating in the WCPFC and the IATTC convention areas. Almost all purse seine-caught tropical tuna in major markets is consumed as a canned or pouched product.

### Tropical Tuna Longline Fishery

The longline fishery for tropical tunas is focused primarily on the Japanese-style sashimi-grade market (and to a lesser extent, emerging fresh/previously frozen tuna markets), and largely targets bigeye and yellowfin tuna. Longline vessels tend to catch larger, deeper-swimming tunas; these fish generally command higher prices than those caught by purse seine. The number of longline vessels involved in the Pacific catching tropical tuna and/or albacore is significantly greater than the number of purse seiners. Across the relevant IATTC and WCPFC fisheries, we identified 1,739 longline vessels fishing in the Pacific; these account for about 7 percent of the

tropical tuna caught in the Pacific. Many Pacific longline vessels catch albacore in addition to or instead of tropical tuna; however, albacore catches and trade flows are addressed separately in the next section.

## Albacore Fisheries

The albacore fishery is much smaller than the tropical tuna fishery in the Pacific, with approximately 103,000 tons of albacore caught by longline in 2019, and approximately 10,000 tons caught by troll and pole-and-line gear (compared to approximately three million tons of tropical tuna caught that year). The distant water longline vessels that target tropical tunas may also catch albacore incidentally, and for some longliners, albacore is the target species. Like purse-seine caught tropical tuna, longline-caught albacore is generally consumed as a canned or pouched product purchased from a retailer (e.g., supermarket) in the U.S. and E.U. markets. The albacore supply chains usually involve exporting frozen albacore to processing centers in locations with low labor costs to be processed into pre-cooked tuna loins. These loins are sent mainly to processing plants in Thailand, American Samoa, and to the U.S. mainland, where the canning process is completed. While most albacore in the Pacific is caught by longline gear, off the U.S. and Canadian west coasts, and in New Zealand, an important component of the albacore fisheries targets younger albacore using troll lines and pole-and-line gear. These catches are also primarily canned.

## Factors Driving Tuna Trade Flows

A variety of geographic, governmental policy, cultural, and economic factors affect the dynamics of how tuna moves between and within countries and the actors that are involved. Factors that influence tuna trade flows include tariffs and non-tariff barriers, subsidies, rules of origin, access agreements, trade agreements, governmental policies on several issues, labor costs, infrastructure availability, and others.

## Primary Data Sources

This analysis relies upon a variety of data and information sources, including public and private compiled datasets, literature, media, and trade publications, outreach to industry experts, and the deep industry knowledge of co-author Guillermo Gomez of Gomez Hall Associates. Chapter 3 of this report identifies and describes the primary data sources that provide the foundation for this analysis. These sources are summarized in Table 1, and described briefly below.

Table 1. Summary of Key Data Sources

Data Source	Source/Author	Description	Downloaded From (Date)
WCPFC Catch	WCPFC	Annual catch statistics for WCPFC-managed fisheries reported by species, gear type, and vessel flag country.	<a href="https://www.wcpfc.int/data-catalogue">https://www.wcpfc.int/data-catalogue</a> (January 5, 2023)
IATTC Catch	IATTC	Annual catch statistics for IATTC-managed fisheries reported by species, gear type, and vessel flag country.	<a href="https://www.iattc.org/en-US/Data/Public-domain">https://www.iattc.org/en-US/Data/Public-domain</a> (September 13, 2022)
BACI	CEPII	Annual country-to-country level trade statistics by commodity type. Dataset derived from UN Comtrade data to resolve duplication of trade flows.	<a href="http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=37">http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=37</a> (January 11, 2023)
Datamyne Global Trade Data and Country-Specific Customs and Census Data	Descartes Datamyne	Proprietary for-fee source of trade data compiled from country-specific customs, census, and other data sources.	Proprietary access, via Datamyne website (December 6, 2022)

## Catch Data

Data reported to the WCPFC and IATTC serve as our primary source of catch information for Pacific tuna fisheries. The WCPFC compiles and maintains databases of annual catch based on information provided by members and cooperating non-members. These catch data are provided separately by year, species, gear type, and vessel flag, in PDF form. Similarly, the IATTC maintains annual catch data by species, gear type, and vessel flag.

## Fleet Data

The analysis relies upon six primary data sources that identify vessels that may be actively engaged in the Pacific longline and/or purse seine fisheries for tropical tunas and albacore. These data sources are identified and briefly described in Chapter 3. Using the International Maritime Organization (IMO) number common across the data sources, we crosswalk between these sources to develop a single compiled list of vessels that pulls key fields of interest from each data source (e.g., MSC certification, vessel characteristics, vessel ownership, involvement in certified fisheries). While some datasets (e.g., the International Seafood Sustainability Foundation [ISSF] Pro-Active Vessel Register) are inherently limited to vessels active in the subject tuna fisheries specifically, others are broader and may include vessels that may be participating in fisheries outside of our analysis (e.g., vessels targeting Southern bluefin tuna). We develop the aggregated list of vessels likely to be participating in the fisheries of interest using the steps outlined in Chapter 3.

## Trade Data

As noted in Table 1, this analysis relies on two primary sources of trade data to understand the flow of Pacific tuna and tuna products internationally – BACI (derived from UN Comtrade) and Descartes Datamyne trade

data.<sup>5</sup> The UN Comtrade Database aggregates annual and monthly trade statistics at the national level by product and trading partner, and represent 99 percent of global trade of merchandise, making them a very comprehensive source of information to understand high-level flows of tuna products between countries.<sup>6</sup> One limitation and challenge with using UN Comtrade data for analysis lies in the fact that an individual trade flow is generally reported within the data by both the exporting and importing country, resulting in two records that report on the same trade flow. Recognizing this limitation, the CEPII BACI dataset considers the relative reliability of the data reporter and removes the less reliable duplicate record, providing a clean accounting of bilateral trade flows.<sup>7</sup> The BACI data provide the primary national-level statistics on international trade for the analysis.<sup>8</sup>

Descartes Datamyne is a private service that offers a paid subscription to compiled global import and export trade data from 170 countries across five continents.<sup>9</sup> Resolution of available data differs depending on the type of trade data reported by an individual country. For a sub-set of 20 countries, Datamyne provides generally comprehensive shipment-level customs or other detailed data by commodity, including details such as shipping company, consignee (i.e., the company receiving the goods), and detailed product descriptions. For others, data represent national-level census-based trade information reporting total quantities and value of imports and exported goods by product type.

Trade data of relevance to this analysis are limited to tuna-associated products, as identified by specific Harmonized System (HS) codes that are specified within the data. The HS Code system is a standardized method for classifying traded products that is used internationally to identify products for purposes of assessing duties, ascribing taxes, and reporting statistics.<sup>10, 11</sup> Using the HS codes provided in those data, we define six key product categories representing the target species for this analysis in its various forms: fresh/chilled tropical tuna; frozen tropical tuna; fresh/chilled and raw frozen albacore; prepared and preserved fish preparations, referred to in this report as “processed” tuna (all species), and “other” frozen tuna.

The global nature of tuna fisheries, the large number of actors at every level of the supply chains, and the limited data available to document the complex international trade in these products – particularly at the level of detail required to identify key actors – present substantial challenges to mapping trade flows.

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<sup>5</sup> In addition, while BACI data and Datamyne serve as the foundational sources of information regarding the trade of tuna products between countries, these data are supplemented by other detailed country or region-specific data as appropriate. Other key sources of trade data relied on include National Marine Fisheries Service (NMFS) Foreign Fishery Trade Data (NMFS Trade Data) and Eurostat data, both described in Chapter 3.

<sup>6</sup> United Nations Statistics Division. 2023b. Comtrade Database. Viewed at <https://comtradeplus.un.org/>, February 27, 2023.

<sup>7</sup> CEPII. 2023. BACI. Viewed at [http://www.cepii.fr/CEPII/en/bdd\\_modele/bdd\\_modele\\_item.asp?id=37](http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=37), February 27, 2023.

<sup>8</sup> Data for the analysis were downloaded from [http://www.cepii.fr/CEPII/en/bdd\\_modele/bdd\\_modele\\_item.asp?id=37](http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=37), on January 11, 2023.

<sup>9</sup> Descartes Datamyne. 2023. Why Customers Choose Descartes Datamyne. Viewed at <https://www.datamyne.com/about-us/why-customers-choose-descartes-datamyne/>, February 27, 2023.

<sup>10</sup> International Trade Administration. 2023. Harmonized System (HS) Codes. Viewed at <https://www.trade.gov/harmonized-system-hs-codes>, February 27, 2023.

<sup>11</sup> The HS Code system is updated every five years and can include changes in the definitions of codes and products that are included in a grouping. This can create difficulties in comparing data by HS code across time. For this analysis, all key data sources relied upon use the HS Nomenclature 2017.

Table 2 identifies the key data gaps and caveats that limit this analysis and represent potential areas in which stakeholders might focus to improve the traceability of tuna products and transparency of the trade flows. The analysis overcomes these limitations by relying on a variety of additional country or fishery-specific references, as well as our detailed professional industry knowledge, to supplement the available data and fill in data gaps. These references are identified and described as they are employed in Chapter 6 through Chapter 8.

## Other Sources Referenced

Tracing and documentation of trade flows and identification of key actors within global tuna fisheries is a notoriously complex and labor-intensive task. Several previous efforts have completed robust evaluations of various components of the supply chain, offering substantial value to the present effort. This report leverages the results of several earlier efforts to supplement our analysis, allowing us to fill in data gaps and provide additional detail not provided by the data sources on which our analysis relies. We acknowledge these impressive efforts and are grateful for these references.<sup>12</sup>

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<sup>12</sup> Campling, L., A. Lewis, and M. McCoy. 2017. The Tuna Longline Industry in the Western and Central Pacific Ocean and its Market Dynamics. Forum Fisheries Agency, Honiara, Solomon Islands; Elizabeth Havice and Liam Campling. 2018. Corporate Dynamics in the Shelf-Stable Tuna Industry. Forum Fisheries Agency, Honiara, Solomon Islands; Havice, E., M.A. McCoy, and A. Lewis. 2019. Market and Industry Dynamics: Western and Central Pacific Tuna Purse Seine Fishery, August. Forum Fisheries Agency, Honiara, Solomon Islands. Downloaded from <https://www-staging.ffa.int/download/market-and-industry-dynamics-wcpo-distant-water-tuna-purse-seine-fishery/>, March 20th, 2023; Havice, E., L. Campling, and M.A. McCoy. 2022. Market and Trade Dynamics: Western and Central Pacific Ocean Tuna Fisheries. June. Forum Fisheries Agency, Honiara, Solomon Islands; and MRAG Asia Pacific. 2019. WCPO Transshipment Business Ecosystem Study. October. Downloaded from <https://mragsiapacific.com.au/wp-content/uploads/2021/12/Pew-WCPO-Transshipment-Report-final.pdf>, March 19, 2023.

Table 2. Key Trade Data Caveats and Limitations

Topic	Description	Approach to Resolving Data Limitation
Fishery of Origin	Although data specify the product type, they do not identify the fishery (i.e., gear type or ocean) from which the product originated.	Consider the trade partners involved (e.g., fleet characteristics, harvest activity, location, markets, consumer product preferences) and best professional judgment to make assumptions regarding the likely fishery of origin for traded products.
Harvest Country of Exported Fish	Typically, the exporting country in the BACI and supplying country in Datamyne data is the flag State that catches the fish or the nation that produces/exports the product. It does not reflect the geographic origin of the tuna itself (i.e., where the tuna was caught) or may assign a supplying country of "International Waters", which similarly does not allow for identification of the country responsible for catching the fish.	Rely on alternate references identifying catch and trade volumes, as well as industry knowledge, to identify likely sources and destinations of tuna and tuna products of unknown origin.
Processed Products	Commodities are only consistently reported at a six-digit HS code resolution, which limits the ability to distinguish between different types of prepared and preserved tuna products falling under HS code 1604.14.	Where available, rely on alternate, more detailed data sources to identify product types at a finer resolution. For the U.S and the European Union, our analysis was complemented using National Marine Fisheries Service/ National Oceanic and Atmospheric Administration data and Eurostat data for processed tuna products imported into the European Union.
"Other" Processed Products	Certain trade entries are identified by "catch all" product codes that include tuna but are not specific as to the preparation or product.	Rely on information about the trade partners' activities and preferences to make a best professional judgment of the most likely product types being traded under those codes in specific instances.
Company Names	Comprehensive shipment-level data identifying company names are available for only a sub-set of countries. Although certain countries key to this analysis are captured comprehensively (e.g., Ecuador), others are not (e.g., Thailand).	For certain countries, the available data identifying shipper/consignee allow for a more comprehensive analysis of tuna trade flows, where specific companies at the harvest, trading and/or processing level could be determined. In those instances, we noted that in the report. Where company information is not available, rely on alternate references and industry knowledge to identify key actors in the supply chain, as possible.

## Key Countries in the Pacific Tuna Fishery Supply Chains

The analysis initially focused on identifying the top countries in each of the Pacific tuna fisheries in terms of harvest, fleet size, and trade.

### Key Catching Countries

The top catching countries in each of the Pacific tuna fisheries are defined as those countries jointly harvesting 85 percent of the total catch in the fishery, ranked by the size of their annual catch in 2019.<sup>13</sup> For the purpose of this report, a deliberate decision was made to use 2019 catch and trade data, primarily because global tuna fisheries were significantly affected by the COVID pandemic during 2020 to 2022, causing tuna fleets to operate less frequently due to limitations on crew replacements, access to fishing ports, and other pandemic impacts on tuna fishing and trade. In addition, catch and trade information for 2022 was incomplete at the time this project began. The results of this analysis are presented in Table 3.

Table 3. Top Pacific Tuna Fishing Countries by Fishery (Top 85 Percent of Catch)

Flag State	Catch (mt of live weight)	Number of Vessels	Percent of Fishery Catch	Cumulative Percent of Fishery Catch
<b>Tropical Tuna Purse Seine Fishery</b>				
<b>TOTAL CATCH</b>	<b>2,743,245</b>	<b>551</b>		
Ecuador	321,821	108	11.7%	11.7%
South Korea	314,817	28	11.5%	23.2%
Papua New Guinea	265,389	15	9.7%	32.9%
Taiwan	240,667	31	8.8%	41.7%
Kiribati	227,777	10	8.3%	50.0%
United States of America	195,228	23	7.1%	57.1%
Japan	170,557	40	6.2%	63.3%
Micronesia (Fed. States)	159,269	26	5.8%	69.1%
Indonesia	139,127	11	5.1%	74.2%
Mexico	126,044	53	4.6%	78.8%
Marshall Islands	95,549	10	3.5%	82.2%
Philippines	77,709	62	2.8%	85.1%
Other Countries	409,291	134	14.9%	100%

<sup>13</sup> Unless otherwise specified in this report, the tuna harvest or catch attributed to any country is a catch taken by the tuna fleet (vessels) from such country or "Flag State"; that is, the vessel flag under which the tuna is caught.



Flag State	Catch (mt of live weight)	Number of Vessels	Percent of Fishery Catch	Cumulative Percent of Fishery Catch
<b>Tropical Tuna Longline Fishery</b>				
<b>TOTAL CATCH</b>	<b>221,568</b>	<b>1,739</b>		
South Korea	35,936	102	16.2%	16.2%
Taiwan	34,998	573	15.8%	32.0%
Japan	32,531	393	14.7%	46.7%
China	27,854	296	12.6%	59.3%
Indonesia	17,170	0	7.7%	67.0%
Vietnam	16,207	0	7.3%	74.3%
United States of America	9,989	109	4.5%	78.8%
Micronesia (Fed. States)	8,583	12	3.9%	82.7%
Solomon Islands	6,601	0	3.0%	85.7%
Other Countries	31,699	254	14.3%	100%
<b>Albacore Longline Fishery</b>				
<b>TOTAL CATCH</b>	<b>102,847</b>			
China	42,722		41.5%	41.5%
Taiwan	18,603		18.1%	59.6%
Fiji	9,072		8.8%	68.4%
French Polynesia	5,822		5.7%	74.1%
Vanuatu	5,063		4.9%	79.0%
Japan	3,271		3.2%	82.2%
South Korea	2,634		2.6%	84.8%
Solomon Islands	2,617		2.5%	87.3%
Other Countries	13,043		12.7%	100%

## Notes:

1. For many Pacific countries, focusing on the flag state gives an incomplete picture of the nationality of the fleet, and therefore how much control the flag state can exert over the fleet. Dynamics around joint ventures, charter arrangements, and other aspects of fleet ownership are addressed in the discussion of each flag state.

Flag State	Catch (mt of live weight)	Number of Vessels	Percent of Fishery Catch	Cumulative Percent of Fishery Catch
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2. Available data do not allow us to distinguish longline vessels targeting albacore for those targeting tropical tuna. As the fishery with substantially higher catch volumes, the majority of identified longline vessels target tropical tuna either exclusively or primarily. It is not specifically known what proportion of these vessels target albacore.

Based on the data sources listed above and looking across the three Pacific fisheries, certain countries emerge as key participants—defined as being in the top five catching countries in at least one year from 2016 to 2020—in multiple fisheries, while others are prominent in only one fishery. As noted above, the purse seine catch of tropical tuna is vastly greater than longline catches. The countries active in the tropical tuna purse seine fishery, even if they are active in the purse seine fishery only, catch much more tuna than countries that focus on the longline fisheries.

South Korea caught more tuna in the Pacific than any other country in 2019. Most of its catch was from the purse seine fishery for tropical tuna, though South Korea also has some catch of tropical tuna by longline. Ecuador is the second-largest catching country in the world and is active mainly in the purse seine tropical tuna fishery. Other countries playing a key role at the catch level of the purse seine fishery include Papua New Guinea, Taiwan, Kiribati, the United States, Japan, the Federated States of Micronesia (FSM), Indonesia, Mexico, the Marshall Islands, and the Philippines. While it is not the top harvester in any single fishery, Taiwan is a key player in all three fisheries—the only country to rank in the top five catching countries in each fishery. It also ranks as the third-largest harvesting country in the world.

Of the countries engaged in longline fishing only, China plays a key role in that fishery. China, the country that catches the most albacore via longline, also has a substantial longline fishery for tropical tuna. It is not significantly active in the purse seine fishery; as such, its total catch is much lower than the countries that have a purse seine fleet. Japan's longline fishery focuses primarily on tropical tuna; the country catches more tropical tuna by longline than any other country. However, Japan also has relatively small catch of albacore by longline (though given the lower catch quantities overall, Japan still ranks in the top five harvesting countries for longline albacore).

This analysis also briefly addresses the pole and line and troll fisheries for albacore tuna. Total catch of this fishery in 2019 was 21,670 metric tons (mt) and only four countries participated: the U.S. were (7,766 mt);<sup>14</sup> Canada (2,402 mt);<sup>15</sup> New Zealand (2,751 mt);<sup>16</sup> and Japan (8,751 mt).<sup>17</sup>

<sup>14</sup> International Scientific Committee for Tuna and Tuna Like Species in the North Pacific Ocean. 2022, Kona, Hawaii, July 12-18, 2022. Plenary 09. National Report of USA (USA Fisheries and Research on Tuna and Tuna Like Fisheries in the North Pacific Ocean). NOAA, NMFS, USA. Page 26 and Table 2, Page 29.

<sup>15</sup> Fisheries and Oceans Canada. 2020. 20th Meeting of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean, Plenary 4, ISC/20/Plenary /4. National Report on Canadian Tuna and Tuna-like Fisheries in the North Pacific in 2019. Table 1, Page 3. Downloaded from [https://isc.fra.go.jp/pdf/ISC20/ISC20\\_PLENARY04\\_National\\_Report\\_of\\_Canada.pdf](https://isc.fra.go.jp/pdf/ISC20/ISC20_PLENARY04_National_Report_of_Canada.pdf), June 7, 2023.

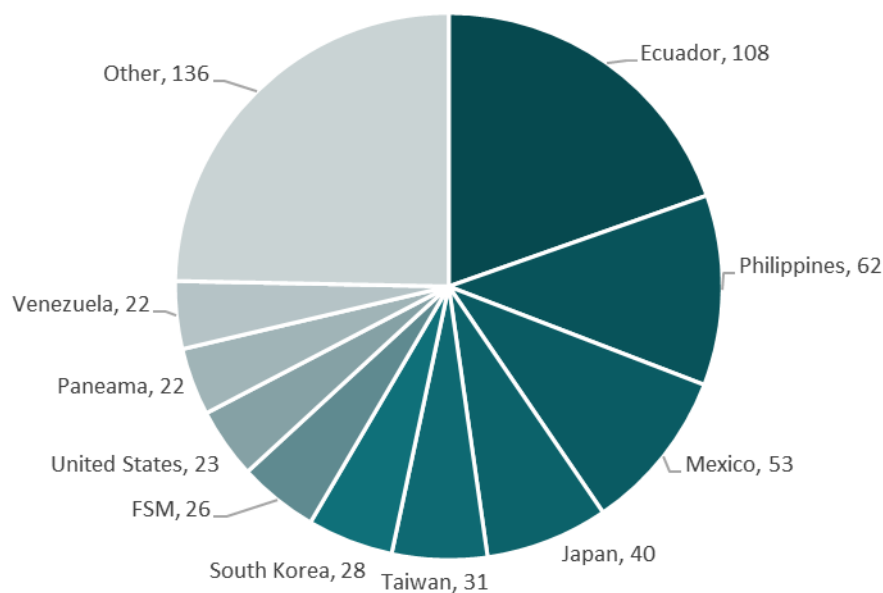
<sup>16</sup> WCPFC. 2022l. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission Part 1: Information on Fisheries, Research and Statistics. WCPFC-SC-18-AR/CMM-16, Ministry for Primary Industries, New Zealand. Table 6, Page 9.

<sup>17</sup> WCPFC. 2022f. Scientific Committee Eighteenth Regular Session, Part 1: Information of Fisheries, Research, and Statistics. WCPFC-SC18-AR/CMM-10 (Rev.02). Japan. Table 6, Page 13.

### Key Countries by Fleet Size

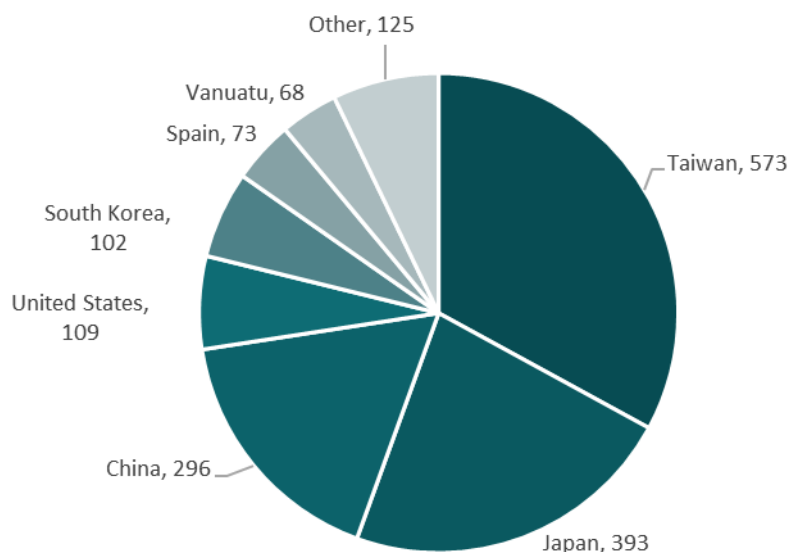
Based on the analysis of fleet data, countries that top the list of catch in the harvest of tropical tunas by purse seine, including South Korea, Ecuador, Taiwan, the United States, and the FSM, are all identified as having amongst the largest purse seine fleets (Figure 4). Although the Philippines, Mexico, and Japan are not identified individually as countries consistently ranking within the top five for catch in the Pacific purse seine fisheries, all are within the group of 12 countries that caught 85 percent of the tropical tuna purse seine catch in 2019, and all are identified as having amongst the largest purse seine fleets. Both Papua New Guinea and Kiribati are amongst the top nations in terms of catch. However, neither register amongst the top 10 in terms of fleet size. This discrepancy may be due to differences in the attribution of catch and the flag of the vessel related to charter, joint venture, and other ownership arrangements, which is discussed in detail in Chapter 6.

The dominance of catch volume of Taiwan, Japan, and China in the longline fisheries for both tropical tunas and albacore are supported by their relative ranks as first, second, and third in terms of the size of their longline fleets (Figure 5). Taiwan and Japan comprise 60 percent of all WCPFC longline vessels while South Korea, China, and the United States together comprise another 30 percent of the WCPFC longline fleet.



**Figure 4. Number of Purse Seine Vessels by Country**

Source: IEC/GHA Vessel Compilation



**Figure 5. Number of Longline Vessels by Country**

Source: IEC/GHA Vessel Compilation

### Key Countries in the Global Trade of Tuna

Given the volume of tuna caught in the purse seine fishery for tropical tuna, those countries engaged in the harvest and processing of those fish occupy dominant positions in the trade flows of Pacific-caught tuna. Identification of key processing centers and markets for tuna products is supported by review of the trade of processed tuna products. BACI trade data show that the countries with the largest imports of frozen tropical tuna are generally also those with the largest reported exports of processed tuna (HS code 1604.14). Figure 6 displays the global trade flows of processed tuna products, including cooked loins and canned and pouched tuna of both tropical tuna species and albacore in 2019, according to the BACI data. Exporting countries are displayed on the left, and importing countries are displayed on the right. Based on an examination of global trade flows in frozen tropical tuna and processed tuna, we identify Thailand, Ecuador, the Philippines, Papua New Guinea, and to a lesser extent, Vietnam, China, and Indonesia as key countries significantly involved in the importing, processing, and trade of Pacific tunas.<sup>18</sup>

The major destination markets of processed tuna products are the U.S, Europe, and Japan, though other countries account for a large share of imports.

<sup>18</sup> Although substantial exports of processed tuna originate from Spain, Mauritius, and the Seychelles, those processing centers rely primarily on non-Pacific fisheries.

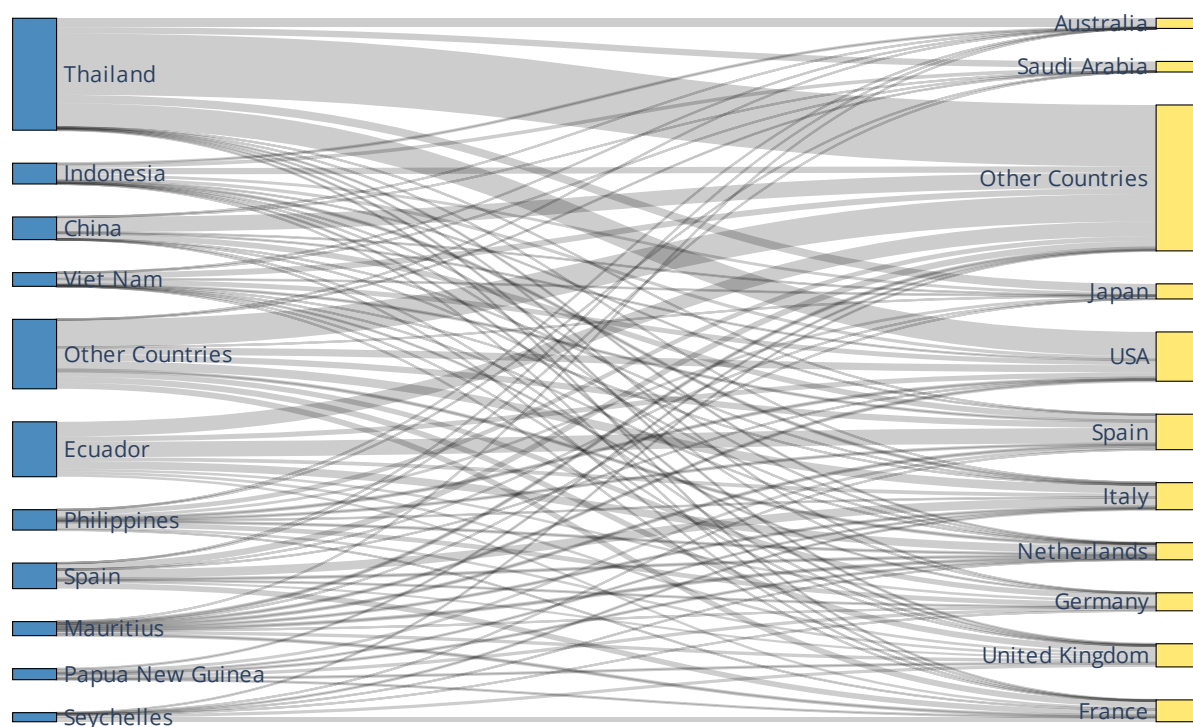


Figure 6. Global Trade in Processed Tuna (Countries Exporting Processed Tuna and Importing Processed Tuna, 2019)

Source: BACI data.

## Supply Chains and Trade Flows in the Purse Seine Fishery for Tropical Tuna

The Pacific purse seine fishery for tropical tuna catches 58 percent of all tropical tuna caught in the world. Most of the purse seine-caught tuna are destined to be consumed as canned/pouched tuna products. In some cases, the raw, frozen tropical tuna goes through the entire canning process in one facility, but it may first be sent to a country with low labor costs and/or a favorable tariff regime to be partially processed into pre-cooked loins that are later sent to another facility to complete the rest of the canning process. Trading companies often facilitate the steps along the tuna supply chain. The main end markets for canned tropical tuna are the U.S. and the E.U.

Tuna destined for these markets flows primarily through four major traditional processing centers in the Pacific basin (Thailand, Ecuador, and to a somewhat lesser extent, the Philippines and Papua New Guinea) and three emerging processing centers (Vietnam, China, and Indonesia). Korea and Mexico have substantial processing industries that primarily serve their own internal markets. The purse seine fleets of many distinct fishing countries supply these processing centers, often through transshipping operations. Taiwan alone is a key harvesting country that does not have its own in-country processing capacity, although the Taiwanese company FCF Fishery Co. Ltd. Has extensive interests in and influence over processing in other countries in the Pacific region.

**Thailand.** Thailand is the world's single largest importer of raw frozen tuna from the Pacific and globally and is the world's single largest exporting country of processed tuna products. Thailand has no tuna fleet of its own

and therefore relies 100 percent on imports of tuna to fulfill the needs of its processing sector. The tuna trade flow from the harvest sector to the processing sector is wholly supported by tuna trading companies like FCF Fisheries Co. Ltd., Tri-Marine, and Itochu.<sup>19</sup> Without the participation of the tuna trading companies which have long-term interpersonal and commercial relationships with tuna purse seine owners fishing in the Pacific, Thailand would not be able to source the almost 1 million mt of tropical tuna and albacore that it requires to keep its processing sector running. Its processing capacity produces canned tuna products that supply the U.S. and E.U. canned tuna markets, as well as other major canned tuna markets in the Middle East, Asia, Africa, Oceania, and Latin America.

**Ecuador.** Ecuador is a major catching, processing, and exporting country for tuna in the Pacific region and in the world. The supply chains that feed Ecuador's processing needs have two components: domestic landings and imports. Ecuador's tuna purse seine fleet is the single largest tuna fleet operating in the world, comprised of 108 tuna vessels. The Ecuadorian fleet produces one-half of the raw material needs of Ecuador's processing sector (about 300,000 mt). The additional 300,000 metric tons required by Ecuador's tuna canneries are supplied by the catches of other Latin American tuna purse seine fleets (~ 100,000 mt) plus the catches of other countries fishing in the Pacific (e.g., Taiwan, Korea, FSM, Kiribati), as well as purse seine catches from fleets that operate in the Indian and Atlantic oceans. Vessels flagged in Panama, El Salvador, Guatemala, and Nicaragua contribute to Ecuador's supply needs. Panama, as a flag of convenience, continues to serve the interests of Spanish and Venezuelan tuna boat owners who flag their vessels in Panama to protect their operations from more onerous requirements established in their home countries while continuing to deliver to fish processors in Ecuador. This trade flow is likely to continue.

Ecuador's imports of frozen tropical tuna caught by purse seiners result in the production of intermediate products such as pre-cooked tuna loins and finished canned and pouched tuna products. Ecuador's main exports for these two types of commodities serve the major E.U. markets (i.e., Spain, Italy, France, Germany, the Netherlands) and the UK, as well as the needs of major tuna-processing European companies that import pre-cooked loins to produce canned tuna sold in these E.U./UK markets. A portion of Ecuador's processed tuna production also complements the import needs of the U.S. market.

**Philippines and Papua New Guinea.** The Pacific tropical tuna harvesting and processing operations of the Philippines and Papua New Guinea (PNG) constitute the next-level cornerstones of the Pacific tuna trade flows associated with purse seine operations, and the activities of these two countries with respect to tuna harvest and processing are inextricably linked. Historically, the Philippines has been a major tuna purse seine fishing country and a major canning country, supplying canned tuna to consumers in the U.S. and the E.U. However, the tuna resources found within the archipelagic waters of the Philippines have been subject to intensive fishing, causing the Philippines fleet to seek access to waters in the Solomon Islands, FSM, and especially PNG.

The need to gain access to tuna resources led the Philippines tuna industry to make substantial land-based tuna-processing investments in PNG two decades ago, enticed by PNG government policies intended to "domesticate" the tuna industry. This resulted in many purse seine vessels from the Philippines reflagging under the PNG flag to gain free access to PNG waters. The result was the emergence of an active PNG tuna processing sector supplied by both a Philippines-controlled tuna fleet and fleets from other countries (e.g., Taiwan). The inbound tuna trade flows of raw tuna going into PNG have made PNG, together with the Philippines, into the

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<sup>19</sup> One industry observer has noted that Itochu's role is most relevant in supplying raw material that is used to produce tuna petfood products (Communication from Kate Barclay 2023). See Chapter 7 for more information about the tuna trading companies.

third/fourth major processing hub, where pre-cooked tuna loins and canned tuna products are produced and exported, mainly for the E.U. markets.

The relatively rapid growth of the PNG processing sector has been accompanied by serious challenges, where PNG government policies have clashed with foreign investors and fleet operators from the Philippines. In addition, with global climate change and intensive fishing in PNG waters, the once-abundant tuna resources off PNG have shifted eastward, requiring the Philippines and PNG-flagged purse seine vessels to seek access at higher costs to other fishing grounds further away (e.g., Kiribati).

To reduce these costs, some of the vessels that once were flagged under PNG as part of the country's domestication policies, including those controlled by the Philippines, are reflagging to the flags of Pacific Island Countries, such as FSM, the Marshall Islands, Tokelau, Kiribati, and Nauru. This allows tuna purse seine vessels to avoid having to pay for fishing days not utilized in PNG under the Vessel Day Scheme (VDS) implemented by the Palau Nauru Agreement (PNA). In addition, this reflagging gives tuna boat operators privileges to fish on the High Seas and to continue to fish during FAD closures that apply to distant water fishing nations (DWFN) but not to the vessels of Pacific Island Countries. The result is that tuna trade flows associated with tuna purse seine operators are now shifting, as the fleet has reflagged to other Pacific Island Countries. Suddenly, a country like Nauru that had no experience in purse seining for tuna has a fleet of 20 vessels controlled by DWFNs. Tuna now caught by "Nauru's" tuna fleet has entered tuna trade flows and is identified in trade data as exports from this country to Thailand.

**Taiwan.** While Taiwan has no in-country, domestic tuna processing capacity, the Taiwanese tuna purse fleet continues to be a dominant player as an exporter of raw frozen tuna for canning and Taiwanese tuna interests are significantly involved and have financial links with major tuna processing facilities in Thailand, Papua New Guinea, and Fiji through companies such as FCF Fishery Co. Ltd., as discussed later in this report. The fleet is closely linked to the operation of FCF Fishery Co. Ltd. Where necessary, the Taiwanese fleet has placed some vessels under the flags of Pacific Island Countries to gain the competitive advantages described above regarding the PNA's VDS. Therefore, as long as Thailand continues to have a major processing sector, the role of the Taiwanese tuna purse seine fleet in Pacific-wide tuna trade flows will continue. The importance of Taiwanese purse seiners may, in fact, increase, with the additional demand for raw material required by Ecuador's tuna processing sector.

**Korea and Japan.** The Korean and Japanese tuna purse seine fleets are focused first on supplying their own domestic markets. Korea's domestic market for canned tuna is growing but the catches of its tuna fleet exceed the current demand from its processing sector. Therefore, any surplus frozen tuna caught by the Korean fleet enters the trade flows of tuna available to processing countries in the Pacific basin and elsewhere. Using its own fleet of reefer carrier vessels, Korea transships the catches of its purse seine fleet back home, allowing the fleet to stay and continue to fish on the fishing grounds.<sup>20</sup> Some of the Korean vessels have reflagged or developed charter arrangements with Pacific Island Countries (e.g., Kiribati, FSM, and the Marshall Islands). The Japanese fleet, whose focus is on supplying skipjack for its katsuobushi market, also catches more tuna than it requires, with any surplus available mainly to Thai tuna processors via the major tuna trading companies. Japan's strategy differs from Korea's, however, in that its vessels return home with their catches every other trip, reducing transshipping operations significantly.

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<sup>20</sup> A reefer carrier is a large vessel with the capacity to refrigerate cargo.



**Mexico.** The Mexican tuna fleet and processing sector are vertically integrated to a high degree, supplying the country's domestic market needs. In the recent past, because of higher prices for exports, Mexico has decided to export large yellowfin to Spain and substitute those exports by importing skipjack from the western Pacific to maintain and grow the domestic market. Therefore, it is likely that an emerging inbound trade flow of tropical tuna into Mexico from the western Pacific will continue via trading companies such as Tri-Marine, with a corresponding outbound trade flow of yellowfin tuna going to Spain.

**Vietnam and China.** At the processing level, both Vietnam and China are playing increasing roles by drawing inbound trade of raw frozen tuna for processing into pre-cooked tuna loins and canning, largely due to low labor costs. Vietnam is particularly active in exporting pre-cooked loins, as well as canned tuna to the E.U. and the U.S. Vietnam does not have a purse seine fleet, so it competes with Thailand for raw material. It is unclear how this competition will develop and what impact this could have on future tuna trade flows, especially if Thailand succeeds in negotiating a Free Trade Agreement with the E.U.

China is also active in processing pre-cooked tuna loins and in processing raw tuna loins for export to sashimi-grade markets. China is actively pursuing joint ventures with Pacific Island Countries, which may also result in modifying existing tuna trade flows in the medium to long term.

## Supply Chains and Trade Flows in the Longline Fishery for Tropical Tuna

The longline fishery for tropical tunas is primarily focused on the Japanese sashimi-grade market and involves two main species: bigeye and yellowfin tuna. The size of this market continues to contract, as younger generations of Japanese consumers have switched their preferences from consuming sashimi tuna to beef. The Japanese sashimi-grade market continues to be supplied by the catches of the Japanese, Korean, Taiwanese, and Chinese DWFN fleets. The strategies followed by each of these fleets relative to fishing and transshipping of tuna is evolving, in turn shaping the trade flows that support the efficient movement of sashimi-grade tuna into the Japanese market. In addition, the emergence of Japanese-style restaurants in the U.S., the E.U., and other regions is creating new market outlets for the catches of these fleets. Four countries – Korea, Taiwan, Japan, and China – caught over half of the total longline catches of tropical tuna in 2019, and these countries dominate the tropical tuna longline trade flows.

**Japan.** Japan's strategy appears oriented toward capitalizing on the higher quality reputation among Japanese tuna consumers of the products caught by the country's own fleet and delivering their catches directly to their home ports. This has reduced the number of High Seas tuna transshipments by the Japanese fleets which, in the absence of substantial observer coverage, was raising doubts as to whether the fleets of Japan and other DWFNs followed RFMO requirements for at-sea transshipments. The catches of sashimi-grade tuna produced by the Japanese fleet are not subject to the same entry requirements as those that Taiwan, Korea, and China must meet to gain access to the Japanese market.

Japanese tuna supermarket chains and trading companies have traditionally relied on markets that cater to wholesalers or consumers where fresh and frozen sashimi-grade, longline-caught tuna is normally auctioned. These supermarkets are increasingly buying directly from tuna producers and bypassing some of the traditional distributional channels historically used to move sashimi-grade tuna into the market.

**Korea.** The strategy of the Korean longline fleet appears to be moving in the direction of transshipping most of their catches back to Busan, South Korea, where the industry has developed processing facilities that can handle ultra-frozen tuna at minus 60 degrees Celsius to produce high-quality, sashimi-grade, value-added products for the Japanese market and Korea's own growing market. Trade in processed sashimi-grade products such as loins, fillets, blocks, and Saku-blocks is increasing. As a result, new tuna trade flows appear to be emerging for value-



added, sashimi-grade, processed products, replacing trade flows that involved whole and gilled-and-gutted tropical tuna. The Korean use of their own reefer carriers limits the use of third-party tuna trading companies in handling this segment of the tropical tuna trade flows.

**Taiwan.** The Taiwanese longline fleet does not appear to be making any significant changes to its *modus operandi*; they continue to limit their efforts to simply catching sashimi-grade tuna rather than turning their catches into value-added, sashimi-grade products. Two features of the Taiwanese strategy to reduce the cost of accessing fishing grounds have been to increase their operations on the High Seas areas where no fishing fees are required, and entering into charter arrangements or reflagging when circumstances are favorable. Taiwan continues to rely heavily on transshipping operations on the High Seas, which represents a weakness given the increasing pressure exerted by non-governmental organizations (NGOs) and RFMOs to closely limit such transshipping activities. The Taiwanese trade flows are not likely to change much in the short term, but if Taiwan increasingly becomes a supplier of emerging sashimi-grade markets in the U.S. and E.U., this flow could change.

**China.** China's longline fleet strategy appears to focus on establishing bases for operations in some key Pacific Island Countries, from which it can support fresh and deep-frozen, sashimi-grade tuna operations. The fresh sashimi-grade tuna operations are supported by air shipments from key locations (the Marshall Islands, FSM, etc.) where reliable air connections to Japan and other markets are available. The deep-frozen tuna longline operations are combined with transshipments that bring the fish back to China for further processing into sashimi-grade, value-added products.

**Indonesia and Vietnam.** Indonesia and Vietnam continue to play a relevant role in the supply of value-added frozen tuna products treated with carbon monoxide to maintain their red color. These products are entering the U.S. market, used at Japanese-style restaurants as sashimi-grade tuna or sold as fresh/previously frozen tuna for grilling by food service and retail markets. Carbon monoxide-treated products are prohibited from sale in the E.U. markets.

## Supply Chains and Trade Flows in the Albacore Longline and Troll/Pole-and-Line Tuna Fisheries

The albacore longline tuna fishery conducted by the DWFNs that also target tropical tunas is focused on exporting frozen albacore to processing centers in countries with low labor costs and/or favorable tariff regimes to produce pre-cooked tuna loins. This involves catches from both northern and southern albacore stocks. These loins are sent mainly to processing plants in Thailand, American Samoa, and to the U.S. mainland, where the canning process is completed. The U.S. canned albacore market is where the majority of Pacific-caught longline albacore is consumed under the major U.S. brands (i.e., Bumble Bee Seafood, Chicken of the Sea, and Starkist), as well as in the private-label and institutional markets. A relatively small portion of the longline-caught albacore from the traditional fleets goes into the Japanese market and is used for sashimi.

At present time, Fiji and the Solomon Islands are locations where round whole frozen albacore is sent for processing into pre-cooked loins. In addition, partial processing (pre-cooked loins) and full processing of albacore are also performed at the Starkist plant in American Samoa. Vietnam is also an emerging processor, importing albacore to be processed into albacore pre-cooked loins. It is unclear if Vietnam's emerging competitiveness in this segment of the albacore trade flows will affect the catches currently going to Fiji and the Solomon Islands.

The primary albacore fishing countries in the Pacific using troll and pole-and-line gear are the U.S., Canada, New Zealand, and Japan, all of which are Marine Stewardship Council (MSC) certified. In the Pacific, the troll

and pole-and-line albacore fishery is about one fifth the size of the longline albacore fishery (around 22,000 mt compared to 102,000 mt), less than one tenth the size of the tropical tuna longline fishery (around 221,000 mt) and tiny compared to the 2.7 million mt tropical tuna purse seine fishery.

About half of the U.S./Canadian catch of troll/pole and line albacore is exported to Spain for canning; about one quarter is consumed domestically in the U.S. and Canada as fresh/previously frozen albacore loins that have been processed domestically or abroad; and the remaining approximately one quarter of the catch is processed as a high-quality canned product in Vietnam, Costa Rica, or a few very small boutique canneries on the Pacific Northwest coast. From time to time, depending on market conditions, some U.S.-caught albacore is exported whole frozen to Thailand for canning.

New Zealand's troll/pole and line albacore catches are exported to Thailand for processing and then sent to either the U.S. market or more recently, to Spain. Japan's troll/pole and line albacore catches are mainly consumed domestically as sashimi; any surplus is exported to Thailand for processing and eventual export to the U.S. market.

## Conclusions and Recommendations

This report presents key conclusions of the analysis and strategic recommendations for organizations interested in promoting sustainable, effective management of Pacific tuna fisheries. It identifies the actors and sectors of the trade flow that likely wield the greatest influence, the segments of the supply chain that are most difficult to decipher, and the applicability of the findings of the analysis to other fisheries managed by the target RFMOs, as well as fisheries managed by the Indian Ocean Tuna Commission (IOTC) and International Commission for the Conservation of Atlantic Tunas (ICCAT). It also provides a series of additional observations related to trends in the target fisheries that have emerged from this analysis.

### Key Actors and Sectors of the Trade Flow Likely to Wield the Greatest Influence in Making Changes at the RFMO Level

This study identifies dozens of companies that are meaningfully engaged in one way or another in the global trade of tropical tuna and albacore caught in the Pacific. Key actors who play particularly critical roles and may have the power to influence changes that could improve the sustainability and effective management of tuna fisheries at the RFMO level include those listed in Table 4.

Table 4. Key Actors in the Pacific Tuna Fisheries

Tropical Tuna Purse Seine Fishery	Tropical Tuna Longline Fishery	Albacore Longline Fishery
<ul style="list-style-type: none"> <li>➤ Thai Union Group (owners of the Chicken of the Sea brand in the U.S. market), Sea Value, and Chottiwat in Thailand</li> <li>➤ Dongwon (owners of the Starkist brand in the U.S. market) in Korea</li> <li>➤ Trading companies: Tri-Marine, FCF Fishery Co. (owners of the Bumble Bee brand in the U.S. market), and Itochu</li> <li>➤ Bolton Group, owners of Tri-Marine and major importer in the EU</li> <li>➤ In Papua New Guinea and the Philippines: RD Tuna Cannery, Frabelle Fishing, and the Papua New Guinea National Fisheries Authority</li> <li>➤ The Parties to the Nauru Agreement (PNA)</li> <li>➤ Walmart, Costco, Kroger, and other major retail chains in the U.S.</li> <li>➤ Mercadona, Alcampo and Eroski in Spain, Carrefour in France and other major retailers in Europe</li> </ul>	<ul style="list-style-type: none"> <li>➤ Dongwon in Korea</li> <li>➤ FCF Fishery Co. in Taiwan</li> <li>➤ Thai Union in Thailand</li> <li>➤ Trading companies in Japan: Toyo Reizo Try Sangyou, Fukuichi Fishery Co. Ltd., and Yamafuku Suisan Co. Ltd</li> <li>➤ Major Japanese trading companies (Mitsubishi Corporation/Owner of Princes brand and processing facilities in Mauritius) and supermarket chains such as Aeon</li> <li>➤ OPRT in Japan</li> <li>➤ Sajo Group in Korea</li> <li>➤ Private companies in China: Luen Thai Fishing Venture, Pingtairong Ocean Fishery Group, and Shanghai Kaichuang Marine International Co. Ltd.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Dongwon in Korea</li> <li>➤ FCF Fishery Co. in Taiwan</li> <li>➤ Thai Union in Thailand</li> </ul>
<p>Notes:</p> <ol style="list-style-type: none"> <li>1. This analysis defines key actors as entities engaged within the trade flows for Pacific tropical tuna and albacore products that play particularly critical roles due to their market share, political position, business model (e.g., vertical integration) or for other reasons, and that may have the power to influence changes that could improve the sustainability and effective management of tuna fisheries at the RFMO level.</li> <li>2. The Marine Stewardship Council, as the Standard Holder of certified sustainable fisheries, is also a relevant player in both the purse seine and longline fisheries.</li> </ol>		

## Segments of the Supply Chain Most Challenging to Determine Trade Flows

Our analysis was limited by the inherent lack of transparency associated with the movement and trade of tuna products globally. Some of the key areas of limited, incomplete, or inconsistent information that prevent a detailed and complete mapping of Pacific tuna trade flows include:

For the harvest segment of the supply chain,

- The inability to identify the catch of each individual vessel duly authorized by the WCPFC and IATTC given current RFMO's confidentiality rules;
- Tuna transshipments that are not always properly monitored or documented; and
- Failure to assign a vessel's catch to the flag of the State the vessel is flying.

For the processing and trade segments of the supply chain,

- Lack of available data on tuna not traded internationally (i.e., consumed domestically);
- Lack of comprehensive data on immediate trade partners (countries) through which products move;
- Data reporting whether imports are for domestic consumption, in transit through the country, or are being processed for export; and
- Lack of identification within trade data on the fishery origin (gear type and ocean region) of fresh, frozen, and processed products.

## Applicability of the Study Results, Insights, and Methodology to Other RFMO-Managed Fisheries

This analysis represents an initial application of a methodology designed for eventual broader use. We thus evaluated the applicability of our methodology, results, and the insights to other fisheries and RFMO regions.

Our analysis specifically describes the trade flows and key actors of the Pacific purse seine and longline fisheries for tropical tuna and albacore. We have determined that these specific documented trade flows and the key actors identified likely have only limited applicability to other tuna fisheries and provide little or no insight into these questions as they relate to non-tuna RFMO-managed fisheries.

However, we believe the analytical approach used to map the supply chains and trade flows associated with the Pacific tuna purse seine and longline fisheries for tropical tuna and albacore would generally be applicable to other tuna fisheries under the WCPFC and IATTC, or applicable to the tuna fisheries managed by RFMOs in the Atlantic and/or Indian Oceans. In the case of the purse seine and longline fisheries for Atlantic and Indian Ocean tuna, the methodology should be quite applicable and in fact would require little additional data collection in terms of catch and trade data. The primary data sources upon which our analysis is based are global in coverage and could be directly applied to a similar mapping analysis of the trade flows emanating from these fisheries. In addition, for both the WCPFC and the IATTC, it might also be possible to undertake a similar analysis for Pacific bluefin tuna, which may be simplified by the fact that bluefin are documented under HS codes that are discrete and specific to the species. However, some adjustments would need to be taken into consideration due to the complexities introduced by the practice of bluefin "farming."

Overall, the methodological approach used for the present analysis could also be applicable for trade flows of other species managed by the RFMOs, such as billfishes, mahi-mahi, sharks, and others, but the information available to support this type of analysis would likely be even more limited than what was found for the present analysis.

## Observations on Pacific Tuna Fishery Trends

Many aspects of the Pacific-wide tuna fisheries are changing, particularly as they relate to tuna trade flows and tuna supply chains. This study offers some observations on trends in the stability of supply chains; the effects of

free trade agreements; the demand for sustainable seafood; effects of the driving factors previously described; challenges to the PNA VDS; changes in tuna abundance, distribution, and migration patterns due to climate change; the evolution of markets for sashimi-grade tuna; the balance of troll vs. pole-and-line-based supply chains; and changing locations of processing capacity. For instance, Thailand is in the process of negotiating a Free Trade Agreement with the E.U. that could significantly increase tuna trade flows from Thailand to the E.U. at the expense of processing companies and countries in other parts of the Pacific. Re-flagging of vessels of DWFNs to Nauru, Kiribati, and other island nations as a negative side effect of the PNA countries' VDS may be threatening the permanence and success of the VDS. This would in turn change tuna supply chains in the Pacific.

## CHAPTER 1 | Introduction

This report documents the results of a year-long study focused on mapping the supply chains and trade flows meeting the demand for tuna products in the world's major markets from the primary tuna fisheries in the Pacific Ocean. By providing detailed information on these trade flows, and on the key companies involved at each step of the chain, the analysis is designed to allow Pew and others to target its efforts and tailor its messaging in ways that will educate consumers, engage market actors, and help to engender sustainable, effective management of the world's tuna fisheries. This introduction presents the purpose and need for this study, its goals and objectives, the study area and target fisheries, the methodological approach, and the organization of the report.

### Purpose and Need for this Analysis

By both volume and value, Pacific tuna fisheries represent some of the largest fisheries in the world. They are managed by a complex system of regional fishery management organizations (RFMOs) and individual countries charged with and trusted to implement and enforce decisions made by those bodies.<sup>21</sup> Tuna fisheries both historically and presently have been subject to many challenges, including overfishing, bycatch of marine mammals and other non-target species, uncontrolled impacts of fish aggregating devices (FADs), and human rights violations, among others. Given the broad array of individuals and countries engaged in catching, transshipping, processing, exporting, importing, and marketing tuna, as well as the vast geographic distribution of these activities, including fishing occurring on the High Seas outside national jurisdictions, it is challenging to track implementation and compliance with management decisions or enforce stated rules and policies. Certain individual companies hold significant control and leverage over global tuna trade flows from catch to distribution and are thus well-positioned to demand action to improve the sustainability of these fisheries. However, given the complexity of these trade flows, the number of participants, the global nature of the trade, and a significant lack of transparency and complete data reporting, it is difficult to pinpoint the actors with the most potential to effect real change.

### Study Goals and Objectives

The primary objective of this study is to bring transparency to key aspects of the supply chains to major world markets of Pacific-caught tropical tunas and albacore, identifying product flows and market actors at a level of detail that will help Pew and others foster the collective action necessary to promote more sustainable management of tuna fisheries worldwide. The more specific goals for this project are described in the text box, *Pacific Tuna Trade Flow Analysis Project Goals*.

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<sup>21</sup> Tuna RFMOs are international organizations tasked to manage the tuna resources found within a certain established geographical area that includes both the Exclusive Economic Zones (EEZs) of certain coastal or island nations and portions of the High Seas (i.e., in international waters). These include the areas through which tunas migrate, are distributed, and are harvested.

### Pacific Tuna Trade Flow Analysis Project Goals

- ✓ Identify the trade flows of product by species from primary production (catch) to point of final sale (i.e., retailer) of the top three tuna fisheries managed by the Western and Central Pacific Fisheries Commission (WCPFC) and Inter-American Tropical Tuna Commission (IATTC).
- ✓ Identify the key trade flow actors for the top product type/form/species/brand, considering who “touches” the most volume of tuna product within the trade flow.
- ✓ Describe trends or significant changes by volume or value in reported data from RFMO catchment area to end markets.
- ✓ Propose which actors and sectors of the seafood trade flow are likely to wield the greatest influence in making changes at the RFMO level.
- ✓ Identify which segments of the supply chain are most challenging to determine trade flows, including identifying particularly opaque exchanges of product.
- ✓ Describe the applicability of the supply chain insights for these case study fisheries to other fisheries within the two RFMOs being examined, and within the other two major RFMOs (the Indian Ocean Tuna Commission or IOTC and the International Commission for the Conservation of Atlantic Tunas or ICCAT).

## Study Area and Target Fisheries

This study focuses on the major fisheries operating under the jurisdiction of two RFMOs formed to regulate commercial fishing for tuna in the Pacific Ocean: the Western and Central Pacific Fisheries Commission (WCPFC) and the Inter-American Tropical Tuna Commission (IATTC).

Figure 7 shows the convention area for each of the five world RFMOs, centered on the WCPFC (shown in purple) and the IATTC (shown in orange), with the area of overlap in jurisdiction between these two identified in orange and purple crosshatch. This report focuses its attention specifically on three types of fisheries that take place in the Pacific Ocean: tuna purse seine fisheries that target tropical tuna species (yellowfin, bigeye, and skipjack tuna) and generally cater to the canned tuna markets; the longline tuna fisheries that primarily supply the Japanese market and other emerging markets for sashimi grade and fresh tuna; and the fishery for albacore using longline gear, whose production is aimed mainly toward the canned albacore markets in the United States (U.S.) and Canada. The report also briefly addresses the fisheries using troll and pole-and-line gear to target albacore.<sup>22</sup> Defining the scope of the analysis in this way includes approximately 62 percent of global tropical tuna and albacore catch, and 94 percent of the total tuna catch of the two RFMOs of interest. Of the nearly 3.3 million metric tons of tropical tuna and albacore caught in the Pacific in 2019, approximately 84 percent was

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<sup>22</sup> Although there are two separate albacore stocks, northern and southern, which are managed separately, the catches of these two stocks supply the same markets and the available trade data do not distinguish between them. Therefore, this analysis treats the trade flows for albacore derived from the Pacific-wide area.



tropical tuna caught by purse seine, 6.8 percent was tropical tuna caught by longline, 3.5 percent was albacore (caught by longline and other means), and 5.5 percent was tropical tuna caught by other gear types.<sup>23</sup>

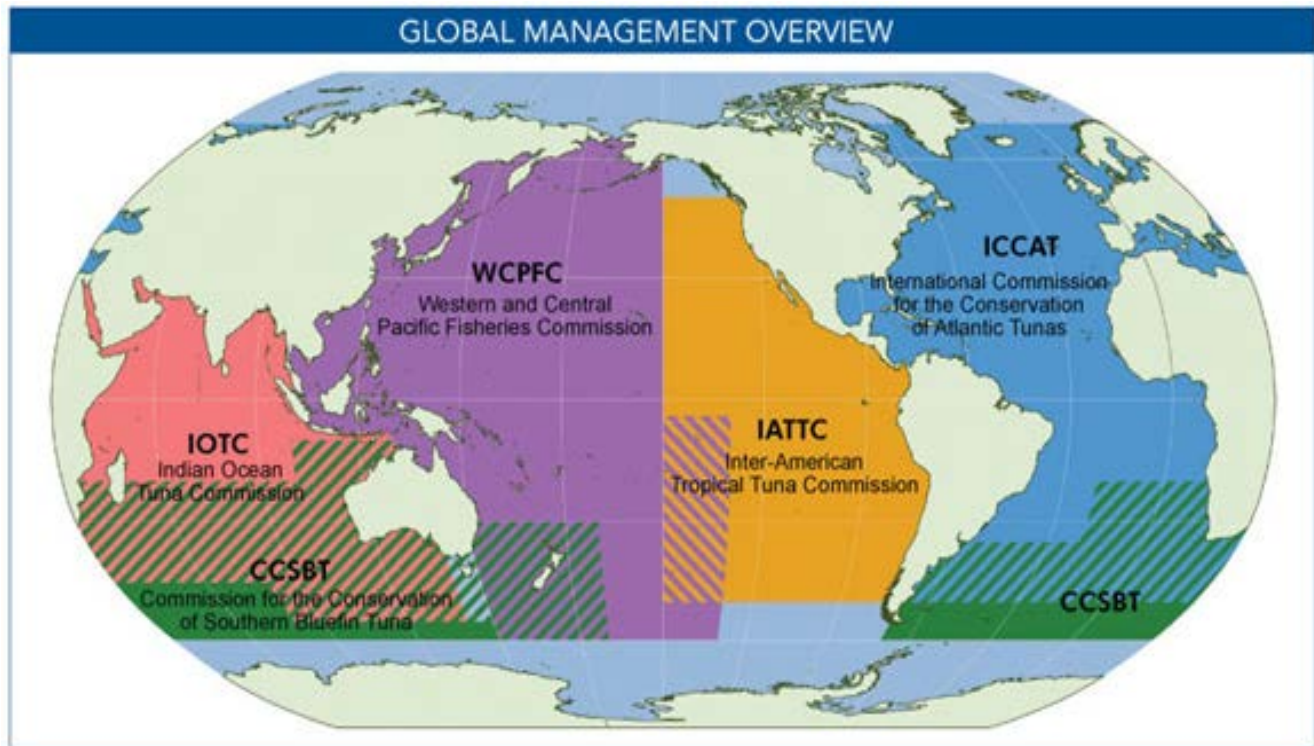


Figure 7. Regional Fishery Management Organization Convention Areas

Source: The Pew Charitable Trusts. 2012. FAQ: What is a Regional Fishery Management Organization? Fact Sheet. February 23. Viewed at <https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2012/02/23/faq-what-is-a-regional-fishery-management-organization>, December 15, 2022.

## Methodological Approach

The global nature of tuna fisheries, the large number of actors at every level of the supply chains, and the limited data available to document the complex international trade in these products – particularly at the level of detail required to identify key actors – present substantial challenges to mapping trade flows. We employ a combination of public and proprietary data, insights of industry participants, and detailed professional knowledge of the industry to develop a best assessment of trade flows and key actors. The goal of this analysis is not to account pound-for-pound for the flows of all fish harvested in the Pacific to their ultimate destinations. Rather, it is to establish the key trade flows supplying the primary markets, and to identify the actors with the greatest influence over these flows.

This analysis uses 2019 catch and trade data as the basis for describing the trade flows of Pacific tuna, and for identifying the relative level of engagement of individual countries and actors within the supply chains. Trade

<sup>23</sup> Based on RFMO catch data for 2019. See Chapter 4 for detailed analysis and references.



flows and supply chains were significantly affected by the COVID-19 pandemic, rendering 2020 and 2021 anomalous years that would not characterize the more typical patterns within the target fisheries. As such, we rely on the most recent complete year of data prior to the start of the pandemic as the starting point for characterizing the subject trade flows. Within our analysis of each individual fishery and country profile, we consider longer-term trends in available data both prior to, during, and since the pandemic to evaluate the likely trajectory and potential changes within the supply chains anticipated in the near future.

We approach the previously identified goals using the following general methodological steps.

1. **Data Collection.** Identify and evaluate available databases containing relevant data on Pacific tuna catches, fleets, processing facilities, intermediate trading vessels, imports, exports, and retail destinations.
2. **Initial Data Analysis.** Apply available data to identify key countries at the harvesting, processing, and trade levels to focus a detailed evaluation of the tropical tuna purse seine, tropical tuna longline, and longline, troll, and pole-and-line fisheries for albacore.
3. **Supply Chain Mapping.** Map the primary supply chains for purse seine and longline-caught tropical tunas and albacore originating in the Pacific, focusing on international trade flows to the major world tuna markets.
  - For each fishery (i.e., tropical tuna purse seine, tropical tuna longline, and albacore longline and troll/pole-and-line), using individual countries as a central organizing premise, conduct a detailed analysis of that country's activities with respect to the catching and processing of fish originating from that fishery based on the identified primary data sources, including key connections within the supply chain to other countries.
  - Evaluate the results of that analysis to identify key data gaps or areas where data appear to be misaligned or run counter to professional knowledge of the activities within that country.
  - Supplement the analysis with additional country-specific data sources, other available research, and information collected through outreach to other industry experts.
  - Within each detailed analysis, identify and describe the activities of the primary companies engaged at each level of the trade flow (i.e., catch, trading, processing, and end market).
4. **Identification of Key Data Gaps.** Throughout the analysis, identify areas where data analysis and supplemental research do not allow for a clear identification and description of a particular trade flow or the companies engaged within that flow.
5. **Summary of Key Trade Flows and Companies.** For each fishery, summarize the key trade flows and identify those companies that occupy particular positions of power based on the relative importance (in terms of volume of product) of the country and point in the trade flow in which they operate, as well as their own position relative to other companies operating within that space.

## Report Organization

The remainder of this report is organized as depicted in Figure 8. By design, each detailed fishery-specific evaluation (Chapters 6 through 8) is presented as a stand-alone piece, allowing the reader to understand the dynamics and components of each fishery independent of the other fisheries. As such, certain data tables and information that is relevant to multiple fisheries is repeated, rather than cross-referenced.<sup>24</sup>

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<sup>24</sup> For example, trade data for raw frozen tropical tuna is not identified within the data to a specific gear type. As such, those trade data are presented in both the Purse Seine (Chapter 6) and Longline (Chapter 7) chapters, alongside a discussion of the likely proportion of those products that came from each respective fishery.

**Chapter 2 Conceptual Overview of Pacific Tuna Fisheries and Supply Chains**

- Conceptual overview of the fisheries and related trade flows and markets for Pacific tuna.

**Chapter 3 Primary Data Sources**

- Overview of the key data sources on which this analysis relies and description of important complexities and limitations of the sources that influence the analysis.

**Chapter 4 Key Countries and Actors at the Harvest Level**

- Uses RFMO catch data and several sources of fleet information to describe activity within the harvest sector, identifying the key countries operating at this level within each fishery.

**Chapter 5 Key Countries at the Trading and Processing Levels**

- Analyzes public and proprietary trade data to understand the key trade flows of raw product and finished processed tuna products between countries to identify the central processing hubs through which the majority of tuna passes.

**Chapter 6 Analysis of the Tropical Tuna Purse Seine Fishery**

- Detailed analysis of the supply chain and trade flows from the Pacific tropical tuna purse seine fisheries, including identification of key companies involved at each step of the flow.

**Chapter 7 Analysis of the Tropical Tuna Longline Fishery**

- Detailed analysis of the supply chain and trade flows from the Pacific tropical tuna longline fisheries, including identification of key companies involved at each step of the flow.

**Chapter 8 Analysis of the Pacific Albacore Fishery**

- Detailed analysis of the supply chain and trade flows from the Pacific albacore fisheries, including identification of key companies involved at each step of the flow.

**Chapter 9 Conclusions and Strategic Recommendations**

- Key conclusions of the analysis and strategic recommendations for Pew to target its efforts toward promoting sustainable, effective management of Pacific tuna fisheries.

Figure 8. Organization of this Report

## CHAPTER 2 | Conceptual Overview of Pacific Tuna Fisheries and Supply

The fisheries for tuna that take place in the Pacific Ocean are part of a complex and efficient system that moves tuna and tuna products worldwide to satisfy processing and market needs. As such, tuna is a global commodity traded in many different forms, from whole fresh fish to significantly processed tuna products. The Pacific is the most productive tuna fishing area in the world and the main contributor to the global tuna trade, but trade of Pacific tuna species and products is affected by competing and complementary tuna production occurring in other ocean regions.

This chapter provides a brief overview of the target fisheries for this analysis, including the primary product forms and their market destinations. It then describes the major factors affecting these flows.

### Overview of Pacific Tuna Fisheries

This analysis focuses on the following fisheries managed by the IATTC and WCPFC: 1) the purse seine fishery for tropical tuna (i.e., bigeye, yellowfin, and skipjack); 2) the longline fishery for tropical tuna; and 3) the longline fishery for albacore.<sup>25</sup> Tropical tuna comprises the vast majority (96 percent in 2019) of tropical tuna and albacore harvest by volume worldwide. A substantial proportion (66 percent) of tropical tuna harvested globally originates from the Pacific Ocean (51 percent from the WCPFC convention area and 15 percent from the IATTC convention area). While tropical tuna caught by fishing methods and techniques other than longline and purse seine also enter the major world marketplaces (i.e., the E.U., U.S., and Japan), the vast majority of the Pacific Ocean's tropical tuna catch (approximately 94 percent) originates from the purse seine and longline fleets. By focusing this analysis on the purse seine and longline fisheries for tropical tuna in the Pacific, we capture 62 percent of global tropical tuna harvest. Our focus on the Pacific longline fishery for albacore captures 50 percent of the worldwide albacore harvest.

Vessels that catch tuna in these fisheries may keep the fish chilled or fresh on ice until the products are brought to port to be sold at local markets or shipped to export markets. Alternatively, many vessels freeze the tuna onboard and keep it for several months until the product is landed at a cold storage facility, a processing facility, or is transshipped to another destination overseas, where the fish will be subject to partial or full processing before it arrives in various presentations at final markets.<sup>26</sup>

In general, the largest final export markets for tuna products of all types are the European Union (E.U.), the U.S., and Japan. Along the way to these and other important end markets, Pacific tuna is imported from and/or exported to many other countries for intermediate and final processing. Tuna may be sold fresh (whole, gutted, headed, in loins, as steaks, or in other fresh presentations), frozen whole or in various frozen forms, semi-processed (into cooked tuna loins for canning, taking advantage of low labor costs and/or favorable tariff

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<sup>25</sup> This report also briefly addresses the troll and pole-and-line fishery for albacore. Volumes of tuna caught with such gear types may be significant and the fish may enter international trade chains in addition to being sold in local markets. For instance, tuna caught by pole and line in Philippine, Indonesian, or other waters may be exported to canned tuna markets in the U.K. and elsewhere, and yellowfin caught by handlines in these countries may be exported to the U.S.; these catches are included in the "Other" categories of trade flow data. Nevertheless, tuna harvested by gears other than purse seine and longline are not addressed in this report (except for pole-and-line and troll-caught albacore).

<sup>26</sup> As an example, tuna caught by purse seine gear in the Western-Central Pacific by a vessel flagged in Kiribati might be unloaded at a processing facility in PNG where the fish might be transformed into cooked frozen loins. The processed loins might subsequently be shipped to a Spanish cannery where the tuna loins are put into cans and then sold in the Spanish and other European markets.

conditions), or fully processed (into finished canned or pouched products). This study traces the primary routes of tuna caught in both the Western/Central and Eastern Pacific Ocean on its way to the final markets, and identifies the key actors engaged in this process at each step.

The supply chains for Pacific tuna fisheries are well-defined by the ultimate product forms and market destinations. For this reason, there are similarities in the supply chains for all tuna ultimately destined for the canned market, versus those tropical tunas caught by longlines that are sold to the fresh or sashimi-grade markets.

This section describes at a high level the fishing, transshipping, processing, product forms, and markets for each of the defined fisheries.

### Purse Seine Fisheries for Tropical Tuna

The Pacific purse seine fisheries in the WCPFC and IATTC convention areas target yellowfin, bigeye, and skipjack tuna and account for 58 percent of all tropical tuna caught globally and 84 percent of the tropical tuna caught in the Pacific. The WCPFC fishery is dominated by the presence of skipjack, while in the IATTC convention area, the catches of skipjack and yellowfin tunas are more balanced.

Globally, there are approximately 650 tuna purse seine vessels that catch tropical tunas in the Atlantic, Indian and Pacific Oceans.<sup>27</sup> This fleet is distributed among the three oceans with the largest number of vessels fishing in the West-Central Pacific and the Eastern Pacific regions. Together, there are approximately 550 purse seine vessels operating in the WCPFC and the IATTC.<sup>28</sup>

Purse seine vessels catch smaller tunas near the sea surface, and the fish caught in these fisheries are almost exclusively destined for canning. Their catches are frozen on board, and most are cooked and processed at land-based canning facilities. These vessels tend to make trips that average about 30 to 60 days and generally have a homeport where they provision, make repairs, off-load, and sell their catches to local canneries. Alternatively, vessels may transship their catches onto refrigerated (“reefer”) carriers bound for more distant processing facilities.<sup>29</sup>

Almost all purse seine-caught tropical tuna in major markets is consumed as a canned or pouched product. In most cases, a two-step process is used to produce the canned or pouched tuna. In the initial, labor-intensive step, the fish are thawed, eviscerated, washed, cut, cooked, cooled, cleaned, and trimmed into loins, often in countries with low labor costs and/or a favorable tariff regime. At this point, the second step, known as filling, may occur in the same processing plant or at a different location. The filling process consists of cutting or flaking the tuna meat, putting it in the can or pouch, adding oil, brine, and/or water, sealing the cans, and pressure cooking them. The filling step is often automated, requiring less labor, and therefore may take place at processing facilities in countries like the U.S. and European countries where labor is more expensive. When the two steps are

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<sup>27</sup> Justel-Rubio, A. and L. Recio. 2022. A Snapshot of the Large-Scale Tropical Tuna Purse Seine Fishing Fleets as of July 2022 (Version 10). ISSF Technical Report 2022-14. International Seafood Sustainability Foundation, Pittsburgh, PA, USA. Downloaded from <https://www.issf-foundation.org/issf-downloads/download-info/issf-2022-14-a-snapshot-of-the-large-scale-tropical-tuna-purse-seine-fishing-fleets-as-of-july-2022/>, April 30, 2023.

<sup>28</sup> IEC/GHA Vessel Compilation analysis.

<sup>29</sup> A reefer carrier is a large vessel with the capacity to refrigerate cargo.

separated, the loins resulting from the initial process are bagged, vacuum packed, and frozen to be exported as pre-cooked tuna loins to other processing plants that will later use the loins to fill the cans (or pouches).

Most transshipping operations are run by a few tuna trading companies that serve as brokers or intermediaries between the fishing fleet and processing centers (see text box, *What is a Tuna Trader?*). The trading companies may also undertake the shipping of partially processed tuna (pre-cooked loins) to canneries, and processed products to final markets, where the canned or pouched tuna products are received by an importer, wholesaler, distributor, and/or retailer (such as a supermarket), eventually reaching the final consumer. The primary markets for purse seine-caught canned or pouched tropical tuna are in the U.S. and the E.U., but markets in many other countries also demand these products.

The basic supply chain for purse seine-caught tuna is presented in Figure 9.

### What is a Tuna Trader?

Tuna traders are third parties whose primary role is to supply raw tuna product to fill processing needs. Tuna traders are also active in other segments of the supply chain. They own and/or charter reefer carriers that are positioned near the fishing grounds so that once the fishing holds of the purse seiners' vessels are full, their catches can be quickly sold and transshipped to the trader's reefer carrier and fishing can resume. Tuna traders finance, negotiate, and purchase tuna from purse seine vessels, organize the transshipment of such fish from different locations in the Pacific and from around the world, and deliver it to the processor's cold storage facilities or to the processing plants directly. In addition, the tuna trading companies help tuna buyers navigate the range of government requirements and private standards across different countries and languages, diverse fishing company suppliers and processors, and other complexities. The three major world tuna trading companies are FCF Fishery Co. Ltd., Tri-Marine Group, and Itochu Corporation.

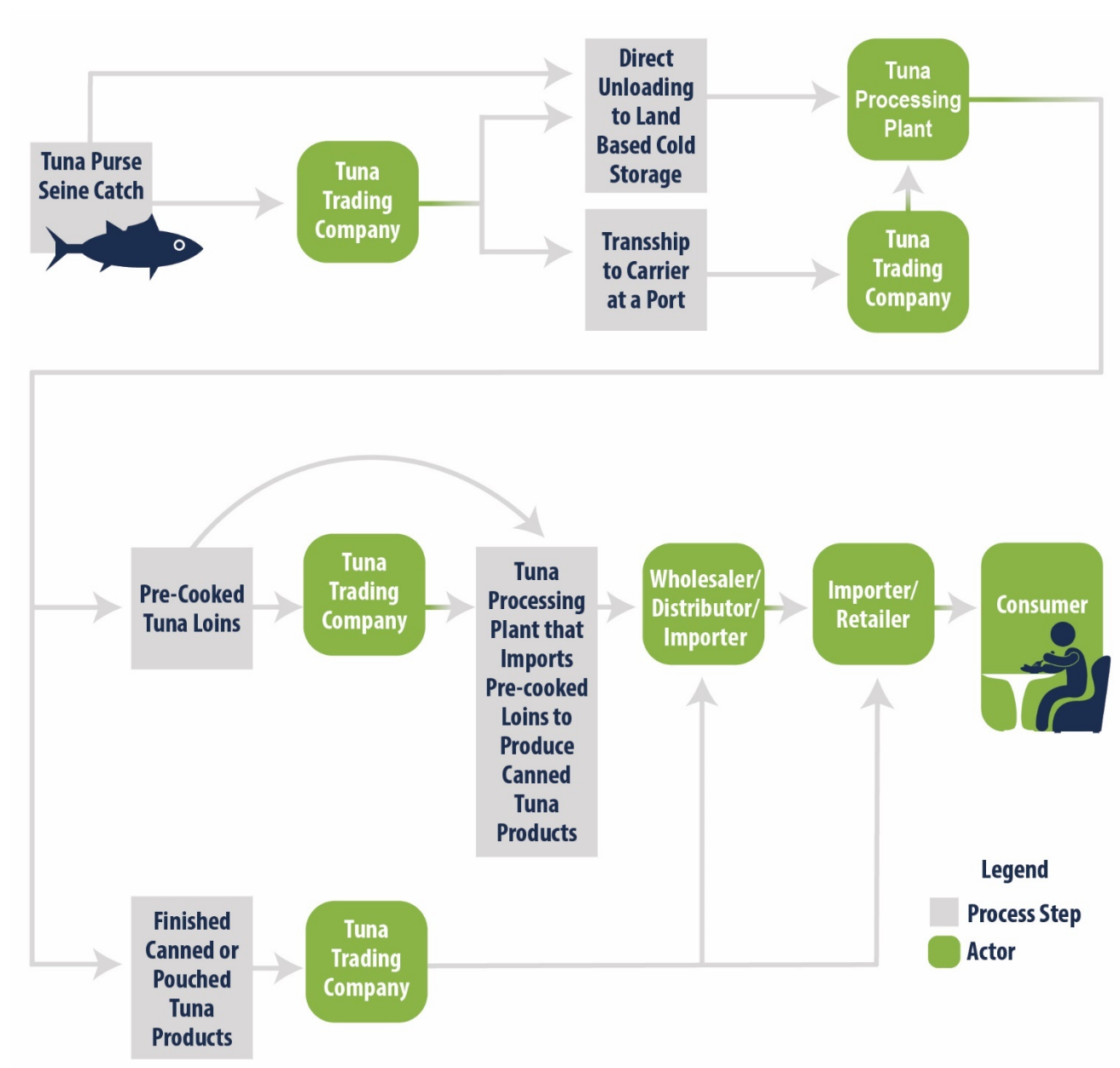


Figure 9. Flow Chart of Supply Chain for Purse Seine Caught Tuna



## Longline Fisheries for Tropical Tuna

The number of longline vessels involved in the Pacific catching tropical tuna and/or albacore is significantly greater than the number of purse seiners, although far less tuna is caught by longline catches. Across the relevant IATTC and WCPFC fisheries, we identify 1,739 longline vessels fishing in the Pacific; these account for about 7 percent of the tropical tuna caught in the Pacific. Many Pacific longline vessels catch albacore in addition to or instead of tropical tuna; however, albacore catches and trade flows are addressed separately in the next section.

Longline vessels tend to catch larger, deeper-swimming tunas; these fish generally command higher prices than those caught by purse seine. The catches of tropical tuna by longline vessels are generally destined for markets, such as Japan, where tuna is eaten in its raw form (e.g., sashimi) or for sale as tuna steaks and other presentations for grilling and related uses. Many longline vessels keep their catches fresh on ice until they are sold in the market; the duration of these trips is typically 10 to 15 days. Other longline vessels targeting tropical tuna or albacore are equipped to deep-freeze tuna on board. These vessels stay at sea for months at a time, transshipping their tuna catches to reefer carriers that bring the fish to processing or distribution facilities, allowing the longline vessels to continue fishing.

Like the purse seine operations described above, longline tuna operations that freeze tuna onboard use transshipment operations (either on reefer carriers and/or to ultra-cold refrigerated containers) to transport the frozen tuna to its ultimate destination. For longline tuna fishing operations producing tuna that is sold fresh in sashimi markets (mainly in Japan), the logistics for getting tuna from the fishing grounds to the final market are more sophisticated, involving time-sensitive air shipments of the product.

Certain specified and commonly used ports in the Pacific basin are the focus of longline tuna transshipping, including ports in Panama, Peru, the Federated States of Micronesia, and the Marshall Islands. However, most longline tuna vessels that transship do so on the High Seas without official “observers” to keep accurate records of volumes, species, and entities involved in the process.

The number of longline vessels involved in the Pacific catching tropical tuna and/or albacore is significantly greater than the number of purse seiners. In general, longline tuna vessels can be grouped into two main categories: small-scale tuna longline vessels (STLL) are generally those smaller than 100 Gross Registered Tons (GRT) (mostly 50-70 GRT) that primarily target tropical tuna with some bycatch of albacore, and large-scale tuna longline vessels (LTLL) whose GRT is 100 GRT or more, which mostly operate on the High Seas or in the Exclusive Economic Zones (EEZs) of coastal and island states under access agreements. The smaller longline vessels tend to keep tuna on board the vessel chilled with ice and are sold fresh mainly to sashimi-grade markets, while the larger longline vessels also catch sashimi-grade tuna but freeze the fish onboard at very low or ultra-low temperatures to maintain the quality of the fish required by sashimi-grade markets.<sup>30</sup>

Small longline vessels that catch tuna for the fresh sashimi market tend to operate closer to the coastline and use shorter longlines. The trip length of these vessels ranges between 8 to 15 days on average and their catches are kept on ice until the fish is unloaded at a port. The fish is graded at the point of landing and, if it meets the quality requirements for the sashimi market, the fish is cleaned and prepared for shipment, often by air, to the

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<sup>30</sup> There are longline vessels under 24 meters long that can freeze the fish at low temperature.

final market, often Japan. If the fish quality is not high enough for the sashimi-grade markets, the fish is diverted into other markets for chilled/fresh tuna.<sup>31</sup>

Larger longline vessels that deep freeze the tuna have fish wells where the fish can be quickly frozen after the guts, gills, and heads are removed. These longline vessels tend to target tunas swimming at midwater or further below the surface. Because the quality of the fish can be preserved at ultra-cold temperatures on these vessels, the vessels' trip length can be several months long, often not homeporting for more than nine months. The catches of these vessels are often transshipped to reefer carriers, which take the product to the final market destination, often Japanese ports. The operations of large longline vessels require the use of other vessels for both transshipping the catches and providing operational support (provisioning of food, fuel, bait, crews, and other needs). Transshipping tuna from these large longline vessels can take place both at a port or on the High Seas. Figure 10 provides a generalized flow chart of the movement of longline-caught tropical tuna to its ultimate destination.

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<sup>31</sup> Other fresh/chilled markets could be, for instance, the U.S. and or E.U., where the fish is sold as steaks to be grilled. The fish could be shipped whole; alternatively, the fish may be filleted or cut into steaks. The fish could be shipped fresh or could be processed into a vacuum-packed product and be frozen.

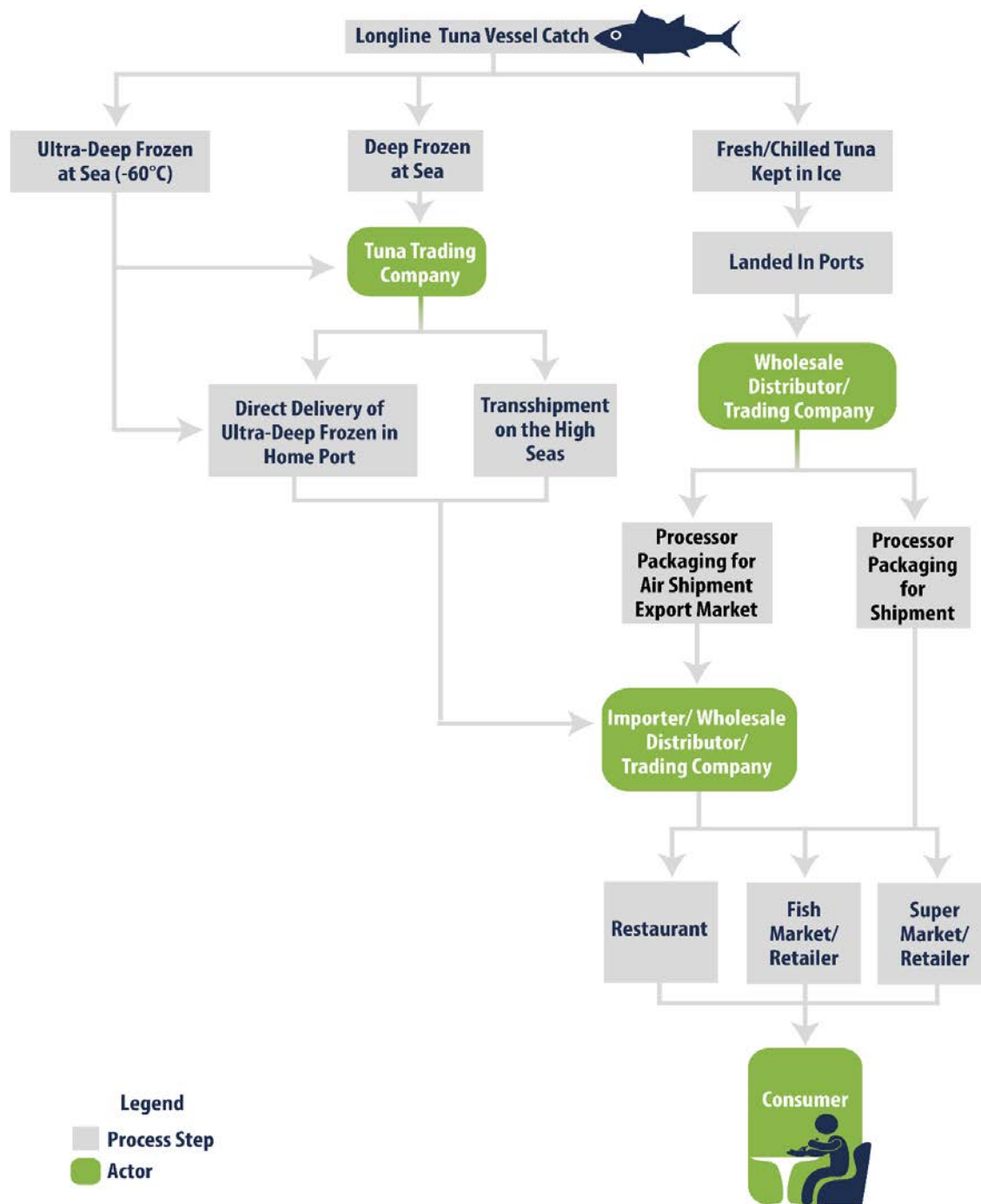


Figure 10. Flow Chart of Supply Chain for Longline-Caught Tropical Tuna

## Longline Fisheries for Albacore

The albacore fishery is much smaller than the tropical tuna fishery in the Pacific, with approximately 103,000 tons of albacore caught by longline in 2019 (in addition to approximately 10,000 caught by troll and pole-and-line gear), compared to approximately three million tons of tropical tuna that year.

For industrial longline-caught albacore tuna, most of the operations involve frozen product primarily used for canning, with the supply chain for this product largely mirroring that of the purse seine caught tropical tunas shown in Figure 9. The distant water longline vessels that primarily target tropical tunas for the sashimi and tuna steak markets may also catch albacore, while other longliners target albacore as the target species. Like purse-seine caught tropical tuna, longline-caught albacore is generally consumed as a canned or pouched product purchased from a retailer (e.g., supermarket) in the U.S. and E.U. markets. The albacore supply chains usually involve exporting frozen albacore to processing centers in locations with low labor costs and/or favorable tariff regimes to be processed into pre-cooked tuna loins. These loins are sent mainly to processing plants in Thailand, American Samoa, and to the U.S. mainland, where the canning process is completed. Trading companies often facilitate the steps along the Pacific albacore supply chain, as shown in Figure 11.

While most albacore in the Pacific is caught by longline gear, off the U.S. and Canadian west coasts, and in New Zealand, an important component of the albacore fisheries targets younger albacore using troll lines and pole-and-line gear. These catches are also primarily canned, following the same general supply chains depicted in Figure 11.

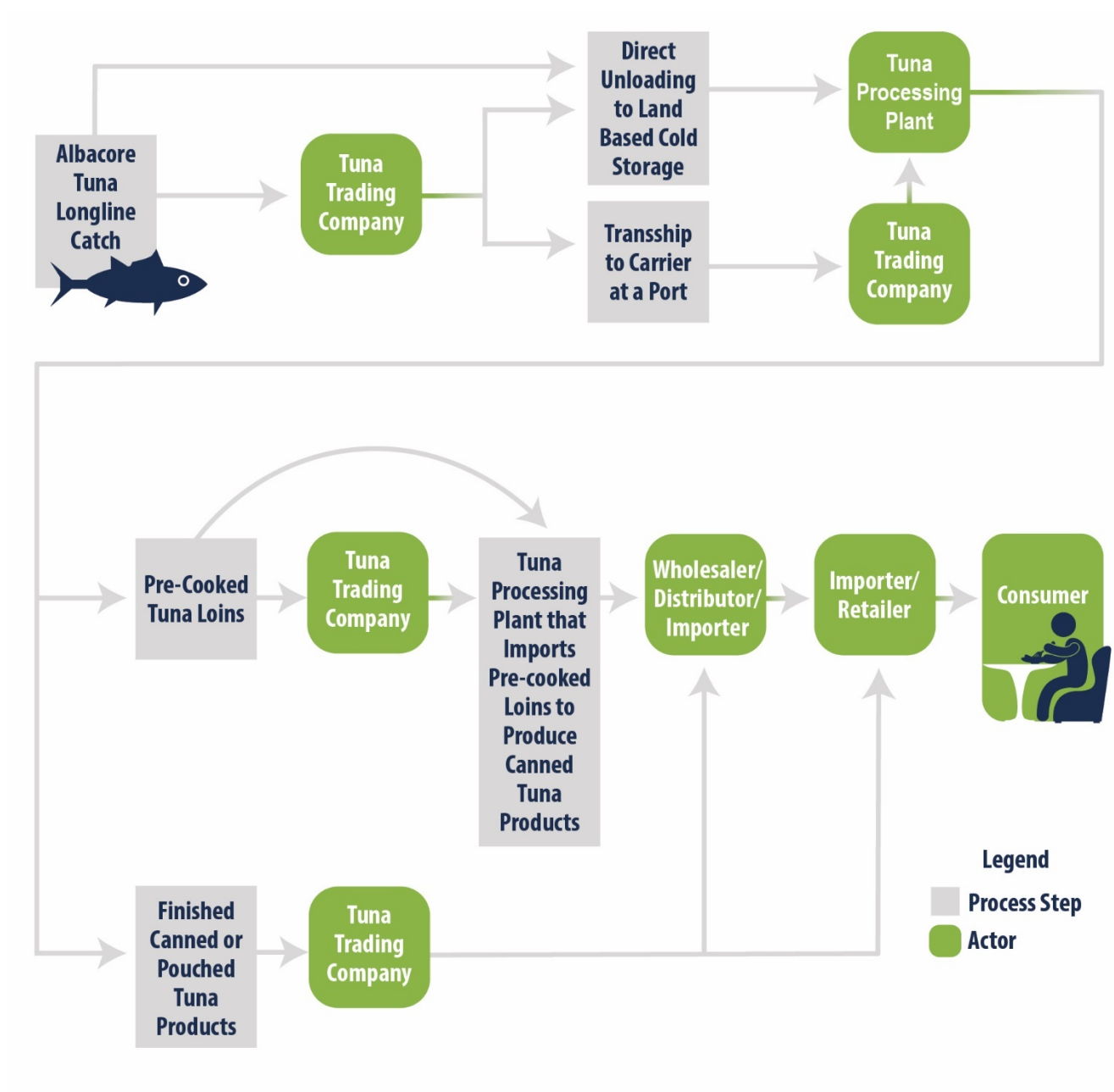


Figure 11. Flow Chart of Supply Chain for Longline-Caught Albacore

## Factors Driving Tuna Trade Flows

A variety of geographic, governmental policy, cultural, and economic factors affect the dynamics of how tuna moves between and within countries and the actors that are involved. Factors that influence tuna trade flows include tariffs and non-tariff barriers, subsidies, rules of origin, access agreements, trade agreements, governmental policies on several issues, labor costs, infrastructure availability, and others. This section briefly describes the key considerations in this regard. A more detailed description of how each of these factors influences specific trade flows in each of the focal fisheries is provided in Chapters 6 through 8.

**Consumer Preferences** – Consumer preferences for canned and pouched tuna products vary significantly across markets and represent a primary driver of tuna supply chains and trade flows. For instance, in the U.S., consumers eat mainly skipjack tuna (“chunk” tuna) in water. In southern Europe, yellowfin tuna (solid pack) in olive oil is preferred, while consumers in northern European markets (e.g., Germany, the Netherlands) and the United Kingdom (UK) generally prefer skipjack, while still consuming yellowfin tuna. For non-canned tuna products, consumers in Japan have much higher standards for fresh and frozen sashimi-grade tuna than do consumers of similar products in the U.S.

**Production Costs** – Whether the fish is caught in the Pacific or elsewhere in the world, the flow of tuna to major markets is affected by the economic interests and needs of the different participants in the tuna supply chain serving each of the major tuna markets. Production costs, for instance, are a critical factor in determining tuna supply chains and trade flows. In general, locations close to abundant fishing grounds, with low labor costs, less stringent environmental and other regulations, and stable, supportive governments are highly desirable.

**Multi-Lateral Trade Agreements** – Individual countries and economic blocks like the E.U. enter into special trade agreements that influence trade flows. These are often promoted in part by industry to satisfy their need to remain competitive, including setting up processing centers where labor is inexpensive and tuna is accessible (e.g., via licenses, vessel day schemes, chartering, and other arrangements). Bilateral trade agreements between individual countries and multilateral agreements like the Generalized System of Preferences (GSP and GSP+)<sup>32</sup> offer reduced or zero import duties on certain products from certain countries, with the goal of assisting developing countries in economic growth. Such agreements may include factors such as:

- *Tariff and Non-Tariff Barriers* – Countries may levy duties or quotas to discourage trade in certain products to make the country’s own national industry more competitive in its own marketplace. In general, the more processed the tuna product is at its source, the more tariff and non-tariff restrictions are imposed in major tuna consumer markets; conversely, less processed tuna (e.g., fish sold whole fresh or whole frozen) is subject to fewer or no tariffs. In certain countries (e.g., China), products

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<sup>32</sup> The GSP was negotiated through the United Nations (UN) and put into place in 1971 to “create an enabling trading environment for developing countries.” The European implementation of this multilateral trade agreement includes three levels: (1) standard GSP for low-income and lower-middle-income countries; (2) GSP+ for such countries that implement certain international conventions related to human rights, environmental and climate protection, and good governance; and (3) EBA (Everything But Arms), which is a special arrangement to provide the least developed countries with duty-free, quota-free access to the E.U. market for all products except arms and ammunition (United Nations Conference on Trade and Development. 2023. Generalized System of Preferences. Viewed at <https://unctad.org/topic/trade-agreements/generalized-system-of-preferences> and <https://ustr.gov/issue-areas/trade-development/preference-programs/generalized-system-preference-gsp#:~:text=U.S.%20trade%20preference%20programs%20such,oldest%20U.S.%20trade%20preference%20program>, April 29, 2023; and European Commission. 2023. Generalised Scheme of Preferences. Viewed at [https://policy.trade.ec.europa.eu/development-and-sustainability/generalised-scheme-preferences\\_en#:~:text=The%20EU%27s%20GSP%20comprises%20three,sustainable%20development%20and%20good%20governance](https://policy.trade.ec.europa.eu/development-and-sustainability/generalised-scheme-preferences_en#:~:text=The%20EU%27s%20GSP%20comprises%20three,sustainable%20development%20and%20good%20governance), April 29, 2023.

imported for consumption are subject to different tariff rates than products that are to be processed for export.

- *Rules of Origin* – Some major markets such as the E.U. give preference to tuna products from certain countries. In some cases, the raw material (i.e., the fish) for the product must have been caught by a vessel from the preferred country's fleet, while in other cases, the product is deemed acceptable if it was processed in the preferred country, even if the fish was caught by a vessel from a third country.

**Bi-Lateral Trade Agreements** – Similar to the previously described multi-lateral agreements, individual countries may negotiate trade agreements to achieve various goals, often in support of their national industries or to enforce certain government policies such as those mentioned below.

**Access to Fishing Grounds** – Developing coastal and island States that are rich in tuna resources are often willing to offer distant-water fishing nations (DWFN) access to tuna fishing grounds in exchange for land-based investment in tuna processing facilities, use of nationals as crews on their vessels, and measures they hope will bring in revenue and develop the capacity of their local tuna industries.

**Government Policies on Illegal, Unreported, and Unregulated (IUU) Fishing**– Both the U.S. and the E.U. have put provisions into place to prevent or combat IUU fishing by their fleets or by others, including denying entry of tuna imports from countries believed to be involved in IUU fishing. In the case of the E.U., a country may be warned first with a “Yellow Card,” indicating that unless the country in question addresses this IUU issue to the E.U.’s satisfaction, the E.U. may issue the offending country a “Red Card,” preventing its fish exports from entering the E.U. until the identified issues have been resolved. In the case of the U.S., exports from a country known to be involved in IUU fishing activities would be denied entry into the U.S. market under the Seafood Import Monitoring Program of the National Marine Fisheries Service. Similarly, in 2021 Japan established a Catch Documentation Scheme to deter IUU-caught fish from being imported into Japan.; this scheme became effective in 2023.

**Government Policies on Labor and Human Rights** – Increasingly, governments have passed legislation oriented toward restricting trade in tuna and tuna products from countries that violate human rights (e.g., by allowing slave labor on fishing vessels or child labor in processing plants). Both the U.S. (H.R. 3075, December 20, 2022) and the European Union (September 14, 2022) have recently introduced proposed legislation that would prohibit the importation of seafood products associated with slave labor.

**Subsidies** – Many governments provide subsidized fuel to their national fishing fleets, subsidized construction of fishing vessels and infrastructure, and offer other benefits to give their fishing industries a competitive edge and promote economic development. The fleets of all distant water fishing nations (DWFNs) have benefited and continue to benefit from subsidies, which in the past few years have been scrutinized. The claim that subsidies are contributing to the overfishing of certain tuna stocks has placed some of these fleets in the crosshairs of public opinion. This situation is likely to continue and could have an impact on current trade flows, particularly if High Seas transshipping tuna operations become heavily regulated or banned.

**RFMO Policies** – WCPFC and IATTC seasonal and area closures, quotas, and other policies affect the supply of tuna to processing centers and markets, prompting fishing industry entities to change their behavior and, in turn, changing trade patterns.

**Vessel Reflagging** – Changing flags, or “reflagging” a vessel under the flag of another country may allow the vessel owner to avoid their own country’s stricter laws, and/or may confer benefits with respect to fishing resource access, market access through preferential tariffs, or other comparative advantages.



**Vertical Integration** – Purse seine and longline tuna fisheries in the WCPFC and especially in the IATTC convention areas are characterized by a significant level of vertical integration between the harvest, processing, and marketing sectors. Ownership of fishing fleets and processing infrastructure by major brands (such as Starkist, Chicken of the Sea, and Bumble Bee in the U.S., and Conservas Garavilla and Salica in Spain and Ecuador) helps define tuna flows, since catches by these fleets are not available on the open market.

The movement of tuna caught in the Pacific to its final destination anywhere in the world is the product of these and other factors defining the evolving supply chains.

## CHAPTER 3 | Primary Data Sources

This analysis relies upon a variety of data and information sources, including public and private compiled datasets, literature, media, and trade publications, outreach to industry experts, and the deep industry knowledge of co-author Guillermo Gomez of Gomez Hall Associates. This section identifies and describes the primary catch, fleet, trade, and other data sources that provide the foundation for this analysis, as well as discrepancies in linking the data sources. Table 5 and Table 6 list the key data sources, which are described in greater detail in the sections that follow. Appendix A identifies individuals contacted to provide data and information to support development of this analysis.

Table 5. Summary of Key Data Sources (Other than Fleet Data)

Data Source	Source/Author	Description	Downloaded From (Date)
WCPFC Catch	WCPFC	Annual catch statistics for WCPFC-managed fisheries reported by species, gear type, and vessel flag country.	<a href="https://www.wcpfc.int/data-catalogue">https://www.wcpfc.int/data-catalogue</a> (January 5, 2023)
IATTC Catch	IATTC	Annual catch statistics for IATTC-managed fisheries reported by species, gear type, and vessel flag country.	<a href="https://www.iattc.org/en-US/Data/Public-domain">https://www.iattc.org/en-US/Data/Public-domain</a> (September 13, 2022)
Base pour l'Analyse du Commerce International (International Trade Database): BACI	CEPII	Annual country-to-country level trade statistics by commodity type. Dataset derived from UN Comtrade data to reconcile discrepancies in mirror trade records.	<a href="http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_international.asp?id=37">http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_international.asp?id=37</a> (January 11, 2023)
Datamyne Global Trade Data and Country-Specific Customs and Census Data	Descartes Datamyne	Proprietary for-fee source of trade data compiled from country-specific customs, census, and other data sources.	Proprietary access, via Datamyne website (December 6, 2022)

Note: Table 6 provides the details of fleet data sources.

## Overview of Primary Data Sources

## Fleet Data

The analysis relies upon six primary data sources that identify vessels that may be actively engaged in the Pacific longline and/or purse seine fisheries for tropical tunas and albacore. These data sources are identified and briefly described in Table 6. Using the International Maritime Organization (IMO) number common across the data sources, we crosswalk between these sources to develop a single compiled list of vessels that pulls key fields of interest from each data source (e.g., MSC certification, vessel characteristics, vessel ownership,

involvement in certified fisheries). While some datasets (e.g., the International Seafood Sustainability Foundation [ISSF] Pro-Active Vessel Register) are inherently limited to vessels active in the subject tuna fisheries specifically, others are broader and may include vessels that may be participating in fisheries outside of our analysis (e.g., vessels targeting Southern bluefin tuna). We develop the aggregated list of vessels likely to be participating in the fisheries of interest using the steps outlined in Figure 12.

We further process the list of relevant vessels by manually reviewing company ownership information to resolve typographical and other minor discrepancies in how individual companies are listed. This step allows for later quantification of the number of vessels associated with individual companies.

Our use of these data for the analysis is subject to the following caveats and limitations:

- **Alignment of Fleet and Catch Data.** Vessels listed in the identified data sources (Table 6 ) represent vessels registered as of 2021, while the catch and trade data used for the analysis are from 2019. As such, the group of vessels identified in the vessel data do not represent the exact composition of the fleet responsible for the catch in 2019.
- **Identification of Tuna Vessels.** Not all data sources definitively identify vessels that are fishing in relevant tuna fisheries (as opposed to other covered fisheries, such as swordfish). For example, IATTC identifies vessels only as “longline” or “purse seine,” necessitating an assumption that all may be associated with tuna fishing. The process outlined in Figure 12 may over- or underestimate the number of vessels operating in the focal fisheries.
- **IMO Number as Primary Key.** Vessel records that do not include an IMO number are excluded from the analysis.<sup>33</sup>
- **Format of Company Name.** One company may be listed across or within a given data source inconsistently.<sup>34</sup> As described previously, we reconcile minor differences where there is near certainty that the companies are one and the same. However, we err on the side of not consolidating company names where the correlation is unclear.<sup>35</sup>
- **Identification of Unique Companies** It is well known that many of the companies listed individually within the vessel registry data are owned by a single company, and there are many complex corporate relationships between and amongst these companies.<sup>36</sup> This analysis does not include a detailed

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<sup>33</sup> The IMO number is the primary key by which vessels appearing in each list can be identified and linked. To ensure the analysis does not double-count individual vessels, it only includes in the analysis those vessels whose identity is confirmed by an IMO number. The proportion of records from each respective data source that contain an IMO number and are included in the analysis are as follows: OPRT (93 percent), VOSI (99 percent), IATTC (30 percent), and WCPFC (90.4 percent). Note that this is not a direct indication of the number of vessels excluded from the analysis, as the same vessel may appear in multiple datasets.

<sup>34</sup> For example, “Caroline Fisheries Corp., Inc. vs “CAROLINE FISHERIES CORPORATION.”

<sup>35</sup> As originally envisioned for this study, reconciliation of company ownership of vessels represented an important step in matching fishing activity and catch with company-level trade data, but data limitations ultimately prohibited this approach within the scope of this project. Future research using other data sources could eventually be used to further clarify the Pacific tuna trade flows identified in this report.

<sup>36</sup> Identifying the complex corporate relationships between companies that appear to be separate in the data could contribute significantly to an understanding of tuna trade flows but is a difficult task that would require additional information; this is beyond the scope of this project.

investigation of the relationships between these companies; they are considered to be individual companies for purposes of reporting vessel ownership if identified as such in the vessel registry data.

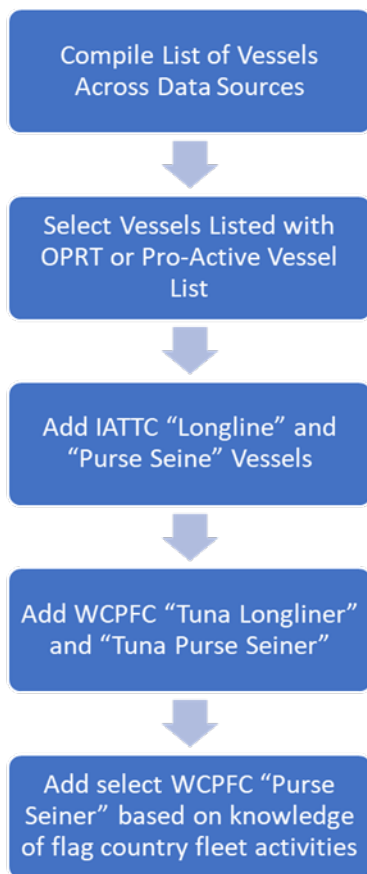


Figure 12. Identification of Tuna Vessels

Table 6. Sources of Fleet Information

Vessel List	Source	Description	Downloaded From
WCPFC Record of Fishing Vessels	WCPFC	List of fishing vessels authorized to fish in the WCPFC convention area outside of the waters of its flag country.	<a href="https://www.wcpfc.int/record-fishing-vessel-database">https://www.wcpfc.int/record-fishing-vessel-database</a>
IATTC Regional Vessel Register	IATTC	List of vessels authorized or known to fish for tunas or tuna-like species in the Eastern Pacific.	<a href="https://www.iattc.org/en-US/Management/Vessel-register">https://www.iattc.org/en-US/Management/Vessel-register</a>
IATTC Authorized Carrier Vessels	IATTC	List of carrier vessels authorized to receive tuna at sea from fishing vessels.	<a href="https://www.iattc.org/en-US/Management/Vessel-register">https://www.iattc.org/en-US/Management/Vessel-register</a>
Pro-Active Vessel Register	ISSF	List of self-identified vessels that are voluntarily listed to demonstrate their commitment to following practices supporting sustainable tuna fisheries.	<a href="https://www.issf-foundation.org/vessel-and-company-commitments/proactive-vessel-register/proactive-vessel-register-pvr/">https://www.issf-foundation.org/vessel-and-company-commitments/proactive-vessel-register/proactive-vessel-register-pvr/</a>
Vessels in Other Sustainability Initiatives	ISSF	List of vessels of all gear types fishing in a Marine Stewardship Council (MSC) fishery or participating in a tuna Fishery Improvement Project (FIP)	<a href="https://www.issf-foundation.org/vessel-and-company-commitments/other-vessel-lists/vessels-in-other-sustainability-initiatives-vosi/">https://www.issf-foundation.org/vessel-and-company-commitments/other-vessel-lists/vessels-in-other-sustainability-initiatives-vosi/</a>
OPRT Positive List	Organization for the Promotion of Responsible Tuna Fisheries (OPRT)	List of vessels of member companies.	<a href="http://oprt.or.jp/eng/">http://oprt.or.jp/eng/</a>

## Catch Data

Data reported to the WCPFC and IATTC serve as our primary source of catch information for Pacific tuna fisheries. Unless otherwise noted, any reported catch statistics are derived from these sources. Weights reported are mt of live weight, prior to any cleaning, gutting, or processing. The WCPFC compiles and maintains databases of annual catch based on information provided by members and cooperating non-members. These catch data are provided separately by year, species, gear type, and vessel flag, in PDF form. Similarly, the IATTC maintains annual catch data by species, gear type, and vessel flag. The IATTC provides these data in spreadsheet form, through 2020 (as of the date downloaded). After downloading these data from the respective RFMOs' websites, we standardize the column names, vessel flags (i.e., country names), species names, and gear types before combining the catch data into a single dataset.

A key caveat and limitation of the RFMO catch data is that catch data are reported by vessel flag; however, in some cases, the companies responsible for the operation of the fishing fleets may be located in a country other than that of the vessel's flag. This discrepancy may lead to by-country catch figures that are inconsistent with

export records. Where RFMO data appear inconsistent with the trade data, or with our professional understanding of the volumes of catch across different countries, we identify and describe alternate sources of catch data to help resolve these discrepancies. These alternate sources and conclusions that we draw from them are described in the fishery-specific chapters of this report (Chapters 6 through 8).

## Trade Data

This analysis relies on two primary sources of trade data to understand the flow of Pacific tuna and tuna products internationally – BACI and Descartes Datamyne trade data. Trade data of relevance to this analysis are limited to tuna-associated products, as identified by Harmonized System (HS) codes that are specified within the data. The HS Code system is a standardized method for classifying traded products that is used internationally to identify products for purposes of assessing duties, ascribing taxes, and reporting statistics.<sup>37</sup> The HS Code system is updated every five years and can include changes in the definitions of codes and products that are included in a grouping. This can create difficulties in comparing data by HS code across time. For this analysis, all key data sources relied upon use the HS Nomenclature 2017. Table 7 identifies the relevant HS codes (2017) for this analysis. Importantly, the primary sources of trade data on which this analysis relies are reported only to the six-digit code level, which is the highest resolution of HS codes resolved internationally. In limited cases, where other sources (e.g., Eurostat or NMFS trade data) provide more detailed descriptions of products being traded, we consider that information within the analysis.

Table 7 also describes the types of products (e.g., canned tuna, cooked tuna loins) that are typically associated with the forms of tuna included within each HS code. This information is applied later in the analysis to describe the movement of fish into and out of countries, and the handling and processing stages that occur at each step. For instance, purse seine-caught tuna is typically used to produce canned or pouched products (longline-caught tuna is seldom processed in this way), so the HS codes for prepared or preserved preparations of tuna and tuna-like species (referred to in this report as “processed tuna”; HS codes beginning with 1604.14) are mainly associated with purse seine-caught tropical tuna.<sup>38</sup> Conversely, sashimi-grade tropical tuna (sold fresh or frozen) is typically associated with longline gear. Longline-caught tuna can be traded under three different categories: fresh/chilled (HS codes beginning with 0302.3), whole frozen (HS codes beginning with 0303.4), or as a frozen, processed product under the “other” category (HS codes 0304.87 and 0303.49). Note that longline tuna frozen onboard the fishing vessel may be defrosted and sold as a fresh/chilled product in major markets.

Trade is reported in terms of the quantity, in metric tons (mt), of the product being traded. Because processing results in loss of weight (e.g., from discard of skin, bones, etc.), there is not a direct pound-for-pound relationship between raw tuna imported and the same tuna being exported in a processed form. A detailed analysis aimed at identifying trade balances between domestic production, imports, exports, and domestic usage for different tuna species could be subject to the use of very detailed conversion factors when trying to quantify the equivalence of a processed tuna product more precisely in relationship with the initial landed weight. While this analysis could be conducted, it would involve many different conversion factors for different species, sizes, and final products and such analysis is not critical for identifying the nature and characteristics of the trade flows for tuna caught in the Pacific. Because a detailed analysis of tuna trade balances was outside the scope of this report, the generally accepted industry conversion factor of a 50 percent yield from raw weight of purse seine-

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<sup>37</sup> International Trade Administration. 2023. Harmonized System (HS) Codes. Viewed at <https://www.trade.gov/harmonized-system-hs-codes>, February 27, 2023.

<sup>38</sup> Apart from canned albacore, which is caught by longline and troll/pole-and-line vessels.

caught tropical tuna to final product (canned/pouched tuna) was used, when necessary (usually implicitly), to check the reasonableness of export data relative to catch and import data.

Tropical tuna and albacore caught by vessels using longline, pole and line, or troll gear is often subject to on-board handling processes such as removing head, guts, and gills. Unlike the case of tuna used for canning, there is no generally accepted rule of thumb to determine the weight loss incurred by the removal of the heads and guts from the whole fish prior to freezing the fish or placing the fish on ice on the longline, pole, and line, or troll vessels. Furthermore, there are instances in which only the guts and gills are removed, but the head is kept, making it even more difficult to come up with a generally accepted conversion factor for tropical tuna and albacore caught with these gear types.<sup>39</sup> While the removal of these parts of the fish does affect the landed weight of the fish at the market destinations, it does not, as in the case of the tuna used for canning, alter the basic tuna trade flow analysis or its conclusions for fish caught with these gears.

It is worth mentioning again that the main goal of this report was to describe and analyze the major trade flows of tuna moving from one country to another (including countries that participate in intermediate tuna processes). The use of more detailed conversion factors would not have produced conclusions that were significantly different than those resulting from the current analysis.

**Table 7. Definitions of Relevant HS Codes (HS 2017)**

HS Code	Description	Product Association
<b>FRESH, SPECIES SPECIFIC<sup>1</sup></b>		
0302.31	Fish; fresh or chilled, albacore or longfin tunas ( <i>Thunnus alalunga</i> ), excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0302.91 to 0302.99	Fresh albacore
0302.32	Fish; fresh or chilled, yellowfin tunas ( <i>Thunnus albacares</i> ), excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0302.91 to 0302.99	Fresh yellowfin, also known as "Ahi"
0302.33	Fish; fresh or chilled, skipjack or stripe-bellied bonito, excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0302.91 to 0302.99	Fresh skipjack
0302.34	Fish; fresh or chilled, bigeye tunas ( <i>Thunnus obesus</i> ), excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0302.91 to 0302.99	Fresh bigeye
<b>FROZEN, SPECIES SPECIFIC</b>		

<sup>39</sup> The European Market Observatory for Fisheries and Aquaculture Products (EUMOFA) provides conversion factors for some of these cases, however, our report did not use any conversion factors when discussing tunas caught by the aforementioned gears given that it would be difficult to ascertain with any degree of precision the particular fishing method associated with the tuna trade flow and the fact that it would not significantly change the result of the analysis.



HS Code	Description	Product Association
0303.41	Fish; frozen, albacore or longfinned tunas ( <i>Thunnus alalunga</i> ), excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0303.91 to 0303.99	Whole frozen albacore
0303.42	Fish; frozen, yellowfin tunas ( <i>Thunnus albacares</i> ), excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0303.91 to 0303.99	Whole frozen yellowfin; gilled & gutted frozen yellowfin; frozen yellowfin, steaks, chunks
0303.43	Fish; frozen, skipjack or stripe-bellied bonito, excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0303.91 to 0303.99	Frozen skipjack, portions, chunks
0303.44	Fish; frozen, bigeye tunas ( <i>Thunnus obesus</i> ), excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0303.91 to 0303.99	Frozen bigeye, portions, chunks
<b>PROCESSED</b>		
1604.14	Fish preparations; tunas, skipjack and Atlantic bonito ( <i>sarda</i> spp.), prepared or preserved, whole or in pieces (but not minced)	Lightmeat tuna in oil, pouched Canned white meat albacore tuna in oil Canned lightmeat tuna in oil White meat albacore in water, pouched White meat albacore in water, canned Lightmeat tuna in water, pouched Lightmeat tuna in water, canned White meat albacore in water White meat albacore in water, canned, over quota Lightmeat tuna in water, pouched, over quota Canned lightmeat tuna in water, over quota Pre-cooked tuna loins, frozen
<b>OTHER<sup>2</sup></b>		
0304.87	Tuna, non-specific, fillet, frozen	Frozen tuna fillets
0303.49	Tuna, other, frozen	Frozen tuna, portion-controlled

HS Code	Description	Product Association
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Sources:

United Nations Statistics Division. 2023a. Classifications on Economic Statistics: HS, 2017 – Code 0302. Viewed at <https://unstats.un.org/unsd/classifications/Econ/Detail/EN/2089/0302>, February 27, 2023.

Note:

1. The HS code 0302.39 includes "Fish; fresh or chilled, tuna, n.e.c. in item no. 0302.3, excluding fillets, fish meat of 0304, and edible fish offal of subheadings 0302.91 to 0302.99." As this product does not identify a specific species and is only identified in very limited quantities in the BACI data, we do not include it in the analysis.
2. There are several other HS codes that are not specific to tuna, but that may include tuna. For example, there may be small amounts of tuna products included within HS code 0304.99, "Fish meat, excluding fillets, whether or not minced; frozen, n.e.c. in item number 0304.9." Similarly, tuna scraps resulting from canned tuna production are sometimes used to produce fishmeal (usually by third parties rather than at the tuna processing plants), so some tuna-based fishmeal may be included in HS 0305.10 (fishmeal). Katsubushi (smoked tuna flakes), traded under HS code 0304.87, can be produced from skipjack tuna, but may also be produced from "bonito" (a "tuna-like" fish). However, because these codes include a wide variety of tuna and non-tuna products that cannot easily be disaggregated using available data, we do not include them within our analysis.

## BACI

The UN Comtrade Database aggregates annual and monthly trade statistics at the national level by product and trading partner. These data cover approximately 200 countries, and represent 99 percent of global trade of merchandise, making them a very comprehensive source of information to understand high-level flows of tuna products between countries.<sup>40</sup>

One limitation and challenge with using UN Comtrade data for analysis lies in the fact that an individual trade flow is generally reported within the data by both the exporting and importing country, resulting in duplication of the same trade flow. Additionally, while the numbers reported in each direction should in theory be identical, for several reasons they often are not. Recognizing this limitation, the CEPII developed the BACI dataset to resolve issues of duplication. Specifically, by implementing a procedure that considers the relative reliability of the data reporter and removing the less reliable duplicate record, BACI provides a clean accounting of bilateral trade flows.<sup>41</sup> The BACI data, which are available for download at CEPII's website, provide the primary national-level statistics on international trade for the analysis.<sup>42</sup> Data downloaded for this analysis rely on HS Nomenclature 2017. Unless otherwise noted, any reported trade figures are derived from BACI.

For purposes of this analysis, the BACI data are subject to several important limitations:

- **Company Name.** Data are aggregated by country and product type. No shipment level information or identification of the companies involved in the import or export of these products is provided.
- **Fishery of Origin.** Although data specify the product type, they do not identify the fishery (i.e., gear type or ocean) from which the product originated. Within the analysis, we consider the trade partners involved (e.g., fleet characteristics, harvest activity, location, markets, consumer product preferences)

<sup>40</sup> United Nations Statistics Division. 2023b. Comtrade Database. Viewed at <https://comtradeplus.un.org/>, February 27, 2023.

<sup>41</sup> CEPII. 2023. BACI. Viewed at [http://www.cepii.fr/CEPII/en/bdd\\_modele/bdd\\_modele\\_item.asp?id=37](http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=37), February 27, 2023.

<sup>42</sup> Data for the analysis were downloaded from [http://www.cepii.fr/CEPII/en/bdd\\_modele/bdd\\_modele\\_item.asp?id=37](http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=37), on January 11, 2023.

and best professional judgment to make assumptions regarding the likely fishery of origin for traded products.

- **Processed Products.** Products are reported at the six-digit HS code level. For tuna products, this means that all tuna species that have been prepared or preserved (other than minced) are reported collectively. This grouping thus prohibits distinction between various processed product forms, such as loins, which may go on to further processing, and canned tuna, which is a finished product. Where available, we rely on alternate, more detailed data sources to identify product types at a finer resolution.
- **“Other” Products.** Certain trade entries are identified by “catch all” product codes that include tuna but are not specific as to the preparation or product. We again rely on information about the trade partners’ activities and preferences to make a best professional judgment of the most likely product types being traded under those codes in specific instances.

### Descartes Datamyne

Descartes Datamyne is a private service that offers a paid subscription to compiled global import and export trade data from 170 countries across five continents.<sup>43</sup> Resolution of available data differs depending on the type of trade data reported by an individual country. For a sub-set of 20 countries, Datamyne provides generally comprehensive shipment-level customs or other detailed data by commodity, including details such as shipping company, consignee (i.e., the company receiving the goods), and detailed product descriptions (see text box, *Countries Reporting Shipment-Level Trade Data to Datamyne*). For others, data represent national-level census-based trade information reporting total quantities and value of imports and exported goods by HS code. Quantities reported by Datamyne differ by country, and may reflect gross weight, net weight, or not specify the basis. Each record relies upon the HS code version that was applicable at the time of the shipment. As this analysis relies on 2019 trade data, the relevant data are reported by the HS Nomenclature 2017. Datamyne does offer some insight into shipment-level trade data for these countries to the extent that the trade partner involved is one that reports shipment-level data.<sup>44</sup>

Key caveats and limitations associated with these data include:

- **Processed Products.** Commodities are only consistently reported at a six-digit HS code resolution, which limits the ability to distinguish between different types of processed tuna products falling under HS code 1604.14 (see Table 7).
- **Fishery of Origin.** Trade is reported by product code and does not allow for direct identification of those products that came specifically from Pacific fisheries or were caught by specific gear types.

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<sup>43</sup> Descartes Datamyne. 2023. Why Customers Choose Descartes Datamyne. Viewed at <https://www.datamyne.com/about-us/why-customers-choose-descartes-datamyne/>, February 27, 2023.

<sup>44</sup> For example, Thailand does not report shipment-level data to Datamyne. However, shipment level information would be available for all trade flows between the U.S. and Thailand because the U.S. does report shipment-level customs data.

- **Exporting/Supplying Country.** Typically, the exporting country in the BACI and supplying country in Datamyne data is the flag State that catches the fish. Unfortunately, this is not always the case. In many instances, the origin of the fish is lost when the fish is transshipped from the fishing vessel to a reefer carrier, or the exporting country is assigned to “International Waters.”
- **Company Names.** Comprehensive shipment-level data identifying company names are available for only a sub-set of countries. Although certain countries key to this analysis are captured comprehensively (e.g., Ecuador), others are not (e.g., Thailand).

The analysis overcomes these limitations by relying on a variety of additional country or fishery-specific references, as well as our detailed professional industry knowledge, to supplement the available data and fill in data gaps. These references are identified and described as they are employed in Chapters 6 through 8.

#### Other Trade Data Sources

While BACI data and Datamyne serve as the foundational sources of information regarding the trade of tuna products between countries, these data are supplemented by other detailed country or region-specific data as appropriate. Other key sources of trade data relied on include:

- **National Marine Fisheries Service (NMFS) Foreign Fishery Trade Data (NMFS Trade Data).** Database of foreign trade of fishery products from 1975 to present derived from data collected from U.S. Customs and Border Protection. Provides information on imports and exports of fishery products to and from the U.S. based upon the Harmonized Commodity Description and Coding System at the ten-digit level.<sup>45, 46</sup> Importantly, these data do distinguish between different types of processed products (e.g., cans vs. pouches vs. cooked loins) for international trade to which the U.S. is a party.
- **Eurostat.** Database of statistics and data for E.U. member countries.<sup>47</sup> Includes comprehensive aggregated import and export data by HS code for all trade activity where an E.U. member country is

#### Countries Reporting Shipment-Level Trade Data to Datamyne

Argentina  
Brazil  
Chile  
Colombia  
Costa Rica  
Ecuador  
India  
Indonesia  
Mexico  
Pakistan  
Panama  
Paraguay  
Peru  
Philippines  
Russia  
Sri Lanka  
U.S.  
Uruguay  
Venezuela  
Vietnam

<sup>45</sup> NOAA Fisheries. 2023. Foreign Fishery Trade Data. Viewed at <https://www.fisheries.noaa.gov/national/sustainable-fisheries/foreign-fishery-trade-data>, April 17, 2023.

<sup>46</sup> Annual data on imports and exports for all relevant HS codes downloaded from NOAA Fisheries. 2023c. Foreign Trade. <https://www.fisheries.noaa.gov/foss/f?p=215:2:11546526678833:::,,>, April 12, 2023.

<sup>47</sup> European Union. 2023. Eurostat. Viewed at <https://ec.europa.eu/eurostat>, April 17, 2023.

either the importer or exporter. Data are available for 8-digit HS codes, which allows us to distinguish between processed products for trade exchanges in which an E.U. member state is involved.

## Other Sources Referenced

Tracing and documentation of trade flows and identification of key actors within global tuna fisheries is a notoriously complex and labor-intensive task. Several previous efforts have completed robust evaluations of various components of the supply chain, offering substantial value to the present effort. This report leverages the results of several earlier efforts to supplement our analysis, allowing us to fill in data gaps and provide additional detail not provided by the data sources on which our analysis relies. By leveraging this previous work, we can focus greater attention on those fisheries and areas of the trade flows that have not yet been investigated in detail, providing a value added in the collective effort to document the complex network of global tuna trade flows, rather than repeating work previously completed. We acknowledge these impressive efforts and are grateful to have these references.

- Campling, L., A. Lewis, and M. McCoy. 2017. *The Tuna Longline Industry in the Western and Central Pacific Ocean and its Market Dynamics*. Forum Fisheries Agency, Honiara, Solomon Islands.
- Havice, E., M.A. McCoy, and A. Lewis. 2019. *Market and Industry Dynamics: Western and Central Pacific Tuna Purse Seine Fishery*, August. Forum Fisheries Agency, Honiara, Solomon Islands. Downloaded from <https://www-staging.ffa.int/download/market-and-industry-dynamics-wcpo-distant-water-tuna-purse-seine-fishery/>, March 20<sup>th</sup>, 2023.
- Havice, E., L. Campling, and M.A. McCoy. 2022. *Market and Trade Dynamics: Western and Central Pacific Ocean Tuna Fisheries*. June. Forum Fisheries Agency, Honiara, Solomon Islands
- MRAG Asia Pacific. 2019. *WCPO Transshipment Business Ecosystem Study*. October. Downloaded from <https://mragasiapacific.com.au/wp-content/uploads/2021/12/Pew-WCPO-Transshipment-Report-final.pdf>, March 19, 2023.

## Discrepancies in Linking Data Sources

Ideally, the available data would link seamlessly together, allowing for a pound-for-pound tracing of fish caught by our target fisheries to the end consumer. Through this analysis, we have discovered a variety of disconnects between data sources that suggest this sort of analysis is not possible to conduct with any degree of certainty.

Starting with the initial harvest, there are discrepancies between catch reported to the RFMOs and trade data. Catch is generally reported to RFMOs by the flag of the fishing vessel. However, in some cases, the company that takes ownership of the fish is not based in the same country as the vessel's registered flag. For example, many of the Kiribati purse seine vessels are owned and operated by South Korean companies. As a consequence, some countries that catch large quantities of tuna (like Kiribati) have very little reported exports of tuna in any form; assuming not all of this fish is consumed domestically, this discrepancy suggests that the catch

data may be reported by vessel flag, while export data may reflect trade one step further in the supply chain, after the controlling company (and thus, country) has assumed ownership of the catch.<sup>48, 49</sup>

Discrepancies and inconsistencies in the quantities of product reported in trade data also limit the ability to directly trace fish from catch through exporting/importing and processing. In the most notable example identified through this research, Ecuador is a major processing hub for purse seine caught tropical tuna, and the inputs to that production include both domestic catch and imports of raw frozen tropical tuna. Alignment of the catch and BACI trade data should demonstrate that the volume of catch and imports of raw frozen tropical tuna substantially exceed the volume of processed products that are exported from the country (accounting for loss of volume associated with processing). However, our analysis found that the quantity of processed products could not be supported by its catch and BACI-reported imports. Import data from alternate data sources, including Datamyne, suggest that imports are much higher than what is reported in BACI, potentially identifying inaccuracies or intentional misreporting of trade data, differences between sources in whether reported weights do or do not include container weight, or differences in trade volumes reported by the importing and exporting country for the same trade flow.<sup>50</sup> Such discrepancies complicate the process of aligning trade volumes by country.

At a company level, the availability and comprehensiveness of trade records varies substantially across countries. While a trade flow between a “reporting” country (i.e., a country that makes detailed trade records available) and a “non-reporting” country may be reflected in the reporting country’s data, subsequent activities in that product’s supply chain may be lost as the non-reporting country exports to another non-reporting country. Furthermore, even for trade between reporting countries, tracking the movement of specific shipments through a supply chain is complex. The same company name may be recorded with many variations; dates may be misaligned (e.g., an import record may be reported with an earlier date than the corresponding export) and reported volumes may differ (rendering it difficult to determine whether a shipment reported by both exporter and importer is in fact the same shipment).

For these reasons, as described in Chapter 1, this analysis does not rely on a systematic linking between catch and trade data that accounts for each pound of fish. Instead, the key data sources provide the initial foundation for the analysis. They are supplemented heavily by other country-specific references and data sources and informed assumptions based on direct information obtained over decades of detailed industry experience. By relying on a multi-source approach that does not overemphasize a strict application of one quantitative accounting technique, we are able to develop a detailed mapping of the flows of tuna products from the Pacific at a degree of specificity needed to address the key questions posed by Pew.

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<sup>48</sup> For example, Kiribati reported a total tropical tuna purse seine catch of 227,777 mt in 2019. That same year, BACI data report total exports of fresh and frozen tropical tuna from Kiribati of just 48,000 mt. Linking these sources together directly suggests a domestic consumption of approximately 183,000 mt – an impossible figure given the population and domestic markets within that country.

<sup>49</sup> Typically, catch would be reported by the DWFN (in this case, South Korea), rather than a host country. In the case of joint ventures, however, the host country may report the catch as their own production. We do not believe that the presence of joint ventures in Kiribati is the basis for this discrepancy.

<sup>50</sup> The latter situation could result in BACI relying on the reporting of one country (e.g., the importer) when the other trade partner (the exporter) is more accurately reporting the trade flow.

## CHAPTER 4 | Key Countries and Actors at the Harvest Level

In this chapter, we provide an overview of Pacific tuna harvest activities within the focal fisheries, considering both the catch of key species by volume, as well as the nature and distribution of the fleets associated with this catch. We first present the catches of tropical tunas and albacore reported by the WCPFC and IATTC for the key fisheries defined in Chapter 2: the purse seine fishery for tropical tunas (bigeye, skipjack, and yellowfin); the longline fishery for tropical tunas; and the longline fishery for albacore.<sup>51</sup> Examining the reported catch by vessel flag, combined with reviewing the characteristics and size of each country's tuna fishing fleet, will identify the most active countries in each fishery. This fishing activity represents the first stage of the tuna supply chain and helps to focus the supply chain analyses we undertake in subsequent chapters.

This chapter will show that South Korea, Ecuador, and Taiwan are the top countries in terms of catch and fleet size in the purse seine tropical tuna fishery, and other key purse seine countries include PNG, Kiribati, the U.S., and the Federated States of Micronesia. The top countries engaged in longline fishing include Taiwan, China, and Japan. The Pacific albacore longline fishery is dominated by China, Taiwan, and Fiji, with other countries including French Polynesia, Vanuatu, and Japan.<sup>52</sup>

### Catches

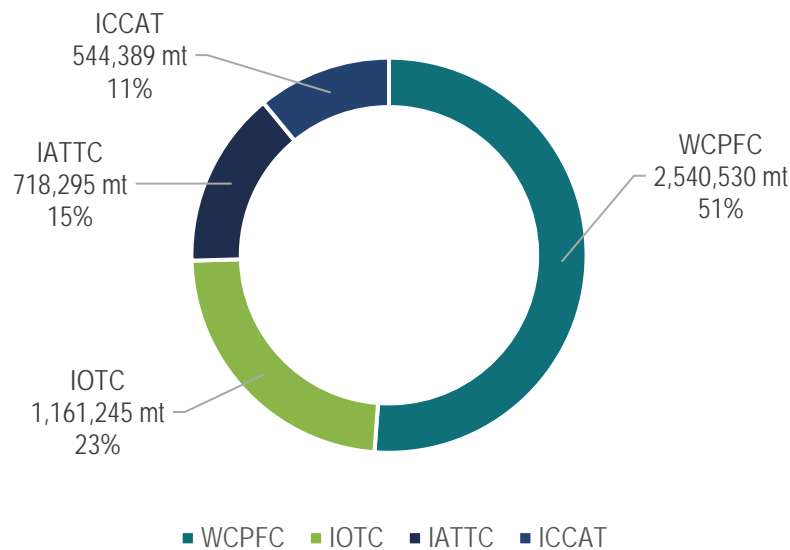
The Pacific Ocean accounted for approximately 66 percent of the global catch of tropical and albacore tunas in 2019. Figure 13 presents the total catch of tropical tuna and albacore in 2019 across all RFMO regions. Global catch in 2019 was approximately 5 million mt, of which 2.5 million mt originated in the WCPFC and 718 thousand mt originated from the IATTC.

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<sup>51</sup> Longline-caught albacore are of greatest importance to trade flows and are thus the focus of this section. However, other segments of the fishery target albacore with troll or pole-and-line gear. This fishery and the associated trade flows are discussed in Chapter 8.

<sup>52</sup> Catch attributed to China within both WCPFC and IATTC catch data are inclusive of catch by Hong Kong.



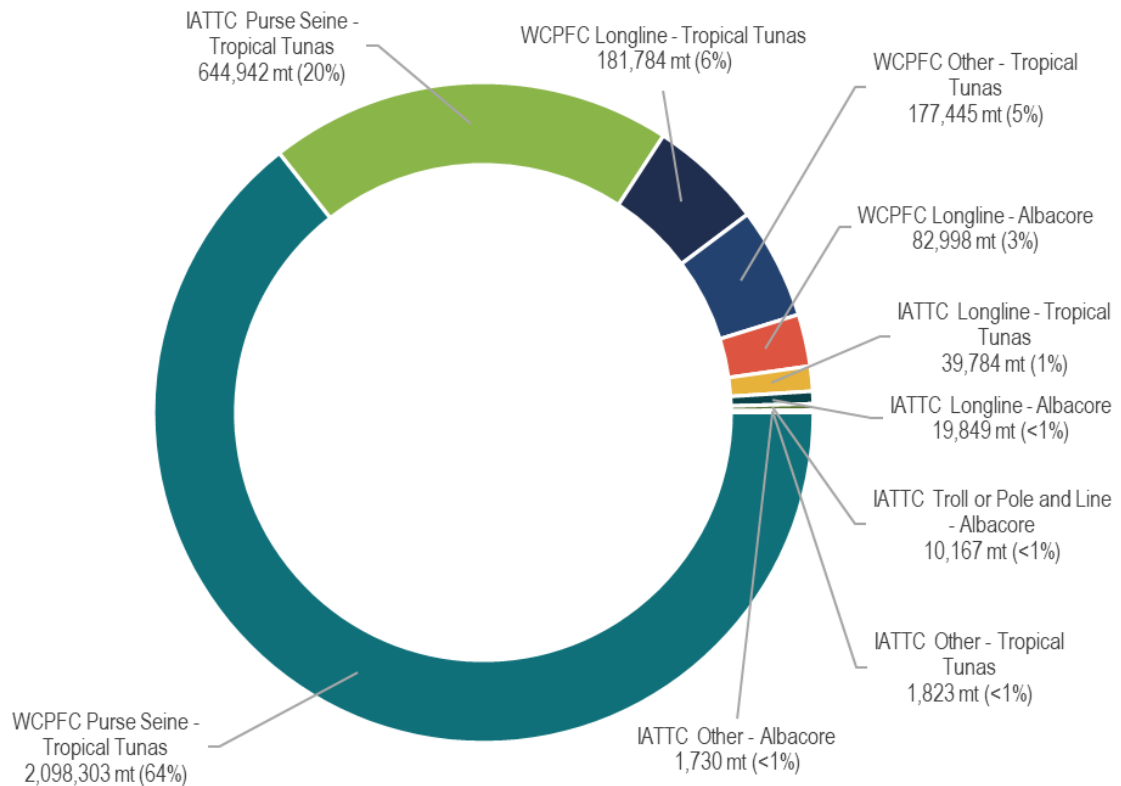


**Figure 13. Global Catch of Tropical Tuna and Albacore**

Source: WCPFC, IATTC, IOTC, and ICCAT Catch Data.<sup>53</sup>

Within the Pacific Ocean, most of the tuna are caught within the WCPFC convention area. Of the 3.3 million mt of tuna caught in the Pacific Ocean in 2019, approximately 78 percent was caught within the WCPFC convention area. As shown in Figure 14, most tuna caught within the Pacific Ocean is caught by purse seine vessels—84 percent of all Pacific tuna across the WCPFC and IATTC.

<sup>53</sup> IOTC data: Indian Ocean Tuna Commission. 2023. Available Datasets “*Best scientific estimates of nominal retained catch data for IOTC species* (used for stock assessment purposes and fully disaggregated by species and gear).” Downloaded from <https://iotc.org/data/datasets>, January 24. ICCAT data: ICCAT. 2023. “Access to ICCAT statistical databases,” “Nominal Catch Information: Task 1 Excel.” Downloaded from <https://www.iccat.int/en/accesingdb.html>, January 25.



**Figure 14. Pacific Catch of Tropical Tuna and Albacore**

Source: WCPFC and IATTC Catch Data.

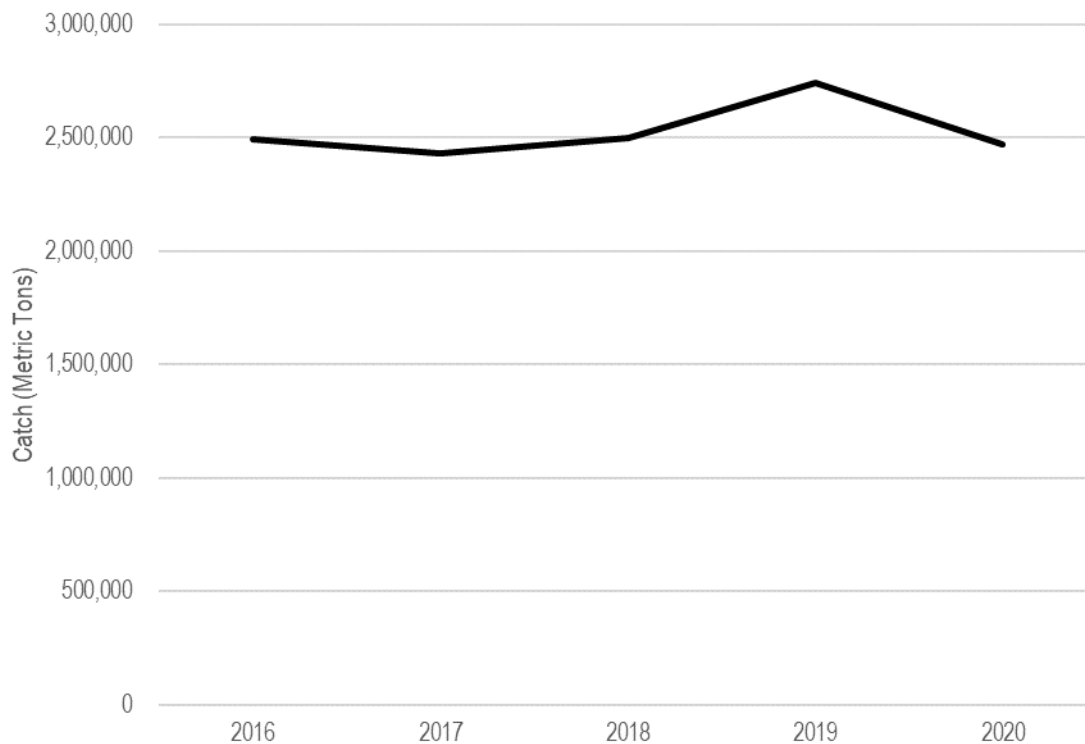
The sections that follow describe in greater detail the catch activity with each fishery of interest, including identifying those countries most active in this level of the supply chain. Importantly, for many Pacific countries, focusing on the flag state gives an incomplete picture of the nationality of the fleet, and therefore how much control the flag state can exert over the fleet. Dynamics around joint ventures, charter arrangements, and other aspects of fleet ownership are addressed in the discussion of each flag state.

### Harvest in Pacific Purse Seine Fisheries for Tropical Tuna

As shown in Figure 15, total purse seine catch of tropical tuna in the Pacific Ocean between 2016 and 2020 has ranged from approximately 2.4 million mt to 2.7 million mt. Figure 16 provides additional detail on the quantities caught by the countries with the largest harvest in these years, as well as the trends in harvest by these countries over time.<sup>54</sup> Ecuador and South Korea have remained among the nations with the largest reported purse seine catch of tropical tunas in all years, while the purse seine harvest of Papua New Guinea (PNG) has

<sup>54</sup> Figure 16 and Figure 17 show seven unique countries (defined as the key catching countries for purposes of these presentations) because each of these countries was among the top five countries in at least one year from 2016 to 2020.

decreased by approximately 35 percent from 2016 to 2020. Over this same period, the Federated States of Micronesia's purse seine harvest of tropical tuna has increased by approximately 150 percent.<sup>55</sup>

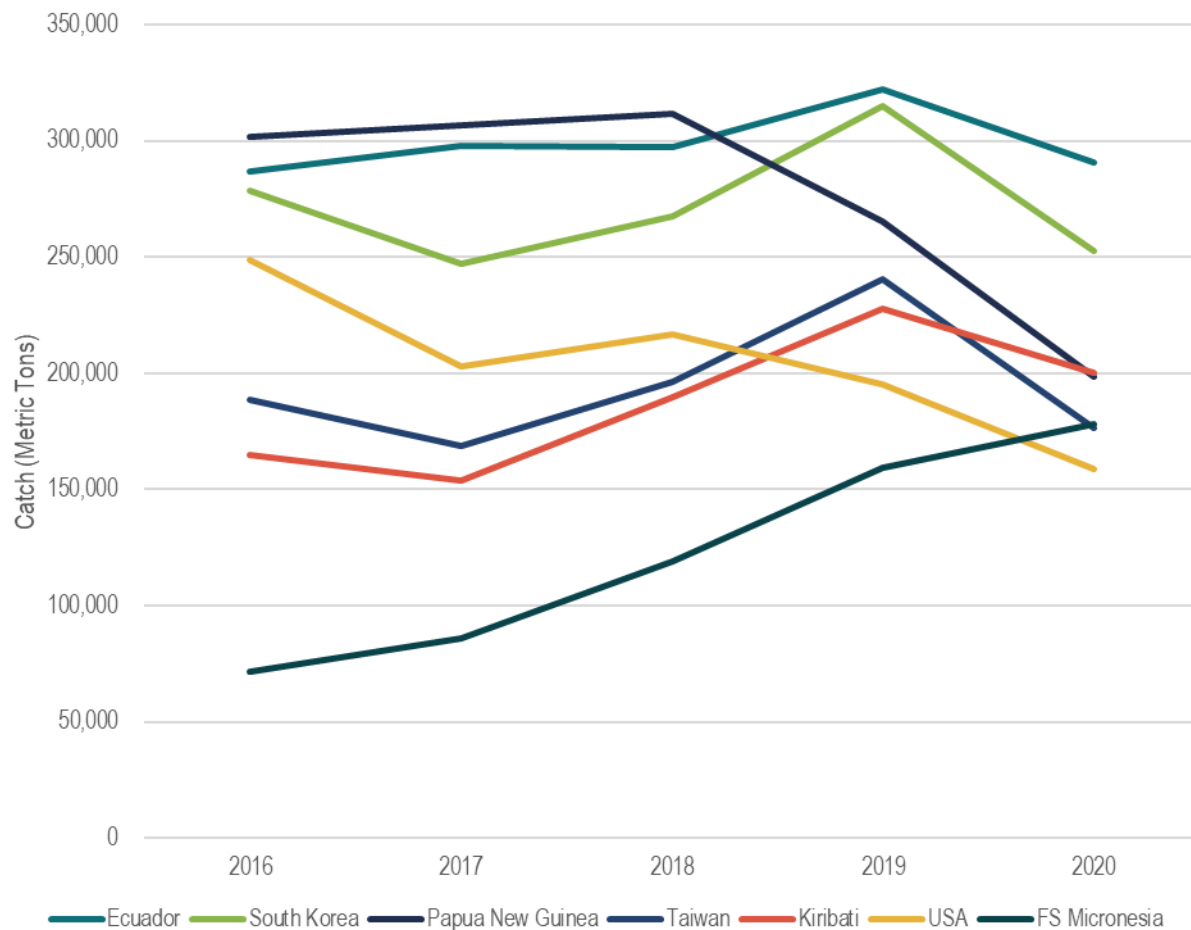


**Figure 15. Total Pacific Purse Seine Catch of Tropical Tuna, 2016-2020**

Source: WCPFC and IATTC Catch Data

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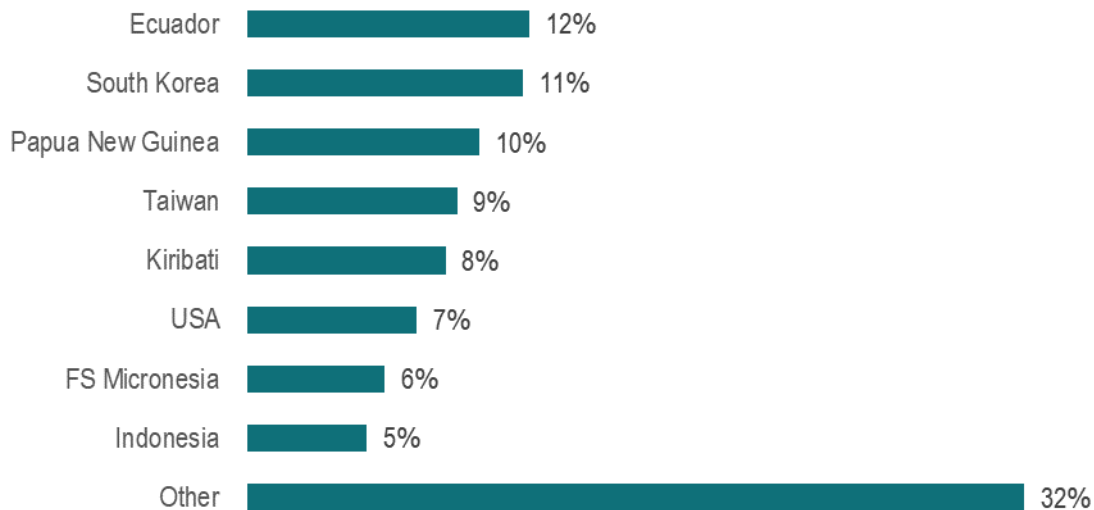
<sup>55</sup> Includes any countries that are in the top five in any year. A country that is number six in catch in all years would be excluded. E.g., in the line chart below, there may be (are likely to be) other countries between Kiribati and Micronesia in 2016, but they are excluded for being ranked as sixth or lower in terms of catch in all years.



**Figure 16. Pacific Purse Seine Catch of Tropical Tuna by Key Countries, 2016-2020**

Source: WCPFC and IATTC Catch Data

As shown in Figure 17, in 2019, Ecuador, South Korea, and PNG's fleets accounted for one-third of the Pacific purse seine catch of tropical tuna. Taiwan, Kiribati, the U.S., the Federated States of Micronesia, and Indonesia each caught between five and ten percent of all purse seine-caught tropical tuna – collectively, approximately one-third of the year's catch. Other countries, each with less than five percent of the total catch of tropical tuna, account for the final third of the year's catch.



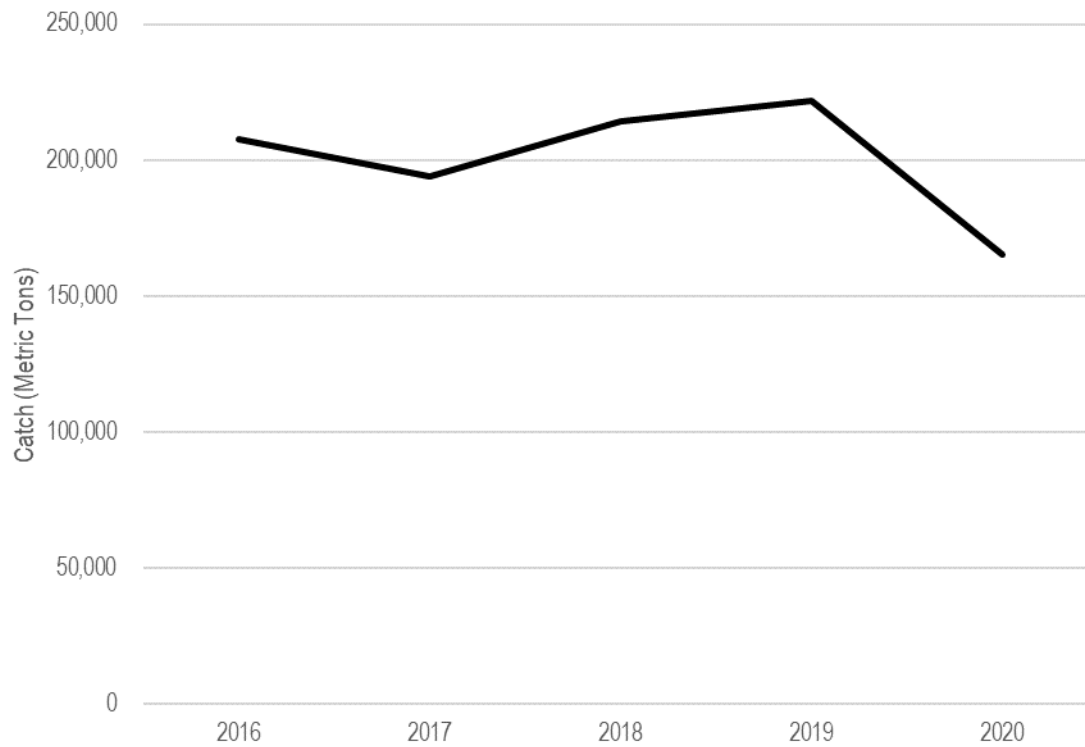
**Figure 17. Percent of 2019 Purse Seine Catch of Tropical Tuna by Top Catching Countries**

Source: WCPFC and IATTC Catch Data.

### Harvest by Longline Fisheries for Tropical Tuna

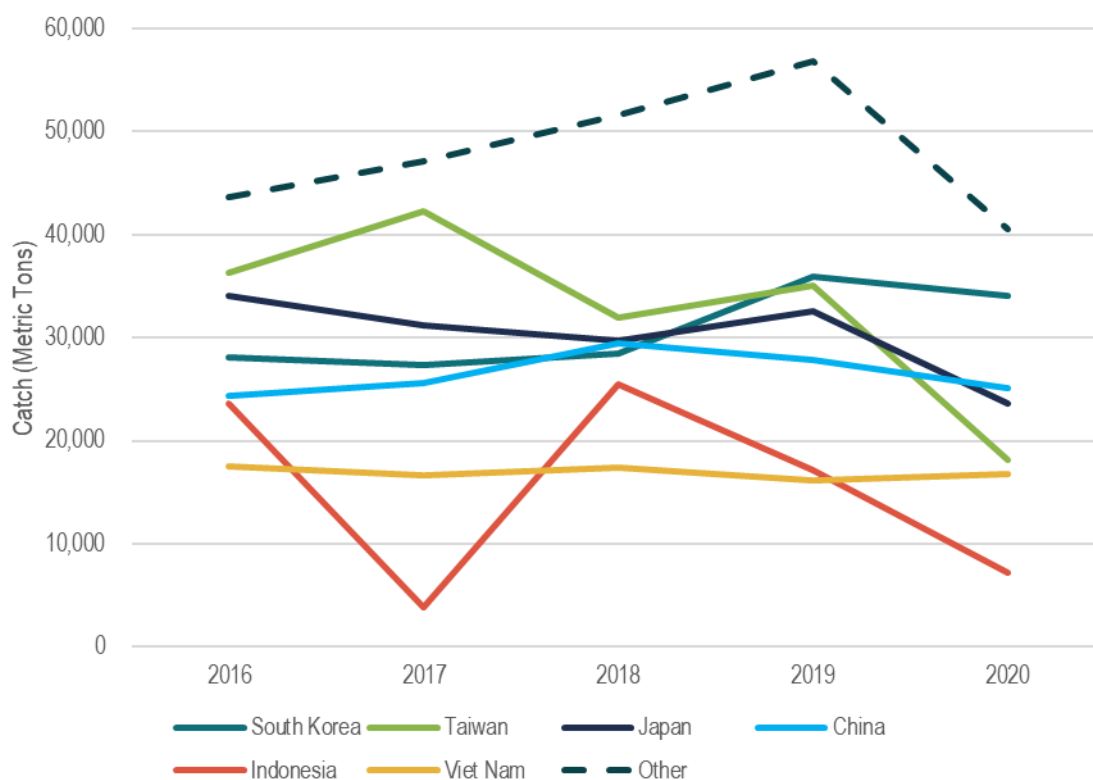
As shown in Figure 18, total longline catch of tropical tuna in the Pacific Ocean has remained relatively consistent from 2016 to 2020, ranging from approximately 160,000 mt to 220,000 mt. The countries most involved in this fishery have also remained consistent over this period: in all years, the top four countries are South Korea, Taiwan, Japan, and China, while the country with the fifth largest catch volume fluctuates between Indonesia and Vietnam. Figure 19 presents the trends in annual catch for these countries. Taiwan and Japan's total catches have declined somewhat (especially in 2020), while South Korea has increased its catch, especially in 2019 and 2020. Indonesia's catch has oscillated substantially between years during this period.

Collectively, in 2019, South Korea, Taiwan, and Japan caught nearly half of all Pacific longline-caught tropical tuna, as shown in Figure 20. China, Indonesia, and Vietnam caught approximately 28 percent, and other countries caught the remaining 26 percent.



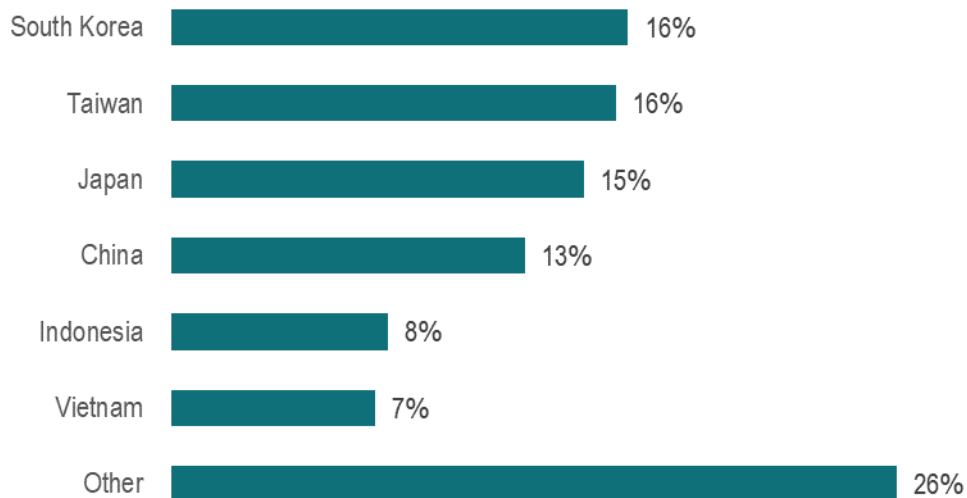
**Figure 18. Total Pacific Longline Catch of Tropical Tuna, 2016-2020**

Source: WCPFC and IATTC Catch Data.



**Figure 19. Pacific Longline Catch of Tropical Tuna by Key Catching Countries, 2016-2020**

Source: WCPFC and IATTC Catch Data.



**Figure 20. Percent of 2019 Longline Catch of Tropical Tuna by Top Catching Countries**

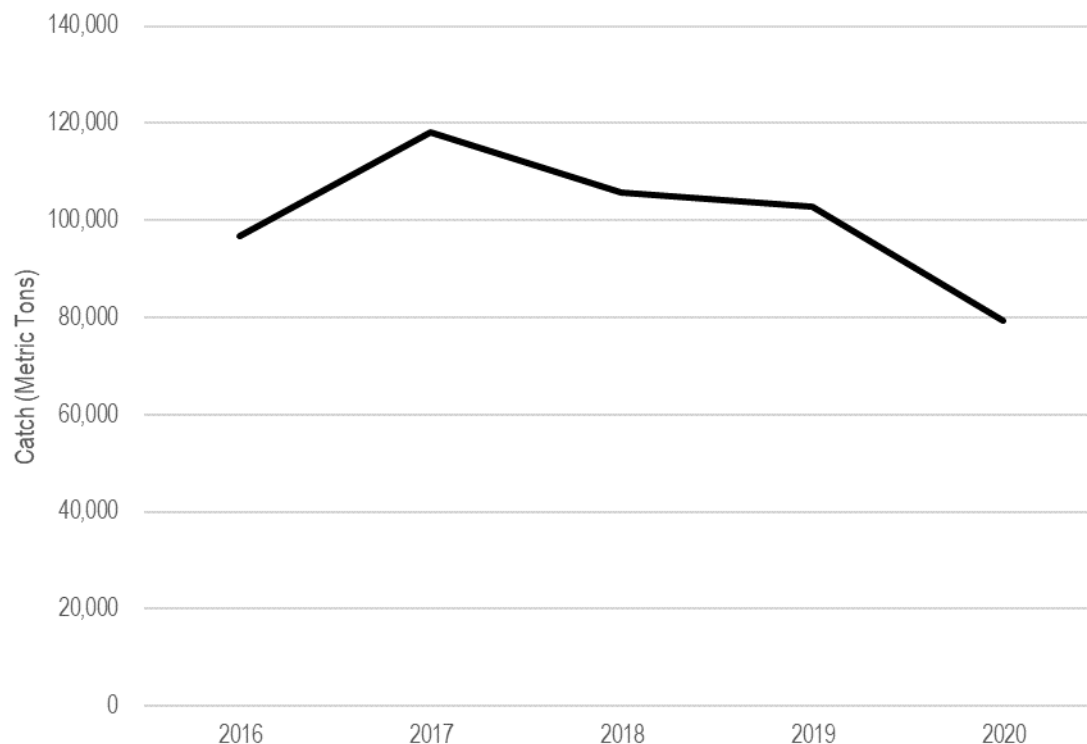
Source: WCPFC and IATTC Catch Data.



## Harvest by Longline Fisheries for Albacore

Total longline catch of albacore in the Pacific Ocean has fluctuated somewhat from 2016 to 2020: from 2017's total catch of approximately 120,000 mt, total catch declined by approximately one-third to 80,000 mt in 2020 (Figure 21). China is consistently the largest longline harvester of albacore, with catch exceeding 30,000 mt in each year (and more than 40,000 mt from 2017 through 2019), as shown in Figure 22. While China is by far the largest longline harvester of albacore, Taiwan and Fiji also catch substantial amounts: 15,000 to 20,000 mt and 6,000 to 11,000 mt, respectively. As shown in Figure 23, in 2019, China caught approximately 42 percent of all longline-caught albacore, Taiwan caught 18 percent, and Fiji caught 9 percent – collectively, nearly 70 percent of all longline caught albacore originating in the Pacific. In contrast to the tropical tuna fisheries, countries other than these three each have a much smaller share of total catch (six percent or less).

While longline-caught albacore is of greatest importance to trade flows and are thus the focus of this section, there are other segments of the fishery that target albacore with troll or pole-and-line gear. This fishery and the associated trade flows are discussed in Chapter 8.



**Figure 21. Total Pacific Longline Catch of Albacore, 2016-2020**

Source: WCPFC and IATTC Catch Data.

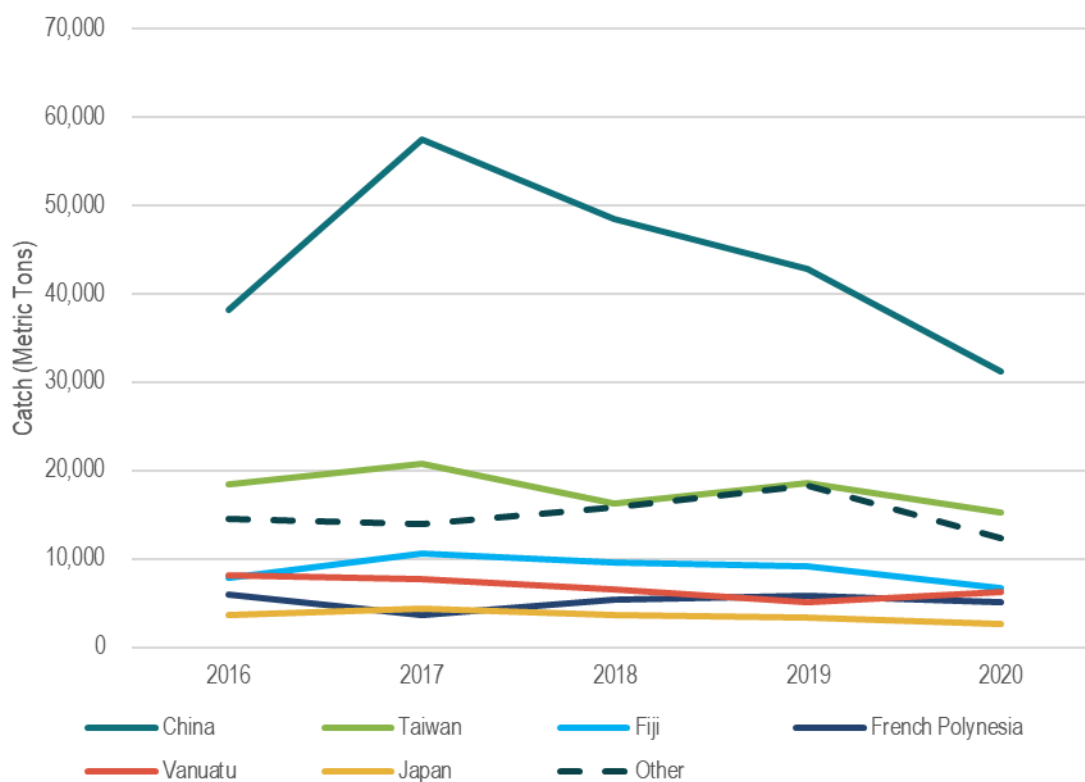


Figure 22. Pacific Longline Catch of Albacore by Key Catching Countries, 2016-2020

Source: WCPFC and IATTC Catch Data.

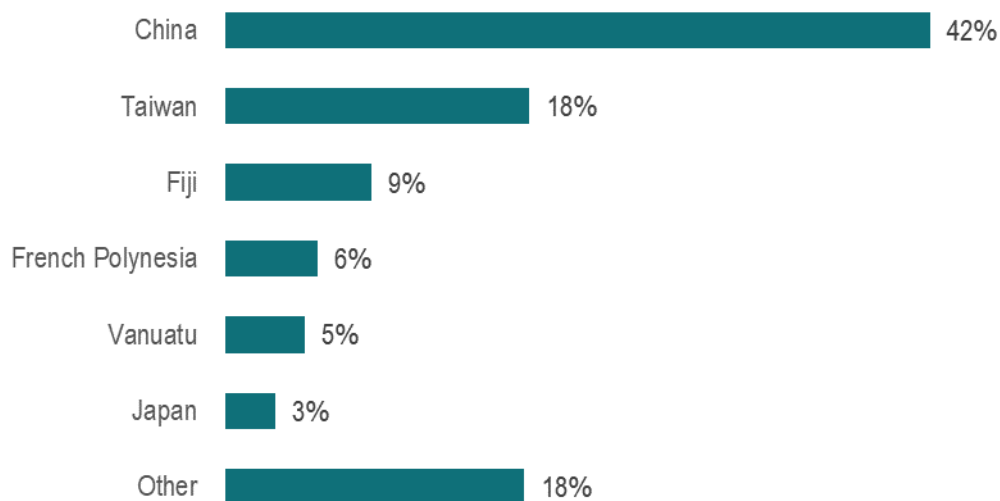


Figure 23. Percent of 2019 Longline Catch of Albacore by Top Catching Countries

Source: WCPFC and IATTC Catch Data.

## Summary of Key Catching Countries

Looking across the three fisheries, certain countries emerge as key participants—defined as being in the top five catching countries in at least one year from 2016 to 2020—in multiple fisheries, while others are prominent in only one fishery. As noted above, the purse seine catch of tropical tuna is vastly greater than longline catches. The countries active in the purse seine fishery for tropical tuna catch much more tuna than countries that focus on the longline fisheries, even if they are active in the purse seine fishery only.

South Korea caught more tuna than any other country in 2019. Most of its catch was from the purse seine fishery for tropical tuna, though South Korea also has some catch of tropical tuna by longline. Ecuador is the second-largest catching country in the world and is active in only the purse seine tropical tuna fishery. Other countries playing a key role at the catch level of the purse seine fishery include PNG, Kiribati, the U.S., and the Federated States of Micronesia.

While it is not the top harvester in any single fishery, Taiwan is a key player in all three fisheries (i.e., tropical tuna purse seine, tropical tuna longline, and albacore)—the only country to rank in the top five catching countries in each fishery. It also ranks as the third-largest harvesting country in the world.

Countries engaged in longline fishing only, but that play a key role in that fishery, include:

- China, the country that catches the most albacore via longline, also has a substantial longline fishery for tropical tuna. It is not active in the purse seine fishery; as such, its total catch is much lower than the countries that have a purse seine fleet.
- Japan's fishery focuses primarily on longline-caught tropical tuna; the country catches more tropical tuna by longline than any other country. However, Japan also has relatively small catch of albacore by longline (though given the lower catch quantities overall, Japan still ranks in the top five harvesting countries for longline albacore).

## Pacific Tuna Fleets

Available catch data from the RFMOs do not identify catches to specific vessels. Instead, we rely on available data describing the fleets targeting tuna species to make inferences into the countries and companies representing the key actors involved in the fisheries of interest to this analysis. In this section, we provide a descriptive overview of the fleets associated with catch of tropical tunas and albacore by focal gear types in the Pacific, based on the sources described in Chapter 3. We then identify those countries associated with the largest fleets within each fishery to supplement catch data in identifying the potential nationalities of companies that are key actors at the catch level in these fisheries.<sup>56</sup> Finally, we consider within the limitations of the available data the companies owning the largest fleets within each fishery.<sup>57</sup> Activity of individual companies within the catch sector of the target fisheries is explored in greater detail in Chapters 6 to 8.

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<sup>56</sup> By considering both the flag countries associated with greatest catches, as well as the largest fleets, we identify the key countries on which to focus more detailed analysis of the countries and companies engaged in catching Pacific tuna.

<sup>57</sup> Absent data describing catch by individual vessel, we rely on the number of vessels owned by an individual company as a proxy for the relative importance of that company in the catch of Pacific tunas.

In utilizing fleet information as one line of evidence to evaluate a country or company's role within the harvest level of the supply chain, it is important to note the extent to which vessel flag and fleet size fluctuates between years. This analysis relies on data that generally represent the vessels registered with the IATTC and WCPFC as of 2021, noting that vessel registrations can change substantially. Additionally, as the analysis relies on catch data from 2019 for reasons described in Chapter 1, the presented catch data do not precisely represent catch by the exact fleet described within the analysis. This chapter presents a Pacific-wide overview of the results of the IEC/GHA Vessel Compilation analysis. Where more detailed or up-to-date information regarding fleet characteristics are available for certain fisheries or countries, those data are presented and discussed in the fishery-specific chapters (Chapters 6 through 8).

This analysis begins with the assumption that the flags flown by a given vessel represents activity by that country within each fishery. However, there are nuances associated with vessel flagging that complicate that assumption (see text box, *Flags of Convenience*). Issues associated with vessel flagging and attribution of fishing activity to specific countries are discussed in greater detail in Chapters 6 through 8.

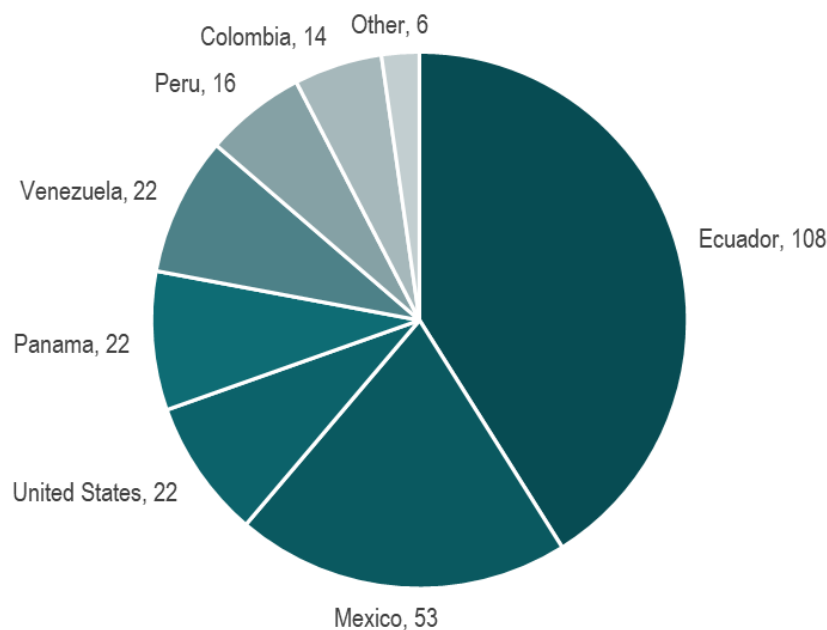
### Flags of Convenience

According to international law, each ship (including fishing vessels) must be registered in a single country, known as its flag state; the vessel is then subject to the laws and regulations of that country. Traditional national flag state registers are open only to ships owned by citizens of that nation, while open registers also accept foreign-owned vessels. Flag states with open registers are known as flags of convenience. Changing flags, or "reflagging" a vessel under a flag of convenience, may allow the vessel owner to avoid their own country's stricter tax, labor, environmental, criminal, or other laws, and/or may confer benefits with respect to fishing resource access, market access through preferential tariffs, or other comparative advantages.

## Pacific Tuna Purse Seine Fleet

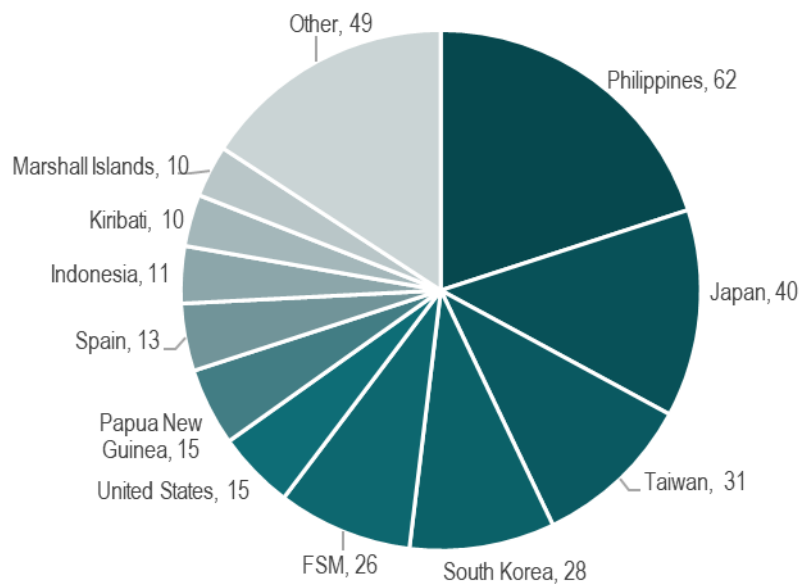
Across the relevant IATTC and WCPFC fisheries, we identified 551 purse seine vessels as relevant to our analysis (263 in the IATTC convention area and 310 in the WCPFC area). Figure 24 and Figure 25 identify the composition of the purse seine fleets in each respective RFMO fishery by nationality of the flag flown by the vessel.<sup>58</sup> Generally speaking, the purse seine fleets are less concentrated amongst countries as compared to the longline fleets. The IATTC purse seine fleet is more concentrated than the WCPFC purse seine fleet, with Ecuadorian and Mexican-flagged vessels comprising 61 percent of the IATTC purse seine fleet. The WCPFC purse seine fleet is split amongst 21 countries with no one distinct major player. Nine out of the 21 countries operating within the WCPFC convention area have fleets of 11 or more purse seine vessels. The "Other" countries depicted in Figure 25 are further broken down in Table 8. Activity of a country within an RFMO convention area is generally driven by the proximity of that country to the fishing grounds. IATTC vessels are flagged predominantly to North and South American countries, while Asian and South Pacific nations are most active in the WCPFC. The U.S. is one of the few countries with substantial fleets operating on both sides of the Pacific.

<sup>58</sup> It is important to note that the number of vessels alone is not a perfect indicator of the harvest capacity of a given country. The sizes (length, tonnage, and carrying capacity) of tuna purse seine vessels vary from country to country. For instance, the purse seine vessels from the Philippines tend to be smaller than those from the U.S., Korea, Panama, or Mexico.



**Figure 24. IATTC Purse Seine Vessels by Flag Country (Number of Vessels)**

Source: IEc/GHA Vessel Compilation (see Chapter 3 for detailed data sources).



**Figure 25. WCPFC Purse Seine Vessels by Flag Country (Number of Vessels)**

Source: IEc/GHA Vessel Compilation (see Chapter 3 for detailed data sources).

Table 8. WCPFC Purse Seine Fleet “Other” Countries

Flag Country	Number of Purse Seine Vessels
Nauru	8
Solomon Islands	8
China	7
Ecuador	7
Vanuatu	7
Tuvalu	6
Marshall Islands	6
El Salvador	3
Panama	1
Nicaragua	1
Cook Islands	1
Total	49

Source: IEC/GHA Vessel Compilation (see Chapter 3, Table for detailed data sources).

Table 9 presents an overview of the companies identified in the available data as owning the greatest number of vessels (more than seven) in the purse seine fleet (WCPFC and IATTC collectively).<sup>59</sup> Together, these companies are reported as owning 15 percent of the fleet. Pesca Azteca, S.A. de C. V. is the largest single owner of purse seine vessels, with a fleet of 22 Mexican-flagged vessels.

<sup>59</sup> As noted previously, it is very likely that many businesses identified as individual companies in the vessel registries are in fact ultimately owned by the same company. This analysis does not include a detailed reconciliation of the relationships and connections between individually listed companies.

Table 9. Top Companies by Purse Seine Vessel Ownership

Flag Country of Vessels	Company	Number of Purse Seine Vessels
Mexico	Pesca Azteca, S.A. de C. V.	22
PNG, Philippines	Frabelle (PNG) Limited	13
Ecuador	Negocios Industriales Real NIRSA, S.A.	12
Philippines	Trans-Pacific Journey Fishing Corporation	12
South Korea	Dongwon Industries Company, Ltd.	10
Peru	Pesquera Hayduk, S.A.	8
Mexico	MT Pesca Industrial, S.A. de C.V.	8

Source: IEc/GHA Vessel Compilation analysis (see Table 6).

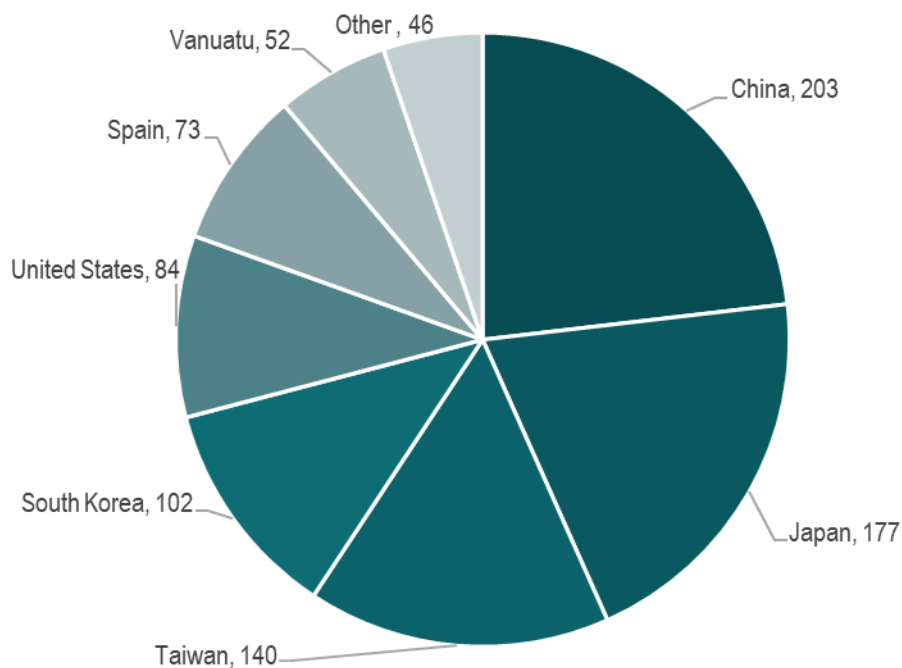
Note: It is likely that many businesses identified as individual companies in the vessel registries are in fact ultimately owned by the same company. This analysis does not include a detailed reconciliation of the relationships and connections between individually listed companies.

## Pacific Tuna Longline Fleet

Across the relevant IATTC and WCPFC fisheries, we identified 1,739 longline vessels fishing in the Pacific. Figure 26 and Figure 27 identify the country composition of the longline fleets in each RFMO area.<sup>60</sup> The IATTC longline fleet is mainly comprised of vessels flagged to four major countries: China, Japan, Taiwan, and South Korea. The most significant of these countries are China and Japan, whose vessels together comprise 43 percent of the IATTC longline fleet. The WCPFC longline fleet is even more concentrated amongst the same major countries, with the U.S. also included in the top five countries by vessel flag. Taiwan and Japan comprise 60 percent of all WCPFC longline vessels while South Korea, China, and the U.S. together comprise another 30 percent of the WCPFC longline fleet.

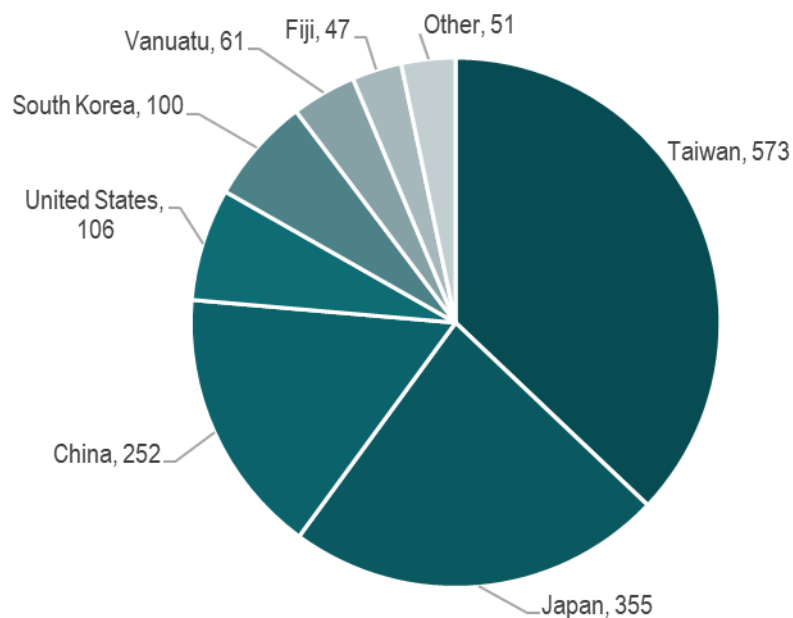
<sup>60</sup> As in the case of the purse seine vessels, the sizes and capacities of the longline vessels of different countries vary widely.





**Figure 26. IATTC Longline Vessels by Flag Country (Number of Vessels)**

Source: IEc/GHA Vessel Compilation (see Chapter 3, Table 6 for detailed data sources).



**Figure 27. WCPFC Longline Vessels by Flag Country (Number of Vessels)**

Source: IEc/GHA Vessel Compilation (see Chapter 3, Table 6 for detailed data sources).

Table 10 identifies the largest companies by vessel ownership in the longline fleet to the extent possible given known limitations in identifying linkages between listed companies. The majority (10 of 15) of companies owning the largest number of longline vessels own vessels flagged to China. There are 843 companies with only one longline vessel, though some unknown portion of these companies are likely associated with a common entity. This accounts for 48 percent of the whole longline fleet across both fisheries. Twenty-four percent of the total longline fleet is comprised of the top 30 companies. As shown in Figure 26 and Figure 27, the longline fleets from Taiwan are amongst the largest of all countries. However, the vessels operating under the Taiwanese flag are potentially split amongst 560 companies, with the largest company's fleet having only six vessels.<sup>61</sup> It is important to note again that with the data currently available to us, we are unable to tell which of the companies identified in our analysis are ultimately owned by the same company as other listed companies.

**Table 10. Top Companies by Longline Vessel Ownership**

Flag Country of Vessels	Company	Number of Longline Vessels
China	CNFC Overseas Fisheries Co., Ltd.	46
South Korea	Sajo Industries Company, Ltd.	26
China, Federated States of Micronesia	Liancheng Overseas Fishery (FSM) Co. Ltd.	24
China	China Southern Fishery (Shenzhen) Company, Ltd.	20
China	Dalian Ocean Fishing Company, Ltd.	19
China	Ping Tai Rong Ocean Fishery Group Co., LTD	15
China	Shan Dong Lidao Oceanic Technology Company Limited	15
Panama	Genesis Ocean, S.A.	15
South Korea	Dong Won Fisheries Company, Ltd.	14
China	Rongcheng Ocean Fisheries Company, Ltd.	12
Korea	Dongwon Industries Company, Ltd.	12
Fiji	Solander Pacific Limited	11
China	Shenzhen Shengang Overseas Industrial Company, Ltd	11
China	Weihai Changhe Fishery Company, Ltd.	10
China	Fujian Zhongji Farsea Fishery Company, Ltd.	10

Source: IEC/GHA Vessel Compilation Analysis (see Table 6).

Note: It is likely that many businesses identified as individual companies in the vessel registries are in fact ultimately owned by the same company. This analysis does not include a detailed reconciliation of the relationships and connections between individually listed companies.

<sup>61</sup> This is in large part due to the requirement that Taiwanese companies form an individual business entity for each individual vessel, as further explained in Chapter 7.

## Summary of Key Countries by Fleet Size

This vessel analysis confirms that several countries emerge as the most important in the catch of Pacific tunas. In the harvest of tropical tunas by purse seine, countries that top the list of catch – including South Korea, Ecuador, Taiwan, the U.S., and the Federated States of Micronesia – are all identified as having amongst the largest purse seine fleets. Although the Philippines, Mexico, and Japan are not identified individually as countries consistently ranking within the top five for catch in the Pacific purse seine fisheries, all are within the group of 12 countries that caught 85 percent of the tropical tuna purse seine catch in 2019, and all are identified as having amongst the largest purse seine fleets. Both PNG and Kiribati are amongst the top nations in terms of catch. However, neither register amongst the top 10 in terms of fleet size. This discrepancy may be due to differences in the attribution of catch and the flag of the vessel, which is discussed in detail in Chapter 6.

Within the longline fisheries for tropical tunas, Taiwan, Japan, and China all emerge as key countries by catch volume. The dominance of these countries in the longline fisheries for both tropical tunas and albacore are supported by their rankings of first, second, and third in terms of the size of their longline fleets.

## CHAPTER 5 | Key Countries at the Trading and Processing Levels

To identify the key countries engaged in the specific tuna product trade flows of interest, we rely on global trade data. As described in Chapter 3, the BACI data cover approximately 200 countries and territories and more than 99 percent of the world's merchandise trade. Using the HS codes provided in those data (see Table 7), we define six key product categories for this analysis: fresh/chilled tropical tuna; frozen tropical tuna; fresh/chilled and raw frozen albacore; processed tuna, and “other” frozen tuna. These categories and the corresponding HS codes are summarized in Table 11.

Table 11. Product Categories as Defined by HS Code

Category	HS Code(s)
Fresh/chilled tropical tuna	0302.32; 0302.33; 0302.34
Raw frozen tropical tuna	0303.42; 0303.43; 0303.44
Fresh/chilled and raw frozen albacore	0302.31; 0303.41
Processed	1604.14
Other	0303.49; 0304.87

BACI data do not allow for the identification of the ocean source of reported trade volumes. Our analysis of global RFMO catch data indicates that most of the countries with large Pacific fleets fish only in the Pacific. Thus, initial exports of unprocessed tuna from countries with active fleets are likely to have originated in the Pacific. However, we are unable to definitively determine the extent to which countries importing fresh tuna, frozen tuna, or processed tuna are sourcing that fish from the Pacific, Indian, or Atlantic Oceans. Additionally, we are not able to directly determine the fishing method associated with these trade flows. However, the product categories specified above align broadly to the fisheries of interest, as purse seine-caught tropical tuna is primarily frozen, while fresh/chilled tropical tuna is more commonly caught by longline. Albacore is analyzed separately, as is processed tuna.

This section describes at a high level the information that can be gleaned from the trade data to identify the key countries engaged in trading and processing of Pacific tuna. As will be shown in this chapter, Thailand, Ecuador, the Philippines, Papua New Guinea, and to a lesser extent, Vietnam, China, and Indonesia are key countries significantly involved in the importing for processing, and trade of Pacific tunas.<sup>62</sup> The major destination markets of processed tuna products are the U.S, Europe, and Japan, though other countries also account for a large share of imports. In Chapters 6 through 8, we provide further evidence to support assumptions regarding the likely proportions of tuna within the trade data that has originated from the fisheries of interest.

<sup>62</sup> Imports and exports attributed to China within BACI and Datamyne trade data do not include trade from and to Hong Kong.

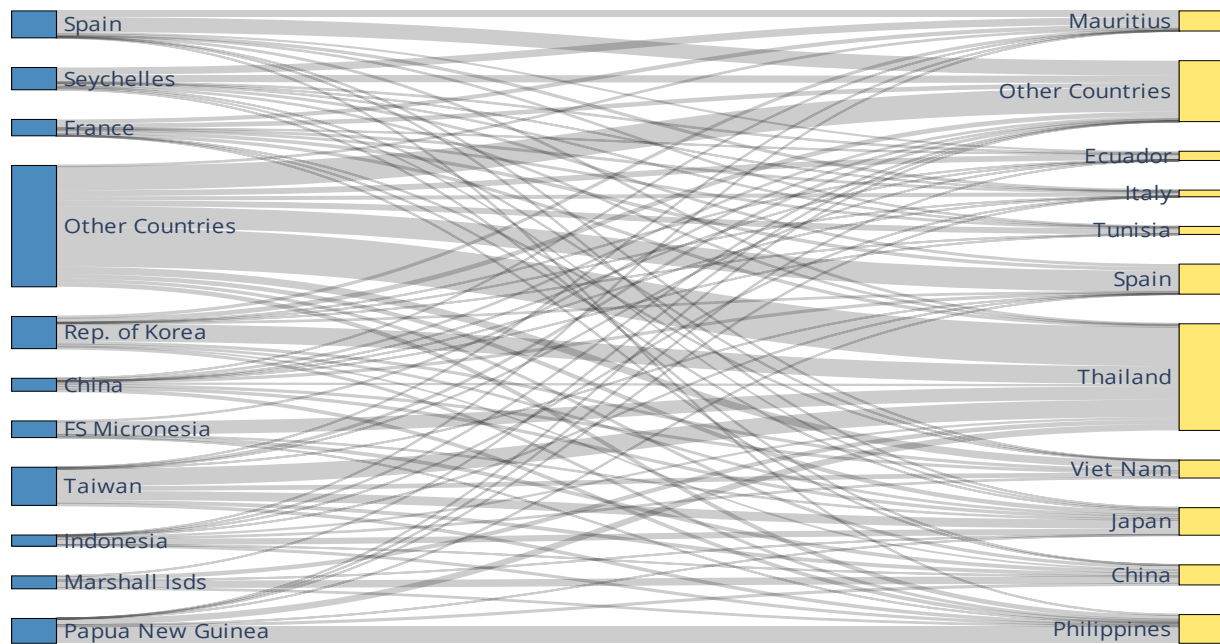
## Global Trade in Frozen Tropical Tuna

As described in Chapter 2, purse seine-caught tropical tuna provides the key input into the production of processed tuna products, including canned or pouched tuna and cooked tuna loins ultimately destined to become canned or pouched products. Major processing centers source these production inputs directly from their domestic fleets, or by importing frozen tropical tuna from other countries. As described in Chapter 2, most frozen tropical tuna is caught by purse seine vessels and ultimately destined for processing into canned or pouched tuna products. These product categories represent the largest volume in global trade of tuna.

By considering the countries importing the greatest volumes of frozen tropical tuna, we can identify several countries that operate as key processing hubs for canned and pouched tuna and are thus central to the trade flows of these products. Figure 28 displays the global trade flows of frozen tropical tuna in 2019, according to the BACI data. Exporting countries are displayed on the left, and importing countries are displayed on the right. This figure shows the total trade volume in frozen tropical tuna (as reported by BACI), and the flows between major exporting countries and major importing countries. It does not, however, provide insight into the destination of these products once imported (i.e., for consumption or further processing).

As shown, Thailand is a major importer of frozen tropical tuna, sourcing from a variety of countries, including South Korea, Taiwan, the Federated States of Micronesia, and PNG – each of which is a prominent catching country within the Pacific RFMOs (see Chapter 4). Other major importers of frozen tropical tuna from countries operating primarily in the Pacific include the Philippines, Japan, Vietnam, and China. While other countries including Mauritius and Spain import substantial quantities of frozen tropical tuna for processing, these countries source primarily from exporting countries that fish primarily in the Atlantic and Indian Oceans (e.g., Spain, the Seychelles), and are thus not a focus of this analysis.

As noted, key processing centers may also be supported by substantial inputs from their own domestic fisheries. The extent to which processing centers rely on their own domestic harvest versus inputs of frozen tuna from other countries varies by country. As described in greater detail in Chapter 6, although not identified as major importers of frozen tropical tuna, Ecuador and PNG are both key processing centers that rely primarily on their own domestic harvest. While the Philippines does import substantial quantities of frozen tuna for processing, it is also supported by catch from PNG. For reasons explained in Chapter 6 the latter may not be identified as imports to the Philippines.

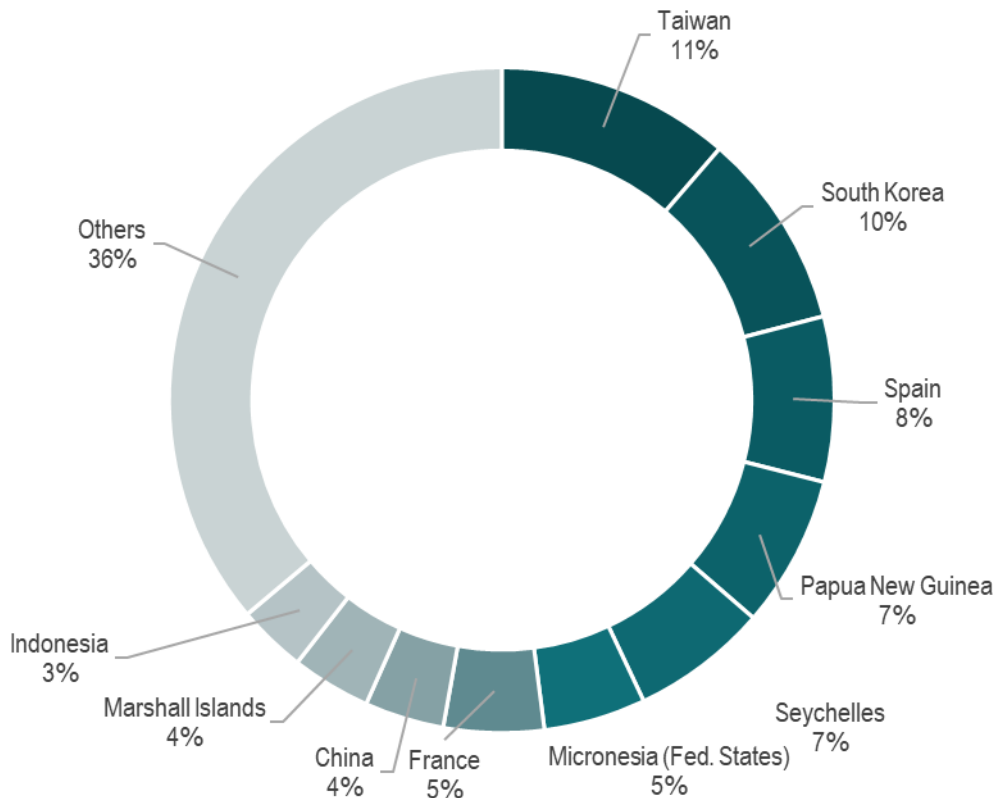


**Figure 28. Global Trade in Frozen Tropical Tuna (Countries Exporting Frozen Tropical Tuna and Importing Frozen Tropical Tuna), 2019**

Source: BACI data.

Note: HS codes 0303.42; 0303.43; and 0303.44.

Figure 29 displays the share of total global exports of frozen tropical tuna in 2019 by country. Taiwan and South Korea each export 10 percent or more of the total trade in frozen tropical tuna, all of which is caught in the Pacific. PNG, the Federated States of Micronesia, China, the Marshall Islands, and Indonesia are also among the top ten exporting countries of frozen tropical tuna caught in the Pacific. While Spain, the Seychelles, and France supply significant volumes of frozen tropical tuna to global markets, those fish originate from locations outside of the Pacific.



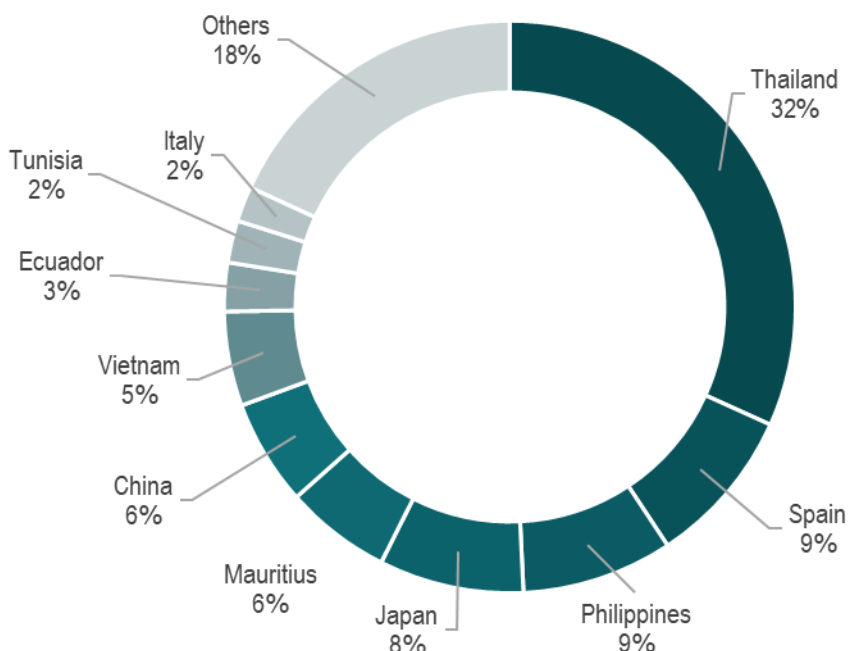
**Figure 29. Top Ten Countries' Share of Global Exports of Frozen Tropical Tuna, 2019**

Source: BACI data.

Note: HS codes 0303.42; 0303.43; and 0303.44.

Figure 30 displays the share of total global imports of frozen tropical tuna in 2019 by country. Thailand is by far the largest importer, accounting for nearly one-third of reported imports of frozen tropical tuna (546,000 mt of 1.7 million mt total). Spain, the Philippines, and Japan are also key importers. Of note, while Ecuador is in the top ten importing countries, the BACI data show it as importing only three percent (47,339 mt) of global trade in frozen tropical tuna in 2019. Alternate trade data from Datamyne, which as described in Chapter 3 are considered comprehensive for Ecuador, indicate that Ecuador receives much higher quantities of frozen tropical tuna. However, much of those reported imports are identified as coming from “international waters,” rather than from a specific country, making it difficult to determine the country that is the source of those exports that are not identified as imports to Ecuador by BACI. Thus, Figure 30 may substantially underrepresent Ecuador’s actual imports of frozen tropical tuna.





**Figure 30. Top Ten Countries' Share of Global Imports of Frozen Tropical Tuna, 2019**

Source: BACI data.

Note: HS codes 0303.42; 0303.43; and 0303.44.

## Global Trade in Fresh/Chilled Tropical Tuna

Longline-caught tropical tuna is primarily destined for consumption as sashimi, though it may also be an input into processed tuna products, including canned or pouched tuna, as well as cooked tuna loins ultimately destined to become canned or pouched products. Longline catch of tropical tuna is much smaller than purse seine catch – see Figure 14.

By considering the countries importing the greatest volumes of fresh or chilled tropical tuna, we identify several countries that operate as import markets for sashimi-grade tuna and are thus central to the trade flows of these products. Figure 31 displays the global trade flows of fresh or chilled tropical tuna in 2019, according to the BACI data. Exporting countries are displayed on the left, and importing countries are displayed on the right. This figure shows the total trade volume in fresh/chilled tropical tuna (as reported by BACI), and the flows between major exporting countries and major importing countries. It does not, however, provide insight into the destination of these products once imported (i.e., for consumption or further processing).

As shown, the U.S. is a major importer of fresh or chilled tropical tuna, sourcing from a variety of countries, including the Philippines, Brazil, Panama, Sri Lanka, and the Maldives – the Philippines and Panama are prominent catching countries within the Pacific RFMOs, as described in Chapter 4. Japan is also a large importer of fresh or chilled tropical tuna, sourcing primarily from Palau, Indonesia, and various other countries. Taiwan is a major exporter of fresh or chilled tropical tuna, exporting primarily to Indonesia and Palau, as well as a range of other countries.

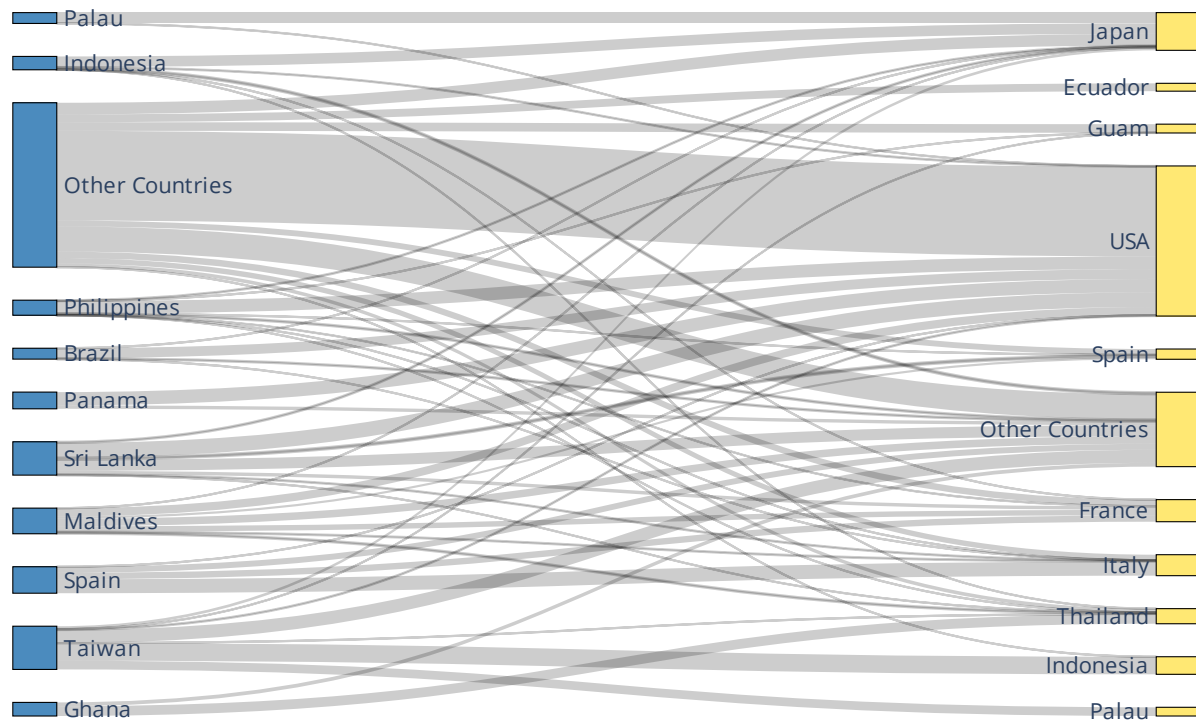


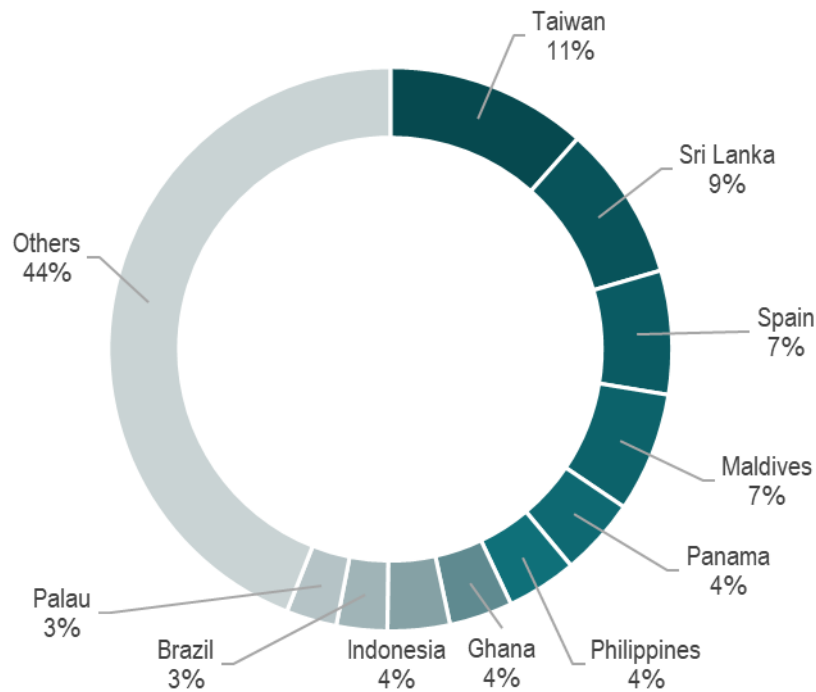
Figure 31. Global Trade in Fresh/Chilled Tropical Tuna (Countries Exporting Fresh/Chilled Tropical Tuna and Importing Fresh/Chilled Tropical Tuna), 2019<sup>63</sup>

Source: BACI data.

Note: HS codes 0302.32; 0302.33; and 0302.34.

Figure 32 displays the share of total global exports of fresh or chilled tropical tuna in 2019 by country. Taiwan is the top exporter of fresh or chilled tropical tuna, with approximately 11 percent of total global exports recorded in the BACI data. Other countries with active longline fleets in the Pacific Ocean RMFOs that export large quantities of fresh/chilled tropical tunas include the Philippines and Indonesia. Sri Lanka, Spain, the Maldives, Panama, Ghana, and Brazil also supply significant volumes of fresh and chilled tropical tuna to global markets, though those fish are likely to originate from locations outside of the Pacific.

<sup>63</sup> BACI data.

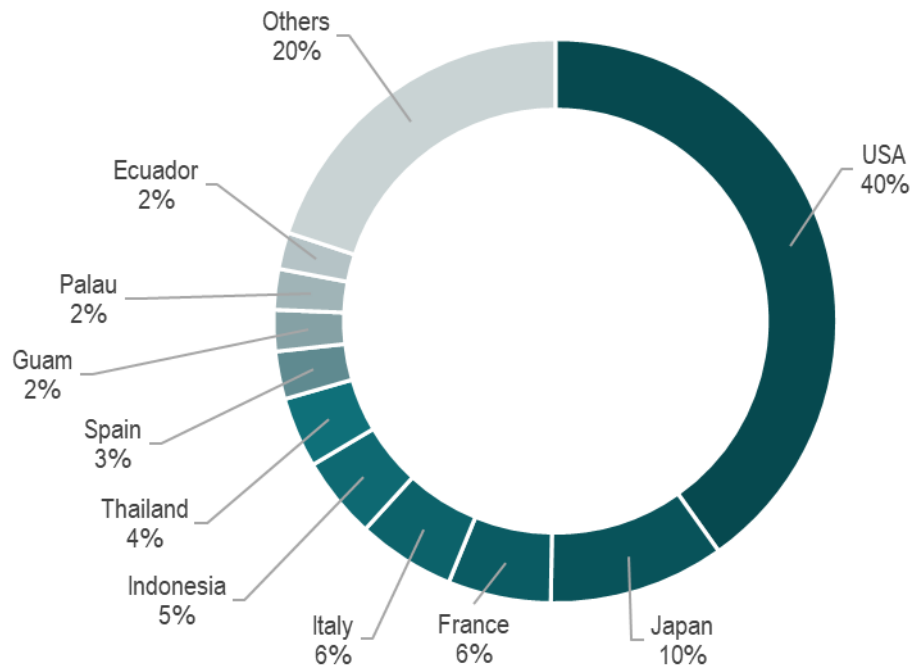


**Figure 32. Top Ten Countries' Share of Global Exports of Fresh/Chilled Tropical Tuna, 2019**

Source: BACI data.

Note: HS codes 0302.32; 0302.33; and 0302.34.

Figure 33 displays the share of total global imports of fresh or chilled tropical tuna in 2019 by country. The U.S. is by far the largest importer of fresh or chilled tropical tuna, accounting for approximately 40 percent of global imports recorded in the BACI data (19,600 mt of 49,000 mt total). This fresh or chilled tuna is likely used for both sashimi and grilling markets in the U.S. Japan, the second-largest importer, accounts for approximately 10 percent of global imports (4,900 mt).



**Figure 33. Top Ten Countries' Share of Global Imports of Fresh/Chilled Tropical Tuna, 2019**

Source: BACI data.

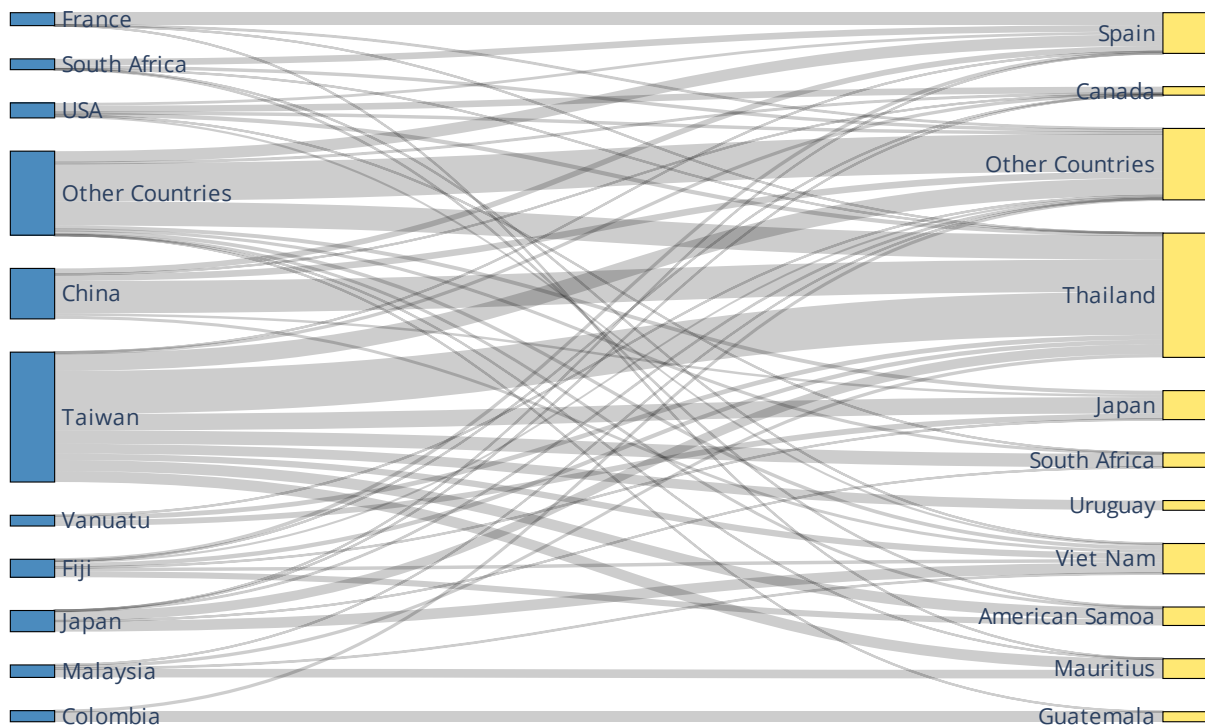
Note: HS codes 0302.32; 0302.33; and 0302.34.

## Global Trade in Albacore

Longline-caught albacore is, like purse seine-caught frozen tropical tuna, primarily destined as an input into the production of processed tuna products, including canned or pouched tuna. As with the longline catch of tropical tuna, the longline catch of albacore represents a much smaller quantity of fish going into the processed product market than the purse seine catch – see Figure 14.

Figure 34 displays the global trade flows of fresh and frozen albacore in 2019, according to the BACI data. Exporting countries are displayed on the left, and importing countries are displayed on the right. This figure shows the total trade volume in albacore (as reported by BACI), and the flows between major exporting countries and major importing countries. It does not, however, provide insight into the destination of albacore once imported (i.e., for consumption or further processing).

Consistent with the catch by vessel flag reported in Figure 23, Taiwan, China, Fiji, Japan, and Vanuatu are among the largest exporters of albacore. Thailand is by far the largest importer of fresh and frozen albacore (importing 49,000 mt of 150,000 mt total), sourcing from a variety of countries, including large portions of Taiwan and China's exports. Japan is both an exporter and importer of fresh and frozen albacore, exporting primarily to Thailand and Vietnam, and importing largely from Taiwan.

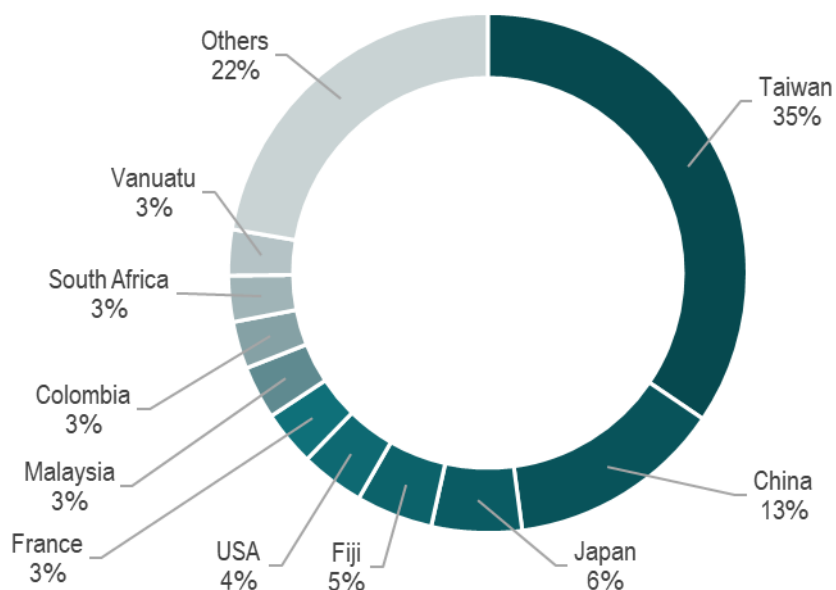


**Figure 34. Global Trade in Fresh and Frozen Albacore (Countries Exporting Fresh and Frozen Albacore and Importing Fresh and Frozen Albacore), 2019**

Source: BACI data.

Note: HS codes 0302.31 and 0303.41.

Figure 35 displays the share of total global exports of fresh and frozen albacore in 2019 by country. Taiwan is the top exporter of albacore, with approximately 35 percent of total global exports recorded in the BACI data. While China has the largest reported Pacific catch of albacore (Figure 23), it only accounts for 13 percent of total exports of fresh and frozen albacore—less than 40 percent of Taiwan’s exports, despite Taiwan’s lower reported catch—indicating that China is also processing and/or consuming a substantial portion of its albacore catch. Japan and Fiji—both of which have active longline fleets—are also among the countries with the largest recorded exports of albacore.

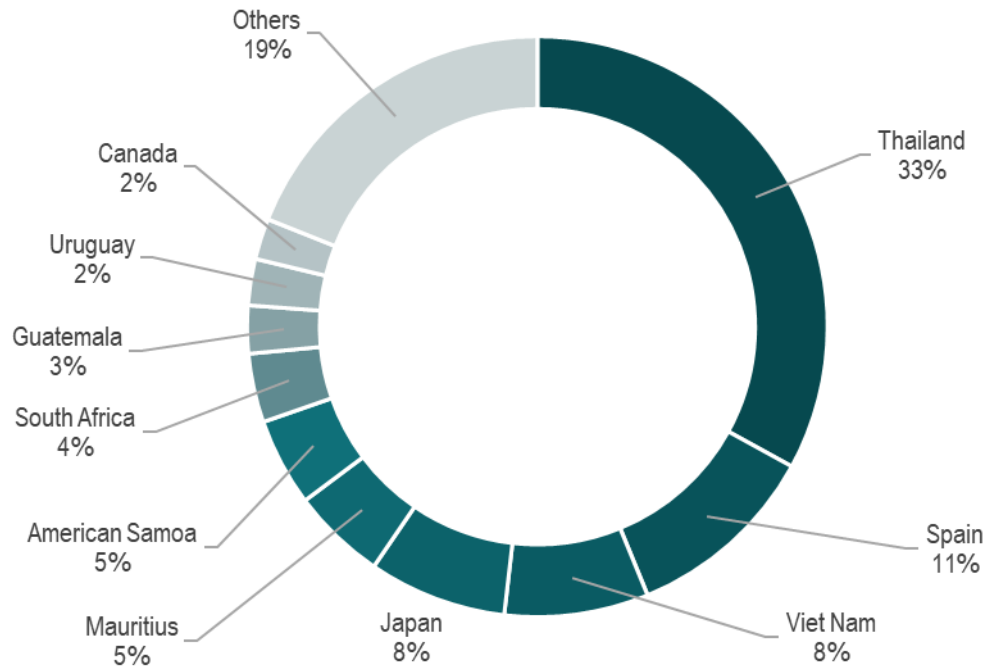


**Figure 35. Top Ten Countries' Share of Global Exports of Fresh and Frozen Albacore, 2019**

Source: BACI data.

Note: HS codes 0302.31 and 0303.41.

Figure 36 displays the share of total global imports of albacore in 2019 by country. As with trade in frozen tropical tuna, Thailand is by far the largest importer of fresh and frozen albacore, accounting for approximately one-third of global imports recorded in the BACI data (49,000 mt of 150,000 mt total). Spain, Vietnam, and Japan are also major importers of fresh and frozen albacore, accounting for eight to 11 percent of global imports each.



**Figure 36. Top Ten Countries' Share of Global Imports of Fresh and Frozen Albacore, 2019**

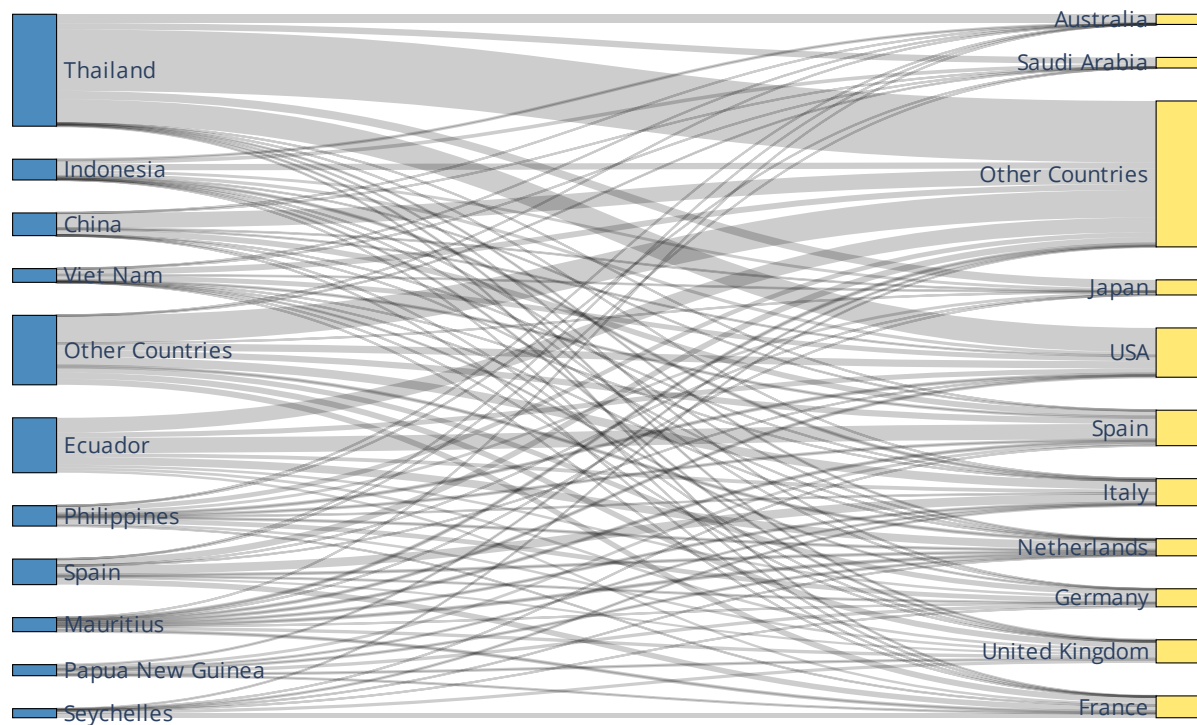
Source: BACI data.

Note: HS codes 0302.31 and 0303.41.

## Global Trade in Processed Tuna

Identification of key processing centers and markets for these products is also supported by review of the trade of processed tuna products. BACI trade data show that the countries with the largest imports of frozen tropical tuna are generally also those with the largest reported exports of processed tuna (HS code 1604.14). Figure 37 displays the global trade flows of processed tuna products, including cooked loins and canned and pouched tuna of both tropical tuna species and albacore in 2019, according to the BACI data. As with Figure 34, exporting countries are displayed on the left, and importing countries are displayed on the right. As shown, Thailand is a major exporter of processed tuna. While Ecuador's imports of frozen tropical tuna as reported in BACI data are likely lower than is accurate, their exports appear to be more accurate: these data indicate that Ecuador is the second-largest exporter of processed tuna products, after Thailand, providing additional support for identification of Ecuador as a major processing center. The major destination markets of processed tuna products are the U.S, Europe, and Japan, though other countries account for a large share of imports.

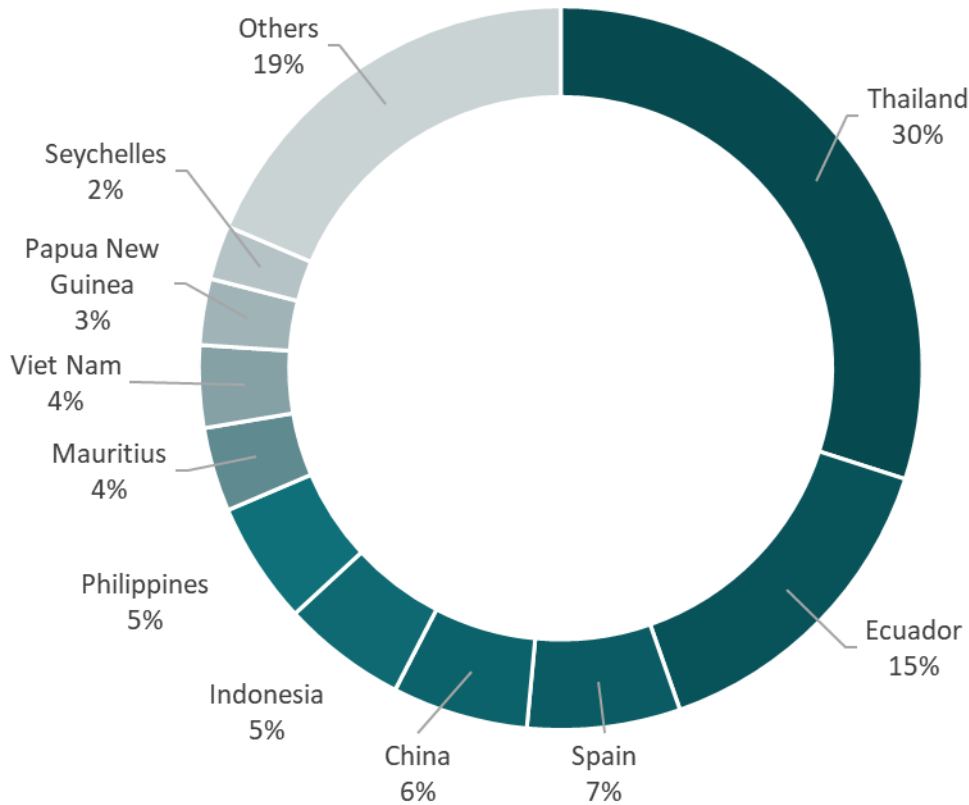




**Figure 37. Global Trade in Processed Tuna (Countries Exporting Processed Tuna and Importing Processed Tuna), 2019**

Source: BACI data.  
Note: HS code 1604.14.

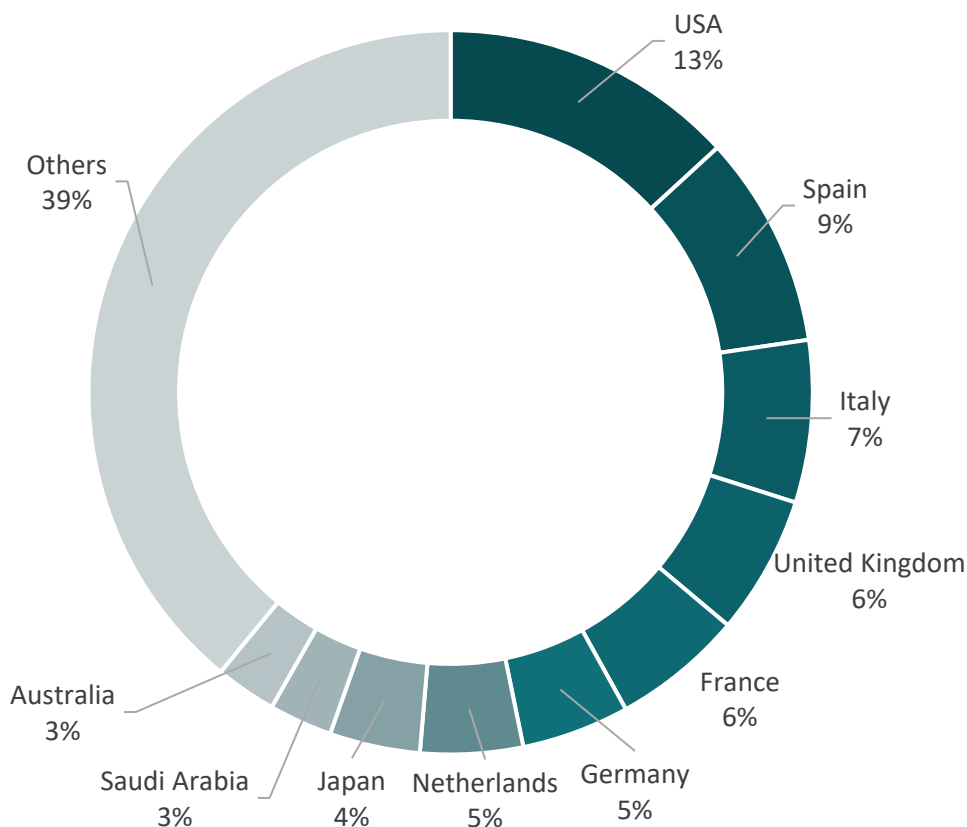
Figure 38 displays the share of total global exports of processed tuna in 2019 by country. Thailand is the major exporter of processed tuna, accounting for 30 percent of global exports in 2019. Ecuador is also a key exporter, with 15 percent of global exports. The Philippines, China, Indonesia, Vietnam, and PNG also appear as primary exporters of processed tuna products sourced primarily from the Pacific. As described previously, the substantial exports of processed tuna from Spain, Mauritius, and the Seychelles originate largely from non-Pacific fisheries.



**Figure 38. Top Ten Countries' Share of Global Exports of Processed Tuna, 2019**

Source: BACI data.  
Note: HS code 1604.14.

Figure 39 displays the share of total global imports of processed tuna in 2019 by country. The U.S. is the largest importer of processed tuna, with various European countries making up most of the rest of the top importing countries. Imports of processed products to each country are generally sourced from multiple exporting countries, making an evaluation of the key countries importing processed products from Pacific fishery sources specifically less straightforward (see Figure 37). Nonetheless, given the proportion of imports coming from Thailand and Ecuador in particular (both of which rely almost exclusively on Pacific-caught tuna), it is clear that the U.S. and Europe (particularly Spain) are key markets for Pacific-sourced processed tuna products.



**Figure 39. Top Ten Countries' Share of Global Imports of Processed Tuna, 2019**

Source: BACI data.

Note: HS code 1604.14.

## Summary of Key Processing Countries

Based on examination of global trade flows in frozen tropical tuna and processed tuna, we identify Thailand, Ecuador, the Philippines, PNG, Vietnam, China, and Indonesia as key processing countries significantly involved in the production and trade of Pacific tunas.<sup>64</sup> As this analysis is based on volumes of product, it follows that this selection of countries represents those most engaged in processing and trade associated with purse seine-caught fish. Several of these countries are long-standing traditional processing hubs for Pacific tuna products, while others have emerged more recently. In the following chapters, we analyze the catch, processing, and trade of each fishery individually. Chapter 6 (Purse Seine) is organized around the key processing hubs identified through this analysis. Chapters 7 and 8 (Longline Tropical Tuna and Albacore) further consider the processing hubs and harvesting countries that supply the processors unique to those fisheries.

<sup>64</sup> Although substantial exports of processed tuna originate from Spain, Mauritius, and the Seychelles, those processing centers rely primarily on non-Pacific fisheries.

## CHAPTER 6 | Analysis of the Tropical Tuna Purse Seine Fishery

The Pacific purse seine fishery accounts for 58 percent of all tropical tuna caught in the world. This chapter provides detailed country-level information based on available data and research to describe the dynamics and primary actors in the supply chains of Pacific purse seine-caught tuna flowing into major world markets. This chapter is divided into four sections, corresponding to the four general roles of individual countries participating in the tuna purse seine supply chains.

- The first group comprises the four traditional processing hub countries involved in the international trade of tropical tuna in the Pacific: Thailand, Ecuador, the Philippines, and PNG. Thailand has no purse seine tuna fleet of its own; its processing sector relies entirely on imports of tropical tuna. The other three major tuna processing countries rely on both the tuna supplied by their own purse seine fleets and imports of tuna caught by foreign-flagged vessels.
- The second group consists of countries that are gaining importance as processing hubs in the international market for tuna products: Vietnam, China, and Indonesia. These emerging processing countries rely on a mix of their own fleets' catches and imported raw frozen tropical tuna.
- The third group consists of countries that have significant processing capacity, most of which is devoted to serving their own domestic markets rather than export markets. This group includes Korea, Japan, and Mexico.
- Finally, several countries focus mainly on catching and/or transshipping tropical tuna to be processed by others in the tropical tuna supply chain. One of these is the U.S., which represents a major canned-tuna market. Although it has its own purse seine fleet and used to have a substantial tuna canning industry of its own, its only processing role now is filling cans with imported pre-cooked tuna loins at two locations. Other countries whose involvement in the supply chain is largely limited to the harvest of tropical tunas are Taiwan, several of the Pacific Island Countries (PICs), and several Latin American countries.

### Summary of Trade Flows and Key Actors in the Purse Seine Fishery for Tropical Tuna

The Pacific Ocean is the main source of tuna for world canned tuna markets. Approximately 551 tuna purse seine vessels harvested close to 2.7 million mt of tropical tuna in 2019. This international purse seine fleet supplies four major traditional processing hubs located in Thailand, Ecuador, the Philippines, and PNG, as well as other processing centers. These processing hubs in turn supply canned tuna to the main world tuna markets, namely, the E.U. and the U.S. markets, as well as other markets.

Thailand is the single largest processor and exporter of canned tuna in the world. The country does not own or operate a tuna purse seine fleet, so its tuna supply must be imported into the country for processing. To accomplish this, tuna processing companies heavily rely on the powerful tuna trading companies, such as FCF Fishery Co. Ltd., Tri-Marine International, and Itochu, with whom they sign yearly supply contracts. These trading companies have developed longstanding relationships with tuna boat owners. They provide financing to many of them and position reefer carrier vessels strategically in the Pacific for their vessels to expeditiously sell and transship their catches to the trading companies so they can resume fishing with minimal downtime.

Of the 2.7 million mt caught by purse seiners in the Pacific in 2019, Thailand absorbed approximately 800,000 mt of tuna.<sup>65, 66</sup> The main countries in the Pacific supplying the Thai processing sector were Taiwan, the U.S., and a handful of PICs; the PICs have allowed the fleets of several DWFNs to reflag these vessels under PIC flags, allowing the DWFNs to gain additional benefits from the tuna resources found in the EEZs of the PICs in exchange for fees and local investments. Major Thai processing companies that wield influence in trade flows include Thai Union Group, Sea Value, Chottiwat, and others.

Thailand is the main “inbound” driver of raw frozen tuna trade flows from the Pacific, importing about 800,000 mt per year of whole frozen tropical tunas. As the world’s largest producer of canned tuna, Thailand is also the main exporting country of canned tuna products to the primary world markets and a major “outbound” contributor of processed canned tuna to the Pacific tuna trade flows. Canned tuna flowing out of Thailand goes to supply the U.S. canned tuna market and also contributes to meeting the demand of the E.U. Thai canned tuna products entering the main markets (U.S. and E.U.) are subject to relatively high duties, approximately 12.5 and 24 percent, respectively.<sup>67</sup>

In addition to the major Thai processors and the three top tuna trading companies, the Bolton Group, owners of Tri-Marine, is highly influential in the tuna world. The Bolton Group’s presence is particularly relevant in the European market, since the group owns major national brands in the Spanish, Italian, French, and other European canned tuna markets. The Bolton Group is even more powerful because Tri-Marine is very tightly linked with the main industry players in Ecuador (especially those associated with Spanish tuna companies such as Conservas Isabel Ecuatoriana, and Sálca Ecuatoriana) as well as with other tuna processing companies in Mexico, Colombia, and El Salvador.

Ecuador is the second-largest tuna processor of canned tuna in the Pacific. Its tuna processing sector requires approximately 600,000 mt of tuna per year to be viable. Half of its raw material needs (about 300,000 mt) are produced by its own tuna fleet, the largest in the Pacific<sup>68</sup>, with 108 tuna purse seine vessels.<sup>69</sup> The balance is imported into the country from around the world. In 2019, approximately 90 percent of its import needs were met with tuna originating in the Pacific, with the remainder caught either in the Atlantic or in the Indian Ocean.<sup>70</sup> Ecuador enjoys preferential access to the E.U. under the GSP and under an additional, separate trade agreement with the E.U. Consequently, Ecuador’s canned tuna products pay zero duties coming into the E.U., but certain rules of origin do apply; for instance, the fish needs to be caught by either Ecuadorian flag vessels or by E.U. flag vessels operating in the IATTC area. Ecuador also exports canned tuna products to the U.S. market.

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<sup>65</sup> Thai Tuna Industry Association, Thai Tuna Import and Export Statistics 2019-2021. Viewed at <https://thaituna.org/main/information/statistics/annual-report/>, March 20, 2023.

<sup>66</sup> Depending on market conditions, Thailand may also import some tropical tuna from the Atlantic and Indian oceans.

<sup>67</sup> Atuna. 2023a. “How 30 Years of the EU Single Market has Impacted Tuna Trade Flows.” January 4; NOAA Fisheries. 2023. Harmonized Tariff Schedule for Selected Tuna and Tuna Products. Viewed at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/harmonized-tariff-schedule-selected-tuna-and-tuna-products>, May 1, 2023.

<sup>68</sup> Ministerio de Comercio Exterior. 2017. Report of the Ecuadorian Tuna Sector. August.

<sup>69</sup> IEC/GHA Vessel Compilation analysis.

<sup>70</sup> Datamyne.

This report identifies several important companies in Ecuador that wield influence in both Ecuador's tuna industry and Pacific tuna trade flows as a whole.

The Philippines and PNG are the two other major traditional tuna processing hubs in the Pacific, where the catches of purse seine vessels flagged under the Philippines and/or under the PNG flag (under beneficial ownership by Philippine companies) are delivered for processing. The Philippines has played a long-standing role as a canned tuna processor over the years, with an important canned tuna processing sector in the Philippines supplying both the U.S. and E.U. markets. Over the past three decades, the Philippines ventured into PNG and is a major stakeholder in PNG's tuna industry. The Philippine tuna companies are so entrenched with the harvest and processing segments in PNG that in some ways, the line between the two countries is blurred as to who controls the companies, and the PNG and Philippines tuna industries are one and the same. There is a symbiotic relationship among the owners of Philippine-flagged purse seiners, the purse seine fleet of PNG flagged vessels, and the processing plants in PNG that are owned by the same stakeholders.

This relationship extends to take advantage of the different beneficial access status of the Philippines and PNG with respect to the E.U. market, where, if need be, companies can export products made in PNG without having to abide by any rules of origin, or they can export products from the Philippines if the circumstances are such that it is preferable to do so. Considering the PNG-flagged and the Philippines-flagged purse seine fleets and the volume of tuna processed or partially processed in each of the countries and exported mainly to the E.U., these countries provide an additional 600,000 mt to the tuna trade flows.

Key industry and government entities in PNG and the Philippines with influence over Pacific fisheries include at the industry level, RD Tuna Cannery and Frabelle Fishing, and at the governmental level, PNG's National Fisheries Authority (NFA).

Vietnam, China, and Indonesia are emerging tuna processing hubs in the Pacific, particularly in the trade for pre-cooked tuna loins and frozen uncooked tuna loins, with major markets in the U.S. and the E.U. Together, these countries process about 140,000 mt of whole frozen tuna. Some key companies in these countries are identified in this chapter.

The Japanese tuna purse seine fleet and the Korean tuna purse seine fleet operating in the Pacific catch more than enough tuna for the requirements of their processing sectors to satisfy their domestic needs. Consequently, both countries' surplus tuna production enters the Pacific international tuna trade flows and is available to be purchased by tuna processors from within or outside the region. Powerful processing companies in Korea include Dongwon Industries, Silla Co., and Sajo Industries.

Mexico has long been self-sufficient in supplying its own substantial domestic market for canned tropical tuna. Mexico's canned tuna market essentially relies on the production of its tuna fleet in the eastern Pacific Ocean. It is only recently that some of the Mexican yellowfin catch has been exported to the Spanish market in the round or in frozen fillets, where this species commands a high price. To make up for the fish that is exported, the Mexican processors have begun importing frozen skipjack from the Western-Central Pacific to fill the Mexican domestic demand. So, while the participation of Mexico in the Pacific international tuna trade flows is limited, Mexico's contribution to these trade flows represents an additional 130,000 mt. Powerful vertically integrated groups dominating the Mexican tuna industry are Pesca Azteca, Grupo Mar, Grupo Procesa, and MT Pesca.

Although the U.S. is no longer a major tuna catching or processing country in the Pacific, it will continue to play a relevant role in the tuna trade flows originating in the region. As the world's largest single canned tuna market, it will continue to be served by tuna processors located in Thailand, Ecuador, the Philippines, PNG, Vietnam, and others, sourcing tuna caught in the Pacific as well as other ocean regions. Pre-cooked tuna loins will likely

continue to feed the processing lines of Bumble Bee and Chicken of the Sea on the U.S. mainland. As a major end market in the tuna trade flows for fish originating in the Pacific, the U.S. will continue to be important, not because of its own fleet, but relying primarily on the tuna processing sectors located in the four major hubs.

Table 12 provides an indication of the key countries involved in the Pacific tuna supply chains, the role of the stakeholder involved, the direction of trade (importer, exporter and/or producer) and a general estimate of the quantities of purse seine-caught whole frozen Pacific tropical tuna that enters supply chains/trade flows to the major domestic and world tuna markets in different form associated with the major stakeholders. The intent is to provide a general sense of the relative importance of these Pacific processing countries. More details are provided throughout Chapter 6.

**Table 12. Roles and Estimated Volumes of Whole Frozen Tuna Processed by Key Countries in the Pacific**

Key Countries	Role of Stakeholder	Tuna Trade Direction	Estimated Volume of Frozen Purse Seine Caught Tropical Tuna Processed in the Pacific
Traditional Processing/Trade Hubs			
Thailand	Processor: importer of frozen whole tropical tunas/exporter of canned/pouched finished products and pre-cooked tuna loins.	Inbound: frozen whole tuna (imports); outbound for processed canned products (exports)	Approximately 800,000 mt.
Ecuador	Own fleet production; import of raw frozen tropical tunas, processing of pre-cooked tuna loins for export; processing of canned and pouched tuna products.	Inbound: Domestic catch plus imports; outbound: pre-cooked loins and canned/pouched tuna products	Approximately 600,000 mt
Philippines & PNG	Own fleet production, import of raw frozen tuna; production of pre-cooked loins; production of canned/pouched tuna products.	Inbound: domestic catch and some imports; outbound: pre-cooked tuna loins and canned/pouched tuna products	Approximately 600,000 mt
Emerging Processing/Trade Hubs			
Vietnam, China, and Indonesia	Emerging catching, importing, processing, and exporting countries that are gaining importance in the international trade flows to major markets. Rely on a mix of their own fleets' catches and imported raw frozen tropical tuna to produce pre-cooked loins and canned/pouched tuna products. Also involved in portion-controlled, value-added products.	Inbound: Domestic purse seine catches from China. Outbound: pre-cooked loins and canned products	Approximately 140,000 mt



Key Countries	Role of Stakeholder	Tuna Trade Direction	Estimated Volume of Frozen Purse Seine Caught Tropical Tuna Processed in the Pacific
Processing Hubs Oriented Toward Own Domestic Market			
Japan and Korea	Japan: Tuna catching for Katsubushi and canned tuna for domestic consumption; surplus for export to canned tuna production primarily to Thailand (net exporter of raw frozen skipjack).	Inbound: Domestic catches for internal processing and domestic market.	Japan: Approximately 170,000 mt
	Korea: tuna catching for domestic market, surplus to highest bidder amongst canned tuna processors (net exporter of raw frozen skipjack).	Outbound: export (surplus) of frozen tuna.	Korea: Approximately 260,000 mt
Mexico	Tuna catches mainly to supply domestic processing sector and domestic market. Emerging import/export volumes.	Inbound: whole frozen skipjack to fill processing deficit for domestic market caused by yellowfin exports to higher priced markets.	Approximately 130,000 mt
	Imports of whole frozen tuna (mainly skipjack from Western and Central Pacific.	Outbound: whole frozen yellowfin and yellowfin loins	
	Exports of whole frozen yellowfin and yellowfin frozen loins, mainly to Spain	Emerging exports of canned product to U.S. market	
<b>Total</b>			<b>2,740,000 mt</b>
Notes:			
1. Countries that exhibit commonalities in their role as a stakeholder and in the trade flows for tropical tuna are grouped together to avoid unnecessary repetition of information in this table.			
2. Most of the volumes reported in this table is caught in the Pacific. As much as ten percent of the tuna processed in Thailand and Ecuador derives from the Atlantic and/or Indian oceans.			
3. These products enter the domestic markets of the processing countries and major world markets.			

## Factors Driving Trade Flows for Canned Tuna to Major World Markets

As described in Chapter 2, a variety of geographic, political, and financial factors influence trade flows for tuna. All these variables, in one way or another, influence tuna trade flows for canned tuna products produced by tuna purse seine fleets that fish in the Pacific Ocean. This section provides a more detailed overview of the role those specific factors play in determining the dynamics within the trade flows for purse seine caught tropical tuna.



## Consumer Preferences and Retail Markets

World tuna production was around 5.1 million mt in 2018; of this total, approximately 3.2 million mt are used to produce canned tuna products, most of which is caught by purse seine vessels.<sup>71</sup> Canned tuna is consumed worldwide, but primarily in two major markets. The E.U. jointly absorbs about 1.2 million mt of canned tuna annually, while the North American market (U.S./Canada/Mexico) absorbs about 1 million mt. Of the consumption by the North American market, the U.S. absorbs approximately half (525,000 to 550,000 mt) per year.<sup>72</sup> These markets are currently very stable and have experienced only limited growth in the past decade. Emerging markets for canned tuna products are primarily located in Latin America and the Middle East.

Purse seine-caught tuna is typically used to produce canned or pouched products (longline-caught tuna is seldom processed in this way), so the HS codes for “processed tuna” (HS codes beginning with 1604.14) are mainly associated with purse seine-caught tropical tuna.<sup>73</sup> There are marked differences in consumer preferences for canned tuna across markets. In the U.S., consumers eat mainly skipjack tuna (chunks) in water. In Europe, especially in the south, consumers eat yellowfin tuna (solid pack) in olive oil. Northern European markets and the United Kingdom (UK) prefer skipjack, although yellowfin tuna is also consumed in these markets (Germany, the Netherlands, etc.).

In the U.S. market, three national brands dominate the market: Starkist, Chicken of the Sea, and Bumble Bee. Previously owned by U.S. companies, these brands are now owned by large foreign companies. Starkist, the brand leader for light meat tuna, is owned by Dongwon Group from Korea. Thai Union from Thailand now owns Chicken of the Sea, and FCF Fishery Co. Ltd., a major tuna trading company in Taiwan owns Bumble Bee. In addition to the national brands, retailers have their own private labels. In 2018, in terms of volume of sales, the Canned Tuna Market Share was: Starkist 37 percent, Bumble Bee 23 percent, Chicken of the Sea 17 percent, private label 15 percent, and other 8 percent. In terms of value of sales, Starkist had 42 percent, Bumble Bee 25 percent, Chicken of the Sea 15 percent, private labels 12 percent, and other 6 percent.<sup>74</sup>

The U.S. supermarket industry is marked by substantial and continued consolidation. For instance, Kroger Company now owns many supermarket chains,<sup>75</sup> and all carry Kroger’s tuna label. In addition to other major supermarket chains with their own private brands, such as Safeway, Savon, Whole Foods Markets, and Metropolitan Markets, major retailers like Walmart, Costco, Aldi, Sam’s, and Target also have their own labels for canned tuna.

In the European Market, a similar situation exists. In Spain, for example, major national tuna brands such as Isabel, Calvo, Campos, and Cuca dominate the shelf space in major supermarkets including Eroski, Al Campo, Mercadona, Carrefour, Dia, Lidl, and El Corte Ingles. However, these retailers, like in the U.S. market, also carry their own private labels for tuna. The same is true in France, where the national labels Saupiquet and Petit

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<sup>71</sup> Marine Stewardship Council. 2021. Sustainable Tuna Handbook. May. Downloaded from <https://www.msc.org/docs/default-source/default-document-library/msc-sustainable-tuna-handbook-2021.pdf>, April 1, 2023.

<sup>72</sup> GHA personal Communication with Peter Trutanich, Tri-Marine. June 10, 2020.

<sup>73</sup> Except for canned albacore, which is caught by longline and troll/pole-and-line vessels.

<sup>74</sup> Havice, E., L. Campling, and M.A. McCoy. 2022. Market and Trade Dynamics: Western and Central Pacific Ocean Tuna Fisheries. June. Forum Fisheries Agency, Honiara, Solomon Islands. Pg. 10.

<sup>75</sup> Kroeger owns Kroger Supermarkets, Ralphs, Dillons, Smith’s, King Soopers, Fry’s, QFC, City Market, Owen’s, Jay C, Pay Less, Gerbes, Harris Teeter, Pick’ n Save, Metro Market, Fred Meyer’s, Food for Less, and Food Co.

Navire dominate, or in the UK where Princes and John West are the main national brands, but major retailers like Sainsbury's, Tesco, and Mark and Spencer's have processors that can tuna under their own private labels.

The tuna supply chains that support these markets are complex and involve the tuna changing hands at different stops along the supply chain. A variety of countries, companies, and actors may be involved from the time the fish is harvested to the time a can of tuna is purchased by the consumer, and these flows are impacted by many variables as described in the following sections.

## Production Costs

Production costs are one of the most important variables influencing tuna supply chains and trade flows. In general, an abundance of tuna and proximity to the fishing grounds, low labor costs, and “friendly” and stable governmental policies are highly desirable. Therefore, actors in the harvesting, processing, and marketing of tuna look for those locations that offer these and other kinds of competitive advantages in the production of canned tuna products. A clear example of this is the status of tuna processing in the U.S. Until the 1980s, southern California hosted a large canning industry, but high labor costs and environmental regulations eventually brought about the closure of these facilities; the industry moved its operations offshore to locations with lower labor costs and less regulation. Decades later, Chicken of the Sea and Bumble Bee opened automated facilities in Lyons, GA and Santa Fe Springs, CA, respectively, where the low-labor functions of canning pre-cooked loins now occurs; the labor-intensive part of the canning process, involving cleaning and cooking the tuna, takes place in numerous off-shore locations where labor costs are low, and the pre-cooked loins are shipped to the U.S. facilities for canning.

## Distribution of Resources and Infrastructure

The trade flows into which Pacific purse seine-harvested tropical tuna enters are driven significantly by differences in the logistics of fishing within the Eastern versus the Western and Central Pacific; these are in turn defined by the distribution of tuna resources and port and processing infrastructure. The first factor influencing the trade flows in this regard is the existence and availability of tuna processing and other logistical infrastructure needed to support the operations of tuna purse seine vessels.<sup>76</sup> Purse seine vessels operating in the Eastern Pacific often discharge their catches at a port facility near where a tuna processing plant is located. It is uncommon in this region for purse seine vessels to transship tuna to carriers that would take their catches to processing facilities located away from major fishing grounds. Conversely, the WCPFC is an immense area that tuna purse seine vessels must cover to search for and catch tuna, at least twice the size of the IATTC convention area. As such, in the WCPFC regional fisheries, tuna processing infrastructure near major fishing grounds is limited or far away. Consequently, vessels in this region depend on the availability of large vessels with the capacity to refrigerate cargo (“reefer”) or carrier vessels to facilitate the transport and sale of their catches, so that the fishing vessel can remain near the fishing grounds (see the text box, *Example of Transshipment in the WCPFC Convention Area* for an example of this process).

Although there are processing facilities within the WCPFC areas in places such as PNG, Fiji, the Solomon Islands, and others, the infrastructure and other logistical supporting services to the purse seine fleets is

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<sup>76</sup> Purse seine vessels engage in fishing trips that can range from 30 to 60 days at a time and must have logistical support at a port or at sea to offload their catches, refuel, provision, and make minor repairs and find spare parts. This type of supporting infrastructure can usually be found on land when there are tuna processing facilities and basic port infrastructure. Absent this land-based supporting infrastructure, purse seine vessels require the logistical support at sea, characterized by the presence of carrier or refrigerated (“reefer”) vessels where the fish can be transshipped from the purse seiner to a cargo vessel that can take the product to a processing facility located away from the fishing grounds. Frequently, reefer carriers also provide support with provisions, fuel, and other needs.

insufficient to service the existing purse seine fleet, or there are seasonal fluctuations or other issues (e.g., FAD closure) that limit the ability to also service the fleet. Consequently, from the perspective of tuna supply chains and tuna trade flows, at least at the point of the first sale, in the WCPFC area, one can expect more complex supply chains with the participation of more stakeholders along the supply chain than in the case of the IATTC area, where most vessels owners directly sell their fish to a processing facility without the use of a tuna trading company.

The two convention areas also differ in the relative presence of each of the target tropical tuna species. While all three tropical tuna species are present in each of the two regional fisheries, the WCPFC fishery is dominated by the presence of skipjack tuna over yellowfin and bigeye. In the IATTC, the catches of skipjack and yellowfin tunas are more balanced and there are certain fleets that can target one species over the others based on their geographical distribution and migratory patterns.

### Tariffs and Trade Agreements

Among the most important variables influencing trade flows of purse seine caught tropical tuna and associated processed products are the existence of tariff and non-tariff barriers that facilitate or limit the flow of raw frozen, semi-processed, or finished canned tuna products. These variables are affected by the existence of bilateral or multilateral agreements between the exporting and importing countries.

Considering Kiribati as an example, a whole round fish caught by a vessel flagged in Kiribati may easily enter global tuna markets without any duties or restrictions, but once that fish is partially or fully processed into a different product, this product could face significant tariffs or other market access limitations. On the other hand, canned tuna products from the Philippines going into the E.U. market under the GSP are exempted from duties, provided the source of the raw material used satisfies certain “rules of origin” provisions. For other countries, like Thailand, canned tuna entering the E.U. market is subject to a 24 percent duty, which puts their canned products at a serious disadvantage. In the U.S., canned tuna products are subject to both a quota and a duty which vary depending upon whether the imported product is entering the country before that year's quota for that product has been reached. If the product is under the quota for water-packed tuna, it is subject to a six percent duty; the duty increases to 12.5 percent after the quota is reached. This compares to a duty of 35 percent for imports into the U.S. of tropical tuna or albacore canned in oil.

### Rules of Origin

In some cases, trade in canned tuna products is also affected by rules of origin, meaning that for a canned tuna product to enter a particular market, the raw material (i.e., the fish itself) must meet certain criteria. For instance,

#### Example of Transshipment in the WCPFC Convention Area

Thailand is the single largest tuna processing center in proximity to the WCPFC convention area. Thailand imports, processes, and exports more tuna than any other country in the world. Yet, tuna purse seine vessels seldom deliver their catches directly in-country. Most of the tuna imported by Thailand for processing arrives either by reefer/carrier vessels or via refrigerated sea containers. As such, tuna purse seine vessels fishing within the WCPFC transship their catches at several locations: the Marshall Islands, the Solomon Islands, PNG, and others. These are operations in which the reefer/carrier vessel anchors outside a country's main capital city or main bay, and fishing vessels transship their catches to the carrier until its cargo wells are full. Then the reefer carrier vessel sails to Bangkok to deliver the fish.

These operations could be organized directly by a tuna processor in Thailand that owns or charters a reefer/carrier and actually purchases the fish directly from the purse seine vessels, or it could be the result of the participation of a major tuna trading company (a company that buys the tuna from the fishing vessels and then sells it to one or several processors and makes a margin from the transaction).

if the raw material used was caught by a Philippine vessel and the fish was processed in the Philippines, the canned tuna product is exempted from duties going into the E.U. However, if the fish was caught by a Taiwanese fishing boat but the fish was processed in the Philippines, the exemption does not apply.

The rules of origin vary from country to country. For instance, canned tuna products from PNG or semi-processed tuna loins can be imported into the E.U. without regard to any rules of origin. If the product is processed in PNG, it does not matter what country caught the fish or where it was caught.

## Government Policies on IUU Fishing, Sustainability, and Human Rights

In addition to these trade barriers, other criteria are increasingly affecting the tuna trade flows to certain markets. For both the U.S. and the E.U. markets, new criteria have emerged to prevent the trade from countries that lack mechanisms to prevent IUU fishing activities occurring in the source country or if the processed fish has the potential to be associated with IUU activities. In the U.S., the fish is simply not permitted to enter the country. The E.U. employs a system of warnings where a Yellow Card is a warning that the country in question needs to take corrective actions. Failure to implement corrective actions would result in an E.U. Red Card, preventing the country in question from exporting tuna products to the E.U. market.

Other variables influencing the trade flows for tuna products may be associated with whether the canned tuna products meet certain sustainability criteria. For example, the trade flow may differ if the tuna in the can originates from a fishery that has been certified by the MSC or from a fishery that is undergoing a FIP and how advanced such project is toward meeting the MSC standard.

Recently, considerations associated with human rights issues related to employment conditions on board fishing vessels and the prevention of slave labor on fishing vessels is a consideration driven by consumers that is requiring tuna processors, distributors, and retailers to demonstrate the details of their tuna supply chain.

## Vertical Integration

Tuna fisheries (both purse seine and longline) in the WCPFC and the IATTC convention areas are characterized by a significant level of vertical integration from the harvest, processing, and marketing segments. Ownership of fishing fleets and processing infrastructure by major brands (such as Starkist, Chicken of the Sea, and Bumble Bee in the U.S., and Conservas Garavilla and Salica in Spain/Ecuador) helps define tuna flows, since catches by these fleets are not available on the open market.

In the Eastern Pacific, in the tuna fleets of Mexico, El Salvador, and Ecuador, a significant number of tuna purse seine vessels are vertically integrated, with the companies controlled by the same individual owning tuna vessels, processing plants, and in some instances marketing channels as well.<sup>77</sup> To a certain degree, vertical integration also occurs in the WCPFC area, where, for instance, Philippine companies have invested in processing plants in PNG and have re-flagged vessels under that country in order to gain access to tuna

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<sup>77</sup> In Mexico, Mr. Jose Elovigildo Carranza has a controlling interest in Pesca Azteca (owner of 20 tuna purse seiners) and Pesca Industrial S.A. (PINSA, the largest tuna processing plant in Mexico located in Mazatlan, Sinaloa). PINSA owns in turn the brand Dolores and Mazatun which, in the Mexican market, represents almost 50 percent of the total sales of canned tuna in the country. Grupo Calvo, from Spain, owns both the two purse seine vessels operating under El Salvador flag and the tuna processing plants located in La Union, El Salvador. Calvo is one of the major national brands for tuna in the Spanish market. In Ecuador, there are several tuna companies that are also vertically integrated. That is the case of Negocios Industriales SA (Nirsa) owned by Mr. Aguirre, who also owns a fleet of 13 tuna purse seiners. Two Spanish companies, Salica (owned by Grupo Albacora) and Conservas Garavilla Ecuador, owner of the brand Isabel – recently acquired by Bolton Group – own tuna processing plants in the country and have vessels under Spanish flag or associated with Ecuadorian interests fishing in the Eastern Pacific and are also examples of vertically integrated tuna operations.

resources within the PNG EEZ at lower costs. This vertical integration has been promoted by the PNG fishing authorities as an effort to develop a domestic tuna industry.<sup>78</sup>

## Major Traditional Processing Hubs for Purse Seine Caught Tropical Tuna

The E.U. and U.S. canned/pouched tuna markets are supplied primarily by four traditional processing centers in the Pacific region. These countries funnel catches from the tuna fishing grounds through primary and/or secondary processing, and then export the product to the major export markets. The four primary processing hubs are Thailand, Ecuador, the Philippines, and PNG; they are described below.

### Thailand

Thailand has no tuna fleet and registers no tropical tuna catches.<sup>79</sup> Nevertheless, Thailand's tuna processing industry is key to the functioning of the tuna industry in the Pacific, as well as the Indian and Atlantic Oceans. Thailand is the world's single largest importer of raw frozen tuna from the Pacific and globally and is the world's single largest exporting country of processed tuna products.

Thailand is located between two major tuna-producing regions, the WCPFC and the IOTC convention areas. The WCPFC convention area is the primary tuna purse seine fishing ground in the world, with 2.46 million mt of tropical tunas harvested annually. The IOTC convention area is a principal fishing ground for the European (Spanish and French) and Seychelles tuna purse seine fleets. Overall, the IOTC convention area produces about 1.1 million mt of tropical tunas per year for all gear types.<sup>80</sup> As the world's largest importer, processor, and exporter of tuna from these and other areas, the Thai tuna processing industry is a primary driver of tuna trade flows, including those that originate in the Pacific Ocean. Figure 40 presents the primary trade flows for purse seine caught tropical tuna that move through Thailand's processing sector.

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<sup>78</sup> Vertically integrated tuna fishing operations are somewhat distinct from those other tuna vessel owner operations. In the Philippines, tuna purse seine owners usually operate one, two or more purse seiners in conjunction with a reefer vessel and a support vessel (i.e., vessels that help provision the fishing vessels, bring crewmen, assist in deploying FADs, etc.). These combined operations are known as "Purse Seine Sets" that is a set of vessels that catch, transport and support the operations. Often, the size of the purse seine vessels used by the Philippines are smaller, with carrying capacities ranging from 300 to 600 mt. These vessels are much smaller than the "super tuna seiners" used by other competitor countries.

<sup>79</sup> Thailand has reported catches of longtailed tuna, *Thunnus tonggol*, in recent years. However, this species is not generally considered a true tropical tuna and is not included in this analysis.

<sup>80</sup> ISSF. 2023a. Status of the World Fisheries for Tuna. International Seafood Sustainability Report Technical Report 2023-01. March. Downloaded from <https://www.issf-foundation.org/research-advocacy-recommendations/our-scientific-program/scientific-reports/download-info/issf-2023-01-status-of-the-world-fisheries-for-tuna-march-2023>, April 25, 2023

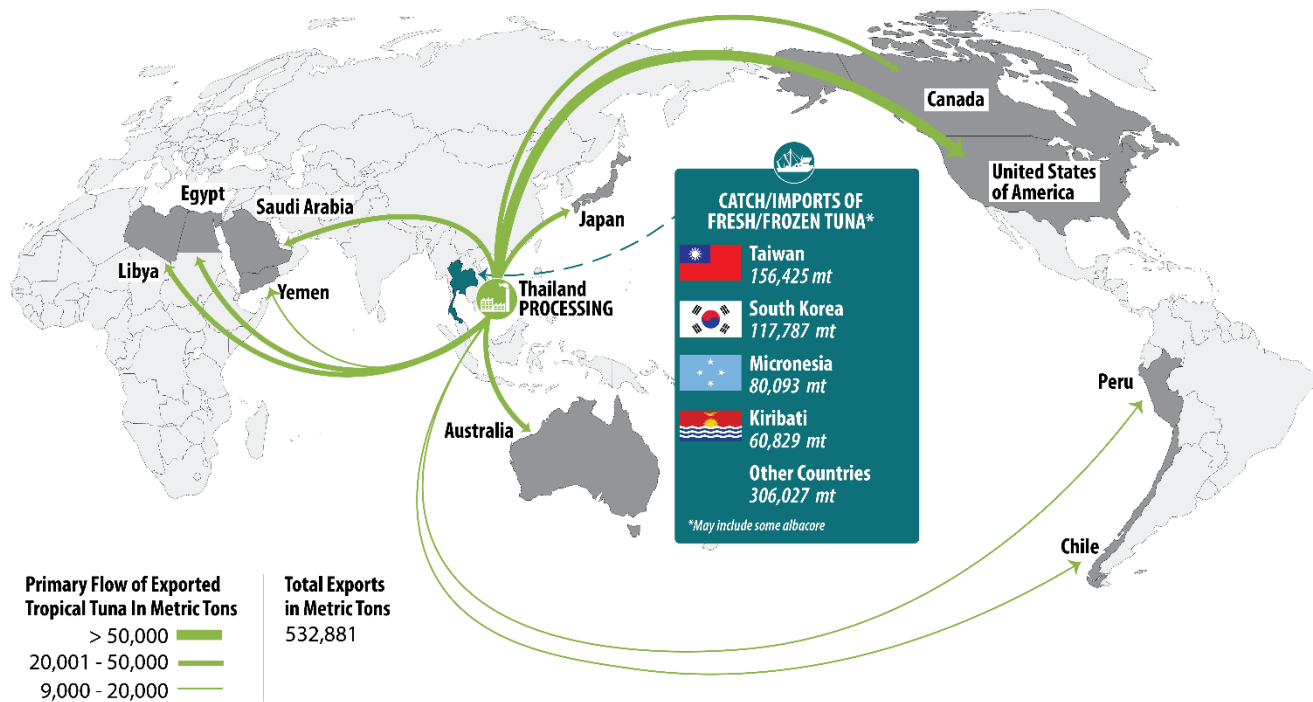


Figure 40. Primary Purse Seine-Caught Tropical Trade Flows via Thailand

#### Harvest Level

Thailand is not involved in the harvest of tropical tuna; it has no tuna fleet and registers no tropical tuna catches.

#### Processing Level

Today's Thai tuna processing industry is the result of a relatively rapid evolution that began in the late 1970s to early 1980s, coinciding with two major developments:

- The demise of the U.S. tuna processing sector, which was characterized by a loss of cost-competitiveness at its California processing sites,<sup>81</sup> compounded by the U.S. tuna fleet's loss of access to fishing grounds in Mexico and Latin American; and,
- Political and economic developments in the Philippines in the final period of President Ferdinand Marcos' reign, which negatively impacted the then-strong Philippines tuna industry in the western Pacific and affected the traditional export market for Philippine tuna in the U.S.

Other factors that drove Thailand's emergence on the tuna world landscape included Thai governmental policies that provided incentives and created a stable environment for investments in the industry, and very attractive low labor costs for cleaning the fish, which is a major component of the tuna canning process.

<sup>81</sup> Factors influencing the U.S.'s cost competitiveness included increasing unionized labor costs, environmental costs associated with controls on water pollution and odor emissions, and new regulations.



Tuna processing plants began to emerge around Bangkok and its surrounding areas, and despite high tariffs making it more difficult for Thailand to sell its canned tuna in the U.S. and European markets, the Thai industry started to penetrate these and many other canned tuna export markets around the world.

### *Thailand's Tuna Processing Capabilities*

In 2014, the Thai Tuna Industry Association (TTIA) was launched by Thai Union, Gold Prize Canning, and Asian Alliance International, among others. Today, the 26 processors in the TTIA that produce canned tuna for human consumption jointly have an estimated capacity of 4,000 mt per day, which allows them to process between 800,000 and 1.2 million mt of canned tuna and pre-cooked loins per year.<sup>82</sup>

No single published source provides the actual number of tuna processing plants in Thailand and/or their capacities. The TTIA lists 26 member companies in its charter. Most of these companies' tuna processes include the production of canned and pouch tuna for human consumption and the production of pre-cooked tuna loins for subsequent canned tuna production using tropical tunas and albacore. In addition, many of these processors include in their product lines pet food products that use tuna by-products.<sup>83</sup> A few of the companies in the association are also only involved in the production of frozen value-added tuna products such as frozen uncooked loins, steaks, and related products.

Table 13 lists tuna processors that are members of the TTIA including, where available, information regarding products produced, the numbers of plants and their estimated processing capacities.

**Table 13. Thailand: Key Thai Tuna Processors/Members of the Thai Tuna Industry Association, 2023**

Company	Products Produced	Estimated Processing Capacity mt/day	Additional Notes
A.E.C. Canning Co., Ltd	Canned tuna		
Abd Khan Co. Ltd	Canned tuna		
Asian Alliance International Public Co. Ltd.	Canned tuna Pet food		
Chotiwat Manufacturing Co. Ltd.	Canned tuna	400	87,900 mt/year into 220 days = 400 mt/day
Diamond Food Product. Ltd	Canned tuna		

<sup>82</sup> IEc/GHA estimate based on Hamilton, A., A. Lewis, M.A. McCoy, E. Havice, and L. Campling, 2011. Market and Industry Dynamics in the Global Tuna Supply Chain. June. Forum Fisheries Agency, European Union, Secretariat of the Pacific, DeFish II Project; and professional industry knowledge of Guillermo Gomez, GHA.

<sup>83</sup> Tuna scraps and waste resulting from canned tuna production for human consumption are often utilized in the production of pet food. These scraps and waste can also be used for fishmeal production, but very few tuna processing companies have fishmeal plants. The scraps and waste may be sold to third parties that collect fish waste from tuna and other fish processing plants to produce fishmeal. Fishmeal products and their trade are not considered in this report.

Company	Products Produced	Estimated Processing Capacity mt/day	Additional Notes
Global Frozen Food (Thailand) Co. Ltd.	Frozen Yellowfin & Albacore		
I.S.A. Value Co. Ltd./ Sea Value Plc. / Unicord Plc.	Canned tuna Pet Food	750	4 Plants; 3 in Thailand 750 mt/day (1 in France 20 mt/day)
I-Tail Corporation Public Co. Ltd.			
Kingbell Producer Co. Ltd	Canned tuna		
Mmp International Co. Ltd.	Canned tuna (including from Pole-and-line)	100	
P & T Food Co. Ltd			
P.C. Tuna Co. Ltd	Pre-cooked loins and flakes	100	
Pataya Food Industries Ltd.	Canned tuna Pet food	360	3 Plants in Thailand, one in Vietnam Estimated capacity 360 mt/day
Patthana Marine And Foods Co. Ltd.	Canned tuna & pouched tuna Pet food		
Premier Canning Industry Co. Ltd.	Canned Pet food		
Rs Cannery Co. Ltd.	Canned tuna for leading Japanese brands (albacore)	140	
S.K. Food (Thailand) Public Co. Ltd.	Canned tuna & pouched tuna Other frozen seafood (non-tuna)	70	
S.P.A. International Food Group Co. Ltd.	Canned tuna	120	
Siam International Food Co. Ltd.	Canned tuna for leading Japanese brands Pet food		



Company	Products Produced	Estimated Processing Capacity mt/day	Additional Notes
Siam Tin Food Product Co. Ltd.			
Southeast Asian Packaging And Canning Ltd. (Safcol)	Canned tuna; frozen value-added seafood products	350	
Thai Inaba Foods Co. Ltd			
Thai Union Group Public Co. Ltd./ Thai Union Manufacturing Co. Ltd. <sup>84</sup>	Canned tuna & pouched tuna Frozen value-added seafood products	1,700	3 plants in Thailand. Thailand estimated capacity 1700 mt/day. Additional plants in Seychelles, Ghana, PNG, Vietnam. Estimated overseas processing capacity 380 mt/day
Tropical Canning Public (Thailand) Co. Ltd.	Canned tuna		
Unicord Public Co. Ltd. (Subsidiary of I.S.A.)	Canned tuna & pouched tuna		1000 mt/day (already accounted in SeaValue/ISA)
<b>Total</b>		<b>4,090</b>	

Source: IEC/GHA estimate using several sources including TTIA. 2023a. The List of TTIA Ordinary Members. Viewed at <https://thaituna.org/main/members/ordinary-members/>, April 17, 2023; and websites of individual companies listed.

### *The Role of Tuna Traders in Supplying the Thai Tuna Processing Industry*

Unlike its tuna processing competitors in the Pacific (Ecuador, the Philippines, and PNG)<sup>85</sup>, which have different degrees of vertical integration from catching to distribution and retail, none of the Thai tuna processors own or operate tuna fishing vessels. Thai tuna processors must import raw frozen tuna to feed their plants, assisted by third-party suppliers known as “tuna traders” to supply their raw material processing needs.

<sup>84</sup> Thai Union. 2023a. Subsidiaries and Associated Companies. Viewed at <https://www.thaiunion.com/en/about/company/subsidiary>, April 29, 2023; and Thai Union. 2023b. Out Brands. Viewed at <https://www.thaiunion.com/en/products-and-brands/our-brands>, April 29, 2023.

<sup>85</sup> In the Pacific, Vietnam and China are gaining momentum as processors of pre-cooked tuna loins, frozen uncooked loins, and canned tuna products. They are not presently on equal footing with Thailand’s other processing competitors, but these newcomers need to be carefully observed.

To supply their plants, processors rely almost exclusively on these tuna traders who can finance, negotiate, and purchase tuna from purse seine vessels, organize the transshipment of such fish from different locations in the Pacific and from around the world, and deliver it to the processor's cold storage facilities located near or at the processing plants in Thailand (or to other Thai-owned processing facilities located overseas). The three major world tuna trading companies are: Fong Chun Formosa (FCF) Fishery Co. Ltd<sup>86</sup>, founded in Taiwan in 1972; Tri-Marine Group<sup>87</sup>, also established in 1972 and based in the U.S.; and Itochu Corporation<sup>88</sup>, originally founded in Japan in 1858. These three major tuna trading companies are involved in the trade flows for both purse seine and longline-caught tropical tuna. FCF and Tri-Marine focus primarily on purse seine-caught tuna, while Itochu focuses slightly more on the Japanese sashimi supply chain based on longline-caught tuna.

Tuna traders own and/or charter reefer carriers that are positioned near the fishing grounds so that once the fishing holds of the purse seiners' vessels are full, their catches can be quickly sold and transshipped to the trader's reefer carrier and fishing can resume. Some of these traders can also arrange to deliver frozen tuna to the processors via refrigerated sea containers loaded at major Pacific transshipping points or other ports in the Pacific or elsewhere.

Typically, tuna processors and tuna traders negotiate long-term contracts that stipulate quantities, species, and times for the tuna to be delivered to the processor. Tuna traders and Thai processors agree upon reference cost, insurance, and freight (CIF) prices, which often include the trader's margins and several other conditions regarding quality, fish rejects, and extraordinary provisions. These contracts often include provisions for significant fluctuations in prices or tuna availability.

Tuna traders have now been involved in the tuna trade for decades and over the years have developed close relationships with tuna purse seine boat owners from different countries that fish in the Pacific and elsewhere. The nature of the relationships between tuna brokerage firms and individual tuna boat owners varies from owner to owner or from company to company that owns and operates tuna fishing vessels. Some boat owners (or companies that own several vessels) sell all their vessels' tuna catch exclusively through those traders. The tuna traders often arrange for bunkering, provisioning, financial advances, documentation, spare parts, crew replacement, and other services. Conversely, some tuna boat owners engage with tuna traders on each load of fish, negotiating prices and other terms. These transactions are usually referred to as "spot market" transactions, which are more opportunistic, depending on the supply and demand conditions for the fish.

Regardless of the specific arrangement, tuna traders have networks of fishing vessels on whom they rely for their sourcing so that, in turn, tuna processors in Thailand can be assured a continued supply of raw material coming into their processing plants. Often, Thai tuna processors purchase tuna and keep large inventories in cold storage. This prevents tuna plants from having to shut down operations temporarily when tuna is scarce; cold storage inventories also influence supply and demand conditions and tuna prices worldwide. Only through the assurances of a continued tuna supply can Thai tuna processors then negotiate production contracts for the finished products with importers, wholesalers, distributors, and retailers from around the world.

In the recent past, tuna trading companies have expanded their activities to include owning and operating tuna fishing vessels themselves to stabilize their supply needs, investing in processing facilities where they can

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<sup>86</sup> See <https://fcf.com.tw> for further information on this company.

<sup>87</sup> See <https://trimarinegroup.com> for further information on this company.

<sup>88</sup> See <https://www.itochu.com/us/en/about/index.html> for further information on this company.

contract the production of pre-cooked tuna loins to offer to their clients, and even entering into a close partnership agreement with major tuna companies that own relevant brands in the marketplace. Both FCF Fishery Co. Ltd and Tri-Marine provide examples of this trend. In the case of FCF Fishery Co. Ltd., the company has operated tuna purse seine, and longline vessels through its subsidiaries. FCF Fishery Co. Ltd, is a shareholder on several tuna processing facilities in PNG and Thailand, and recently purchased Bumble Bee Seafood, a major tuna brand in the U.S. tuna market. In the case of Tri-Marine, the company was recently acquired by the Bolton Group, owner of major tuna brands, especially in the European Market, such as Rio Mare (Italy), Saupiquet (France), Isabel (Spain), and Wild Planet (U.S.). Similarly, Bolton Group acquired Conservas Isabel, which owns two processing plants in Spain (O’Grove in Galicia and Mundaka in the Basque Country) and one plant in Ecuador (Ecuadoriana).

### *Imports of Raw Frozen Tropical Tuna to Supply Thailand’s Tuna Processing Plants*

Thailand is the single largest importer of raw frozen tuna used for canning and the single largest exporter of processed tuna products in the world. However, sources differ regarding the specific quantity of raw frozen tuna imported into Thailand for processing annually. Table 14, Table 15, and Table 16 present the quantities of tuna imported into Thailand, all of which are discussed in greater detail below.

According to BACI data, in 2019 Thailand imported 546,933 mt of raw frozen tropical tunas. The top supplying countries to Thai processing companies (in order of importance by volume) were South Korea, Taiwan, the Federated States of Micronesia and the U.S., which collectively contributed 53 percent of Thailand’s tuna processing industry raw material requirements.<sup>89</sup>

These BACI data on imports differ from similar data reported by the TTIA based on Thai government statistics. The TTIA data indicate a total of 721,416 mt of raw frozen tropical tuna imported into Thailand under the same HS codes in 2019. According to the TTIA, the top supplying countries to Thai processing companies in 2019 were Taiwan, South Korea, the Federated States of Micronesia, and Kiribati (not the U.S.), which collectively contributed 58 percent of Thailand’s tuna processing industry raw material requirements. It is unclear why the BACI data and TTIA data differ to such a degree.<sup>90</sup> Based on detailed industry knowledge and comparison with other available data sources, and the fact that TTIA is generally considered a reliable source of trade data, imports are believed to be closer to those figures reported by TTIA.<sup>91</sup> Thus, for Thailand, this analysis relies on the TTIA data as the primary source used in this analysis.

A third source of tuna import data from the Department of Fisheries of Thailand indicates that the total volume of imported whole frozen tuna in 2019 was 769,468 mt, which is similar to but higher than the volume reported by the TTIA (both of which are larger than the volume reported in the BACI data). Again, the reasons for these differences are unclear and may include the factors identified relative to the TTIA data. This analysis relies on

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<sup>89</sup> Thailand's tuna processing industry also imports other tuna-like species, such as Tonggol tuna, which is not a true tropical tuna species, to complement its processing needs. In 2019, Thailand imported 2,183 mt of Tonggol tuna (GHA personal communication with Francisco Blaha, March 21, 2023).

<sup>90</sup> One possible explanation is that TTIA may be reporting values in HS Code version 2012. However, the specific HS code version is not identified in the data, and we thus assume the code used is the most recent version available at the time of the report (i.e., HS 2017). Another possible explanation may be that TTIA data could include container weights in the reported figures. However, treatment of container weights within the TTIA data are similarly unclear.

<sup>91</sup> Professional industry knowledge of Guillermo Gomez, GHA.

Department of Fisheries data when they provide information unavailable from the TTIA data, namely the relative proportions of tuna arriving in Thailand by reefer carrier vs. containers.

Table 14 presents TTIA's data on the total imports of tunas, showing the top 10 countries supplying tuna to the Thai tuna processing industry in the period 2019 – 2021.

**Table 14. Thailand: Raw Frozen Tropical Tuna Imports by Exporting Country, 2019 - 2021 (mt of product weight)**

Region	2019	2020	2021
<b>World Total</b>	<b>721,416</b>	<b>748,919</b>	<b>667,275</b>
<b>Top 10</b>	<b>571,122</b>	<b>611,707</b>	<b>598,361</b>
Taiwan	156,425	143,806	129,288
Micronesia	80,093	77,015	113,077
Nauru	13,904	56,052	68,698
S. Korea	117,787	70,370	66,062
Japan	29,296	41,448	41,769
Maldives	38,490	46,450	43,681
Kiribati	60,829	52,975	44,406
Vanuatu	17,199	51,738	40,836
China	31,905	39,218	18,909
Marshall Islands	25,194	32,635	31,635
Others	150,039	67,981	25,872

Source: IEC/GHA recreated from TTIA. 2023b. Thai Tuna Industry Association Annual Reports. Downloaded from <https://thaituna.org/main/informations/statistics/annual-report/>, April 17, 2023.

Note: Includes HS Codes: 0303.42, 0303.43, and 0303.44.

Apart from the Maldives (which conducts its harvest activities in the Indian Ocean), the top 10 suppliers to the Thai tuna processing industry all fish primarily in the Pacific Ocean, so it is reasonable to assume that most tuna imported by Thailand in 2019 originated in the Pacific. A more detailed discussion about the ocean origin of the tuna used by the tuna processing industry in Thailand is provided later in this section, but this report assumes that approximately 90 percent of the raw frozen tropical tuna imported into Thailand originated in the Pacific.

Table 15 presents TTIA data on Thailand's total raw frozen tuna imports by species, which highlights the importance of skipjack tuna for Thailand's canning industry. It also provides information on annual tuna loin

imports to supplement imports of raw frozen tuna for canning. Tuna loin imports are less important for the Thai canning industry than for the industries of countries like Spain and the U.S. which have higher labor costs.<sup>92</sup>

**Table 15. Thailand: Total Imports of Raw Frozen Tropical and Pre-Cooked Tuna Loins by Product, 2019 - 2021 (mt of product weight)**

Product	2019	2020	2021
Raw Frozen Yellowfin	105,348	113,959	101,375
Raw Frozen Skipjack	598,701	610,553	494,534
Raw Frozen Bigeye	17,112	24,414	28,504
<b>Total Raw Frozen Tuna</b>	<b>721,161</b>	<b>748,926</b>	<b>624,413</b>
<b>Tuna Loins</b>	<b>21,122</b>	<b>37,419</b>	<b>35,027</b>
<b>Grand Total (Whole Frozen Tuna + Loins)</b>	<b>742,283</b>	<b>786,345</b>	<b>659,440</b>

Source: IEC/GHA recreated from TTIA. 2023. Op. cit.

### *Logistics of Thailand's Tropical Tuna Imports*

As previously indicated, tuna traders organize the shipment of frozen tuna from the fishing grounds to the Thai ports where the processing companies have cold storage and processing facilities. The logistics of how fish move from the fishing grounds to the processors is a critical component of understanding the trade flows through Thailand's processing sector, and the magnitude and importance of Thailand within the international trade.

Table 16 shows the quantities of frozen tunas imported into Thailand by species and by transportation method. Fish are generally either transshipped into the reefer carrier<sup>93</sup> or the catch is off-loaded from the purse seine vessel at an intermediate, transshipping port facility (e.g., in FSM, the Marshall Islands, or the Solomon Islands), and placed inside refrigerated sea containers bound for Thailand.<sup>94</sup>

<sup>92</sup> Processing of raw tuna into tuna loins is labor-intensive, and thus expensive to do in countries with high costs of labor. As such, high labor cost countries will often import tuna in a loined form to avoid high costs of production. For countries with lower labor costs, like Thailand, it is cost effective to produce tuna loins domestically, and import of loins is thus not necessary.

<sup>93</sup> Purse seine fishing vessels typically transship the contents of their fishing vessel hold or wells to the cargo holds of reefer carriers. The fish is transported in bulk. If the reefer carrier transports frozen fish from more than one tuna purse seiner (which is normally the case), nets are used to divide the fish so that the transferred fish from one fishing boat does not get mixed with the fish transferred from other purse seine vessels. The fish is hoisted from the carrier vessel in nets using a crane that has an attached digital scale to weigh each load, and as the frozen fish moves from the fishing boat to the carrier, observers tally the fish and evaluate the quality, sizes, species composition, and weight of the fish being transferred.

<sup>94</sup> Purse seine fishing vessels can also unload their catch directly into a land-based cold storage facility where the fish is kept until it is subsequently placed into 40' sea containers or transferred into a reefer carrier. While these kinds of operations do happen, they are not common because they involve additional handling and storage costs that vessel owners and processors would prefer to avoid.

**Table 16. Thailand: Total Imports of Raw Frozen Tropical Tuna by Mode of Transportation, 2019 (mt of product weight)**

Species	HS Code	By Reefer Carrier (mt)	By Refrigerated Sea Container (mt)	Total (mt)
Skipjack Tuna	0303.43.00	542,733	100,836	643,569
Yellowfin Tuna	0303.42.00	75,403	34,154	109,557
Bigeye Tuna	0303.44.00	11,564	4,778	16,342
Total		629,700	139,768	769,468

Source: GHA personal communication with Francisco Blaha, March 21, 2023

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

According to the Department of Fisheries of Thailand, 769,468 mt of frozen tuna arrived in Thailand in 2019. Of this, 629,700 mt or 82 percent of the total were transported by reefer carrier while 139,768 mt or 18 percent entered the country by sea container.<sup>95</sup>

The following calculations serve to illustrate the magnitude of the logistics involved in shipping such large quantities of fish by these two transportation modes. Reefer carrier capacities can range from 1,000 to 10,000 mt. The smaller reefer carriers tend to move more sashimi-grade, longline caught tuna, whereas the larger carriers are more commonly used for purse seine-caught tuna. For moving purse seine-caught tuna, reefer carrier capacity ranges from 6,000 to 10,000 mt. Therefore, if we assume an average of 8,000 mt per carrier, it would have taken 79 carrier-trips (and the same number of transshipments) to deliver the approximately 630,000 mt to Thailand in 2019. To fully load an 8,000 mt reefer carrier with frozen tuna, it takes the catch of about seven tuna purse seiners, each with a typical carrying capacity of 1,200 mt. In other words, it would have required the total catch (full loads) of 525 large (1,200 mt capacity) tuna purse seine vessel trips to account for the 630,000 mt imported by reefer carriers into Bangkok, Thailand in 2019.

In addition to the reefer carriers, the equivalent of approximately 5,600 forty-foot sea containers was required to carry the nearly 140,000 mt of tuna arriving in Thailand by this transportation mode in 2019 (each container can hold an average of 25 mt). A line of 5,600 semi-trucks (each averaging 53 feet long) carrying these containers nose to tail on a highway would extend an estimated 56 miles.

<sup>95</sup> GHA personal communication with Francisco Blaha, March 21, 2023.

### *Ocean Origins of Thailand's Tropical Tuna Imports*

As discussed in previous sections, the Thai tuna industry imports tuna from the Atlantic, Pacific, and Indian Oceans. BACI and TTIA data do not specify the ocean of origin of Thailand's imported fish, yet understanding the quantity of fish being sourced from the Pacific is important to this analysis.

To estimate the proportion of fish likely to have originated in the Pacific, we begin by noting that the Maldives is the only non-Pacific country listed in the top ten suppliers to Thailand of raw frozen tuna, and they supplied just over five percent of Thailand's imports in 2019. Other non-Pacific supplying countries may be included in the "Others" category of the TTIA data, but details of this category are unavailable; based on the logic below, we estimate that about ten percent of all raw frozen tuna imported into Thailand derives from the Indian or Atlantic Oceans.

Industry experts estimate that in 2019, between 630,000 and 680,000 mt of the total of 721,000 mt of raw frozen tuna that arrived in Thailand may have originated from the Pacific Ocean.<sup>96</sup> This estimate includes 100 percent of the fish that arrived in Thailand by carrier vessel as reported by the Department of Fisheries of Thailand (629,700 mt; see Table 16). It also includes an additional 50,000 mt of the 139,768 mt of fish that arrived in Thailand via containers (see Table 16). The remaining approximately 90,000 mt of tuna arriving in Thailand via container very likely originated in the Indian Ocean. These estimates are based on the following considerations.

In general, tropical tunas caught in the Atlantic and Indian Oceans tend to be processed by tuna processors (including Thai tuna processors) that own facilities in these regions (in Ghana in the Atlantic Ocean and the Seychelles or Mauritius in the Indian Ocean). It makes economic sense to use processing plants in the vicinity of the catching areas, rather than shipping such fish thousands of miles to Bangkok for processing.<sup>97</sup> By this logic, fish shipped to Bangkok would most likely have been caught in the Pacific, not the Atlantic or Indian Oceans.

Major processors in other ocean areas, especially in the western Indian Ocean, run their own reefer fleet to supply their own processing centers, and these reefers generally do not go to Thailand. Some tuna from outside the Pacific may arrive in Thailand as container cargo, but tuna traders and their clients in Thailand prefer receiving their fish by reefer carriers, since it appears to be less expensive than receiving the fish via containers.<sup>98</sup> As shown in the Thai Department of Fisheries data, about 82 percent of the tropical tuna catches imported into Thailand arrive by reefer carrier, with only about 18 percent arriving by containers. This is consistent with the fact that few locations in the WCPFC convention area have the necessary port infrastructure to handle refrigerated sea containers and ocean carriers moving containerized cargo do not have regular port calls at many of the PICs, thus requiring a feeder service from these nations. This would add to the costs of shipping containers to Thailand from these regions and also make the service less reliable.<sup>99</sup> Some countries do

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<sup>96</sup> GHA personal communication with Francisco Blaha, March 21, 2023.

<sup>97</sup> This is not to say that such events do not take place when supply/demand conditions require them.

<sup>98</sup> GHA personal communication with Francisco Blaha, March 21, 2023, and MRAG Asia Pacific. 2019. WCPO Transshipment Business Ecosystem Study, October 2019. Downloaded from <https://mragasiapacific.com.au/wp-content/uploads/2021/12/Pew-WCPO-Transshipment-Report-final.pdf>, March 19, 2023, pg 28. The report identifies several benefits to using reefer carriers and suggests that this method is the most commonly used and preferred by tuna trading companies and their Thai clients. One benefit identified in the report is that it takes three to four days to unload the catch of a tuna purse seiner into a reefer carrier, compared to six to seven days to unload the fish into containers. In addition, carrier vessels offer a "door to door" service to the client.

<sup>99</sup> In the WCPFC, there are a few locations where tuna is loaded and shipped in containers; these are Majuro (Marshall Islands), Kosrae (FSM), Honiara (Solomon Islands), and Suva, (Fiji).



ship some of their tuna by container because they have the infrastructure and want to provide employment to local populations; this is the case at the ports of Majuro in the Solomon Islands and Kosrae in FSM.<sup>100</sup> In general, though, most fish are transshipped into carrier vessels.

## Export Level

### *Thailand's Exports of Raw Tropical Tuna for Processing Elsewhere*

In 2019, Thailand exported small amounts of its raw frozen tropical tuna imports for processing elsewhere; these exports represented about 1.8 percent of its total imports of raw frozen tuna. These quantities were received as imports, probably placed temporarily in cold storage, identified as more appropriate for processing or direct consumption elsewhere, and then exported, primarily to Vietnam and Japan, as shown in Table 17. Thai exports of frozen tuna to Japan may involve sashimi-grade fish received in Thailand that was suitable to be exported to Japan rather than canning. Thai exports of frozen tuna to Vietnam may involve product received in Thailand that was forwarded to a Thai-owned processing plant in Vietnam for processing there.

**Table 17. Thailand: Raw Frozen Tropical Tuna Exports by Importing Country, 2019 (mt of product weight)**

Importer	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye	Total	Percent
Vietnam	6,023	0	0	6,023	44%
Japan	3,860	78	0	3,938	29%
Italy	1,682	0	0	1,682	12%
Seychelles	786	0	0	786	6%
Spain	528	0	0	528	4%
Australia	0	311	0	-	2%
Philippines	67	0	0	67	0%
United Arab Emirates	19	42	0	19	0%
India	0	52	0	-	0%
Portugal	47	0	0	47	0%
Others	64	23	45	64	1%
<b>Total</b>	<b>13,076</b>	<b>507</b>	<b>45</b>	<b>13,627</b>	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

<sup>100</sup> GHA personal communication with Francisco Blaha, March 21, 2023.



*Thailand's Exports of Tropical Tuna Processed Products*

As in the case of Thailand's tuna exports, data reported by BACI and TTIA differ. The TTIA reports total exports of processed tuna products (HS Code 1604.14) of 532,880 mt versus BACI data of 484,690 mt, a difference of 48,190 mt. Thailand's exports of processed tuna products to certain individual countries, like the U.S., are closely aligned in the BACI and TTIA data (104,952 mt and 104,948 mt, respectively, in 2019). This suggests that reporting for certain trade partners to BACI may be incomplete.

As reported by the TTIA, Table 18 presents Thailand's total exports of processed tuna products (including tuna loins for further processing) under HS Code 160414 by world region for the period 2019 to 2021. Table 19 presents the same export data for processed tuna products by individual country for the top 10 countries.

**Table 18. Thailand: Exports of Processed Tuna Products by Importing Region, 2019 - 2021 (mt of product weight)**

Region	2019	2020	2021
World	532,880	582,745	471,017
U.S.A.	104,948	144,049	94,050
Middle East (15)	97,173	101,003	81,091
Africa	100,610	102,469	106,646
Latin America	47,413	62,644	35,039
Japan	35,741	40,132	39,925
Australia & Oceania	53,130	47,957	45,989
EU (28)	24,094	22,398	12,985
Other	69,771	62,093	55,292

Source: IEc/GHA adapted from TTIA. 2023b. Op. cit.

Notes: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species. However, it is unlikely that albacore loins are included in these exported quantities. Any small quantities of canned albacore were likely exported to the U.S.

Table 19. Thailand: Exports of Processed Tuna Products by Importing Country, 2019 - 2021 (mt of product weight)

Region	2019	2020	2021
World	532,880	582,745	471,017
<i>Top 10 Countries</i>	<i>358,392</i>	<i>426,989</i>	<i>336,932</i>
U.S. A.	104,948	144,049	94,050
Japan	35,741	40,132	39,925
Egypt	46,280	55,763	71,180
Australia	37,744	36,590	32,989
Canada	25,896	28,515	23,804
Saudi Arabia	30,668	36,062	22,278
Libya	38,232	33,737	19,449
Yemen	9,597	15,338	14,372
Peru	15,444	19,686	10,800
Chile	13,842	17,117	8,085
Others	174,489	155,757	134,085

Source: IEC/GHA recreated from TTIA. 2023b. Op. cit.

Notes: Includes prepared and preserved fish preparations (HS code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species. However, it is unlikely that albacore loins are included in these exported quantities. Any small quantities of canned albacore were likely exported to the U.S.

As reported for Thailand's raw frozen tuna imports, the volumes of processed tuna exported by Thailand in 2019 are enormous. For perspective, the nearly 533,000 mt of processed tuna products exported would have filled 21,320 semi-trucks, creating a line of trucks about 214 miles long.

The destination of these exports of canned finished products is affected by tariff and non-tariff considerations. Importing countries, particularly those that have small tuna processing interests, commonly protect their industries by establishing import duties/tariffs. Oftentimes, there are also quotas for importing canned tuna. This affects major tuna-exporting countries and Thailand is no exception.

The principal tuna importing country for Thailand's canned tuna is, by a large margin, the U.S. In 2019, the U.S. imported about 105,000 mt or about 20 percent of Thailand's total exports of 533,000 mt (Table 19). Imports of canned tuna into the U.S. are subject to a quota, based on the previous year's domestic canned tuna

production.<sup>101</sup> In addition, there are duties of six and 12 percent for tuna packed in water or vegetable oil. Thailand's exports, like those of many other countries that do not have a trade agreement with the U.S., are subject to these requirements. However, tuna exported as loins to the U.S. for canning are exempted from this duty.<sup>102</sup>

Thailand's canned tuna products are subject to a 24 percent duty in the E.U. Because of this, Thailand does not have a major presence in this market region.<sup>103</sup>

Thailand's other significant trading partners are Japan, Canada, Australia, and several Middle East countries such as Egypt, Saudi Arabia, Yemen, United Arab Emirates, and Israel. Finally, Thai processors have successfully penetrated some markets in Latin America, namely Peru, Argentina, and Chile. In addition, Thai canned tuna products packed under many private labels can be found in nearly every country around the world.

### Major Tuna Companies in Thailand

Datamyne data includes only limited information on Thailand at the company level. Shipper-consignee data are only provided as "mirror data" based on records provided by a few consignee countries, primarily the U.S. These data are provided in Table 20, which shows Thailand's top 10 companies exporting processed tuna products in 2019, primarily to the U.S. Although these data represent only 68,450 mt of the total exports of processed products exported from Thailand, they provide insight into some of the companies operating in this space and align with our professional knowledge and TIAA's identification of the key exporting companies of processed products.

Table 20 lists the top-tier tuna processing companies, namely Thai Union Group/Thai Union Manufacturing, Chotiwat Manufacturing Company (CMC), and Unicord Ltd., a subsidiary of SeaValue Co.<sup>104</sup> The second tier of Thai processing companies is represented by RS Cannery, MMP International, Tropical Canning Thailand, and Golden Prize Canning Co. Ltd. The top-tier companies are described briefly at the end of this section. Given Thailand's position of dominance in the processing of purse seine caught tuna, these companies represent some of the most important actors operating within the trade flows for the tropical tuna purse seine fisheries.

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<sup>101</sup> The U.S. quota for imported canned tuna is a limit on how much tuna can be imported at a lower duty; it is based on the previous year's canned tuna production by the U.S. If imports exceed the quota, they are subject to higher duties.

<sup>102</sup> Thai Union owns the Chicken of the Sea brand in the U.S. market, a major national brand for canned tuna, and packs tuna loins from Thailand at its facility in Lyons, Georgia.

<sup>103</sup> It should be noted that Thai Union Group, the largest Thai tuna processor, owns important brands in three major E.U. markets. In Italy, it owns the brand Mareblu, in France it owns Petit Navire, and in the UK it owns John West, all important national brands. To overcome the 24 percent duty in the E.U., these markets are supplied from tuna processing facilities that Thai Union owns elsewhere, like the Seychelles and Ghana, or from other facilities in which Thai Union Group is a partial owner (PNG, Indonesia, Vietnam). Tuna products originating from these locations are often eligible for zero duty.

<sup>104</sup> Two of the ten companies in Table 16, Trafigura PTE Ltd. and Ray-Mont Logistics, are logistics companies rather than tuna processing companies. They were likely contracted by some of the major processors to handle their export logistics.

Table 20. Thailand: Top Companies by Volume Exporting Processed Tropical Tuna from Thailand to the U.S., 2019 (mt of product weight)

Rank	Exporting Company	Quantity (mt)
1	Thai Union Group Public Company Lim	18,358
2	Trafigura Pte Ltd 10 Collyer Quay049315singaporesia*	7,739
3	Ray-Mont Logistics America Incon Behalf of Anchor*	6,745
4	Chotiwat Manufacturing Co. Ltd	6,418
5	Unicord Public Company Limited	6,359
6	Thai Union Manufacturing Company	6,045
7	R S Cannery Co. Ltd	4,895
8	Mmp International Co. Ltd	4,727
9	Tropical Canning Thailand Public	3,937
10	Golden Prize Canning Co. Ltd	3,227
Total for Top 10 Companies		68,450

Source: Datamyne

Notes:

1. As a point of reference, TTIA data indicate that the U.S. imported more than 104,000 mt of processed tuna from Thailand in 2019 (See Table 19).
2. Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.
3. Companies identified with an asterisk (\*) are logistics companies, rather than processors.

Datamyne data similarly does not capture the total volume of processed tuna products imported by the receiving companies. The availability of “mirror data” from the U.S. (the main market for processed products from Thailand), however, does provide insight into the U.S. companies specifically that are importing processed tuna from Thailand. Table 21 list the names of the top importing companies in the U.S. based on the available data.

Table 21. Thailand: Top Ten U.S. Companies by Volume Importing Processed Tuna from Thailand, 2019 (mt of product weight)

TOP IMPORTING COMPANIES	
USA	Qty (mt)
Chicken of the Sea International	19,266
Ocean S Brands Gp	6,394
The Tuna Store <sup>1</sup>	4,512
Bumble Bee Foods Llc	3,797
J A Kirch Corp	3,278
Acme Food Sales Inc	2,441
Safe Catch Inc	1,414
Starkist Co	1,353
Loblaw Company Limited	1,346
Rema Foods Inc 140 Sylvan	1,146
Total For Top 10 Companies	44,947

Source: Datamyne

Notes:

1. As a point of reference, TTIA data indicate that the U.S. imported more than 104,000 mt of processed tuna from Thailand in 2019 (See Table 19).
2. Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.
3. Datamyne entry of "The DNA Store" presumed to be a typographical error. Manually corrected to "The Tuna Store."

Even with the limited data available, the three major U.S. brands (Chicken of the Sea, Bumble Bee, and Starkist) appear amongst the top 10 companies. Given the volume of tuna processing occurring in Thailand and the U.S.'s position as the top importer of these processed products, these companies can be confirmed as occupying important positions in the global supply chain for purse seine-caught tuna.

### Top Three Tuna Processing Companies in Thailand

The three dominant tuna processing companies are Thai Union Group, Chotiwat Manufacturing Company (CMC), and Unicord Ltd./SeaValue Company. As the dominant processing companies in the largest processing country of Pacific-caught tropical tuna, these companies represent some of the most important actors in the trade flows associated with this fishery. These companies are described below.

### Thai Union Group

Thai Union Group (and its subsidiaries) is a publicly held company listed on the Thailand Stock Exchange. Most of the stock is held by the corporation's founders and current executive managers. The company has three divisions centered around seafood: the Shelf-Stable Seafood division, which includes tuna, sardines, salmon, mackerel, and herrings; a Frozen and Chilled Seafood and related division, which includes shrimp, salmon, and lobsters among other products; and, a Pet Care division, offering a line of seafood-based cat and dog food products.<sup>105</sup>

In 2017, Thai Union established a Global Procurement Team with the purpose of centralizing its purchasing power and reducing the risk associated with fluctuating tuna supplies in the different ocean regions. The group owns 17 production facilities in North America, Europe, Africa, and Asia, included among them 6 tuna processing facilities. Two of these facilities are in Thailand (Thai Union Manufacturing and Songkhla); Indian Ocean Tuna is in the Seychelles (350 mt/day); Pioneer Food Cannery is in Ghana (60 mt/day); Yueh Chyang Canned Food is in Vietnam (80mt/day); and, Juifta International Foods (30mt/day) is in Indonesia, and is a factory exclusively designed to produce albacore pre-cooked loins.<sup>106</sup>

The growth of Thai Union Group has been the result of the acquisition of assets and major brands in different markets. Over the years, Thai Union has acquired the following tuna-related assets and/or brands:

- In 1977, in partnership with Tri-Marine and Ed Gann,<sup>107</sup> Thai Union acquired the Chicken of the Sea label in the U.S. and a tuna processing plant in American Samoa.<sup>108</sup>
- In 2008, Thai Union became a major stakeholder in Yueh Chyang Canned Food Ltd., a Vietnam-based tuna producer.
- In 2009, Thai Union Group became a one-third owner of Moresby International Holding, a joint venture with Century Canning Corporation and Frabelle Fishing Company Ltd. (both Philippines tuna companies with processing plants in that country) and gave birth to Majestic Seafood Corporation, a tuna cannery in PNG.
- In 2010, Thai Union purchased MW Brands in Europe,<sup>109</sup> which included John West brand in the UK (30 percent share of that market), Mareblu in Italy (second major brand with 6 percent market share), and Petite Navire in France (approximately 32 percent of that market).<sup>110</sup>

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<sup>105</sup> For an excellent and detailed analysis of Thai Union Group's role in tuna fisheries globally and particularly in the Pacific, see Havice, E. and L. Campling. 2018. Corporate Dynamics in the Shelf-Stable Tuna Industry. Forum Fisheries Agency, Honiara, Solomon Islands. Downloaded from <https://www.ffa.int/system/files/Havice-Campling%202018%20Corporate%20Dynamics%20in%20the%20Shelf-stable%20Tuna%20Industry.pdf>, March, 15, 2023.

<sup>106</sup> Thai Union. 2023c. Company History. Viewed at <https://www.thaiunion.com/en/about/company/company-history>, April 26, 2023.

<sup>107</sup> Ed Gann was a very successful U.S. tuna boat owner based in San Diego.

<sup>108</sup> Hirsch, E. 2000. Thai Firm Takes control of Chicken of the Sea Brand. Los Angeles Times. December 27. Viewed at <https://www.latimes.com/archives/la-xpm-2000-dec-27-fi-5054-story.html>, April 26, 2023. Today, Chicken of the Sea Brand has a 15 percent share of the U.S. canned tuna market.

<sup>109</sup> MW Brands was restructured to become Thai Union Europe in 2010.

<sup>110</sup> Havice and Campling. 2018. Op. cit., pg. 28.

The global reach of Thai Union Group in the world tuna fisheries and markets is unquestionable. As previously mentioned, Thai Union has enjoyed close commercial links with both Tri-Marine and with FCF Fishery Co. Ltd., who over the years have been involved in supplying raw frozen tuna to Thai Union processing facilities in Thailand and around the world. The commercial links of Thai Union with the Taiwanese purse seine industry via FCF Fishery Co are extensive and these alliances are likely to continue.<sup>111</sup>

Thai Union, working with Pacifical, a global tuna market development company based in the Netherlands and an avid supporter of the Parties to the Nauru Agreement (PNA),<sup>112</sup> are currently packing tuna for Walmart's private label "Great Value." This product is MSC certified.<sup>113</sup> Similarly, Thai Union is engaged in negotiations for another toll packing arrangement under the auspices of The Nature Conservancy, where the company Pacific Island Tuna Provisions (PITP)<sup>114</sup> is sourcing MSC-certified fish from a group of 12 purse seine vessels fishing under the PNA. Six of these vessels are flagged under the Republic of the Marshall Islands and the other six under the FSM flag. PITP coordinates with the vessels to unload their catches either in Majuro, Marshall Islands, or in Kosrae, FSM. In these two locations, the fish is unloaded from the purse seine vessels into 40-foot refrigerated containers. Both locations are suitable for this, since their port facilities have the area necessary to conduct these operations and have electric plugs to connect the refrigerated containers until ocean vessels capable of transporting the containers call these ports. Currently, PITP sends these containers to processing facilities in both the Philippines and Thailand to process the fish into cans and pouches. The product is then exported to the U.S. and sold to Walmart also under its Great Value label. One of the goals of the PITP program is to also support PNA goals and to increase the local employment opportunities in the Pacific Island region by employing locals to unload the vessels and load the refrigerated containers.<sup>115</sup>

#### *Chotiwat Manufacturing Company (CMC)*

CMC and I.S.A SeaValue both contend for the position of second largest tuna processing company in Thailand in terms of processing capacity and global market reach. CMC was founded in 1960, with a plant producing steamed fish for the local markets and by the late 80s, it was selling frozen seafood products in Japan and subsequently to Europe and the Americas. In the late 90s and early 2000s, the company acquired and established several tuna processing plants. In 2004, the company launched a factory in which a variety of products are produced, such as canned tuna and salmon, pet food products and soups.<sup>116</sup> The company is capable of processing 362 mt per day and in 2021 processed 87,900 mt. In 2021 CMC, acquired 49 percent of PT Lautindo Synergy Sejhtera (LSS), an Indonesian processor and distributor of frozen trimmed tuna capable of processing

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<sup>111</sup> Havice and Campling. 2018. Op. cit., pg. 29.

<sup>112</sup> The PNA Agreement is a subregional agreement which set the terms and conditions for tuna purse seine fishing in the Pacific Island Region. The parties to the agreement are FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Solomon Islands and Tuvalu. FFA. 2023. Nauru Agreement. Viewed at: [https://www.ffa.int/nauru\\_agreement](https://www.ffa.int/nauru_agreement), March 20<sup>th</sup>, 2023.

<sup>113</sup> GHA personal communication, Cynthia Asaf, Pacific commercial manager, January. 26, 2023.

<sup>114</sup> For additional details viewed at: <https://www.pacificislandtuna.com/> accessed March 20<sup>th</sup>, 2023.

<sup>115</sup> GHA personal communication with Cary Gann, CEO Pacific Island Tuna Imports, February 9, 2023.

<sup>116</sup> For more details about the company, see <https://www.chotiwat.com/our-company/our-history/>.

12,700 mt of finished product per year.<sup>117</sup> This added production complements CMC's Thailand plant's raw material requirements. The company products are exported to over 50 countries around the world.<sup>118</sup>

One of Chotiawat's U.S. customers with 8.5 percent share of the U.S. sales is The Tuna Store, which sells MSC-certified tuna products. CMC packs the company's private label Ocean Naturals.<sup>119</sup> The company is part of Tri-Marine Group and sources its fish from U.S. flag vessels fishing in both the WCPFC and the IATTC convention areas. No information is readily available as to what ocean regions CMC sources its raw material from and it is not clear whether LSS raw material comes from both the Pacific and Indian Oceans. However, our estimate that most fish transported into Thailand via reefer carriers originates in the Pacific applies across the board to all Thai major tuna processors.

#### *SeaValue Co. (Unicord Ltd., and I.S.A. Value Co. Ltd.)*

SeaValue owns and operates four state-of-the-art tuna processing facilities, three of them in Thailand (under the subsidiaries Unicord Plc and I.S.A. Value Co. Ltd) and one facility with a 30 mt/day processing capacity in France. The processing capacity of the plants in Thailand is estimated at 750 mt/day.<sup>120</sup>

As mentioned before, SeaValue is one of the top three canneries in Thailand, tied in second place with CMC. The company produces canned and pouched tuna and is significantly involved in the production of petfood products. SeaValue works with all three major tuna trading companies to supply their raw material needs. In fact, amongst SeaValue's key partners, both Itochu and FCF Fishery Co. Ltd. are sitting in the SeaValue Group's organizational structure depicted in Figure 41 at a very high hierarchical level.

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<sup>117</sup> Stock News. 2021. "Chotiawat Manufacturing showing potential as Thailand's major integrated processor producer, aiming to develop and produce foods with innovations and safety to expand customer base." Viewed at <https://www.ryt9.com/en/prg/252676>, April 23, 2023.

<sup>118</sup> Tridge. 2023 Cotiwat Manufacturing Co., Ltd. Viewed at: <https://www.tridge.com/sellers/chotiawat-manufacturing-co-ltd#:~:text=Summary,capacity%20of%20362%20MT%2Fday>, April 23, 2023.

<sup>119</sup> Abrams World Trade Wiki. 2023. Chotiawat Manufacturing Co., Ltd. Viewed at: <https://en.abrams.wiki/Chotiawat-Manufacturing-Co-Ltd/3-NCTA3qWkpggz3WvplzNgRg>, April 23, 2023, and Fish Choice. 2023. The Tuna Store LLC. Viewed at <https://fishchoice.com/business/the-tuna-store-llc-0>, April 23, 2023.

<sup>120</sup> Sea Value. 2023a. Factories. Viewed at: <https://www.seavalue.eu/en/about-us/factories->, March 20, 2023



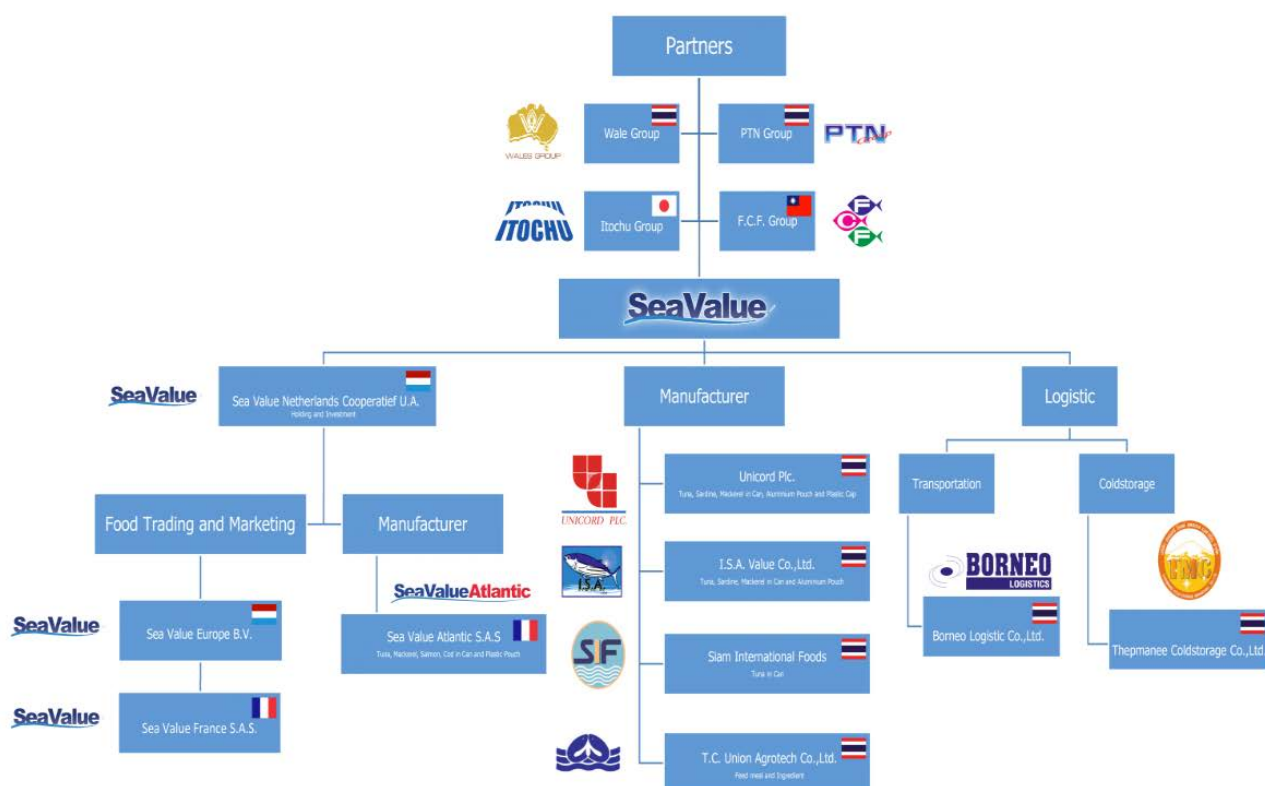


Figure 41. Sea Value Group Organizational Structure

Source: Sea Value. 2023b. About Us: Group Structure. Viewed at <https://www.seavalue.eu/en/about-us/group-structure>, March 25, 2023.

No information is available to confirm how much frozen tuna utilized by SeaValue and its subsidiaries is supplied by each of the two major trading partners, Itochu and FCF Fishery Co. Ltd.

The U.S. market is also targeted by SeaValue. SeaValue packed MSC-certified tuna for Walmart's Great Value brand for the first time in 2019; some of these products were chunk light (Skipjack) and some were albacore. According to Atuna, in 2018 Walmart sold an estimated 7 million cases of tuna or 104,000 mt from all sources.<sup>121</sup> As of 2020, It appears that SeaValue has continued to supply Walmart's private label with MSC-certified tuna.<sup>122</sup>

## Ecuador

Ecuador is a major catching, processing, and exporting country for tuna in the Pacific region and in the world. Of the approximately 3.3 million mt caught by the international fleet fishing in the Pacific in 2019, the Ecuadorian fleet caught approximately 322,000 or approximately 10.5 percent of all Pacific tuna catches, and 11.7 percent of the Pacific-wide tropical tuna catch; nearly all the Ecuadorian tuna catch was purse seine caught

<sup>121</sup> Atuna. 2019a. "Walmart introduces MSC Tuna competitively under Great Value." December.

<sup>122</sup> Atuna. 2020. Walmart Now 100% MSC for its Chunk Light. August.

tropical tunas. The Ecuadorian purse seine fleet consists of 108 vessels or 20 percent of the 551 tuna purse seiners fishing in the Pacific. Ecuador processed and exported approximately 238,000 mt of tuna products in 2019, making it the second-largest exporter of processed tuna after Thailand. Consequently, this country's role in the catch, processing, and export sectors makes it one of the four main hub countries in the tuna trade flows originating in the Pacific.

Figure 42 depicts the primary trade flows for purse seine caught tropical tuna that go through Ecuador's processing sector.

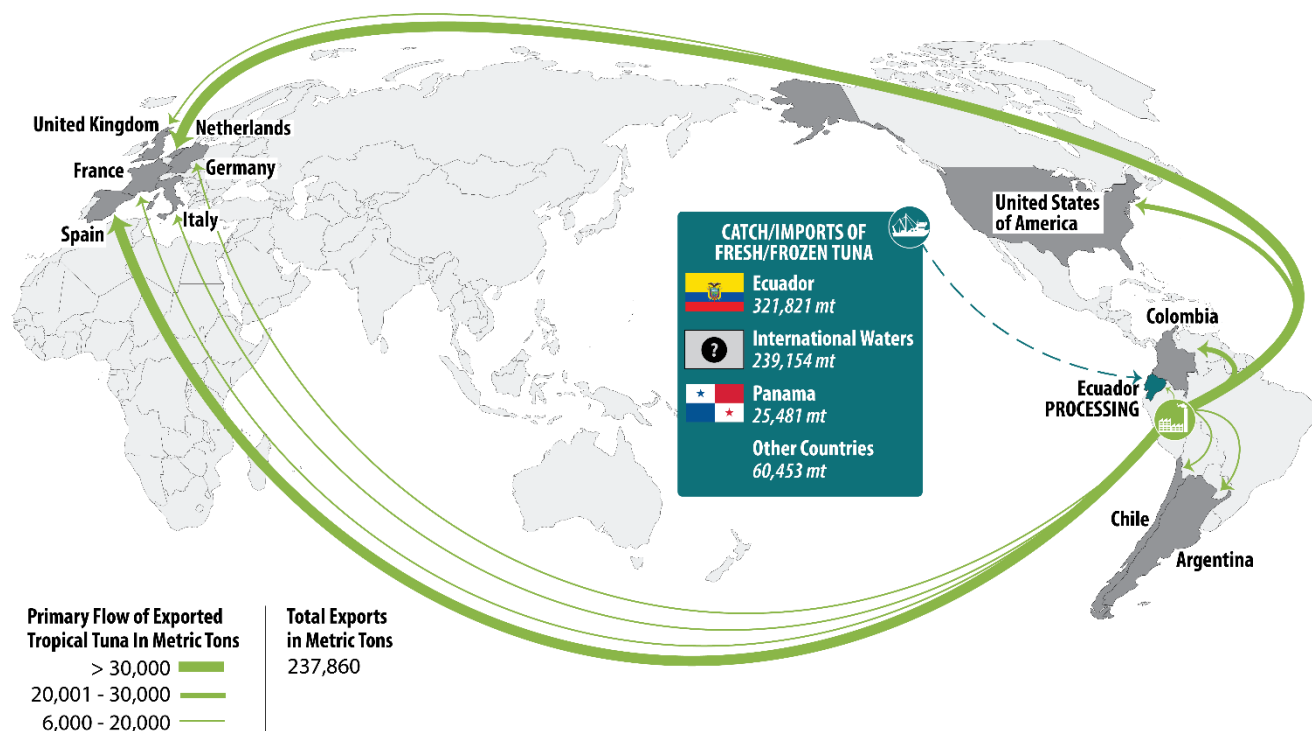


Figure 42. Primary Purse Seine-Caught Tropical Trade Flows via Ecuador

## Harvest Level

### Ecuador's Tuna Purse Seine Catch

In 2019, Ecuador was the top purse seine harvester of tropical tunas in the Pacific Ocean, with a catch of nearly 322,000 mt. Of this catch, skipjack tuna accounted for 230,386 mt or 72 percent of the total Ecuadorian tuna catch. Ecuador's fleet operates exclusively in the Pacific Ocean.

### Ecuador's Tuna Purse Seine Fleet

Ecuador has the largest tuna purse seine fleet operating in the Pacific, with most of the operations taking place within the IATTC convention area. According to the IATTC vessel register, the fleet comprised 108 tuna purse seine vessels (20 percent of the total Pacific purse seine fleet); these include large tuna purse seiners that are capable of operating in distant waters and smaller purse seiners that tend to operate within the country's 200-

mile Territorial Sea and around the Galapagos Islands.<sup>123</sup> Just a handful of Ecuadorian flag vessels engage in fishing operations both in the “overlapping area” where the IATTC Convention area and the WCPFC Convention area overlap, and in the WCPFC area itself (see Figure 7). Virtually all of Ecuador’s vessels deliver directly to ports in Ecuador; transshipping of Ecuadorian fish is uncommon.

As the largest harvester of purse seine caught tropical tuna in the Pacific, the companies associated with the Ecuadorian tuna fleet/catch are critical players not only in Ecuador’s fisheries but in the Pacific tuna fisheries as a whole. The RFMO catch data and vessel registries do not identify catch specific to individual vessels, but ownership of significant numbers of vessels is an indicator of the importance of certain companies in the fishery.

According to sources in Ecuador<sup>124</sup>, six vertically integrated companies own 47 large purse seiners (more than half of the Ecuadorian fleet). These six companies are: Servigroup (seven vessels), NIRSA (13 vessels), Eurofish (13 vessels), Marbelize (six vessels), Grupo Buehs-Manacripex (six vessels), and Pacific Tuna (two vessels).<sup>125</sup> Ecuador’s importance in harvest and processing make these vertically integrated companies key actors. The remaining vessels include small and larger purse seiners owned by many small companies that have commercial links to processing companies but are not vertically integrated.

### Processing Level

In addition to having the largest tuna purse seine fleet in the Pacific, Ecuador is one of the top three countries in terms of tropical tuna processing capacity in the Pacific region (along with Thailand and the Philippines). It is a key participant as an inbound importer of tuna caught in the WCPFC and IATTC that it uses for processing, and as an outbound exporter of processed cooked loins and canned/pouched tuna products to major markets. Currently, nearly one quarter<sup>126</sup> of the purse seine caught tuna in the Pacific that is used to produce canned or pouched tuna moves through Ecuador.

Ecuador’s processing sector is primarily aimed at European markets. This sector focuses on the production of canned and pouched product, as well as tuna loins for final processing elsewhere. The country’s tuna processing plants are characterized by a high degree of vertical integration and are supplied by catches of Ecuadorian vessels and imports of raw, frozen fish caught by other countries’ fleets. The following sections describe in more detail these characteristics of Ecuador’s processing sector.

### *Ecuador’s Tuna Processing Capabilities*

Ecuador is second only to Thailand with respect to tuna processing output in the Pacific as a whole.<sup>127</sup> It is the country with the most tuna processing capacity in the Eastern Pacific, with 19 tuna processing plants;<sup>128</sup> industry

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<sup>123</sup> Ecuador does not claim a 200-mile EEZ, but rather a 200-mile territorial sea over which the country claims full sovereignty rights.

<sup>124</sup> Ministerio de Comercio Exterior. 2017. Op. cit.; and Tuna Cons. 2023. Vessels of Tunasons’ Companies. Viewed at <https://tunacons.org/fleet/>, April 23, 2023.

<sup>125</sup> TUNACONS. 2023a. Vessels of TUNACONS’ Companies. Viewed at <https://tunacons.org/fleet/>, April 26, 2023.

<sup>126</sup> Calculation: Domestic catch of 322,000 mt plus Pacific imports of about 287,000 mt of raw frozen tropical tuna divided by the total Pacific purse seine catch of 2.7 million mt equals 23 percent. Pacific imports calculated as 88 percent of total Ecuadorian imports of approximately 325,000 mt.

<sup>127</sup> The Philippines almost ties Ecuador for second place.

<sup>128</sup> Ministerio de Comercio Exterior. 2017. Op. cit.

observers estimate that Ecuador has a combined processing capacity of close to 800 mt per day.<sup>129</sup> Ecuador's tuna products are exported primarily to the E.U. and the U.S., with additional volumes destined for Latin American markets.

Table 22 presents the ownership, location, and types of tuna products processed in Ecuador's tuna processing plants in 2017.

**Table 22. Ecuador: Tuna Processing Plants, 2017**

Company	Location		Product Type
A Siservy S.A.	Jaramillo	Manabí	Loins and Canned Tuna
Bilbosa S.A.	Montecristi	Manabí	Loins
Eurofish S.A.	Manta	Manabí	Loins and Canned Tuna
Galapesca S.A.	Guayaquil	Guayas	Canned Tuna
Ideal Cia. Ltda.	Manta	Manabí	Loins and Canned Tuna
Inepaca	Manta	Manabí	Canned Tuna
Conservaisabelecuadorianas.A.	Manta	Manabí	Canned Tuna
Marbelize S.A.	Manta	Manabí	Loins and Canned Tuna
Negocios Industrialesreal N.I.R.S.A. S.A.	Posorja	Guayas	Loins and Canned Tuna
Pespesca	Montecristi	Manabí	Loins
Salica Del Ecuador S.A.	Posorja	Guayas	Loins and Canned Tuna
Seafman Sociedad Ecuatoriana Dealimentos Y Frigoríficos Manta Ca	Manta	Manabí	Loins and Canned Tuna
Tecnica Y Comercio De La Pesca C.A. Tecopesca	Manta	Manabí	Loins and Canned Tuna
Serviterra S.A.	Monteverde	Santa Elena	Loins, Canned and Pouched Tuna
Envasur S.A	Valdivia	Santa Elena	Canned Tuna
Incopes Cia Ltda	Guayaquil	Guayas	Canned Tuna
Olimar	Manta	Manabí	Canned Tuna
Conservera Tropical	Manta	Manabí	Loins
Celdemar Elaboradosdel Mar S.A.	Santa Elena	Santa Elena	Canned Tuna

<sup>129</sup> GH A personal communication with Ecuadorian tuna industry representatives Guillermo Moran (Director of TUNACONS) and Rafael Trujillo (Executive Director of the Camara Nacional de Pesquerías of Ecuador), February/March 2023.

Company	Location	Product Type
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Sources: Ministerio de Comercio Exterior. 2017. Report of the Ecuadorian Tuna Sector. August; TUNACONS. 2023b. Multiple pages. Viewed at Tunacons.org, April 17, 2023.

### *Total Imports of Raw Frozen Tropical Tuna to Supply Ecuador's Tuna Processing Plants*

Virtually all of Ecuador's harvest of tropical tuna (nearly 322,000 mt) is caught in the IATTC convention area and offloaded directly in Ecuadorian ports to supply the country's processing plants. Ecuador's large tuna processing capacity, however, cannot be supplied by Ecuadorian catches alone. As such, Ecuador's processors import significant volumes of raw, frozen tuna each year to support their operations.

According to BACI data, in 2019, Ecuador imported 47,339 mt of whole, raw, frozen tropical tunas for processing. However, as discussed in Chapter 3, Datamyne data report that Ecuador imported far more (approximately 325,088 mt of raw, frozen tropical tunas in 2019). Of this, 239,154 mt were identified as supplied not by a specific country, but from "International Waters." The remainder of the Ecuadorian imports of raw frozen tuna were from identified supplying countries. Based upon detailed knowledge of the industry and of tuna trade in Ecuador in particular, and the fact that Datamyne data from Ecuador are based upon detailed customs records and considered comprehensive, we believe that the Datamyne data may more accurately reflect the actual imports of raw frozen tuna into Ecuador.<sup>130</sup> We thus rely on the Datamyne data for subsequent analysis for Ecuador.<sup>131</sup> However, the significant discrepancy between data reported in BACI and customs records reported in Datamyne suggest the potential for reporting misalignments (e.g., differences between sources in whether container weights are included within the reported values), flaws in BACI's logic in selecting which trade partner's records to rely on, or accidental or intentional misreporting.

According to Datamyne (rather than BACI) data, the main supplying countries were "International Waters" with 239,154 mt or 73 percent of the Ecuador's total import of raw frozen tuna for processing; Panama (25,481 mt or 7.8 percent); Nicaragua (6,210 mt or 1.9 percent); El Salvador (6,305 or 1.9 percent); Venezuela (4,887 mt or 1.5 percent); Kiribati (2,727 or 0.9 percent); the U.S. (2,680 mt or 0.9 percent); and Colombia (2,637 mt or 0.9 percent).

In general, Ecuador's imports of raw frozen tuna from the WCPFC area were transshipped, arriving in Ecuador by reefer carrier or container, while most of its raw frozen tuna imports from the IATTC area were delivered directly by the fishing vessels into Ecuadorian ports.

### *Ocean Origins of Ecuador's Tropical Tuna Imports*

Like Thailand, Ecuador processes tuna sourced from all three ocean areas, i.e., the Pacific, Atlantic, and Indian Oceans. As discussed in Chapter 3, the BACI and Datamyne do not identify the origin of the fish by ocean area. Further analysis, however, indicates that approximately 88 percent of the volume of frozen tropical tunas imported into Ecuador in 2019 likely originated from the Pacific Ocean. The justification for this conclusion is discussed below.

<sup>130</sup> Professional industry knowledge of Guillermo Gomez, GHA.

<sup>131</sup> Ecuador is one of the countries that regularly reports comprehensive customs data to Datamyne and thus coverage within the system is considered robust and complete.

Because our primary data sources do not specify the ocean of origin for tuna and tuna products imported by any country, we rely on our detailed knowledge of the industry and other available data to inform reasonable assumptions as to how much of Ecuador's imported tuna originates from the Pacific.<sup>132</sup> Insight is provided by Datamyne data on the countries and companies exporting to Ecuador, combined with knowledge of the areas of operation for their respective tuna fleets.

Although Ecuador imported raw frozen tuna primarily from Latin American countries fishing in the IATTC region, it also received imports from vessels flagged operating in the WCPFC area, from countries like Kiribati, New Zealand, and Korea, and under the opaque category of "International Waters." Per Datamyne, of the countries supplying Ecuador with raw frozen tropical tuna for processing, the fleets of Panama (25,481 mt), Nicaragua (6,210 mt), Venezuela (4,887 mt), Colombia (2,637 mt),<sup>133</sup> El Salvador (6,305 mt), Guatemala (212 mt), Kiribati (2,727 mt), New Zealand (891 mt), and the U.S. (2,680 mt) are known to fish exclusively in the Pacific Ocean. Ecuadorian imports of raw frozen tuna from these countries were assigned as originating in the Pacific. Of Ecuador's total imports of 325,088 mt of raw frozen tropical tuna, these Pacific-only fishing countries account for approximately 52,030 mt.

In addition, one reference consulted suggests that out of Korea's global purse seine fleet (which it identifies as having 28 vessels), four vessels fish in the Atlantic, typically delivering their fish to Ghana and two vessels fish in the Indian Ocean, typically delivering their fish to the Seychelles. The remaining 21 vessels fish in the Pacific, so it is likely that any Korean purse seine fish imported into Ecuador derives from the Pacific. Ecuadorian imports from Korea totaled 1,794 mt, which can be added to the previous subtotal of 52,030 mt, so the total imports from these Pacific fishing countries comes to 53,824 mt, out of Ecuador's total raw frozen tropical tuna imports of 325,088.

The fleets of many countries supplying Ecuador with raw frozen tropical tuna for processing are known to operate exclusively in the Indian or Atlantic Oceans; these include (in alphabetical order) Bahamas, Belize, Brazil, Cape Verde, Cote d'Ivoire, the Dominican Republic, France, India, Malta, Senegal, and the Seychelles. In addition, although Spain has a few tuna purse seine vessels (13) operating in the Pacific Ocean (both in the IATTC and WCPFC areas), most of its vessels operate in the Indian and Atlantic oceans. Therefore, most of the tuna imported by Ecuador from Spain is also likely to have originated from Spanish catches outside of the Pacific. Ecuadorian imports of raw frozen tuna from these countries were considered non-Pacific tuna and were eliminated from further consideration in this study. Of Ecuador's 2019 total imports of 325,088 mt of raw frozen tropical tuna, these non-Pacific fishing countries account for approximately 31,290 mt.

As previously noted, the majority of Ecuador's imports of raw frozen tuna for processing are identified as coming from "International Waters." Our analysis indicates that most, if not all of these imports consist of Pacific fish, as explained below.

Review of the names of the shipping companies supplying tuna to Ecuador from "International Waters" indicated that nearly all of these were based in the Pacific region or linked to companies that primarily operate in the Pacific. This review identified only a few companies (Mayte Business, Inc., Atunsa, Internatuna NV, and Compagnie Française) that we believe likely supplied raw frozen tuna from the Atlantic or Indian Oceans.

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<sup>132</sup> As discussed previously, 100 percent of the tuna caught by Ecuador itself originates from the Pacific.

<sup>133</sup> Professional industry knowledge of Guillermo Gomez, GHA indicates that 10 Colombian flagged tuna purse seine vessels are controlled by a single company, Seatech, although registered under multiple Panamanian companies. These vessels fish in the Pacific and sell directly to Ecuadorian processors and/or transship their catch to Colombia via Ecuadorian ports.



Imports from these companies totaled about 6,000 mt, which represents only 2.5 percent of the approximately 239,000 mt of imports from “International Waters.” Therefore, we assume that about 233,000 mt of Ecuador’s imports of raw frozen tuna from “International Waters” is likely to have originated in the Pacific.

In conclusion, considering the 2019 Ecuadorian imports from countries fishing exclusively or nearly exclusively in the Pacific (53,824 mt) and the approximately 233,000 mt of Ecuadorian imports from Pacific “International Waters,” we estimate that about 287,000 or 88 percent of the approximately 325,000 mt of raw, frozen tropical tuna imported into Ecuador in 2019 likely originated in the Pacific, with the primary suppliers being “International Waters” and Latin American countries fishing in the IATTC area.

## Export Level

### *Ecuador’s Exports of Raw Tropical Tuna for Processing Elsewhere*

Ecuador does not export significant quantities of whole frozen tropical tunas. According to BACI data, in 2019, Ecuador exported 16,877 mt; these exports were primarily sent to El Salvador, Peru and Spain, which received 83 percent of this total.<sup>134</sup> Such imports were primarily associated with price differentials for particular species and sizes of the fish (especially larger yellowfin) that command higher prices in these countries.

### *Ecuador’s Exports of Tropical Tuna Processed Products*

In 2019, the processing of Ecuador’s catch in the Pacific of approximately 322,000 mt, together with the estimated imports of frozen tropical tunas of 325,088 mt for processing, made the country the second largest tuna exporting country in the world, second only to Thailand.

Ecuador’s domestic market for tuna products is relatively small, but important for certain companies.

According to BACI data, Ecuador exported a total of 237,860 mt of processed tuna products (HS code 1604.14). This includes canned and pouched tuna products and pre-cooked, frozen tuna loins, which represent a partially processed product that is subsequently used to fill cans.

Table 23 shows Ecuador’s 2019 tropical tuna exports of processed tuna products by the countries importing the product.<sup>135</sup>

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<sup>134</sup> Datamyne shows raw whole tuna exports of 9,435 mt in 2019, mainly to Spain and Peru.

<sup>135</sup> Processed products include all tuna products under HS code 1604.14, which include canned and pouched tuna products and pre-cooked processed tuna loins used for subsequent canning.

Table 23. Ecuador: Processed Tropical Tuna Exports from Ecuador by Importing Country, 2019 (mt of product weight)

PROCESSED			
Importer	Quantity (mt)	Percent	Cum. Percent
Spain	66,703	28%	28%
Netherlands	34,330	14%	42%
USA	22,038	9%	52%
Colombia	20,523	9%	60%
Italy	16,530	7%	67%
United Kingdom	12,024	5%	72%
Germany	11,179	5%	77%
France	10,993	5%	82%
Argentina	8,959	4%	85%
Chile	6,774	3%	88%
Others	27,807	12%	100%
Total	237,860		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Ecuador's tuna industry, since its beginnings in the early 1950s, has been oriented toward catching, importing, and processing tuna for export to international markets. Over the years, Ecuador's tuna development has been significantly influenced, first by the presence of U.S. tuna interests throughout the early 1950s and into the early 1980s, and subsequently by the European presence, mainly of Spain, from the mid to late 1980's to the present day.

As previously noted, about one quarter<sup>136</sup> of the purse seine caught in the Pacific that was used to produce canned or pouched tuna was processed Ecuador in 2019. Both BACI and Datamyne data indicate that approximately 238,000 mt of processed tuna products were exported from Ecuador in 2019, primarily to the E.U. and U.S. markets. Approximately 19 percent of these export products consisted of tuna loins for subsequent processing elsewhere (see Eurostat and NMFS trade data below).

<sup>136</sup> Calculation: Domestic catch of 322,000 mt plus Pacific imports of about 287,000 mt of raw frozen tropical tuna divided by the total Pacific purse seine catch of 2.7 million mt equals 23 percent. Pacific imports calculated as 88 percent of total Ecuadorian imports of approximately 325,000 mt.



Today, Ecuador remains an important supplier of primarily pouched tuna to the U.S. market, primarily provided by a tuna processing facility (Galapesca) linked to the Starkist/Dongwon Group of Korea. NMFS data for U.S. tropical tuna processed product imports from Ecuador indicate 22,054 mt<sup>137</sup> in 2019, with 20,515 mt in the form of pouched or canned products and the remainder (1,539 mt) in the form of tuna loins for subsequent processing.

Ecuador has also become the main supplier of both pre-cooked frozen tuna loins and canned tuna products to the E.U., with commercial linkages to various tuna Spanish tuna processing interests associated with the Bolton Group and Grupo Albacora, and the trading company Tri-Marine International (also owned by the Bolton Group).

Eurostat 2019 data indicates that the 27 E.U. countries imported the following from Ecuador:

- 104,660 mt of canned/pouched tuna products. The top importing European countries were Spain, the Netherlands, Germany, France, and Italy.
- 43,914 mt of tuna loins. The primary importing European countries were Spain and Italy.

This is not to minimize the importance of local Ecuadorian companies that are not owned or controlled by foreign companies, such as Negocios Industriales Real, S.A. (NIRSA), Asiservi, Marbelize, and other vertically integrated tuna fishing and processing companies, which represent a significant market share of the total harvesting and production of Ecuadorian tuna and tuna products. Because the Ecuadorian domestic market is limited, some of these locally owned tuna companies have developed strong markets in Chile, Argentina, and other Latin American countries for their canned tuna products.

### Major Tuna Companies in Ecuador

As previously noted, six vertically integrated companies in Ecuador are the owners of nearly half of the Ecuadorian fleet: Servigroup, NIRSA, Eurofish, Marbelize, Grupo Buehs-Manacripex, and Pacific Tuna. All the vessels owned by these companies have been certified by the Marine Stewardship Council (MSC) for yellowfin and are seeking MSC certification for skipjack tuna. Given Ecuador's prominence in the purse seine harvest of tropical tunas, these companies represent key actors in the global supply chain for this fishery.

Based on Datamyne data, which appears to be comprehensive and reliable for the Ecuadorian tuna industry, Table 24 lists the top 10 Ecuadorian exporting companies. These companies together exported nearly 200,00 mt or 83 percent of the approximately 238,000 mt of processed tuna products exported from Ecuador in 2019. Each of these 10 companies has established commercial linkages in the markets they serve. Important companies at the processing level include the following:

- Vertically integrated companies commercially controlled by Spanish interests, especially Salica de Ecuador and Conservas Isabel Ecuatoriana;
- Companies controlled by U.S. interests (Dongwon-Starkist/Korea);
- Vertically integrated Ecuadorian companies (NIRSA, Asiservi, Marbelize) not controlled by foreign interests; and

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<sup>137</sup> BACI data indicate 22,038 tons imported from Ecuador into the U.S. in 2019.

- Tri-Marine, which is significantly involved in supplying imported tuna to Ecuador from the WCPFC and other areas (“International Waters”).

Table 24. Ecuador: Top Tropical Tuna Exporting Companies by Volume, 2019 (mt of product weight)

Rank	Exporting Company	Quantity (mt)
1	Galapesca S.A.	37,930.18
2	Salica Del Ecuador S.A.	29,057.58
3	Eurofish S.A.	22,367.80
4	Negocios Industriales Real N.I.R.S.A. S.A.	21,526.43
5	Tecnica Y Comercio De La Pesca C.A. Tecopesca	21,344.13
6	Conservas Isabel Ecuatoriana Sa	17,353.87
7	Marbelize S.A.	16,448.31
8	Seafman Sociedad Ecuatoriana De Alimentos Y Frigorificos Manta Ca	16,028.53
9	Asiservy S.A.	8,503.34
10	Pespesca S.A.	7,553.78
Total of Top 10 Companies		198,113.95

Source: Datamyne

Note:

1. As a point of reference, BACI data report that Ecuador exported more than 237,000 mt of processed tuna products in 2019. (See Table 23)
2. Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Looking at Ecuador’s tropical tuna trade from the market point of view, Table 25 lists the top buyers of Ecuador’s processed tuna (canned and loins under HS code 1604.14) in its main markets, showing the names of the importing companies and quantities of Ecuador’s processed products imported in 2019.

Table 25. Ecuador: Top Importers of Processed Tuna by Volume from Ecuador, 2019 (mt of product weight)

Spain - Company	Spain - Quantity (mt)	Netherlands - Company	Netherlands - Quantity (mt)	USA - Company	USA - Quantity (mt)	Colombia - Company	Colombia - Quantity (mt)	Italy - Company	Italy - Quantity (mt)
FRINSA DEL NOROESTE	10,975	LIDL STIFTUNG CO KG	14,100	STARKIST CO. C/O DSC LOGISTICS	18,705	LIDL STIFTUNG CO KG	5,252	TRI-MARINE EUROPE, SPA	5,173
SALICA INDUSTRIA ALIMENTARIA SA	7,574	LIDL STIFTUNG AND CO. KG	1,899	STARKIST CO.	6,533	KOBA COLOMBIA S A S	5,068	SALICA INDUSTRIA ALIMENTARIA SA	1,422
JEALSA RIANXEIRA, S.A.	4,880	DHL FOOD SERVICES GMBH	1,291	STARKIST CO	1,770	TRILLADORA LA MONTANA S.A.S	3,250	BOLTON FOOD SPA	950
MARPESCA EUROPA S.L	4,376	FRINSA DEUTSCHLAND GMBH	858	STARKIST CO C O DSC LOGISTICS	1,165	SOBERANA S.A.S.	3,142	TRI-MARINE EUROPE, S.P.A	591
CONSERVAS SELECTAS DE GALICIA S.L.	4,181	PRINCES FOODS B.V.	796	TRI-UNION SEAFOODS LLC D.B.A,	986	SUPERTIENDAS Y DROGUERIAS OLIMPICA S.A.	2,215	NINO CASTIGLIONE SRL	432
CALVO CONSERVAS S.L.U.	3,059	GLOE & ZEITZ INTERNATIONAL B.V.	444	CHICKEN OF THE SEA INTERNATIONAL	428	GOOD PRICE CORPORATION S.A.S.	1,413	IGINO MAZZOLA SPA	322
ACTEMSA S.A.	2,137	METRO LOGISTICS GERMANY GMBH	386	TRI UNION FROZEN PRODUCTS INC	337	COLOMBOESPANOLA DE CONSERVAS LIMITADA	1,247	FRINSA ITALIA SRL	272
LIDL STIFTUNG CO KG	1,825	IGNACIO GONZALEZ MONTES S.A.	232	FRINSA DEUTSCHLAND GMBH	278	COLOMBOESPA?OLA DE CONSERVAS LTDA	1,032	MENU SRL	103
NUDISCO S.L.	1,487	FRINSA DEL NOROESTE	223	LVDH USA	276	COMERCIALIZADORA LUHOMAR SAS	970	PREGIS SPA	102
REDISCO ALIMENTACION SL	1,331	AES BV	190	CHICKEN OF THE SEA FROZEN FOODS	265	CONSERVAS HERSAN SL	776	MA.PR.I.COM. S.P.A.	93

Source: Datamyne

Note:

1. As a point of reference, BACI data report that Spain imported approximately 66,700 mt of processed tuna products from Ecuador in 2019; the Netherlands imported 34,300 mt; the U.S.A. imported 22,000 mt; Colombia imported 20,500 mt; and Italy imported 16,500 mt. (See Table 23)
  2. Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.
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The companies listed in Table 25 are major buyers in the primary world retail markets. They sell tuna processed in Ecuador in these markets, and many have strong commercial linkages with specific companies in Ecuador. Important observations regarding these linkages and the key actors within this market include:

- Frigoríficos del Noroeste (FRINSA), a major importer of processed tuna loins and private label tuna products located in Galicia, Spain, enjoys commercial links with three major Ecuadorian processors, Asiservy, S.A., Eurofish S.A. and TECOPESCA. FRINSA also produces private labels for some of France's major retailers.
- Another major Spanish tuna processor buying processed product from Ecuador is Jealsa Rainxera, another Galicia-based tuna processor, which sells tuna under its own label (Rainxeira) and supplies the private label canned tuna for Mercadona, the single largest retailer in Spain.
- Salica Industria Alimentaria is the parent company of Salica de Ecuador, both subsidiaries of the Albacora Group in Spain, a major vertically integrated tuna company. Salica sells canned tuna products under its own Campos brand, but also packs tuna for El Corte Ingles, a major department store/retailer in Spain.
- In the case of the Netherlands, there are commercial relationships established between some major retailers (or their local subsidiaries) like LIDL and Metro, and Negocios Industriales Real (NIRSA), who produces canned tuna for these brands.
- Looking at the processed tuna of Ecuador going into the Italian market, one can see the commercial links clearly established and organized by the parent company Bolton Group. For instance, Tri-Marine, owned by the Bolton Group, owns Seafman Sociedad Ecuatoriana, where tuna loins are processed. This processing plant is supplied by fish traded by Tri-Marine International and/or from its own tuna purse seine vessels. These loins are sent to a processing plant owned by Bolton Group in Italy where their major brand Rio Mare is produced.
- For the North American market, Galapesca is a processing facility historically linked to Starkist, a major U.S. brand now owned by the Korean Dongwon group. This group processes tuna products in Ecuador that are shipped to the U.S. market, mostly in a pouched presentation.

Table 26 identifies the top Ecuadorian tuna harvesting and processing companies, their commercial affiliation and the brands they own or supply in the domestic and foreign markets. These are the most influential actors in the Ecuadorian industry; furthermore, because of Ecuador's dominance in the Pacific at both the catch and processing levels and because they are linked to key European retailers and tuna companies, including Bolton Group, these are major actors in the region's tropical tuna trade flows.

Table 26. Ecuador: Top Companies in the Ecuadorian Tuna Industry at the Processing and Fleet Levels, 2019

Company Name	Processing Capacity mt/day	Fleet (No. of Vessels)	Exports of Tuna Loins/ Canned/Pouch HS Code 1604.14 (mt of product weight)	Controlling Interests	Other Relevant Commercial Affiliations	Retail: National Brands and Private Labels
Galapesca	180		37,930	Dongwon-Starkist (U.S. / Korea)	Starkist brand in US	In U.S.: Starkist
Salica de Ecuador	250		29,058	Salica Industria Alimentaria/ Albacora Group (Spain)	Salica Industria Alimentaria and Jealsa (Spain)	Salica has packs for own National Brand Campos and Private Label for El Corte Ingles (Spain)
Eurofish	350	13	22,368	Ecuadorian owned	Exporter with commercial links with major European Retailers and National Brands	US Food Service: Empress; UK: Princes and Private labels for Tesco, Morrisons, ASDA; France: Metro Chef; Italy: Palmera; Spain: Isabel
NIRSA	400	13	21,526	Ecuadorian owned	Commercial Links with Major E.U. and U.S. Brands; and Retailers in Argentina and Chile	NIRSA sells canned tuna worldwide (35 countries). U.S. and the E.U. as main partners in private labels.
Tecopesca	230		21,344	Ecuadorian owned	Supplier of pre-cooked loins to Frigorificos del Noroeste (FRINSA) (Spain)	FRINSA processes canned tuna products for their own brand (Riveira) and for Private Labels in the UK, French, and German markets.
Conservas Isabel Ecuatoriana	170		17,354	Bolton Group	Supply links to Bolton Group which owns tuna purse seine vessels, processing plants, and major national brands in the	National Brands Isabel and Cuca in Spain

Company Name	Processing Capacity mt/day	Fleet (No. of Vessels)	Exports of Tuna Loins/ Canned/Pouch HS Code 1604.14 (mt of product weight)	Controlling Interests	Other Relevant Commercial Affiliations	Retail: National Brands and Private Labels
					Italian, Spanish, French, UK, and U.S. markets.	
Marbelize	250	6	16,448	Ecuadorian owned	Links with Salica Industria Alimentaria, FRINSA and Tri-Marine (Bolton Group)	70% of Marbelize's revenues are from exports with Salica, Delina GMHB (Germany); FRINSA Deutschland GMHB (Germany) FRINSA; Redisco (Spain); Amati (Italy); Tri-Marine (Panama). Tadel (Spain); Conservas Hersan (Spain) Bilbao Peru (Peru).
Seafman	135		16,029	Bolton Group/ Tri-Marine	Supply links to Bolton Group which owns tuna purse seine vessels, processing plants, and major national brands in the Italian, Spanish, French, UK, and U.S. markets.	Major European national tuna brands: Rio Mare, Saupiquet, Isabel, Cuca, Palmera, and Wild Planet (US)
Asiservy	120		8,503	Ecuadorian owned	Supplier of pre-cooked tuna loins from both domestic Ecuadorian production and imports	Commercial links with ACTEMSA SA., a Spanish tuna trader/broker that also works with Jealsa, which supplies the national label Mercadona (Spain)
Pespesca	150	2	7,554	Independent Ecuadorian	Process pre-cooked tuna loins, canned products, and frozen tuna loins	No particular links to tuna brands

Company Name	Processing Capacity mt/day	Fleet (No. of Vessels)	Exports of Tuna Loins/ Canned/Pouch HS Code 1604.14 (mt of product weight)	Controlling Interests	Other Relevant Commercial Affiliations	Retail: National Brands and Private Labels
<b>Processor Subtotals</b>	<b>2,235</b>	<b>34</b>	<b>198,114</b>	-	-	-
Servigroup	N/A	7	N/A	-	Tuna vessels with commercial links to top tuna processors/exporters	-
Grupo Buehs-Manacripex	N/A	6	N/A	-	Tuna vessels with commercial links to top tuna processors/exporters	-
Pacific Tuna	N/A	2	N/A	-	Tuna vessels with commercial links to top tuna processors/exporters	-
Tri-Marine /Cape Fisheries Mgt Co.	N/A	7	N/A	-	Tuna vessels with commercial links to top tuna processors/exporters	-
<b>Fishing Company Subtotals</b>	<b>N/A</b>	<b>22</b>	<b>N/A</b>	-	Tuna vessels with commercial links to top tuna processors/exporters	-
<b>Total</b>	<b>2,235</b>	<b>56</b>	<b>198,114</b>	-	-	-

## Sources:

1. Professional industry knowledge of Guillermo Gomez, GHA.
2. Datamyne.
3. TUNACONS. 2023b. Multiple pages. Viewed at Tunacons.org, April 17, 2023.
4. Company websites.



## The Philippines

Historically, the Philippines has played a central role in tuna fisheries in the Pacific, catching, processing, and exporting tuna to the E.U., U.S., and other world markets.<sup>138</sup> The Philippines recorded a catch of approximately 78,000 mt of tuna in 2019, which represented 2.8 percent of the 2.7 million mt of tropical tuna caught by the international purse seine fleet fishing in the Pacific that year. As of 2021, the Philippines' purse seine fleet is comprised of 62 tuna vessels.<sup>139</sup>

The Philippines catch is taken in its own archipelagic waters by a large fleet of small artisanal and semi-artisanal vessels<sup>140</sup>, as well as by larger purse seine vessels that fish within and outside of the Philippines EEZ and in the waters of other nations such as the Solomon Islands, FSM, and most importantly, PNG.<sup>141</sup>

The distant-water Philippines tuna fleet is assisted by their own reefer carrier vessels and other support vessels that bring the fish back to tuna processing facilities located in General Santos, Navotas (Manila), and Zamboanga. However, in addition to the processing capacity in the Philippines, in the past two decades, the country has expanded tuna processing operations to PNG. Therefore, an analysis of the Philippines' tuna industry and its role in tuna trade flows in the Pacific necessarily requires consideration of the participation of the Philippines. A holistic approach to this analysis therefore includes many of the fishing and processing activities closely controlled by the Philippines tuna industry that take place in PNG.

To complement its raw material processing needs, in 2019, the Philippines imported approximately 147,000 mt of frozen tropical tuna. The Philippines exported around 88,000 mt of processed tuna products, mainly to the E.U. and U.S. markets. The Philippines is the third-largest exporter of processed tuna in the Pacific after Thailand and Ecuador. For tuna processed in the Philippines, the country enjoys a zero-import duty in the E.U. markets under the GSP+, as long as the fish was caught by Philippine vessels. Consequently, this country's role in the catch, processing, and export sectors makes it one of the four main hub countries in the tuna trade flows originating in the Pacific.

Figure 43 depicts the primary trade flows for purse seine caught tropical tuna that go through the Philippines processing sector.

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<sup>138</sup> In addition to its export-oriented processing of canned tuna, the Philippines also processes specialized products for local markets, including fried tuna skin, tuna sausages, and other products.

<sup>139</sup> IEC/GHA Vessel Compilation analysis.

<sup>140</sup> “Artisanal” and “semi-artisanal” fisheries are relative terms used in contrast to “industrial” fisheries. They generally use smaller amounts of capital and energy, smaller fishing vessels (if any), shorter fishing trips that are closer to shore and mainly for subsistence or commercially for local consumption.

<sup>141</sup> GHA personal Communication with Lara Manarangi-Trott, Compliance Manager, WCPFC, Jan 25, 2023.

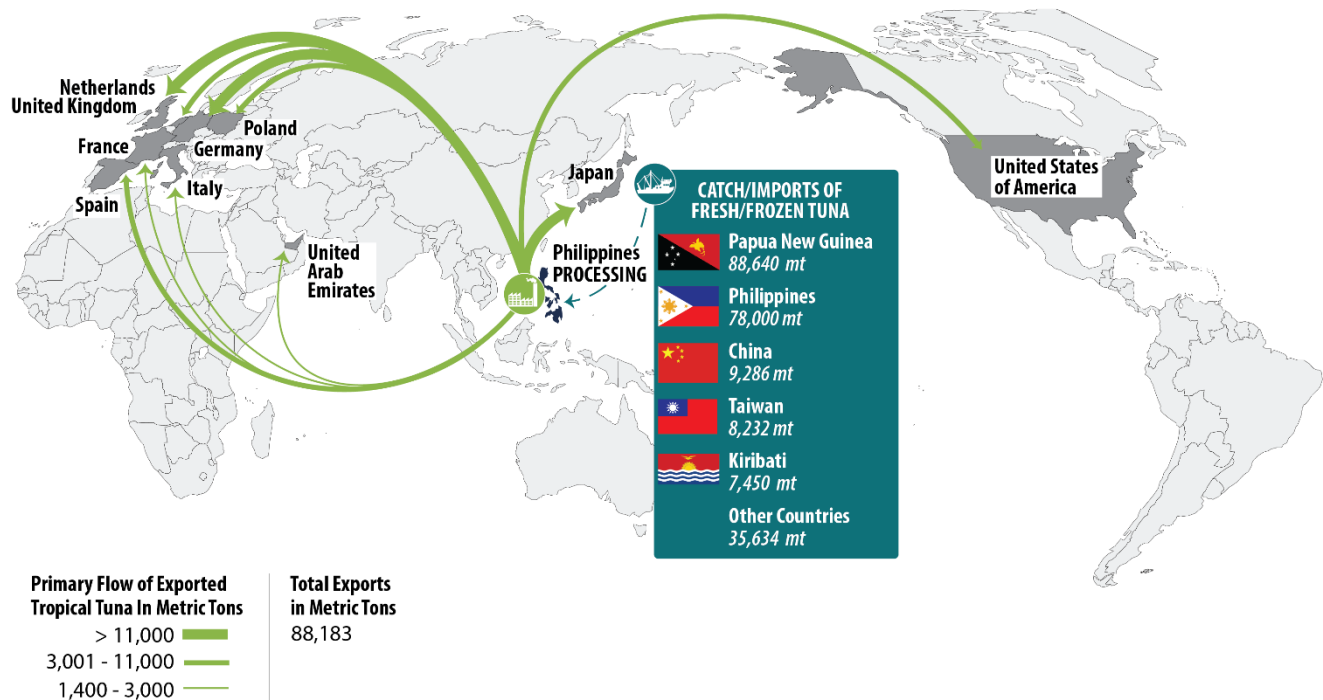


Figure 43. Primary Trade Flows for Purse Seine Caught Tropical Tuna via the Philippines

## Harvest Level

### Philippines' Tuna Purse Seine Catch

As of 2021, the Philippines had a fleet of 62 purse seine vessels registered to fish in the WCPFC convention area as of 2021, and these vessels registered a catch of approximately 78,000 mt. However, the 62 vessels may not reflect the actual size of the fleet of Philippines-controlled purse seine vessels fishing in the WCPFC convention area, which includes many vessels fishing under the PNG flag under various licensing arrangements. A recent report by Havice et al.<sup>142</sup> suggests that the Philippines-controlled tuna fleet included 91 tuna purse seine vessels authorized to fish within the WCPFC convention area in 2017. The estimated combined catches of these 91 vessels in 2017 was approximately 310,000 mt of tuna, far more than the 78,000 mt recorded in 2019. This discrepancy, which illustrates the importance of considering how catches are attributed to a specific country, is explained below.

<sup>142</sup> Havice, E., M.A. McCoy, and A. Lewis. 2019. Market and Industry Dynamics: Western and Central Pacific Tuna Purse Seine Fishery, August. Forum Fisheries Agency, Honiara, Solomon Islands. Downloaded from <https://www-staging.ffa.int/download/market-and-industry-dynamics-wcpo-distant-water-tuna-purse-seine-fishery/>, March 20<sup>th</sup>, 2023.

*Philippines' Tuna Purse Seine Fleet*

The total number of purse seine vessels from the Philippines is difficult to establish, since some of the vessels are flagged under the Philippines flag and others under other flags, and this situation is fluid. For this reason, the analysis relies on several alternate sources of more detailed fleet information than what is provided by the WCPFC vessel registry. According to Havice et al. (2019), the Philippines tuna fleet can be classified into three components.

1. A first component, comprising 55 domestic purse seine vessels, which in 2017 caught approximately 67,908 mt. These vessels are relatively small and mostly fish within the Philippines' archipelagic waters.<sup>143</sup>
2. The second component involves 37 purse seine vessels that fish within PNG's waters under the Philippines flag and under distant water access agreements or as "Locally Based Foreign Vessels" (LBFVs) under charter from Philippines-owned, PNG tuna processing facilities. These vessels caught an estimated 141,126 mt in 2017.<sup>144</sup>
3. The third component includes 25 to 30 purse seiners fishing under the PNG flag with beneficially owned<sup>145</sup> Philippine companies and operating under charter to PNG companies; this number may include five vessels owned predominantly by Taiwanese interests. Combined, these 25 to 30 vessels under the PNG flag caught 131,467 mt, of which the 25 Philippine beneficially owned PNG flag vessels caught approximately 110,000 mt. or about 80 percent of the total PNG flag vessels' catch in 2017.<sup>146</sup>

There are several different schemes under which the tuna purse seine vessels owned and controlled by Philippines companies operate in PNG. These schemes were the result of PNG policies oriented toward attracting land-based investments to the country to develop a tuna processing sector in PNG. Responding to PNG policies, companies from the Philippines invested in or formed joint ventures in tuna processing facilities in PNG and were granted preferential access to fish in PNG waters. The newly established processing companies could obtain fishing licenses as LBFVs under charter arrangements established with the processing companies themselves or licenses could also be issued to Philippine vessels under distant water fishing agreements. In addition, Philippines companies could also flag their vessels under the PNG flag and obtain a license to fish in PNG at no cost, as long as the catch remained in PNG for processing.<sup>147</sup>

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<sup>143</sup> Some of these vessels and catches may not be registered to fish in the WCPFC convention area, but rather only in Philippine territorial waters. The report included only 29 of the 55 vessels in its total count of 91 tuna purse seine vessels authorized to fish within the WCPFC convention area in 2017.

<sup>144</sup> Of the 37 vessels under this category, five have not fished in PNG waters for some time and it is not clear where or under what flag these five vessels may be fishing. GHA personal communication, Maurice Brownjohn, former commercial manager for the PNA, March 20<sup>th</sup>, 2023.

<sup>145</sup> In situations in which ownership or control is exercised indirectly, a beneficial owner is a natural person who ultimately owns or controls a legal entity or arrangement, such as a company, a trust, or a foundation (Inter-American Development Bank. 2019. A Beneficial Ownership Implementation Toolkit, March. Viewed at: <https://publications.iadb.org/en/beneficial-ownership-implementation-toolkit>, April 23, 2023).

<sup>146</sup> Havice et al. 2019. Op.cit., pg 65.

<sup>147</sup> Under these arrangements, the Philippines vessels obtained preferential access to PNG waters (essentially at a discounted cost) compared to a license that any other Distant Water fishing country would have had to pay to get access to PNG waters (GHA personal communication, Maurice Brownjohn, former commercial manager for the PNA, March 2, 2023).

Table 27 lists the estimated number of purse seine vessels and the names of the Philippines-controlling companies that manage the vessels licensed to fish in PNG waters under Philippines and PNG flags in 2018. It also shows the known number of reefer carrier vessels associated with each fishing company in 2018.<sup>148</sup> These companies are vertically integrated, with tuna processing facilities both in the Philippines and PNG.

Several Philippines-controlled vessels fishing have received MSC certification under the PNA through their association with PNG; MSC certification is an important advantage for entry into some of the E.U. export markets.

**Table 27. Philippines: Estimated Breakdown of Philippine-Controlled Purse Seine Vessels, 2018**

Ownership Beneficiary	Philippines-controlled Purse Seine Vessels Fishing in PNG Waters and WCPFC Convention Area under Philippines Flag	Philippines-controlled Purse Seine Vessels Fishing in PNG Waters and WCPFC Convention Area under PNG Flag	Total Number of Philippines-controlled Purse Seine Vessels Fishing in PNG waters and WCPFC Convention Area as of 2018	Total Number of Philippines-controlled Reefer Carrier Vessels
Frabelle Fishing	6	17	23	8
RD Corporation/Fishing	12	2	14	5
Trans-Pacific Journey	10	3	13	N/A
TSP Marine Industries	3	3	6	N/A
<b>Total</b>	<b>31</b>	<b>25</b>	<b>56</b>	<b>13</b>

Source: IEc/GHA estimate based various published documents:

1. Havice, et.al. 2019. Op. cit.
2. RD Corporation. 2023a. RD Fishing Group. Viewed at <http://rdgroup.rdphilippines.com/fishing/>, March 21, 2023
3. Trans-Pacific Journey Fishing Corporation. 2023. About Us. Viewed at <https://tpj.ph/about.html>, March 21, 2023
4. TSP Marine Industries. 2023. Company Profile. Viewed at <https://tspmi.com.ph/company-profile/>, March 21, 2023
5. Frabelle. 2023a. About Frabelle. Viewed at <http://frabelle.com/foundation-and-history/>, March 21, 2023
6. Professional industry knowledge of Guillermo Gomez, GHA.

## Processing Level

As previously noted, the Philippines' role in tuna trade flows is important due to a relatively large, vertically integrated tuna catching and processing sector and the favorable tariff conditions it enjoys, which allow the country to export tuna products to the E.U. free of duties. The country is a key participant as an inbound importer of tuna caught in the WCPFC convention area, which it uses for processing, and as an outbound

<sup>148</sup> This table represents IEc/GHA's estimate of the size and composition of the Philippines-controlled tuna purse seine fleet based on RFMO data, published documents, and GHA personal communications with industry representatives familiar with the operations of this fleet. The numbers included in this table reflect a snapshot of the likely status of the fleet in 2018/2019. These data do not correspond directly to the 2017 fleet sizes quoted in Havice et al. (2019), and the numbers in 2023 may be significantly different.

exporter of processed canned tuna products to major E.U. and U.S. markets. For the most part, the Philippines process only Pacific-caught tropical tuna.

The Philippines' processing sector is primarily aimed at European markets because of its special trade status. This sector focuses on the production of canned tuna products for the German and Dutch markets. In addition, exports to the U.S. market include the institutional can sizes used by the food service industry. Although the Philippines produces pre-cooked tuna loins, this product line is not as dominant as the canned/pouched products. The country's tuna processing plants are characterized by a high degree of vertical integration and foreign investment. They are supplied by catches made by Philippines vessels in the WCPFC area and particularly catches associated with LBFV vessels fishing in PNG waters.

### *Philippines' Tuna Processing Capabilities*

The Philippines follows immediately behind Thailand and Ecuador with respect to tuna processing output in the Pacific as a whole. It has approximately 10 tuna processing plants with an estimated combined processing capacity of approximately 1100 mt per day.<sup>149</sup> The Philippines' tuna products are exported primarily to the E.U. and the U.S.

The Philippines' tuna processing sector is primarily located in General Santos, although there are a few other canneries located in Navotas (Manila) and Zamboanga (Mindanao) in the southern Philippines. Table 28 lists the main tuna companies located in General Santos. The total estimated capacity in General Santos is approximately 870 mt/day.

**Table 28. Philippines: Main Tuna Processing Companies and Estimated Annual Production (mt of product weight)**

Philippines Tuna Processing Companies	Ownership	Capacity (mt/day)	Market Orientation	Annual Production Estimate (mt)
Alliance Select Tuna International Inc.	Publicly Listed Company	150	100% Export	30,000
Celebes Canning Corporation	RD Corporation	100	100% Export	10,000
Philbest Canning Corporation	RD Corporation	140	90% Export/10% Domestic	40,000
General Tuna Corporation (Century Pacific)	Century Pacific Group	200	60% Export/40% Domestic	85,000
Ocean Canning Corporation	Philippines Corporation	100	100% Export	15,000
Seatrade Development Canning Corporation	Philippines Corporation	80	100% Export	15,000

<sup>149</sup> IEc/GHA estimate using various sources, including company websites, and Hamilton et al. 2011. Op. cit. Pg. 203. There are seven plants in General Santos and a few others in Navotas and Zamboanga; the processing capacity in General Santos is estimated at about 870 mt/day and the capacity for the other plants in other locations is approximately 300 mt/day, for a total of 1100 mt/day.

Philippines Tuna Processing Companies	Ownership	Capacity (mt/day)	Market Orientation	Annual Production Estimate (mt)
Permex P&E	International Private fund	100	90% Export 10% Domestic	25,000
<b>Total</b>		<b>870</b>		<b>220,000</b>

Source: IEc/GHA estimate using the following sources:

1. Hamilton et. al. 2011. Op. cit. pg. 203
2. RD Corporation. 2023b. Company websites. Viewed at <http://rdgroup.rdphilippines.com/> and <http://rdgroup.rdphilippines.com/investments/>; , May 1, 2023.
3. Greenpeace. 2019. Tuna Cannery Ranking: Indonesia & Philippines. Downloaded from [https://www.greenpeace.org/static/planet4-philippines-stateless/2019/05/a8431058-a8431058-tuna\\_cannery\\_ranking.pdf](https://www.greenpeace.org/static/planet4-philippines-stateless/2019/05/a8431058-a8431058-tuna_cannery_ranking.pdf), March 29, 2023.
4. Fish Information & Services. 2023a. Companies Directory: Alliance Select Foods International, Inc. Viewed at [https://www.seafood.media/fis/companies/details.asp?l=e&company\\_id=151912](https://www.seafood.media/fis/companies/details.asp?l=e&company_id=151912); May 1, 2023.
5. Century Pacific Food, Inc. 2023. General Tuna Corporation, a subsidiary of Century Pacific Foods Inc. Viewed at, <https://centurypacific.com.ph/>, May 1, 2023

### *Imports of Raw Frozen Tropical Tuna to Supply the Philippines' Tuna Processing Plants*

The Philippines tuna processing plants are supplied by its own fleet's catches, but the industry also imports frozen tuna from other countries to satisfy its raw material requirements. According to BACI data, the Philippines imported 147,242 mt of raw frozen tropical tuna in 2019, as shown in Table 29.

As show in Table 29, PNG is by far the main supplier of raw frozen tuna to the Philippines. These imports reflect a portion of catches made by Philippine tuna purse seiners fishing in PNG waters either under the Philippines flag or under the PNG flag but controlled by Philippines companies. These imports probably occurred as transshipments on Philippine controlled reefer vessels. All of the imports of frozen tropical tuna to the Philippines were likely caught in the WCPFC convention area, except possibly some of the imports listed in Table 30 from Indonesia, which fishes in both the WCPFC and IOTC convention areas.

Table 29. Philippines: Imports of Raw Frozen Tropical Tuna by Exporting Country, 2019 (mt of product weight)

Rank	Exporter	Total	Percent
1	PNG	86,640	59%
2	China	9,286	6%
3	Other Asia, nes (Taiwan)	8,232	6%
4	Kiribati	7,450	5%
5	Vietnam	6,068	4%
6	Indonesia	6,057	4%
7	South Korea	5,831	4%
8	Marshall Islands	3,883	3%
9	Solomon Islands	2,863	2%
10	U.S.	2,104	1%
>10	Others	8,828	6%
Total		147,242	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

## Export Level

### *PNG's Exports of Raw Tropical Tuna for Processing Elsewhere*

Despite the Philippines being a major tuna processing country and its need to import tuna for processing, according to BACI data, in 2019 it also exported about 19,000 mt of tropical tuna in raw frozen form. These exports represented 24 percent of the Philippines's total recorded tuna purse seine catch.<sup>150</sup> One hundred percent of these exports were Pacific-caught fish. Of these exports, about 73 percent went to three countries: Vietnam, Italy, and Spain (see Table 30).

<sup>150</sup> If one uses as a reference the estimated 310,000 mt tons of tuna caught by Philippines-controlled purse seiners in PNG waters in 2017, the approximate 19,000 mt of exports of frozen tuna would have represented only 6.1 percent of the total Philippines catch.

Table 30. Philippines: Tuna Exports of Raw Frozen Tropical Tunas by Importing Country, 2019 (mt of product weight)

Rank	Importer	Total	Percent
1	Vietnam	5,008	26%
2	Italy	4,827	25%
3	Spain	3,926	21%
4	Portugal	1,429	8%
5	Japan	1,428	8%
6	Netherlands	438	2%
7	Indonesia	424	2%
8	Costa Rica	386	2%
9	USA	201	1%
10	Cabo Verde	185	1%
>10	Others	708	4%
Total		18,960	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

Although no data are available to confirm this assumption, based on industry knowledge, it is likely that these exports represented high-quality tuna that could be sold as fresh/chilled, previously frozen yellowfin in the Italian and Spanish markets or could have been used for re-processing by Vietnamese companies for further sale to the U.S. as fresh/chilled previously frozen yellowfin. It does not appear that these exports were associated with tuna canning operations in Italy or Spain. However, Datamyne does not provide importing company names that might help confirm this assumption.

#### *Philippines' Exports of Tropical Tuna Processed Products*

In 2019, BACI data indicate that the Philippines' tuna processing sector exported 88,183 mt of processed tuna products, which includes pre-cooked tuna loins and canned/pouch tuna products. This compares with approximately 533,000 mt exported by Thailand and, almost 238,000 mt exported by Ecuador. Table 31 shows the Philippines' 2019 tropical tuna exports of processed tuna products according to the BACI data, by the countries importing the product.<sup>151</sup>

<sup>151</sup> Processed products include all tuna products under HS code 1604.14, which include canned and pouched tuna products and pre-cooked processed tuna loins used for subsequent canning.



**Table 31. Philippines: Tuna Exports of Processed Tuna by Importing Country, 2019 (mt of product weight)**

Rank	Importer	Total	Percent
1	Germany	20,623	23%
2	Japan	12,673	14%
3	United Kingdom	11,200	13%
4	USA	7,747	9%
5	Spain	5,909	7%
6	Netherlands	5,577	6%
7	Poland	2,988	3%
8	United Arab Emirates	2,566	3%
9	Italy	1,597	2%
10	France	1,468	2%
>10	Others	15,835	18%
<b>Total</b>		<b>88,183</b>	

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Except for Japan, the U.S., and the United Arab Emirates, which collectively account for 26 percent of the total Philippines' exports, the majority of the processed tuna products were destined for the E.U. markets. According to Eurostat data, which do not completely align with BACI data, the E.U. imported 45,046 mt of processed tuna products from the Philippines in 2019; of this, 17 percent (7,738 mt) were tuna loins destined for canning and 83 percent (37,308 mt) were canned/pouched tuna products.

### Major Tuna Companies in the Philippines

As shown in Table 28, General Tuna Corporation, Philbest Canning/RD Corporation, and Seatrade Canning Corporation were the top three companies exporting processed tuna products in 2019 according to Datamyne data. Additional important processing companies listed in Table 28 are Alliance Select Tuna International Inc., Celebes Canning Corporation, Ocean Canning Corporation, and Permex P&E.

The two most important Philippine-owned fishing companies are RD Corporation, which is also a processor, and Frabelle Fishing. RD Corporation is currently experiencing financial difficulties that are impacting its operations in both the Philippines and PNG, and is actively seeking an investor for its plant in PNG and its purse

seine fleet.<sup>152</sup> This situation is something that should be monitored closely in the future, since other important tuna industry groups such as Bolton Group, Tri-Marine, and FCF Fishery could potentially be interested in acquiring RD Cannery in PNG. Should RD Corporation's assets be sold, trade flows in and out of PNG and the Philippines could significantly change.

### Papua New Guinea (PNG)

PNG is a major catching, processing, and exporting country for tuna in the Pacific region and in the world. Of the approximately 2.7 million mt of tropical tuna caught by the international purse seine fleet fishing in the Pacific in 2019, the PNG fleet caught approximately 265,389 mt or 9.8 percent.<sup>153</sup> All of the PNG tuna catch was caught in the WCPFC convention area. PNG is an important member of the PNA, whose combined EEZs represent the primary fishing grounds for tuna purse seine fleets in the WCPFC (see text box, *Parties to the Nauru Agreement*).

In 2018, 165 purse seine vessels<sup>154</sup> or 34 percent of the 551 tuna purse seiners fishing in the Pacific were authorized to fish in the PNG EEZ, which highlights the importance of PNG's tuna resources, but the fleet size varies greatly each year and is closely tied to the Philippines's fleet. PNG also processed and exported approximately 47,847 mt of tuna products in 2019, making it the fourth-largest exporter of processed tuna in the Pacific after Thailand, Ecuador, and the Philippines. Consequently, this country's role in the catch, processing, and export sectors makes it one of the four main hub countries in the tuna trade flows originating in the Pacific. Because of PNG's rich tuna resources, this role could expand in the future.

As explained below, PNG has developed into an important participant in tuna trade flows because of its comparative advantages in terms of abundant tuna resources, low labor costs, and favorable tariff conditions that allow the country to export tuna products to the E.U. without duty. Foreign investments, encouraged by PNG governmental initiatives, have developed the industry (both vessels and land-based infrastructure) in exchange for access to tuna stocks in PNG waters and to take advantage of PNG's low labor costs and special tariff

### Parties to the Nauru Agreement (PNA)

The Nauru Agreement Concerning Cooperation in the Management of Fisheries of Common Interest (known as The Nauru Agreement) is a western Pacific subregional fisheries management and licensing agreement established in 1982 among the Federated States of Micronesia, Kiribati, the Marshall Islands, Nauru, Palau, PNG, the Solomon Islands and Tuvalu. The eight members of the PNA together control the fisheries in an area roughly 40 percent larger than the U.S. or Europe, containing about a quarter of the world's tuna resources and half of the global stocks of skipjack, which is the tuna species most commonly used for canning.<sup>1</sup>

The PNA countries operate the Vessel Day Scheme (VDS), a tuna access licensing program in which vessel owners can purchase and trade days fishing in PNA waters. The VDS is aimed at reducing catches of target tuna species while increasing income for the PNA countries from distant water fishing fleets fishing in PNA waters.<sup>2</sup> PNA members themselves pay reduced VDS fees when fishing in each other's' waters and do not have to abide by many of the Conservation and Management Measures (CMMs) implemented by the WCPFC, including the prohibition on fishing during the Fish Aggregation Devices (FADs) closure.

#### Sources:

1. Marine Stewardship Council. 2016. Small islands, big opportunities. Viewed at <http://pna-stories.msc.org>, March 25, 2023.
2. Pacific Islands Forum Fisheries Agency (FFA). 2023. What We Do: Introduction. Viewed at <https://www.ffa.int/vds>, March 25, 2023.

<sup>152</sup> Atuna. 2023b. "RD factories "Doing OK" but tuna supply an issue for all PNG Plants. April 3.

<sup>153</sup> Nearly all of the PNG tuna catch was purse seine-caught tropical tunas; only 312 mt of albacore and 1,648 mt of tropical tuna were caught by longline.

<sup>154</sup> FFA's TunaPacific: Fisheries News and Views. 2019. PNG industry, Frabelle hope MSC certification can boost processing sector. May 24. Viewed at <https://tunapacific.ffa.int/2019/05/24/png-industry-frabelle-hope-msc-certification-can-boost-processing-sector>, April 17, 2023.

structures. In particular, the Philippines, Taiwan, and Thailand have invested in various elements of the tuna industry in PNG.

Over the past two decades, PNG has been the focus of attention of major tuna industry actors from around the world. PNG offers tremendous potential that could place the country at an even higher level of tuna catch and processing volume than some of its competitors like Ecuador and the Philippines, since it has all the main variables that could attract further foreign investment to mature, consolidate, and grow the PNG industry. If this were to happen, PNG could become one of the leading countries determining Pacific tuna trade flows.<sup>155</sup>

Figure 44 depicts the primary trade flows of purse seine caught tropical tuna through PNG's processing sector.

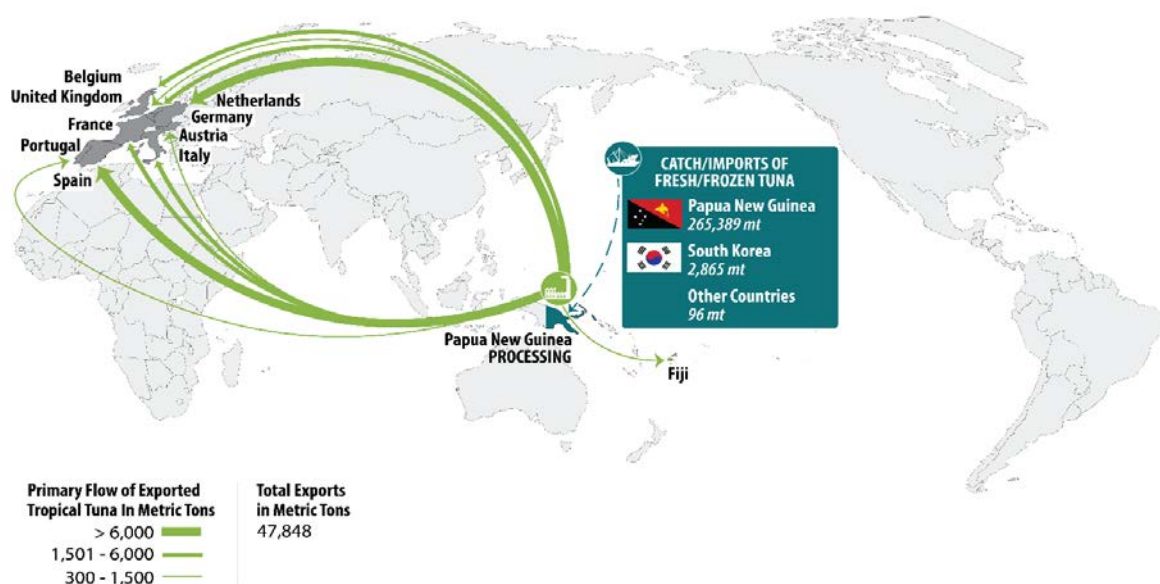


Figure 44. Primary Purse Seine-Caught Tropical Tuna Trade Flows via Papua New Guinea

## Harvest Level

### PNG's Tuna Purse Seine Catch

In 2019, PNG was the third largest purse seine harvester of tropical tunas in the Pacific Ocean, with a catch of 265,389 mt, taken entirely within the WCPFC convention area. This catch likely includes the catch of PNG flag

<sup>155</sup> Several issues have prevented PNG from moving in this direction. Perhaps the most important variable is that the socio-economic and political landscape in PNG does not yet inspire the level of long-term confidence that global industry players would like to have to make significant additional investments. The indigenous culture and local traditions do not appear to have fully merged to support a stable tuna processing segment in PNG and some of the foreign investors in tuna processing facilities are facing challenges to keep their fleets and plants operating. The PNG government and its development agency, the NFA, have tried with varying degrees of success to maintain the domestic PNG flag fleet in place, but more importantly, to prevent LBFVs authorized to fish in PNG waters under preferential status from switching flags and reflagging in other PICs, where their operations are less restricted than in PNG.

vessels and LBFVs licensed in PNG<sup>156</sup> that operate under charter/or other access agreements (see discussion under the subheading “PNG’s Tuna Purse Seine Fleet” below). The definition of what constitutes a PNG vessel vs. a foreign vessel or a PNG export vs. a foreign catch in terms of catch data reporting appears to be variable and unclear at times, particularly since 2019, when many vessels previously flagged to PNG left to reflag under other countries’ flags elsewhere in the western Pacific. This makes it especially difficult to interpret fleet, catch, import, and export data, which is already complex because of conflicting data sources. In general, “PNG catch” is considered here to include catches by PNG-flagged vessels throughout the WCPFC convention area, and by LBFVs in PNG waters. However, it is possible that the catches of LBFVs in non-PNG Pacific waters are also being included in the PNG catch statistics from the RFMOs.

It should also be noted that, with recent flagging shifts within the western Pacific in the past few years due to changes in resource availability and better access opportunities offered by other countries in the region, PNG’s fleet and catches are currently much lower than they were in 2019.

### *PNG’s Tuna Purse Seine Fleet*

PNG has a significant but fluctuating tuna purse seine fleet harvesting the abundant tuna resources present in its EEZ and in adjacent waters of other PNA nations. As explained in the previous section, “The Philippines”, most of the PNG tuna purse seine fleet is and has been actually owned or controlled by Philippines fishing and processing companies. In 2021, according to the WCPFC vessel register, PNG has a fleet of only 15 tuna purse seiners registered under its flag. The recorded ownership of these PNG flag vessels is presented in Table 32. As previously noted, the PNG fleet fishes within its own EEZ and throughout the Western Pacific, since PNG is a member of the PNA.

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<sup>156</sup> LBFVs are a category of fishing vessel developed as part of the PNG’s fisheries development (“domestication”) policies and recognized by the Forum Fisheries Agency (FFA; one of the fisheries management organizations in the western Pacific). Although flagged under a country other than PNG (mostly the Philippines), LBFVs are licensed to fish in local waters and have obligations to the coastal state (PNG). FFA’s recognition of the LBFV category was likely an accommodation to PNG during development of the PNA’s Vessel Day Scheme.

Table 32. Papua New Guinea: Company Ownership of PNG Flagged Tuna Purse Seiners, 2021

Company Name	Number of Vessels
Frabelle (PNG) Limited	10
KF (PNG) Ltd	2
RD Fishing PNG Limited	1
United Lion Fishery (PNG) Limited	1
Winmax Fishery (PNG) Limited	1
<b>Total</b>	<b>15</b>

Source: IEc/GHA Vessel Compilation analysis.

Currently, there may be an additional 10 to 15 vessels operating under LBFV arrangements.<sup>157</sup>

Although PNG does not currently have a large fleet under its own flag, it is important to tuna trade flows because the associated fleet and land-based tuna infrastructure are built around joint ventures with other countries, especially the Philippines and, to a lesser extent, Taiwan (FCF Fishery).

PNG's NFA has been the entity in charge of promoting the development of the tuna processing industry in the country and establishing policies to attract investments in fleets and processing infrastructure. Its "domestication program," intended to grow a domestic tuna industry rather than just serve as a destination for distant water fishing fleets, was designed to promote investments in land-based processing infrastructure and to attract fishing companies to flag their vessels in PNG in exchange for access to tuna resources at lower costs. In this way, the NFA regulates access by tuna vessels that want to fish in PNG's EEZ.<sup>158</sup>

PNG flag vessels also benefit from the country's membership in the PNA, including access to the waters of other PNA countries at lower costs via the PNA's Vessel Day Scheme (VDS), and exemption from the ban on fishing with FADs when FAD closures are in place. These domestication policies have allowed the PNG fleet to grow over the years, with major fluctuations in the number of tuna purse seine vessels flagged in PNG or under

<sup>157</sup> GHA personal communication with Maurice Brownjohn, former commercial director for the PNA with Guillermo Gomez, GHA on multiple dates between February and April 2023.

<sup>158</sup> PNG tuna "domestication" policies in the early 2000s and over the past decades brought in investments from Philippines tuna stakeholders. These stakeholders were both tuna fishing companies that historically operated in waters of the Solomon Islands, the Federated States of Micronesia and more importantly, in PNG waters, in addition to fishing within the Philippines' own archipelagic waters. These policies also brought investments from Philippines companies that already had tuna processing plants in the Philippines and saw expanding their processing operations into PNG as a way to grow their business and secure access to fish resources at lower costs. The attractiveness of low labor costs for processing in PNG represented an additional benefit. In addition to Philippines stakeholders, the combined interests of U.S., Taiwanese, and Thai tuna industry players also resulted in additional land-based investments in PNG.

other LBFV licensing or charter arrangements. Catches by vessels under LBFV and other access agreements may be recorded as PNG catches, even though the vessel flag is not PNG, which may cause some statistical confusion.

As indicated in the previous section for the Philippines, in 2018 there were 56 tuna beneficially owned tuna purse seiners under the PNG flag or the Philippines flag fishing in PNG waters and/or within the WCPFC convention area. Table 33 shows the estimated breakdown of Philippines-controlled vessels licensed to operate in PNG waters.

Besides the 56 vessels listed in Table 33, other vessels were owned and controlled by Taiwan that were licensed and under PNG flag.<sup>159</sup> In fact, it is estimated that a total of approximately 165 foreign flag tuna purse seiners and 61 carrier vessels received licenses to fish in PNG's waters in 2018.<sup>160</sup>

The Philippine system of purse seine fishing involves working closely with reefer vessels on the fishing grounds. The vessels operating in PNG waters and/or the WCPFC convention area would typically deliver their catches to the canneries to which the vessels were associated or transship them to the reefers that shuttle back and forth to processing plants in PNG and/or the Philippines. Other countries' vessels fishing in the area under various access agreements may also transship tuna in PNG. Tuna transshipping for export takes place mainly at Rabaul Port.<sup>161</sup>

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<sup>159</sup> These vessels were associated with FCF Fishery Co. Ltd. and were delivering fish to two PNG based canneries (GHA personal communication with Maurice Brownjohn, former commercial director for the PNA, March 2023).

<sup>160</sup> FFA's TunaPacific: Fisheries News and Views. 2019. PNG industry, Frabelle hope MSC certification can boost processing sector. May 24. Viewed at <https://tunapacific.ffa.int/2019/05/24/png-industry-frabelle-hope-msc-certification-can-boost-processing-sector>, April 17, 2023.

<sup>161</sup> Havice et.al. 2019. Op.cit.

**Table 33. Papua New Guinea: Estimated Breakdown of Philippine-Controlled Purse Seine Vessels, 2018**

Ownership Beneficiary	Philippines-controlled Purse Seine Vessels Fishing in PNG Waters and WCPFC Convention Area under Philippines Flag	Philippines-controlled Purse Seine Vessels Fishing in PNG Waters and WCPFC Convention Area under PNG Flag	Total Number of Philippines-controlled Purse Seine Vessels Fishing in PNG waters and WCPFC Convention Area as of 2018	Total Number of Philippines-controlled Reefer Carrier Vessels
Frabelle Fishing	6	17	23	8
RD Corporation/Fishing	12	2	14	5
Trans-Pacific Journey	10	3	13	NA
TSP Marine Industries	3	3	6	N/A
<b>Total</b>	<b>31</b>	<b>25</b>	<b>56</b>	<b>13</b>

Source: IEC/GHA estimate based various published documents:

1. Havice, et.al. 2019. Op. cit.
2. RD Corporation. 2023a. RD Fishing Group. Viewed at <http://rdgroup.rdphilippines.com/fishing/>, March 21, 2023
3. Trans-Pacific Journey Fishing Corporation. 2023. About Us. Viewed at <https://tpj.ph/about.html>, March 21, 2023
4. TSP Marine Industries. 2023. Company Profile. Viewed at <https://tspmi.com.ph/company-profile/>, March 21, 2023
5. Frabelle. 2023a. About Frabelle. Viewed at <http://frabelle.com/foundation-and-history/>, March 21, 2023
6. Professional industry knowledge of Guillermo Gomez, GHA.

The ownership and flag links among the companies and vessels is complex. For instance, in 2018 the Frabelle Group, a diversified business from the Philippines involved in fishing, aquaculture, canning, food manufacturing, and processing, etc. and which had established a tuna processing plant in PNG, operated 11 PNG-flagged purse seiners through Frabelle PNG Ltd; five Philippines-flagged purse seiners and six reefer carrier vessels through one of its subsidiaries (Frabelle Fishing Company-FFC); and, through another subsidiary (FFC Subic Seafood Corp), two additional Philippines-flagged tuna purse seiners, one small carrier vessel, and one support vessel.<sup>162</sup>

Three other Philippines-based companies participated in this domestication process intended to grow the PNG fleet, contributing fishing and carrier vessels, as follows:

- Trans-Pacific Journey Fishing Corporation brought in 10 purse seiners, five carriers, and 19 small support vessels in support of the processing facility Nambawan Seafood PNG Ltd
- TSP Marine Industries also brought three purse seiners and six carrier vessels to support the Nambawan operations. Nambawan is a joint venture involving Taiwanese interests (FCF Fishery Co. Ltd);

<sup>162</sup> MRAG Asia Pacific. 2019. Op. cit.



- RD Corporation brought 15 purse seiners and 4 carrier vessels.<sup>163</sup>

Finally, a Taiwanese company (Fair Well Fishery Group) had seven PNG-flagged purse seiners and two reefer carriers.

It is important to note that PNG has an MSC certificate through the PNA that includes 64 purse seine vessels eligible to use the MSC certificate. This includes 31 purse seine vessels flying the PNG flag and 33 purse seiners under the Philippines flag. In this way, the Philippines has been able to access the benefits of belonging to the PNA and being MSC certified through its association with PNG.

Since 2019, many PNG-flagged and LBFV have switched flags to other PICs, such as Nauru, Tuvalu, and FSM<sup>164</sup>, so it is difficult to determine how many these vessels continue to regularly operate in PNG waters. As previously mentioned, according to the WCPFC vessel register, PNG currently has a fleet of only 15 tuna purse seiners registered under its flag, fishing in its own and other WCPFC waters; in addition, an estimated 15 additional vessels fish under LBFV arrangements in PNG waters.<sup>165</sup>

In addition to promoting the development of the fleet, NFA policies have resulted in the development of six tuna processing plants.<sup>166</sup> Four of the five are vertically integrated; together they owned or controlled 61 purse seine vessels in 2018. The five processing companies are discussed below.

### Processing Level

As previously noted, PNG's role in tuna trade flows is important due to its location (access to tuna resources), low labor costs, and the favorable tariff conditions it enjoys, which allow the country to export tuna products to the E.U. free of duties. In addition to having abundant tuna resources and a purse seine fleet, PNG is fourth among the countries with the greatest tropical tuna processing capacity in the Pacific region (after Thailand, Ecuador, and the Philippines). It is a key participant as an inbound importer of tuna caught in the WCPFC area, which it uses for processing, and as an outbound exporter of processed cooked loins and canned/pouched tuna products to major markets. Currently, only Pacific-caught tropical tuna is processed in PNG, nearly all of it for export.

PNG's processing sector is primarily aimed at European markets because of its special trade status. This sector focuses on the production of canned and pouched products, as well as tuna loins for final processing elsewhere. The country's tuna processing plants are characterized by a high degree of vertical integration and foreign investment. They are supplied by catches made by PNG vessels and associated LBFV vessels (mainly from Philippines- and Taiwanese-controlled operations), as well as imports of raw, frozen fish caught by other countries' fleets in the Pacific. The following sections describe in more detail the characteristics of PNG's processing sector.

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<sup>163</sup> MRAG Asia Pacific. 2019. Op. cit.

<sup>164</sup> GHA personal communication with Maurice Brownjohn, former commercial director for the PNA, March 2023.

<sup>165</sup> GHA personal communication with Maurice Brownjohn, former commercial director for the PNA, March 2023.

<sup>166</sup> More information on the role of the NFA of PNG, see <https://www.fisheries.gov.pg/>.



*PNG's Tuna Processing Capabilities*

PNG is fourth after Thailand, Ecuador, and the Philippines with respect to tuna processing output in the Pacific as a whole. It has five tuna processing plants with an estimated combined processing capacity of approximately 475 mt per day.<sup>167</sup> PNG's tuna products are exported primarily to the E.U. and the U.S.

Table 34 presents the ownership, processing capacity, and fleets owned or controlled by PNG's tuna processing plants in 2019. Please note that the numbers in this table may differ from the 2018 vessel estimates in Table 33.

**Table 34. Papua New Guinea: Tuna Processing Companies and Associated Fleets, May 2019**

Company	Daily Processing Capacity (mt)	PNG Flag Vessel	Locally Based Foreign Vessels	Total Number of Vessels
RD Tuna Cannery	140	2	13	15
Frabelle PNG	90	15	6	21
Majestic (joint venture involving Frabelle Fishing, Century Canning Corp. & Thai Union)	80	3	5	8
Nambawan Seafood (FCF Fishery Co. Ltd.)	15	0	10	10
South Seas Tuna Corporation (SSTC)	110	6	1	7
<b>Totals</b>	<b>435</b>	<b>26</b>	<b>35</b>	<b>61</b>

Source: IEc/GHA estimate using data from:

1. FFA's TunaPacific: Fisheries News and Views. 2019. PNG industry, Frabelle hope MSC certification can boost processing sector. May 24. Viewed at <https://tunapacific.ffa.int/2019/05/24/png-industry-frabelle-hope-msc-certification-can-boost-processing-sector>, April 17, 2023.
2. RD Corporation. 2023a. RD Fishing Group. Viewed at <http://rdgroup.rdphilippines.com/fishing>, April 17, 2023.
3. Frabelle. 2023b. Multiple pages. Viewed at <http://frabelle.com/#>, April 17, 2023.
4. Majestic does not have a company website, but information derived from Fish Information & Services. 2012. Biggest tuna cannery in the country to open soon. August 17. Viewed at: <http://www.fis-net.com/fis/techno/newtechno.asp?l=e&id=54656&ndb=1n> April 26, 2023.
5. South Seas Tuna Corporation. 2023. Multiple pages. Viewed at <https://www.southseastuna.com/>, April 17, 2023.

The PNG tuna processing sector has developed via joint ventures and investments with companies from the Philippines, Taiwan, and Thailand. Three of the processing plants listed in Table 34 are joint ventures with PNG parties but are controlled by Philippine companies that are vertically integrated and also own tuna processing

<sup>167</sup> IEc/GHA estimate using data from FFA's TunaPacific: Fisheries News and Views. 2019. PNG industry, Frabelle hope MSC certification can boost processing sector. May 24. Viewed at <https://tunapacific.ffa.int/2019/05/24/png-industry-frabelle-hope-msc-certification-can-boost-processing-sector>, April 17, 2023.

plants in the Philippines; these are RD Tuna Cannery in Madang<sup>168</sup>, Frabelle PNG in Lea,<sup>169</sup> and Majestic Canning in Wewak. Majestic Canning is also a joint venture between Century Canning (Philippines) and Thai Union Products (Thailand).<sup>170</sup>

PNG's other processing plants are also owned by foreign interests. Nambawan Seafoods is a subsidiary of FCF Fishery Co. Ltd. (FCF) and FCF is also a main stockholder of South Seas Tuna Corporation (SSTC),<sup>171</sup> which is entirely dedicated to tuna loin production.<sup>172</sup>

Growth in the processing sector in PNG appears to have stalled, due to concerns associated with resource access to PNG waters, the VDS from the PNA countries, and PNG's land-based investment policies. These concerns have resulted in underutilization of PNG's current processing capacity.

Whole frozen tropical tuna is delivered to PNG's processing plants directly from fishing vessels under agreements such as FCF's supply contract with SSTC, as well as via reefer carriers owned by the Philippine processors who have invested in the PNG plants.

As noted, PNG's processing plants produce both tuna loins for subsequent processing elsewhere, and canned and pouched finished tuna products. PNG is an important source of loins for processors in the Philippines, and to a lesser extent, in Thailand and the E.U. (especially Spain, France, and Italy). In addition, investments in PNG processing plants allow Philippines and Thai companies to access the E.U. market duty free. Companies with processing facilities have an alternative option if the E.U. stops the current GSP Plus zero duty for Philippines tuna products.

#### *Imports of Raw Frozen Tropical Tuna to Supply PNG's Tuna Processing Plants*

PNG's tuna processing plants are supplied primarily by their own fleet, including PNG-flagged vessels and LBFVs. According to BACI data for 2019, PNG imported only 2,961 mt of whole frozen tuna; 97 percent of these imports came from South Korea, with the remainder from Taiwan and China. These data probably do not consider catches attributable to foreign flags fishing under charter arrangements with PNG and/or the Philippines and delivering directly to processing plants in PNG.

Table 35 shows PNG imports of raw, frozen tropical tuna in 2019.

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<sup>168</sup> RD Corporation. 2023c. Company Website. Viewed at <http://rdmanufacturing.rdphilippines.com/about-us/rdtc/>, April 26, 2023; RD Corporation. 2023d. Philbest Canning Corporation. Viewed at <http://www.philbest.com.ph/?fbclid=IwAR2m5lyN-3HH96G-AMbQUk-9HJzuFICu9WKdIplZBJi1fQKhxw4xHRzLQA0..>, April 26, 2023.

<sup>169</sup> Frabelle is a Philippine fishing company involved in several pelagic fisheries in the Philippines and throughout the West-central Pacific. For more information, see <http://frabelle.com/>.

<sup>170</sup> According to Havice, et al. (2019), Majestic Canning has struggled with high utility overheads, the need to import all non-tuna inputs, and low labor productivity, but it has served as a successful source of raw, frozen tuna for Thai Union's other processing operations.

<sup>171</sup> Bumble Bee Seafoods used to have an interest in the SSTC plant and FCF now owns Bumble Bee.

<sup>172</sup> Havice et al. 2019. Op. cit.

Table 35. Papua New Guinea: Raw Frozen Tropical Tuna Imports by Exporting Country, 2019 (mt of product weight)

FROZEN TROPICAL			
Rank	Exporter	Total	Percent
1	South Korea	2,865	97%
2	Other Asia, nes (Taiwan)	58	2%
3	China	38	1%
4	Australia	0	0%
Total		2,961	

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 03030.42, 0303.43, and 03030.44

Because Datamyne and other sources consulted do not cover PNG, it is not possible to compare the import data reported by BACI data to verify its validity, and the names of the companies involved in this import trade are not available. The lack of Datamyne shipper-consignee data also means we do not have information at a company level from this source to determine the shares of imports or exports by PNG processing companies.

### Export Level

#### *PNG's Exports of Raw Tropical Tuna for Processing Elsewhere*

According to BACI data, in 2019, PNG exported 127,387 mt of raw tropical tuna, which represented 48 percent of PNG's total tuna purse seine catch. One hundred percent of these exports were Pacific-caught fish. Of these exports, 94 percent went to the Philippines and Thailand to supply their processing plants, as shown in Table 36.

Raw frozen tuna transshipments in PNG mostly involve fish caught by PNG vessels, or by vessels controlled by Philippine companies operating as LBFVs or under other access agreements. Of the PNG catch by PNG flag vessels and LBFVs, approximately 86,600 mt of frozen tuna were transshipped in 2019 to canneries in the Philippines via the reefers that work with the purse seine vessels on the fishing grounds. In addition, about 33,000 mt of raw frozen tuna probably mostly caught by vessels controlled by Taiwanese companies likely associated with FCF Fishery Co. Ltd were exported to Thailand for processing. Such exports were registered in BACI data as PNG exports, as shown in Table 36. Other countries' vessels fishing in the area under various access agreements may also transship tuna in PNG.

Table 36. Papua New Guinea: Raw Frozen Tropical Tuna Exports by Importing Country, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Philippines	86,640	68%	68%	27,012	59,496	132
2	Thailand	33,045	26%	94%	3,674	29,081	291
3	China	5,930	5%	99%	477	5,453	-
4	Japan	827	1%	99%	827	-	-
5	Spain	428	0%	100%	428	-	-
6	Italy	351	0%	100%	351	-	-
7	South Korea	134	0%	100%	91	-	43
8	Fiji	26	0%	100%	-	26	-
9	Other Asia, nes (Taiwan)	5	0%	100%	-	5	-
10	Ecuador	2	0%	100%	0	2	-
>10	Others	-	0%	100%	-	-	-
	Total	127,387					

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

*PNG's Exports of Tropical Tuna Processed Products*

In 2019, BACI data indicates that the PNG tuna processing sector exported 47,847 mt of processed tuna products (HS code 1604.14), which includes pre-cooked tuna loins and canned/pouch tuna products.<sup>173</sup> This compares with approximately 533,000 mt exported by Thailand, almost 238,000 mt exported by Ecuador, and about 78,000 mt exported by the Philippines.

PNG's domestic market for tuna products is unknown but likely small, since canned tuna is not a traditional food and world market prices would make it an expensive food item in the local economy.

<sup>173</sup> Because PNG catches and imports almost no albacore and any longline-caught tuna would probably be destined for fresh markets, all of this processed product is assumed to be purse seine-caught tropical tuna.

Table 37 shows PNG's 2019 tropical tuna exports of processed tuna products by the countries importing the product.<sup>174</sup>

**Table 37. Papua New Guinea: Processed Tropical Tuna Exports by Importing Country, 2019 (mt of product weight)**

PROCESSED			
Rank	Importer	Total	Percent
1	Germany	14,772	31%
2	Spain	13,040	27%
3	Netherlands	5,152	11%
4	United Kingdom	4,500	9%
5	Italy	3,720	8%
6	France	3,206	7%
7	Fiji	1,451	3%
8	Portugal	571	1%
9	Austria	349	1%
10	Belgium	327	1%
>10	Others	760	2%
Total		47,847	

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

The E.U. accounts for almost 97 percent of the total volume of processed tuna exported by PNG in 2019, with the top six E.U. tuna consuming countries absorbing 93 percent of the volume.

According to Eurostat data, which do not completely align with BACI data, the E.U. imported 38,446 mt of tuna products from PNG in 2019. Of this, 58 percent were tuna loins and 42 percent were canned/pouched tuna products. Spain and Italy were the destination for 95 percent of the loin imports (15,164 mt), with 78 percent of the total loin imports going to Spain. E.U. imports from PNG of final canned/pouched products for the were

<sup>174</sup> Processed products include all tuna products under HS code 1604.14, which include canned and pouched tuna products and pre-cooked processed tuna loins used for subsequent canning.

22,490 mt, with Germany, the Netherlands, and France importing 19,698 mt (91 percent of the total imports of canned and pouched processed product).<sup>175</sup>

### Major Tuna Companies in PNG

Because Datamyne data do not include PNG, we do not have information at a company level to determine the shares of imports or exports by PNG processing companies. As the only major tuna processors (and fleet owners) in PNG, however, RD Tuna Cannery, Frabelle PNG, Majestic Canning, Nambawan Seafoods, SSTC, and IFC, as well as their parent and/or investor companies Century Canning (Philippines), Thai Union Products (Thailand), FCF, and International Finance Corporation (IFC) World Bank Group are key players in PNG at the processing/exporting and in some cases, fleet levels. In turn, because PNG is one of the top processing hubs in the Pacific, these companies are also key players in the Pacific tropical tuna trade flows.

In general, ties between the PNG tuna industry and Philippine companies, as well as Thai Union and FCF, are close. PNG supplies Philippine companies with raw material for processing, and it serves as a platform for Philippine and Thai tuna processors to access E.U. markets under preferential tariff structures.

Finally, PNG's NFA is a key player in terms of tuna industry access and development policies, with subsequent impacts on tuna trade flows.

## Emerging Processing/Trade Hubs for Purse Seine Caught Tropical Tuna

### Vietnam

Vietnam is an emerging country that is presently expanding its role in the trade of tuna caught in the Pacific. Over the last decade, it has increasingly participated in the trade for pre-cooked tuna loins and frozen uncooked tuna loins, with major markets in the U.S. and the E.U.

Vietnam's is emerging as a country focused mainly on the production of fresh/frozen and pre-cooked tuna loins. Its strategy is emphasizing imports of yellowfin, targeting the Japanese sashimi markets, the U.S. market for fresh/frozen (CO<sub>2</sub> treated) tuna, and the pre-cooked U.S. and E.U. markets as well. Vietnam's closest competitor appears to be China. Its competitive advantage is related to low labor costs and the apparently significant investments made in processing infrastructure to handle products at very low ambient temperatures. The growth in fresh/frozen CO<sub>2</sub>-treated products in the U.S. market appears to be a key driver allowing Vietnam processors to successfully compete in the market for yellowfin tuna with other major canned tuna processors in the Pacific.

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<sup>175</sup> According to Eurostat data, Germany imported 12,071 mt of canned/pouched tuna; the Netherlands 5,245 mt; and France 2,383 mt.

## Harvest Level

### *Vietnam's Tuna Purse Seine Catch*

In 2019, Vietnam registered a purse seine catch of 60,303 mt according to the WCPFC.<sup>176</sup> As a Cooperating Non-Member of the WCPFC, Vietnam's Directorate of Fisheries annually submits a report to the WCPFC Scientific Committee informing them about the status of the country's tuna fishery (referred to here as "the Vietnam Annual Fishery Report").<sup>177</sup> According to this report, the 2021 purse seine tuna catch by species was 54,231 mt, of which the vast majority (50,836 mt) was skipjack.<sup>178</sup> This purse seine catch was 6,072 mt less than the catch reported for 2019.<sup>179</sup>

### *Vietnam's Tuna Purse Seine Fleet*

No Vietnamese purse seine vessels are identified as registered in the 2021 WCPFC vessel registry. According to the Vietnam Annual Fishery Report, however, Vietnam had 7,088 vessels targeting tuna species in 2021, with all tuna fishing activity occurring within the country's EEZ. The report did not identify any fishing in the WCPFC convention area or in the EEZ's of other coastal states. Of the 7,088 identified tuna vessels, 2,659 were purse seiners<sup>180</sup>; the remainder were gillnetters and longliners/handliners.<sup>181</sup> Table 38 shows the evolution, number of vessels, and capacity of Vietnam's purse seine fleet (measured by vessel horsepower [HP]) during the period 2011 to 2021.

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<sup>176</sup> The purse seine catch composition reported by the WCPFC for 2019 was: 55,380 mt of skipjack, 4,247 mt yellowfin and 675 mt bigeye.

<sup>177</sup> WCPFC. 2022a. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission Part 1: Information on Fisheries, Research and Statistics, WCPFC-SC18-AR/CCM-38. Vietnam's Annual Fishery Report.

<sup>178</sup> The remainder of the catch comprised yellowfin (2,670 mt) and bigeye (725 mt).

<sup>179</sup> Vietnam's reported catch by all gears for 2021 was 127,068 mt, with skipjack tuna contributing 68,822 (54.1 percent), 17,020 mt of yellowfin tuna (13.3 percent), and 3,176 mt of bigeye tuna (2.5 percent), and the remaining 38,050 mt (31.1 percent), corresponding to a variety of other non-specified species of billfishes and others (WCPFC. 2022a. Op. cit., pg. 4).

<sup>180</sup> These vessels use purse seine nets; however, no information is available about the size of the nets they use or the size of the vessels themselves. These are not the typical tuna purse seine vessels used by DWFN.

<sup>181</sup> WCPFC. 2022a. Op. cit., pg. 4. Information on the characteristics of these seiners is not available.

Table 38. Vietnam: Number of Tuna Purse Seine Vessels by Year and Capacity (HP), 2011-2021<sup>182</sup>

Size class (HP)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
50 – 89	134	136	131	79	64	59	64	78	81	353	108
90 – 149	184	194	118	90	73	58	66	81	185	569	178
150 – 249	44	56	114	154	138	127	120	147	186	69	291
250 – 399	233	206	242	513	456	404	350	423	483	373	420
> 400	20	0	409	750	730	811	893	1,043	1,349	1,333	1,662
<b>Total</b>	<b>615</b>	<b>592</b>	<b>1,014</b>	<b>1,586</b>	<b>1,461</b>	<b>1,459</b>	<b>1,493</b>	<b>1,772</b>	<b>2,284</b>	<b>2,697</b>	<b>2,659</b>

Source: WCPFC. 2022a. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission Part 1: Information on Fisheries, Research and Statistics, WCPFC-SC18-AR/CCM-38. Vietnam's Annual Fishery Report.

No information is available regarding ownership of Vietnam's tuna purse seine fleet.

### Processing Level

Based on industry knowledge, Vietnam's tuna processors appear to focus on the production of fresh/frozen tuna loins/steaks as well as the production of pre-cooked tuna loins. Some are also involved in the production of canned and pouched tuna. Many of the Vietnamese tuna processing plants are designed to handle frozen products in facilities in which the ambient temperature is very low to prevent the fish from defrosting. The processes typically involved using band saws that cut the fish into loins, removing those portions where the viscera of the fish are located or there are a blood lines. The loins are then treated with CO<sub>2</sub>, which allows the fish to maintain its color. These products are exported to countries like the U.S. where CO<sub>2</sub> treated tuna is allowed in the market. Similar products are not allowed in other markets, such as the E.U.

Many seafood processors in Vietnam belong to the Vietnam Association of Seafood Exporters and Producers, which includes producers of several species such as shrimp, octopus, tilapia, tuna, and other species. There are approximately 15 processors in Vietnam that process tuna products. However, there is no readily available information as to the total tuna processing capacity in the country, how much of the processing capacity is utilized for processing fresh/frozen and pre-cooked tuna loins, or how much may be available for production of pouched and canned tuna products. Among the more important companies are Dragon Waves (owned by Hi Vuong Group), Bidfisco, and Havico. In addition, two other companies, Yueh Chyang Co. and Pattaya Vietnam, are owned by Thai Union and Pattaya respectively in Thailand.<sup>183</sup>

<sup>182</sup> WCPFC. 2022a. Op. cit., pg. 4.

<sup>183</sup> Atuna. 2022a. "Top 3 Vietnamese Processors' Sales Expected to Reach USD 300 million." October 28.



Hai Vuong Group, owner of Dragon Waves owns five factories, four of which are dedicated mainly to processing tuna products and jointly may be capable of processing 400 mt/day.<sup>184</sup> Binh Dinh Fishery Joint Stock Company, trading as Bidifisco, is perhaps the second largest processor; it is focused on the production of pre-cooked yellowfin tuna loins and frozen steaks, loins, and cubes that it sells to the U.S., Europe, China, Korea, and Japan. The plant has a processing capacity of 60 mt/day and is processing about 5,000 mt per year.<sup>185</sup>

According to *Atuna*, some Vietnamese tuna processing companies have focused their production on the Japanese market, selling both sashimi grade yellowfin and skipjack loins. This is the case of Mariso Vietnam Co. Ltd., FoodTech Joint Stock Company, and Fijiura Nha Trang Co. Ltd.<sup>186</sup>

### *Imports of Raw Frozen Tropical Tunas to Supply Vietnam's Processing Plants*

Vietnam's tuna processing sector has had a significant focus on the production of tuna loins (fresh/frozen or pre-cooked) from yellowfin tuna. The domestic catches of these species are not sufficient to satisfy the industry's processing needs, so Vietnam relies on imports. This is not to minimize Vietnam's processing of skipjack tuna for tuna loins products. In 2019, according to BACI data, the country imported 92,003 mt of frozen whole tunas, of which yellowfin accounted for 59,390 mt or 64.5 percent of the total imports, with skipjack tuna accounting for 29,484 mt or 32 percent, and bigeye making up 3,129 mt or 3.4 percent. Table 39 shows Vietnam's 2019 imports of frozen tropical tuna. Taiwan, Korea and the U.S. were the main suppliers in 2019.

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<sup>184</sup> Hai Vuong Group, possesses five factories but four state-of-the-art manufacturing facilities, are used to process tuna products. **The Hai Vuong Factory**, with 100 mt/day, four cold storage areas with a capacity of 400 mt at -35 degrees Celsius, and a cooling storehouse at -35 degree Celsius, with a capacity of 9,000 mt. The plant is equipped with 20 band saws machines, 3 air blast quick freezers, 2 carbon monoxide rooms, and a chiller room. The second plant is **Dragon Waves Frozen Food Factory Co.** This processing plant is separately used for fresh/frozen and pre-cooked products and is equipped with 50 band-saw machines, 2 super-cooling storehouses at -60 degrees Celsius for about 300 mt, 3 deep freezing tunnels for IQF products at -45 Degrees Celsius, 1 air blast freezing system at -70 degrees Celsius, 4 cooling storehouses at -35 degrees Celsius with 1500 mt capacity, 1 seaming room 1 carbon monoxide room and 1 chiller room for treating carbon monoxide. This plant can process about 100 mt/day. **Nha Trang Bay Factory** this plant can also process 100 mt/day and is used to process separately fresh/frozen products and pre-cooked loins. It is equipped with 40 band saws machines, 5 air blasts quick freezers, 1 carbon monoxide room, and 1 chiller room for treating carbon monoxide. The plant has 3 separate stores at -55 degrees Celsius, with a capacity of 2000 mt. Finally, the group owns **Tuna Vietnam Factory**, a complex of eight separate buildings that include, a processing plant, a fish powder plant, a fish meal plant, cold storage, and a warehouse. This plant is used to process fresh/frozen, pre-cooked, canned, and pouched tuna products, and can process 90 mt/day. It has 1,500 mt cold storage areas at -35 degrees Celsius. More information is available at the company website. Viewed at <http://www.dragonwaves.com/facilities/content.html>, accessed March 25, 2023.

<sup>185</sup> Bidifisco. 2023. Company website. Viewed at <http://www.bidifisco.com/public/introduction.html>, March 25, 2023.

<sup>186</sup> *Atuna*. 2022b. "Vietnam Tuna Exports to Japan Reach US D 31 Million." November 15.

Table 39. Vietnam: Imports of Raw Frozen Tropical Tunas by Exporting Country, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Exporter	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Other Asia, nes (Taiwan)	24,246	26%	26%	14,559	8,862	825
2	South Korea	16,651	18%	44%	8,831	7,651	169
3	USA	10,501	11%	56%	5,011	5,278	212
4	Thailand	6,023	7%	62%	6,023	-	-
5	China	5,972	6%	69%	3,562	2,344	66
6	Philippines	5,008	5%	74%	4,971	38	-
7	India	4,923	5%	80%	4,769	154	-
8	Indonesia	3,593	4%	84%	1,962	1,040	591
9	Ghana	2,712	3%	87%	2,146	332	234
10	Fiji	2,306	3%	89%	1,838	0	468
>10	Others	10,067	11%	100%	5,718	3,787	562
Total		92,003			59,390	29,484	3,129

Source: BACI

Notes: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

### Export Level

As discussed earlier, Vietnam has become active in the processing of tuna loins (fresh/frozen and pre-cooked) that are oriented to export markets; however, Vietnam also registered a meaningful volume of exports of whole frozen tuna. Three countries, Italy, the Philippines, and the U.S., imported 17,427 mt of whole frozen tuna from Vietnam out of a total volume of 20,730 mt in 2019.<sup>187</sup> The bulk of Vietnam's exports, however, involved tuna that was processed into loins that were fresh/frozen or pre-cooked. Table 40 shows Vietnam's 2019 exports of processed tuna products.

<sup>187</sup> BACI data.

Table 40. Vietnam: Exports of Processed Tuna Products by Importing Country, 2019 (mt of product weight)

PROCESSED				
Rank	Importer	Total	Percent	Cum. Percent
1	USA	21,523	36%	36%
2	Spain	5,455	9%	45%
3	Thailand	5,089	9%	54%
4	Israel	4,385	7%	61%
5	Germany	2,939	5%	66%
6	Canada	2,087	4%	70%
7	Japan	1,922	3%	73%
8	Jordan	1,252	%	75%
9	Other Asia, nes (Taiwan)	1,225	2%	77%
10	Egypt	1,206	2%	79%
>10	Others	12,462	21%	100%
Total		59,545		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

As Table 40 suggests, the U.S. is the main importer of Vietnam's processed tuna products. According to NMFS data on U.S. fishery product imports (which distinguish between types of processed products), the U.S. imported a total of 21,708 mt of processed tuna products from Vietnam, of which 6,518 mt were pre-cooked tuna loins and the remainder (15,190 mt) were canned or pouched tuna products.

Some of the major tuna processors named earlier in this section, including Hai Vuong and Yueh Chyang Co., are also the top Vietnamese tuna companies exporting products to the world. Table 41 shows the top ten exporting companies in 2019 according to Datamyne.

**Table 41. Vietnam: Top Ten Exporting Companies by Volume for Processed Tuna, 2019 (mt of product weight)**

EXPORTS FROM VIETNAM - PROCESSED TUNA		
Rank	Top Exporting Companies	Quantity (mt)
1	Yueh Chyang Canned Food Company Lim	4,165
2	Vif Co., Ltd.	2,619
3	Highland Dragon Enterprise	2,344
4	Tuna Vietnam Company Limited	1,450
5	Hai Vuong Co. Ltd.	1,035
6	Kien Giang Trading Joint Stock Comp	935
7	None	638
8	Halong Canfoco Danang Co. Ltd.	303
9	Tin Thinh Co. Ltd	166
10	Xi Nghiep Che Trai Cay Foodtech	119

Source: Datamyne

Note:

1. As a point of reference, BACI data report that Vietnam exported approximately 59,500 mt of processed tuna products in 2019. (See Table 40.)
2. Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

As previously noted, the largest importer of tuna products from Vietnam is the U.S. Table 42 shows the main U.S. importers of Vietnam's processed tuna products in 2019 according to Datamyne.

It is worth noting that among the top U.S. importers are two of the major tuna brands, Chicken of the Sea International (owned by Thai Union) and Bumble Bee Seafood (owned by FCF Fishery Co. Ltd.). These two companies are importers of tuna loins for their processing facilities in Lyons, Georgia and Santa Fe Springs, California respectively. Wild Planet Foods is a national brand recently acquired by the Bolton Group. Wild Planet imports are of canned products. J.A. Kirsch Corp. is an importing company selling tuna under the Ruby brand.

Table 42. Vietnam: Top U.S. Companies by Volume Importing Vietnam's Processed Tuna Products, 2019 (mt of product weight)

TOP IMPORTING COMPANIES	
USA	Qty (mt)
Chicken of the Sea International	3,966
J A Kirsch Corp.	3,496
Bumble Bee Foods LLC	2,222
Wild Planet Foods Inc.	1,623
Limson Trading Inc.	333
Nemco Food Tradinginc	290
Atlantic Beverage Company	186
Northeast Marketing Co.	185
Bumble Bee Trading	179
Kosher First LLC	175
<b>TOTAL</b>	<b>12,654</b>

Source: Datamyne

Note:

1. As a point of reference, BACI data report that Vietnam exported approximately 21,500 mt of processed tuna products to the U.S. in 2019. (See Table 40.)
2. Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Although for most countries processed tuna is traded under HS code 1604.14, which includes canned and pouched products and pre-cooked loins destined for canning, Vietnam also exported processed tuna products to many other countries under different HS codes (0304.87, and 0303.49). In 2019, the total quantity of Vietnam's exports under these two HS codes represented 35,586 mt. Table 43 shows Vietnam's 2019 export of other tuna products.

Table 43. Vietnam: Exports of “Other” Tuna Products by Importing Country, 2019 (mt of product weight)

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	USA	14,145	40%	40%	14,124	21
2	Russian Federation	1,813	5%	45%	1,813	-
3	Israel	1,768	5%	50%	1,768	-
4	Japan	1,675	5%	55%	906	769
5	Mexico	1,581	4%	59%	1,581	-
6	Thailand	1,510	4%	63%	40	1,470
7	Netherlands	1,395	4%	67%	1,383	13
8	China	1,183	3%	70%	1,180	3
9	Germany	1,099	3%	74%	1,094	5
10	Spain	1,010	3%	76%	1,010	-
>10	Others	8,407	24%	100%	6,948	1,460
Total		35,586			31,845	3,740

Source: BACI

Note: Includes HS Codes 0304.87 and 0303.49

The U.S. imported 14,145 mt or 40 percent of Vietnam’s exports of “Other” tuna products in 2019. Several countries, such as the Russian Federation, Israel and others follow the U.S. with imports ranging from 1,000 to 2,000 mt in 2019. The HS codes involved in this trade usually include frozen fillets, steaks, cubes, which are all processed tuna products that are normally treated with carbon monoxide. The quantities reported are significant, particularly if one adds Vietnam’s total exports of tuna and tuna products; together, the 35,586 mt of “Other” tuna products, combined with 20,730 mt of whole frozen tunas, and 59,545 mt of processed tuna bring Vietnam’s total exports for 2019 to 115,861 mt. Although it is not possible to identify the specific products exported under these two HS codes, the quantities exported shows Vietnam’s strength as an emerging stakeholder in Pacific trade flows.

## China

China’s importance in today’s world economy is unquestionable. The country has successfully penetrated myriad markets, from micro-chips to computers to smartphones. Tuna is no exception; in addition to China’s established presence in tuna longline fishing, it is emerging as an important purse seine fishing and tuna processing nation. In 2016, Shanghai Kaichuang Marine International Co. Ltd. acquired Conservas Albo,

perhaps one of the most valuable brands in the Spanish market, with a leading presence in the solid yellowfin in olive oil presentation. Breaking into the top tier of world tuna markets, China is now exporting pre-cooked tuna loins, caught by its purse seine fleet and processed domestically, to be packed under the Albo label in Spain. This is perhaps only a small indication of what may be coming in the next five to ten years.

China's huge population also represents a potentially very attractive market for canned tuna products, but this emerging market is still in its earlier stages. China is expected to continue to catch tuna with its purse seine fleet, both under its own flag and/or using other countries' flags (FSM, Marshall Island, Kiribati, etc.), if conditions require. China will continue to demand additional supplies that will need to be imported from other tuna-catching countries in the Pacific, and from other ocean areas.

## Harvest Level

### *China Tuna Purse Seine Catch*

In 2019, China's purse seine catch of tropical tuna amounted to 6,518 mt.<sup>188</sup> Over the 2017 to 2021 period, China's tuna purse seine has fluctuated, reaching a record catch in 2021 of 36,156 mt. Skipjack tuna represented the majority of the catch (30,016 mt or 83 percent of the catch), and yellowfin represented 6,037 mt or 16.6 percent.<sup>189</sup> Table 44 shows China's tropical tuna purse seine catches in the WCPFC convention area for the period 2017 to 2021.

**Table 44. China: Tropical Tuna Purse Seine Catch, 2017 to 2021 (mt)**

Year	Bigeye	Yellowfin	Skipjack	Total
2017	326	4,254	10,895	15,475
2018	26	172	1,775	1,973
2019	28	297	6,193	6,518
2020	76	387	6,022	6,485
2021	103	6,037	30,016	36,156

Source: WCPFC, 2022b. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission. Part 1: Information on Fisheries, Research, and Statistics. WCPFC -SC18-AR/CMM-03 (Rev 01). China Report. August 18th, 2022

<sup>188</sup> The RFMO catch data on which the primary analysis relies do not identify any Chinese purse seine catch of tropical tuna in 2019. This catch is reported in WCPFC. 2022b. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission. Part 1: Information on Fisheries, Research, and Statistics. WCPFC -SC18-AR/CMM-03 (Rev 01). China Report. August 18th, 2022.

<sup>189</sup> WCPFC. 2022b. Op. cit.

*China's Tuna Purse Seine Fleet*

China is a newcomer to the Pacific tuna purse seine trade. Until 2001, China had no tuna purse seine vessels at all, but over the years, has established a fleet comprising both older purse seine vessels and newly constructed vessels. According to the WCPFC annual report submitted by China in 2021 (referred to here as the “China Country Report”), China had 16 purse seine vessels operating in the WCPFC convention area and caught 36,156 mt, including catches taken in the EEZs of PICs.<sup>190</sup> The Chinese tuna purse seine fleet operates under charter arrangements with the Federated States of Micronesia, Kiribati, the Marshall Islands, and at times with PNG.

According to Havice et. al. (2019), in 2018, China had 21 vessels (15 vessels operating under Chinese flag, plus six additional vessels beneficially owned by a Chinese company and operating under the Marshall Islands flag).<sup>191</sup> The most recent registry data from the WCPFC suggests there are seven Chinese purse seine vessels operating in the convention area.

Table 45 lists, as of 2018, China's companies involved in tuna purse seining, the number of tuna vessels owned by each company, other relevant ownership information such as the nature of the company (privately held company or a State-Owned Enterprise [SOE]), and other commercial links with tuna processing plants in China or elsewhere.

**Table 45. China: Profile of Chinese Companies Involved in Tuna Purse Seining in the WCPFC Convention Area, 2018**

Company Name	Number of Vessels Under Chinese Flag	Number of Vessels under Other Flags	Total Number of Vessels	Privately Held Company or a State-Owned Enterprise (SOE)	Owns Tuna Processing Plant?
Shanghai Kaichuang Deep Sea Fisheries Corporation	6 (2 of these vessels may be operating off the west coast of Africa)	6 (Marshall Islands)	12	SOE. Owned by Shanghai Kaichuang Marine International Co. Ltd., a listed company controlled by Bright Food (Group), an SOE.	Owns the brand Albo (Spain). Does not currently (2018) own a processing plant in China but is planning to open one.  The company is related to the tuna loining plant Pan Pacific Fisheries in Majuro, Marshall Islands <sup>192</sup>
Zhong Yu Global	2		2	SOE. Subsidiary of China National	No

<sup>190</sup> WCPFC. 2022b. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission. Part 1: Information on Fisheries, Research, and Statistics. WCPFC-SC18-AR/CMM-03 (Rev 01). China Country Report. August 18.

<sup>191</sup> Havice et al. 2019. Op. cit.

<sup>192</sup> Shanghai Kai Chuang Marine International Co., Ltd. 2023. Holding Company. Viewed at <https://www.skmic.sh.cn/en/company.html>, March 21, 2023.



Company Name	Number of Vessels Under Chinese Flag	Number of Vessels under Other Flags	Total Number of Vessels	Privately Held Company or a State-Owned Enterprise (SOE)	Owns Tuna Processing Plant?
				Fisheries Corporation (CNFC), a large SOE based in Beijing.	
Zhejiang Ocean Family (also known as Da Yang Shi Jia)	4		4	Privately Held Company	Owns a tuna loining plant and a Joint Venture with Mitsubishi to handle Ultra Low Temperature (ULT) purse seine- and longline-caught tuna, and has 55% ownership of a second plant
Liaoning Pelagic Fisheries	2		2	Privately Held Company	
Ningbo Yongfa Ocean Fisheries	1		1	N/A	Apparently no longer active in 2022
<b>Total</b>	<b>15</b>	<b>6</b>	<b>21</b>		

Source: Developed by IEc/GHA based on information provided in Havice et.al. 2019. Op. cit. and professional industry knowledge of Guillermo Gomez, GHA.

According to China's WCPFC Country Report, the Chinese purse seine vessels mainly operate in the tropical waters close to the equator area, targeting skipjack, and within the EEZs of PNG, the Marshall Islands, Micronesia (FSM), Nauru, the Solomon Islands, and Tuvalu.<sup>193</sup> In the past, up to 14 Chinese purse seine vessels were chartered to Kiribati, allowing them to fish on FADs throughout the FAD closure,<sup>194</sup> however some of the vessels have shifted their operations to FSM and the Marshall Islands. The catches of the purse seine vessels are mostly transshipped to Thailand. Havice et.al. (2019), estimate that in 2018, the total catch of Chinese-flagged, chartered and beneficially owned vessels, assuming an average of 7,000 mt per vessel per year, could have been

<sup>193</sup> WCPFC. 2022b. Op. cit., pg. 3

<sup>194</sup> The catches taken by the Chinese vessels chartered to Kiribati were attributed to Kiribati, while the catches of beneficially owned Marshall Islands-flag vessels were attributed to the Marshall Islands. It is for these reasons that it is difficult to ascertain the total catch of the Chinese purse seine fleet.

around 150,000 mt.<sup>195</sup> In 2020, the Chinese purse seine fleet operating in the Pacific reported that all their catches were off-loaded for transshipping by reefer carrier or container ship at a port (as opposed to in a High Seas area). Additionally, all 45 transshipments that occurred in the WCPFC convention area involved catches taken inside the WCPFC convention area.<sup>196</sup>

### Processing Level

According to Havice et. al. (2019), “China’s tuna processing capacity is growing, with around 50 factories authorized to process tuna at least some of the time. Many of these factories, most of which are privately owned and located primarily in Zhejiang and Shandong provinces, also produce other products as well as loins and/or canned tuna.”<sup>197</sup>

Like Vietnam, China has started to produce processed frozen tuna caught by both purse seine and longline vessels to produce fresh/frozen tuna loins for the sashimi grade market and pre-cooked tuna loins for the canned tuna markets. The Chinese processing sector produces these products not only from the fish caught by its domestic fleet but also from imported frozen tuna caught by other countries.

Little information is available about most of the Chinese companies identified. Two important private companies are Luen Thai Fishing Venture, which is part of an industrial conglomerate, and Pingtairong Ocean Fishery Group, which is a family-owned operation; both are involved in tuna fishing and processing.<sup>198</sup> The Shanghai Kaichuang Marine International Co. Ltd. tuna processing facility has a plant capable of processing both fresh/frozen tuna loins and steaks, as well as pre-cooked tuna loins that are oriented to the export market. The facility can handle Ultra Low Temperature (ULT) products for the Japanese sashimi market.

The Zhejiang Ocean Family also has a processing facility that is designed to produce pre-cooked tuna loins exclusively for Bumble Bee Seafoods.<sup>199</sup> No information was available on any other tuna processing plants in China.

### *Imports of Raw Frozen Tropical Tuna to Supply China’s Tuna Processing Plants*

In 2019, China imported 102,991 mt of whole frozen tropical tuna, with the Marshall Islands, Taiwan, Korea, and the Federated States of Micronesia supplying over 75 percent of China’s raw material processing needs. Table 46 shows China’s 2019 imports of tropical tuna.

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<sup>195</sup> Havice et.al. 2019. Op. cit., pg. 39. This volume differs from the data reported by China to the WCPFC as Chinese catch.

<sup>196</sup> WCPFC. 2022b. Op. cit., pg. 11.

<sup>197</sup> Havice et.al. 2019. Op. cit., pg. 51.

<sup>198</sup> Campling et al, 2017 page 180.

<sup>199</sup> Ocean Family and Bumble Bee have an exclusive agreement to produce pre-cooked tuna loins in China. Viewed at <https://www.youtube.com/watch?v=Exw9Bg8Z5D4>

Table 46. China: Imports of Frozen Tropical Tuna by Exporting Country, 2019 (mt of product weight)

Rank	Exporter	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Marshall Islands	38,195	37%	37%	2,812	35,383	-
2	Other Asia, nes (Taiwan)	20,115	20%	57%	2,012	17,165	938
3	South Korea	10,228	10%	67%	1,171	8,929	127
4	Micronesia (Fed. States)	9,478	9%	76%	958	8,395	125
5	PNG	5,930	6%	82%	477	5,453	-
6	Ghana	5,442	5%	87%	1,864	3,577	-
7	Vanuatu	4,059	4%	91%	137	3,915	7
8	USA	2,586	3%	93%	117	2,394	75
9	Fiji	1,612	2%	95%	373	62	1,177
10	Kiribati	1,471	1%	96%	51	1,420	-
>10	Others	3,877	4%	100%	2,869	878	130
<b>Total</b>		<b>102,991</b>			<b>12,840</b>	<b>87,571</b>	<b>2,580</b>

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

## Export Level

### *China's Exports of Raw Tropical Tunas for Processing Elsewhere*

BACI data do not segregate China's exports of frozen sashimi-grade tropical tuna caught by its longline fleet from the catches made of the same species by its tuna purse seine fleet. Based on the professional industry knowledge of Guillermo Gomez, GHA, it is reasonable to assume that, of the total 66,543 mt of frozen tuna exported by China in 2019, about 46,000 were used for canning processes while the remaining approximately 20,000 mt represented exports of sashimi-grade tuna that went to Japan (17,699 mt) and South Korea (1,035 mt). This is because bigeye tuna is only consumed as sashimi and yellowfin is also highly valued as sashimi in the Japanese market. Table 47 shows China's 2019 exports of frozen tropical tuna.

Table 47. China: Exports of Raw Frozen Tropical Tuna by Importing Country, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Japan	17,669	27%	27%	6,333	204	11,132
2	Thailand	11,887	18%	44%	4,819	5,602	1,466
3	Philippines	9,286	14%	58%	319	8,440	528
4	Iran	7,889	12%	70%	-	7,889	-
5	Spain	6,688	10%	80%	5,693	995	-
6	Vietnam	5,972	9%	89%	3,562	2,344	66
7	Indonesia	2,826	4%	93%	1,899	927	-
8	South Korea	1,035	2%	95%	53	71	911
9	Russian Federation	430	1%	96%	-	430	-
10	Malaysia	335	1%	96%	2	333	-
>10	Others	2,527	4%	100%	574	1,675	278
Total		66,543			23,254	28,909	14,380

Source: BACI data.

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

*China's Exports of Tropical Tuna Processed Products*

In 2019, China exported 98,195 mt of processed tuna products under HS Code 1604.14, which includes tuna loins and canned/pouched tuna products. Spain was the single largest importer of these processed tuna products from China with 25,059 mt, representing 26 percent of China's total exports for that year. Thailand and Algeria accounted for 12,812 mt (13 percent) and 10,902 mt (11 percent), respectively. These three top countries accounted for 50 percent of China's total exports of processed tuna products. It is likely that the quantities imported by both Spain and Thailand involved pre-cooked tuna loins to serve canneries in those countries.<sup>200</sup> Table 48 shows China's 2019 exports of processed tuna products.<sup>201</sup>

<sup>200</sup> Eurostat data for 2019 indicate that Spain imported 25,016 mt of processed tuna products. This amount was identified as pre-cooked tuna loins and is consistent with BACI data in terms of the overall volume of imports.

<sup>201</sup> BACI export data under HS code 1604.14 likely includes albacore loins.

Table 48. China: Exports of Processed Tuna Products by Importing Country, 2019 (mt of product weight)

PROCESSED				
Rank	Importer	Total	Percent	Cum. Percent
1	Spain	25,059	26%	26%
2	Thailand	12,812	13%	39%
3	Algeria	10,902	11%	50%
4	Mexico	6,345	6%	56%
5	Israel	4,832	5%	61%
6	Oman	3,434	3%	65%
7	Venezuela	3,328	3%	68%
8	Peru	2,808	3%	71%
9	USA	2,677	3%	74%
10	Vietnam	2,244	2%	76%
>10	Others	23,754	24%	100%
Total		98,195		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

*China's Exports of "Other" Tuna Products*

In addition to China's exports of processed tuna products under HS Code 1604.14, in 2019 China also exported 22,738 mt of "Other" non-specified tuna products. Japan was the main importer of China's "Other Frozen Tuna" products with 11,273 mt. Although it is not possible to identify the specific products, it is likely that some of them could have originated from Chinese longline sashimi-grade tuna operations that were processed in China. Table 49 shows China's exports of "Other" tuna products in 2019. Other countries importing Chinese products under this HS code were the Russian Federation and Thailand.

Table 49. China: Exports of “Other” Tuna Products by Importing Country, 2019 (mt of product weight)

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	Japan	11,273	50%	50%	11,267	6
2	Russian Federation	3,686	16%	66%	3,686	-
3	Thailand	2,029	9%	75%	316	1,713
4	Vietnam	784	3%	78%	70	714
5	South Korea	643	3%	81%	618	24
6	Turkey	583	3%	84%	583	-
7	USA	527	2%	86%	527	-
8	Costa Rica	500	2%	88%	-	500
9	Côte d'Ivoire	468	2%	90%	-	468
10	Fiji	463	2%	92%	27	436
>10	Others	1,783	8%	100%	1,363	420
Total		22,738			18,458	4,280

Source: BACI

Note: Includes HS Codes 0304.87 and 0303.49

## Indonesia

Indonesia is the single largest tuna producing country in the world. In 2021, Indonesia had an estimated tuna catch of approximately 546,947 mt<sup>202</sup> with all gears in both oceans,<sup>203</sup> although its catch data are reported to be unreliable. The country had thousands of small craft that catch tuna and most of the catches can be considered artisanal or semi-artisanal. Indonesia has been a contracting member of the WCPFC since 2013.

Although a significant country in the global tuna trade for fresh, frozen, and processed tuna products, Indonesia's relevance in Pacific tuna trade flows is difficult to assess. Data limitations on the ocean region of

<sup>202</sup> WCPFC. 2022c. Scientific Committee Regular Session, Annual Report to the Commission, Part 1: Information on Fisheries, Research and Statistics. WCPFC-SC18-AR/CCM-9 (Rev.01). Indonesia Country Report, August 18. Downloaded from <https://meetings.wcpfc.int/node/15324>, March 26, 2023.

<sup>203</sup> WCPFC. 2022c. Op. cit., pg. 17. Tunas in Indonesia are caught by many different gear types such as handlines, troll lines, pole and line, gillnets, longline, and purse seine nets.

origin, combined with significant differences in catch estimates across data sources, make it very difficult to establish the impact that Indonesia may or not have on Pacific tuna trade flows.

## Harvest Sector

### Indonesia's Tuna Purse Seine Catch

In 2019, according to data downloaded from the WCPFC by IEc/GHA, Indonesia reported a tuna purse seine catch of approximately 139,127 mt in the Pacific Ocean, taken by a fleet of 11 tuna purse seiners.<sup>204</sup> However, these catch data conflicts with an estimated purse seine catch in 2019 of 36,423 mt reported by the Ministry of Marine Affairs and Fisheries of the Republic of Indonesia in its report to the WCPFC Scientific Committee (referred to here as the “Indonesia Country Report”).<sup>205</sup> The reasons for this substantial discrepancy are unclear, and make it difficult to evaluate the importance of Indonesia as a harvesting country in the tropical tuna purse seine fishery.

Table 50 shows Indonesia's purse seine tropical tuna catches for the period 2000 to 2021 within the Fisheries Management Areas (FMAs) that correspond to Indonesia within the WCPFC Convention Area.<sup>206</sup> Based on the Indonesia Country Report, the average purse seine catches over the period 2009 to 2021 of tropical tuna taken by Indonesia was 36,356 mt. For each recent individual year reported, catch appears to be consistently within this range, and significantly lower than the catch reported in WCPFC catch data.

**Table 50. Indonesia: Purse Seine Estimated Catches within Fishery Management Areas (FMA) 716 and 717, 2000 - 2021 (mt)**

PURSE SEINE (FMAs 716 and 717)							
Year	Estimated Tuna Catch (mt)						
	Skipjack	%	Yellowfin	%	Bigeye	%	Total
2000	8,577	82%	1,735	16,6%	144	1,4%	10,456
2001	7,892	82%	1,596	16,6%	132	1,4%	9,621
2002	7,586	82%	1,534	16,6%	127	1,4%	9,248
2003	7,738	82%	1,565	16,6%	130	1,4%	9,433
2004	10,188	82%	2,061	16,6%	171	1,4%	12,420
2005	12,462	65%	6,114	32,0%	544	2,8%	19,120

<sup>204</sup> According to Lara Manarangi-Trott, data manager at WCPFC, the catch of 139, 127 mt is an estimate by the WCPFC and the Secretariat of the Pacific Commission (SPC) which is the scientific arm of the WCPFC. GHA personal communication with Lara Manarangi-Trott, Compliance Manager, WCPFC, Jan 25, 2023.

<sup>205</sup> The Indonesia national report indicates a catch of 114,224 for all gears in the WCPFC convention area and a purse seine catch of only 39,492 mt. The 11 reported tuna purse seine vessels had a gross tonnage (GT) of approximately 500 tons each. The GT for vessels usually refers to the total weight of the fishing craft and not to the vessel's fish hold carrying capacity. It is thus difficult to imagine that 11 vessels of 500 tons each could have caught 139,127 mt of tuna in a year.

<sup>206</sup> FMAs 716 and 717

PURSE SEINE (FMAs 716 and 717)							
Year	Estimated Tuna Catch (mt)						
	Skipjack	%	Yellowfin	%	Bigeye	%	Total
2006	12,665	75%	3,634	21,6%	502	3,0%	16,802
2007	8,619	67%	3,958	30,7%	301	2,3%	12,877
2008	5,625	70%	2,122	26,3%	320	4,0%	8,068
2009	7,551	78%	1,742	18,0%	387	4,0%	9,681
2010	5,525	87%	635	10,0%	191	3,0%	6,351
2011	9,815	83%	1,656	14,0%	355	3,0%	11,825
2012	25,164	75%	8,198	24,4%	235	0,7%	33,597
2013	62,726	96%	2,614	4,0%	0	0,0%	65,340
2014	36,085	83%	7,000	16,1%	289	0,7%	43,374
2015	25,205	73%	8,247	9,0%	1,153	1,3%	34,604
2016	40,262	66%	20,546	33,5%	509	0,8%	61,317
2017a)	46,741	66%	23,370	33%	708	1%	70,820
2018	15,650	71%	5,951	27%	441	2%	22,043
2019	27,072	74%	8,671	24%	680	2%	36,423
2020	24,887	66%	12,304	33%	566	2%	37,758
2021	29,430	74.52%	9,885	25,03%	178	0,45%	39,492
Fishing Port	15,287	74.52%	5,135	25.03%	92	0.45%	20,514
Non- Fishing Port	14,142	74.52%	4,750	25.03%	85	0.45%	18,978
Average 2009-2021	27,393	76%	8,525	22%	438	2%	36,356

Source: WCPFC. 2022c. Op. cit., pg. 10.

### Indonesia's Tuna Purse Seine Fleet

While the WCPFC Vessel Register and data from the Indonesia Country Report provided by the Ministry of Marine Affairs and Fisheries of Indonesia appear to coincide on the numbers of tuna purse seine vessels (11) operating in the WCPFC convention area, the International Seafood Sustainability Foundation (ISSF), an industry Non-Governmental Organization (NGO) focused on tuna industry interests, includes 26 tuna purse seine vessels in its records of Large-Scale Purse Seine Vessels (LSPSV). The record list the names of the vessels



and other characteristics, including the gross tonnage. The vessels included in this list are relatively small vessels compared to other purse seine vessels.<sup>207</sup>

Records for the 11 vessels in the Indonesia tuna purse seine fleet as listed by the WCPFC and the Indonesian government indicate that four companies owned these 11 vessels, as shown in Table 51.

**Table 51. Indonesia: Companies Owning Tuna Purse Seine Vessels**

Company Name	Number of Purse Seine Vessels Owned
Bintang Mandiri Bersavdari Pt	4
Samudra Mandiri Sentose	3
Multi Indofish Pt	3
Sumber Mextika Dawindi Pt	1
<b>Total</b>	<b>11</b>

Source: IEC/GHA Vessel Compilation analysis.

### Processing Level

The Indonesia tuna processing sector is large, including over 40 tuna processing companies. Some of the companies are involved in freezing tuna and making a wide variety of frozen products such as loins, steaks, poke cubes, etc., while others are involved in the production of both canned and pouched tuna products as well as pre-cooked tuna loins.<sup>208</sup>

The tuna processing sector in Indonesia is supplied by the catches taken by the different types of fishing vessels. Many of the processing facilities work with the pole-and-line vessels located in nearby areas and also source from purse seine vessels. Some of these companies have financial investments from overseas companies from the Philippines, Thailand, and/or Japan.

### Indonesia's Tuna Processing Capabilities

Table 52 provides a list of the main canned tuna processing companies in Indonesia. It is estimated that these companies can process approximately 445 mt/day or close to 98,000 mt/year. Importantly, Indonesia's tuna processing sector uses tuna caught by its own fleet and other fleets in both the Indian and Pacific Oceans; it is very difficult to determine which ocean the tuna came from that resulted in a particular finished product. Of these companies, the most relevant in terms of importance in global supply chains are Sinar Pure Foods, PT Aneka, and Juifa based on their capacity and linkages to the Japanese canned market and to other key actors such as Thai Union.

<sup>207</sup> ISSF. 2023b. LSPSV records. Records accessed and downloaded at <https://www.iss-foundation.org/vessel-and-company-commitments/other-vessel-lists/record-of-large-scale-purse-seine-vessels/>, March 25, 2023.

<sup>208</sup> In addition to its export-oriented processing of canned tuna, Indonesia also produces some katsuobushi for Japan (refer to <http://www.saricakalang.com/>) and has a significant domestic processing industry of various specialized products including smoked fish such as Ambon, fish balls, and others.

Table 52. Indonesia: Top Tuna Processing Companies

Cannery	Location	Structure/Affiliation	Source of Supply	Annual Production Estimate
Sinar Pure Foods International	Bitung	Consortium (Majority Philippines/some Indonesia)	Local Vessels and PS	20,000 ~ 100 mt/day <sup>209</sup>
International Alliance Foods	Bitung	Philippines 70%, Indonesia 30%	Local Vessels and PS	5,000 ~ 60 mt/day canning + ~20 mt/day pre-cooked loins <sup>210</sup>
Deho	Bitung	Citra Raja Ampat (CRA) Indonesia	Local Vessels, PS, P&L, Artisanal	5,000
Delta Pasific Indotuna	Sorong	Citra Raja Ampat, Surabaya (Philippines equity in CRA)	Local vessels & PS	8,000, ~ 50mt/day <sup>211</sup>
Citra Raja Amopat	Sorong	CRA, Surabaya (possible Philippines equity in CRA)	Local Vessels, PS and P&L	8,000 ~ 35 mt/day <sup>212</sup>
PT Aneka Tuna Indonesia	Pasuruan, East Java	Hagoromo/Itochu Joint Venture (Japan)	Some local/some imported	30,000 ~ 150 mt/day <sup>213</sup>
PT Samuedra Mandri Sentosa	Bitung	DFC, Philippines	Local vessels	150 mt/day <sup>214</sup>

<sup>209</sup> Pt. Sinar Pure Foods International. 2023 Company website. Viewed at <http://ptsinarpurefoods.com/company-metamorphosis/>, March 29, 2023.

<sup>210</sup> Fish Information & Services. 2023b. PTIAFI – P.T. International Alliance Food Indonesia. Viewed at [https://www.seafood.media/fis/companies/details.asp?l=e&filterby=companies&=&country\\_id=&page=1&company\\_id=159112](https://www.seafood.media/fis/companies/details.asp?l=e&filterby=companies&=&country_id=&page=1&company_id=159112), March 29, 2023

<sup>211</sup> Greenpeace. 2019. Tuna Cannery Ranking: Indonesia & Philippines. Downloaded from [https://www.greenpeace.org/static/planet4-philippines-stateless/2019/05/a8431058-a8431058-tuna\\_cannery\\_ranking.pdf](https://www.greenpeace.org/static/planet4-philippines-stateless/2019/05/a8431058-a8431058-tuna_cannery_ranking.pdf), March 29, 2023. Pg. 9.

<sup>212</sup> Tobin, M. 2019. This Week in Asia/Economics: From Kyoto to Kansas City, it's Indonesia tuna on the world's sushi counters. March 19. Viewed at [https://www.scmp.com/week-asia/economics/article/3002223/kyoto-kansas-city-its-indonesian-tuna-worlds-sushi-counters?module=perpetual\\_scroll\\_0&pgtype=article&campaign=](https://www.scmp.com/week-asia/economics/article/3002223/kyoto-kansas-city-its-indonesian-tuna-worlds-sushi-counters?module=perpetual_scroll_0&pgtype=article&campaign=), April 23, 2023.

<sup>213</sup> Pt. Aneka Tuna Indonesia. 2023. Company website. Viewed at <https://tunaindonesia.com/about.html>, March 29, 2023.

<sup>214</sup> SMS. 2023. Company website. Viewed at <https://www.tunasms.com/about-us/our-company>, March 29, 2023.

Juifa Int. Foods	Calicap, Java	Thai Union 76%, Indonesian 24%	Imported Fish/ Albacore	6,000, ~30 mt/day
Total				~ 445 mt/day or 97,900 per/year @ 220 days per year

Source: Adapted from Hamilton, A., A. Lewis, M.A. McCoy, E. Havice, and L. Campling. 2011. Market and Industry Dynamics in the Global Tuna Supply Chain. June. Forum Fisheries Agency, Honiara, Solomon Islands. Updated information by IEc/GHA using company websites and Greenpeace. 2019. Op. cit. pg. 9.

### *Imports of Raw Frozen Tropical Tunas to Supply Indonesia's Tuna Processing Plants*

In 2019, Indonesia imported 28,024 mt of tropical tunas, with almost 50 percent of this quantity supplied by the Seychelles and Spain, both countries with active tuna purse seine fleets in the Western Indian Ocean. The remaining 50 percent of Indonesia's imports of tropical tunas came from countries with active tuna fleets operating in the WCPFC. Table 53 shows Indonesia's 2019 imports of frozen tropical tunas.

**Table 53. Indonesia: Imports of Raw Frozen Tropical Tunas by Exporting Country, 2019 (mt of product weight)**

FROZEN TROPICAL				
Rank	Exporter	Total	Percent	Cum. Percent
1	Seychelles	9,655	34%	34%
2	Spain	3,630	13%	47%
3	Micronesia (Fed. States)	2,879	10%	58%
4	China	2,826	10%	68%
5	Solomon Islands	1,696	6%	74%
6	Japan	1,354	5%	79%
7	South Korea	1,010	4%	82%
8	Marshall Islands	837	3%	85%
9	Samoa	793	3%	88%
10	Malaysia	716	3%	91%
>10	Others	2,629	9%	100%
Total		28,024		

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

## Export Level

*Indonesia's Exports of Raw Tropical Tunas for Processing Elsewhere*

Indonesia exported 57,407 mt of whole frozen tropical tunas in 2019. Japan, Thailand, the Philippines, Vietnam, and Mauritius were the beneficiaries, capturing 93 percent of the total outbound trade. Again, it is not possible to determine how much of these exports included fish caught in the Pacific or in the Indian Oceans. Table 54 shows Indonesia's 2019 exports of frozen tropical tunas.

**Table 54. Indonesia: Exports of Raw Frozen Tropical Tunas by Importing Country, 2019 (mt of product weight)**

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Japan	31,694	55%	55%	51	31,594	50
2	Thailand	12,215	21%	76%	4,752	6,783	680
3	Philippines	6,057	11%	87%	95	5,485	477
4	Vietnam	3,593	6%	93%	1,962	1,040	591
5	Mauritius	1,010	2%	95%	9	1,002	-
6	USA	801	1%	96%	761	-	40
7	Mexico	475	1%	97%	475	-	-
8	Spain	406	1%	98%	206	200	-
9	Italy	311	1%	99%	300	12	-
10	Portugal	198	0%	99%	-	198	-
>10	Others	647	1%	100%	265	344	38
	Total	57,407			8,874	46,656	1,876

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

It is worth noting that most of Indonesia's exports are of frozen skipjack. Japan's imports of frozen skipjack are probably associated with katsuobushi production, whereas Thailand's imports of frozen skipjack are associated with the canning process. Also relevant is that Vietnam's imports are primarily of yellowfin, corroborating previous findings that this country has a marked preference for this species in the production of pre-cooked tuna loins.

*Indonesia's Exports of Tropical Tuna Processed Products*

Indonesia is an important exporter of processed tuna under HS Code 1604.14 (canned/pouched tuna and tuna loins). In 2019, Indonesia exported 90,007 mt of processed products under this category. Table 55 shows Indonesian's 2019 exports of processed tuna (HS Code 1604.14).

**Table 55. Indonesia: Exports of Processed Tuna by Importing Country, 2019 (mt of product weight)**

PROCESSED				
Rank	Importer	Total	Percent	Cum. Percent
1	Saudi Arabia	15,974	18%	18%
2	USA	14,533	16%	34%
3	Japan	12,732	14%	48%
4	Thailand	11,017	12%	60%
5	Italy	7,851	9%	69%
6	Australia	4,823	5%	74%
7	United Kingdom	3,949	4%	79%
8	Jordan	2,578	3%	82%
9	PNG	2,178	2%	84%
10	Algeria	1,700	2%	86%
>10	Others	12,672	14%	100%
Total		90,007		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Top on the list of countries importing processed tuna was Saudi Arabia, with 15,974 mt. These imports are likely to be for the product in its canned form.

The U.S., Japan, and Thailand were the next countries importing processed tuna products from Indonesia. The U.S. imported 14,533 mt and included both pre-cooked tuna loins and canned/pouched products.<sup>215</sup> Japan imported 12,732 mt. It is quite possible that a significant portion of these imports represented canned tuna products, given the significant Japanese investments in PT Aneka Tuna plant. Finally, it is possible that the 11,017 mt of tuna exported to Thailand represented pre-cooked tuna loins, rather than canned tuna products.

<sup>215</sup> According to NMFS import data, in 2019 the U.S. imported 12,062 mt of processed tuna products under HS code 1604.14. Of these, 11,224 mt were canned/pouch products, with only 838 kilograms of pre-cooked tuna loins.

*Indonesia's Exports of "Other" Tuna Products*

In addition to exporting canned/pouched tuna and tuna loins, Indonesia is an important exporter of "other" product forms. As shown in Table 56, in 2019, Indonesia exported 27,506 mt under the "other" category, which, together with 90,007 mt of processed canned/pouched tuna and tuna loins, brought Indonesia's total of processed tuna exports to 117,513 mt.<sup>216</sup> It is worth noting that the U.S. was the top importer of non-specified frozen fillets from Indonesia in 2019, with a volume of 16,482 mt. Japan, Thailand and Vietnam were also important trading partners of Indonesia for these products. These products represent frozen loins, steaks and cubes that are used for both lower grade sashimi yellowfin tuna (Carbon Monoxide treated), and loins and steaks that are sold as fresh, previously frozen for the restaurant trade and home consumers.

**Table 56. Indonesia: Exports of "Other" Tuna Products by Importing Country, 2019 (mt of product weight)**

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	USA	16,482	60%	60%	16,482	0
2	Japan	3,301	12%	72%	2,313	988
3	Thailand	2,376	9%	81%	126	2,250
4	Vietnam	1,481	5%	86%	1,424	57
5	France	992	4%	90%	847	145
6	Philippines	501	2%	91%	180	321
7	Australia	328	1%	93%	328	0
8	Malaysia	201	1%	93%	65	136
9	Canada	191	1%	94%	182	9
10	Spain	145	1%	95%	145	-
>10	Others	1,508	5%	100%	1,310	198
<b>Total</b>		<b>27,506</b>			<b>23,402</b>	<b>4,103</b>

Source: BACI

Note: Includes HS Codes 0304.87 and 0303.49

<sup>216</sup> As previously noted, Indonesia also produces and exports katsubushi for Japan.

## Processing Hubs Primarily Focused on Domestic Markets for Purse Seine-Caught Tropical Tuna

### Korea

Korea is a relevant player in tuna trade flows originating in the Pacific because its purse seine fleet catches tuna to supply a relatively large and growing domestic canned tuna market and because the surplus catch that is not used domestically enters the “pool” of available fish to be purchased by the other tuna processors, namely Thailand, Ecuador, the Philippines, PNG, and others.

The Korean tuna purse seine fleet comprises 28 vessels<sup>217</sup>, and in 2019, recorded a purse seine catch of 314,817 mt in the WCPFC convention area. The Korean purse seine fleet does not usually return home to directly deliver fish to its processing sector; the vessels operate in conjunction with reefer carrier vessels that bring the fish back to Korea, allowing the purse seine fleet to remain on the fishing grounds.

Korea has an important processing sector comprised of three companies: Dongwon Industries, Silla Co., and Sajo Industries, which together have a combined tuna processing capacity of approximately 370 mt/day.<sup>218</sup> The Korean domestic market yearly absorbs approximately 150,000 mt<sup>219</sup> of tuna caught by the Korean fleet, with the remaining catch (~ 165,000 mt) exported as whole frozen tuna to other processing countries. These catches are not physically brought into Korea and then sent out again; rather the Korean fleet transships these in multiple ports, including Pohnpei, FSM; Majuro, Marshall Islands; Tarawa, Kiribati; and Honiara, Solomon Islands.

### Harvest Level

#### *Korea's Tuna Purse Seine Catch*

As indicated, in 2019 the catch of the Korean purse seine fleet was about 315,000 mt, entirely caught in the WCPFC convention area.

#### *Korea's Tuna Purse Seine Fleet*

The Korean tuna fleet operates mainly in the Pacific Ocean; however, a few vessels operate in the Indian and Atlantic Oceans. As indicated, in 2019 the catch of the Korean fleet comprised about 315,000 mt. The Korean fleet is perhaps one of the most modern and efficient tuna fleets currently fishing in the Pacific since many of the vessels were built within the past decade. Some of these vessels are capable of freezing tuna at an ULT that is suitable for sashimi-grade markets, but most of the production is destined for processing into canned products. The size of the Korean fleet has fluctuated over the past few decades from 39 vessels in 1990 to between 25 and 29 vessels in 2000.<sup>220</sup> Over time, some of the older beneficially owned Korean tuna purse seine vessels have been involved in Joint Ventures with PICs (Kiribati [10], Nauru [2], Tuvalu [1], and Vanuatu [1]).<sup>221</sup>

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<sup>217</sup> IEc/GHA Vessel Compilation analysis.

<sup>218</sup> Havice et.al. 2019. Op. cit., pg 25.

<sup>219</sup> GHA personal communication with Cary Gann, CEO, Pacific Island Tuna Imports, January 2023.

<sup>220</sup> Havice et.al. 2019. Op. cit.

<sup>221</sup> Havice et.al. 2019. Op. cit., pg 24.

The Korean purse seine fleet is vertically integrated. Table 57 shows a profile of the Korean tuna purse seine fishing companies operating in the Pacific and their relationship to major processing companies. Over the years, these companies have developed joint ventures with PICs, mainly with Kiribati.

As mentioned earlier, three main companies<sup>222</sup> are involved in the Korean tuna industry at the harvest and processing levels. Dongwon Industries Co. Ltd, is Korea's largest deep-sea fishery company, operating about 40 fishing vessels in the Pacific, Atlantic, and Indian Oceans. Of these, 19 are purse seine vessels, 12 operating in the Pacific, two in the Indian, and five in the Atlantic oceans.<sup>223</sup> Dongwon owns a tuna processing facility in Korea, a Starkist plant in American Samoa, and a tuna processing plant in Senegal (SDCDS/ S.C.A. S.A). Dongwon F & B represents Dongwon's tuna processing and marketing arm; the company has approximately 80 percent of the Korean canned tuna market. In the U.S., Dongwon owns Starkist, which is the leading brand in the U.S. market for light-meat tuna, with approximately 37 percent of the market share.<sup>224</sup>

Silla Co. is another important Korean tuna fishing company with 6 purse modern vessels, some equipped with ULT capabilities to process part of the catch for sashimi markets (export to Japan or for the domestic Korean sashimi market). Two of the 6 purse seine vessels are in a Joint Venture with Frabelle fishing (Philippines and PNG) and operate in Kiribati under the local company Kirikore Fisheries Ltd.,<sup>225</sup> and under the Nauru Fisheries Development Corporation (NFDC).<sup>226</sup>

Sajo Industries has been involved in the seafood business for over 40 years. It owns a large fleet of tuna longline vessels (40) in addition to six purse seine vessels. It is a vertically integrated company also producing canned tuna products for the domestic market.<sup>227</sup>

Most of the Korean tuna purse seine vessels operate in the western Pacific area and work together with their own reefer vessels.

### Processing Level

There are four major tuna processing companies in Korea. Two of them, Dongwon and Sajo Industries, are vertically integrated, while two Ottogi canneries are supplied primarily by vessels related to Silla Co.

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<sup>222</sup> An additional small company, Hansung Enterprises, has only one vessel, which is involved in a joint venture in Kiribati.

<sup>223</sup> Havice and Campling. 2018. Op. cit.

<sup>224</sup> Havice and Campling. 2018. Op. cit. pg 34.

<sup>225</sup> Havice et.al. 2019. Op. cit. pg 27.

<sup>226</sup> Kirikore Fisheries Co. Ltd was founded in Tarawam Republic of Kiribati as a joint venture in 2011. The company manages three vessels, two with Silla Co. as beneficiary-owner (F/V Moamari and F/V Moakona); NFDC Fisheries Co. Ltd, was founded in Lae, PNG as a joint venture (involving Frabelle Fishing) and the company manages two purse seiners, F/V Naoero Sun and F/V Naoero Star. (Silla. 2023. Company website. Viewed at [http://www.sla.co.kr/eng/b\\_csea03\\_eng.htm](http://www.sla.co.kr/eng/b_csea03_eng.htm), March 22, 2023).

<sup>227</sup> Three companies own and separately manage the six purse seine vessels: Sajo Industries manages F/V Sajo Alexandria, F/V Sajo Columbia, F/V, Sajo Familia, and F/V Sajo Concordia; Sajo Seafood manages the F/V Sajo Potentia; and Sajo Oyang manages the F/V Sajo Posedonia (Sajo Industries. 2023. Company website. Viewed at <https://ind.sajo.co.kr/eng/business/pelagic02.asp#tabMenu>, March 22, 2023).



*Korea's Tuna Processing Capabilities*

Korea's tuna processing plants have an estimated combined processing capacity of 370 mt/day, as shown in Table 57.

**Table 57. Korea: Profile of Korean Fishing Companies Operating in the Pacific and Affiliation with Tuna Processors, 2018**

Company	No. of Vessels	Base / Registered Port	Observations
Dongwon Industries	12 (2 fish in the Atlantic)	Seoul/Busan	a) Major industrial group established in 1969. b) Owner of Starkist in U.S. (2008) c) JV with Kiribati (3 vessels) d) Large Cannery in Changwon (170 mt/day)
Silla Co.	6	Seoul/Busan	e) JV with Kiribati (3 vessels) and Nauru (2) f) Supplies two third-party Ottogi canneries (140/mt day) in the Bussan Area
Sajo Industries (includes Oyang Corp. a subsidiary, which owns one vessel)	6	Seoul/Busan	g) JV with Kiribati (3 vessels); Tuvalu (1), Vanuatu (1) h) Supplies own cannery Geosong (60 mt/day), near Busan.
Hansung Enterprises	1	Busan	i) Involved in tuna and various other fisheries. j) JV with Kiribati (1 vessel)

Source: Adapted from Havice et al. 2019. Op. cit., pg. 25

Note: JV = Joint Venture

*Imports of Raw Frozen Tropical Tuna*

Korea does not import a significant amount of frozen tuna. In 2019, such imports accounted for only 6,212 mt. Table 58 shows Korea's imports of frozen tuna in 2019.

Table 58. Korea: Imports of Raw Frozen Tropical Tuna by Exporting Country, 2019 (mt of product weight)

FROZEN TROPICAL			
Rank	Exporter	Total	Percent
1	Kiribati	1,131	18%
2	Vanuatu	1,048	17%
3	China	1,035	17%
4	Nauru	672	11%
5	Other Asia, nes (Taiwan)	646	10%
6	Senegal	507	8%
7	Vietnam	390	6%
8	Seychelles	142	2%
9	PNG	134	2%
10	Maldives	130	2%
>10	Others	376	6%
Total		6,212	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

### Export Level

As mentioned earlier, Korea is a net exporter of frozen tuna. In 2019, Korea exported approximately 165,044 mt.<sup>228</sup> Table 59 shows Korea's exports of frozen tunas in 2019.

<sup>228</sup> Korea has a large longline fleet that targets tropical tunas that are aimed at the sashimi-grade market in Japan (and in Korea's own domestic market). BACI data do not identify what volumes of frozen tuna exports are sashimi grade vs. cannery grade. However, given that most countries are not significant consumers of sashimi-grade tuna, it is reasonable to assume that, apart from exports to Japan, most of Korea's frozen tropical tuna exports involve cannery grade tuna associated with purse seine catches.

Table 59. Korea: Exports of Raw Frozen Tropical Tuna by Importing Country, 2019

FROZEN TROPICAL			
Rank	Importer	Total	Percent
1	Thailand	90,684	55%
2	Vietnam	16,651	10%
3	Mexico	12,507	8%
4	China	10,228	6%
5	Mauritius	6,883	4%
6	Philippines	5,831	4%
7	Japan	4,556	3%
8	Spain	3,456	2%
9	PNG	2,865	2%
10	American Samoa	2,155	1%
>10	Others	9,229	6%
Total		165,044	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

It is worth noting that Thailand received more than one-half of Korea's exports in 2019. Tri-Marine and FCF Fishery Co. Ltd. were both at the top of the companies associated with Korean exports in 2019. Table 60 lists the top exporting companies of Korean frozen tuna in 2019.

Table 60. Korea: Top Exporting Companies by Volume of Raw Frozen Tuna from Korea, 2019 (mt of product weight)

EXPORTS FROM SOUTH KOREA - FROZEN TROPICAL TUNA		
Rank	Top Exporting Companies	Quantity (mt)
1	Tri Marine International S. De R.L	7,395
2	Tri Marine International (Pte) Ltd	3,562
3	F.C.F. Fishery Co., Ltd	1,550
4	None	532
5	Aria Co Ltd	184
6	Knk Foods Co Ltd	16
7	Johnson Max	5
8	Harrell, Joshua	3
9	Tampus, Antonio	1
10	Smith, S	1

Source: Datamyne

Note:

1. As a point of reference, BACI data report that South Korea exported approximately 165,000 mt of frozen tropical tuna in 2019. (See Table 59.)
2. Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

Korea is not a major exporter of processed tuna products (canned/pouched tuna or tuna loins); almost all of its canned/pouched tuna is destined for its domestic market. In 2019, the country exported only 2,501 mt of processed tuna products under HS Code 1604.14.

### Major Tuna Companies in Korea

Clearly, Dongwon Group represents the major tuna company in Korea, both as a processor for its own domestic market and as a harvester for its own needs and to export to other processing countries. Its international dimension is related to the ownership of the Starkist brand in the U.S. Its domestic relevance is related to the dominance the company has in the domestic canned tuna market. Therefore, Dongwon is a major player in the tuna trade flows for fish originating in the Pacific. Other important Korean countries, especially at the harvest level, are Silla Co. and Sajo Industries, as described previously in this section.

### Japan

Japan is well known for its tradition of eating fish. Tuna consumption in Japan has declined over the years as younger generations eat less fish and more meat, among other reasons. In 2016, Japan's tuna consumption was estimated at approximately 750,000 mt. Most of Japan's tuna consumption is as sashimi (raw): in 2016, Japanese consumers ate approximately 464,000 mt of sashimi tuna. The second form of tuna consumption in Japan is as katsuobushi (a fermented, dried, flaked product made from skipjack tuna); katsuobushi consumption

in 2016 amounted to 174,000 mt approximately. Finally, Japanese consumers also eat canned tuna products, but in the context of overall tuna consumption, canned tuna demand is small; in 2016, Japanese consumers ate approximately 63,000 mt of canned tuna products.<sup>229</sup>

Japan consumes approximately 175,000 mt of katsuobushi every year, the production of which is primarily the result of the operations of its own tuna purse seine fleet.<sup>230</sup> No other purse seine fleet in the world currently has the expertise, knowledge, and interest to pursue skipjack fishing in the manner necessary to satisfy Japan's demand for katsuobushi. Therefore, the main relevance of the Japanese tuna purse seine fleet is as the supplier of skipjack to satisfy the katsuobushi needs of Japanese consumers, and this will likely continue to be true for the foreseeable future. However, other countries such as Indonesia, the Solomon Island and the Philippines have supplied the Japanese katsuobushi market from time to time.<sup>231</sup> Surplus catches of skipjack tuna taken by the Japanese purse seine fleet contribute to Thailand's supply needs for canning; this is the second way in which Japan's purse seine fleet plays an important role in the Pacific.

Finally, Japan's tuna purse seine fleet also contributes to supplying the canning needs of its own canned tuna processing sector. Details of Japan's domestic canning industry are not available, but most of the canned tuna consumed in Japan is now produced in Thailand, Indonesia, Vietnam, and the Philippines.<sup>232</sup>

This section focuses exclusively on Japan's tropical tuna purse seine fishery; its tropical tuna longline and albacore fisheries will be addressed in later sections of this report.

## Harvest Level

### *Japan's Tuna Purse Seine Catch*

In 2019, the Japanese purse seine fleet caught an estimated 170,557 mt of tropical tuna, of which 76 percent of the catch (129,601 mt) was skipjack. The Japanese purse seine catch of skipjack is mostly used to produce katsuobushi. However, some of the Japanese skipjack catch also goes to export markets, depending on the availability of alternative sources of skipjack tuna for katsuobushi.<sup>233</sup>

### *Japan's Tuna Purse Seine Fleet*

Based on RFMO vessel registry data, Japan has 40 purse seine vessels fishing in the Pacific. Over time, older vessels have been replaced by newer vessels that can freeze a portion of the catch at ULT. This means that some of the purse seine caught fish, rather than being frozen on board in brine, making it only suitable for canning, is frozen at low enough temperatures that it is acceptable for sashimi-grade markets.

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<sup>229</sup> Kawamoto, Taro. Director, Kyokuyo Suisan Co. Ltd. 2016. Tuna Market in Japan, Current Status, Challenges, and Prospects. Infotuna Conference, May 23-15, 2016. Bangkok, Thailand.

<sup>230</sup> Professional industry knowledge of Guillermo Gomez, GHA and Kawamoto. 2016. Op. cit.

<sup>231</sup> IEC/GHA personal communication with Dr. Kate Barclay, University of Technology Sydney, July 24, 2023.

<sup>232</sup> PT Aneka is a joint venture company between Itochu Corporation and Haboromo Foods Corporation. The cannery was founded in 1991 (PT. Aneka Tuna Indonesia. 2023. Company Website. Viewed at <https://tunaindonesia.com/index.html>, April 25, 2023). Mitsubishi is also part owner of Thai Union (Thai Union. 2023c. Company History. Viewed at <https://www.thaiunion.com/en/about/company/company-history>, April 26, 2023).

<sup>233</sup> Japan also has a relatively important fleet of pole and line vessels that catch skipjack tuna that is used for katsuobushi. In general, skipjack tuna caught by pole and line vessels is preferred for katsuobushi over the catches obtained by purse seine vessels, although both are used regularly.

The current Japanese tuna fleet comprises vessels with a hold carrying capacity of between 800 and 1,200 mt tons; these are relatively smaller vessels than those typically used by other countries fishing in the WCPFC, such as Korea, Taiwan, and the Philippines. Japanese purse seine vessels are permitted to fish in local fishing grounds within Japan's EEZ, as well as in areas beyond national jurisdiction (i.e., in distant water fishing areas). Five of the 40 vessels have been reflagged to the Federated States of Micronesia in recent years.<sup>234</sup>

According to Havice et al. (2019), "Ownership of the 28 vessels is quite diverse, with just two companies operating five vessels (Fukuichi, Kyokuyo), one company owning three vessels (Ohkura), five companies with two vessels and the remainder (five companies) with a single vessel."<sup>235</sup> Table 61 provides a profile of the two largest companies, as well as the beneficially owned joint venture, Taiyo Micronesia Corporation (TMC), both of which own five purse seine vessels."<sup>236</sup>

**Table 61. Japan: Profiles of the Largest Japanese Purse Seine Fishing Companies**

Company	Profile
Kyokuyo Suisan Co. Ltd	<ul style="list-style-type: none"> <li>Parent company Kyokuyo Co. Ltd. – fishing company established 1937, evolved to become a vertically integrated marine products supplier; Kyokuyo Suisan the largest subsidiary.</li> <li>Commenced purse seine tuna fishing 1973; owns 5 vessels, including one large (1,800 GRT) vessel built in 2009; annual catch ~33,000 mt in 2018</li> <li>Sashimi tuna processing facility (own fish, as well as other sources)</li> <li>8,000 mt cold storage; retail outlets</li> <li>JV in PNG 2010; withdrawn and company dissolved</li> </ul>
Fukuhi Gyogo Co.	<ul style="list-style-type: none"> <li>Japan's oldest fishing company, engaged in fishing for three centuries</li> <li>Operates 5 DW PS vessels, including one 1,800 GRT vessel (2009)</li> <li>Processing PS special, LL products</li> <li>Two large ULT cold storage facilities (16,000 mt total)</li> <li>Varied business interests: retail outlets, online sales, hotels, restaurants (fast seafood, fine dining including one in Singapore)</li> <li>JV with Kiribati (2010) failed</li> </ul>

<sup>234</sup> Havice et.al. 2019. Op. cit.

<sup>235</sup> This figure differs from what was found in the IEC/GHA Vessel Compilation analysis, as reported above, but is consistent with the figure of 29 purse seine vessels reported in WCPFC. 2022f. Annual Report submitted by Japan to the WCPFC Scientific Committee Eighteenth Regular Session, Part 1: Information of Fisheries, Research, and Statistics. WCPFC-SC18-AR/CMM-10 (Rev.02), pg. 2.

<sup>236</sup> Havice et.al. 2019. Op. cit., pg 34.

Company	Profile
Taiyo A & F Co (TAFCO)	<ul style="list-style-type: none"> <li>Parent company Maruha Nichiro; TAFCO took over fisheries interests</li> <li>5 DW PS transferred to TMC (see below)</li> <li>Varied fishing interests with various gear types, in many countries</li> <li>4 Japan offshore PS vessels (Niigata)</li> <li>Numerous overseas offices and fisheries JVs</li> </ul>
Taiyo Micronesia Corp (TMC)	<ul style="list-style-type: none"> <li>Established JV 2012 with National Fisheries Corp (NFC) in Pohnpei, FSM</li> <li>NFC holds 25% equity in TMC, with management fees and dividends payable</li> <li>5 DW PS progressively re-flagged to FSM</li> <li>Annual catch ~40,000 mt/year; 75% of catch transshipped in FSM ports, 25% directly unloaded in Japan during intermittent visits</li> <li>Katsuobushi plant with container storage; fish meal facility established 2018</li> <li>Processes 1 mt/day SKJ</li> <li>Plan to divert to pig feed production, with collection of transshipment discards, bycatch; aim to replace current feed imports of ~1,000 mt</li> </ul>

Source: Table reproduced with minor edits from Havice et al. 2019. Op. cit., pg 35.

Notes: GRT = Gross Registered Tons; JV = joint venture; DW = Distant water; PS = purse seine; LL = longline; PNG = Papua New Guinea; FSM = Federated States of Micronesia; mt = mt; SKJ = skipjack; ULT = ultra-low temperature.

A few interesting features characterize the operation of the Japanese tuna purse seine fleet. First, unlike most purse seine fleets in the Pacific, Japanese purse seine vessels call at their home ports in Japan every other trip. This is, in part, to directly deliver the fish that is suitable for entering into sashimi-grade markets (ULT). The second aspect of this *modus operandi* has to do with social considerations (e.g., ensuring fishermen can take time off in between trips) while reducing the fuel costs of going back and forth to Japan every trip. In the past, the purse seine fleet also operated in conjunction with reefer carrier vessels; it still does, but not as much as in the past.<sup>237</sup> When not docking at their home port, the Japanese fleet frequent ports including Majuro (Marshall Islands), Kosrae (FSM), and Honiaria (Solomon Islands).

## Processing Level

### Japan's Tuna Ports and Processing Industry

The Japanese purse seine fleet typically lands its fish at its own ports, in the following locations: Yaizu, where approximately 50 percent of the fish is normally landed, and two other locations, Yamagawa and Makurazaki, which jointly account for the remaining 50 percent of the landings.<sup>238</sup>

<sup>237</sup> GHA personal communication with Maurice Brownjohn, former commercial manager for the PNA, March 14, 2023.

<sup>238</sup> Havice et al. 2019. Op. cit., pg 39.

Table 62 shows the percentage of landings of the Japanese purse seine fleet and product destinations by port in Japan in 2018.

**Table 62. Japan: Percentage of Japanese Purse Seine Landings by Port and Product/Market Destination, 2018**

Market Category	Percent of Purse Seine Landings at All Ports by Ultimate Product Type	Percent of Purse Seine Landings at Port of Yaizu by Ultimate Product Type	Percent of Purse Seine Landings at Ports of Yamagawa and Makurazaki by Ultimate Product Type
Katsuobushi	46%	37%	56%
Sashimi	36%	36%	36%
Canned Tuna	14%	20%	8%
Exports	3%	7%	0%
Other	1%	1%	0%
Total	100%	100%	100%

Note: Approximately 50 percent of all Japanese purse seine landings occur at the Port of Yaizu and the remaining 50 percent occur at Yamagawa and Makurazaki.

Source: Reproduced from Havice et al. 2019. Op. cit. pg 39.

Katsuobushi and canned tuna processors are located near Yaizu, so after being auctioned, products are shipped to these processing facilities. As indicated, some of the ULT fish enter the sashimi grade market. A relatively small portion (about 22,547 mt or 13 percent) of its purse seine caught raw frozen tuna (mainly skipjack) is also exported by container ship, mainly to Thailand.<sup>239</sup>

### *Japan's International Trade for Tunas*

Although Japan's domestic market consumes most of its production, it also participates in the international tuna trade. Most of Japan's international trade of tuna is oriented toward the sashimi-grade markets and involves fresh tuna caught by longline gear or longline tuna that is frozen on board at ULT. These trade flows are discussed in Chapter 7 of this report. However, because some of the tuna catches obtained by the Japanese purse seine fleet are exported and Japan imports some quantities of frozen skipjack tuna (used mainly to produce katsuobushi), the following sections briefly discuss these trade flows. Note that because Datamyne data do not cover Japan comprehensively, very little information is available on the companies undertaking the imports and exports, and it is likely that any companies listed would be handling sashimi-grade, longline tuna rather than purse seine tuna.

<sup>239</sup> Havice et al. 2019. Op. cit.



*Japanese Imports of Raw Frozen Tropical Tuna*

According to BACI data, in 2019, Japan imported approximately 141,257 mt of frozen tropical tuna, as shown in Table 63.<sup>240</sup> Indonesia supplied 31,594 mt out of a total of 37,093 mt of frozen skipjack tuna. Since Indonesia uses mainly pole-and-line gear to catch tunas, it is likely that this volume of skipjack tuna imports was caught by pole-and-line rather than purse seine and was used for katsuobushi production. Taiwan and China were the primary suppliers of Japan's imports of frozen yellowfin and bigeye tuna from the Pacific.

**Table 63. Japan: Imports of Raw Frozen Tropical Tunas by Exporting Country, 2019 (mt of product weight)**

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Exporter	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Other Asia, nes (Taiwan)	46,118	33%	33%	17,176	154	28,788
2	Indonesia	31,694	22%	55%	51	31,594	50
3	China	17,669	13%	68%	6,333	204	11,132
4	Seychelles	11,721	8%	76%	7,856	151	3,714
5	Vanuatu	5,943	4%	80%	1,660	-	4,284
6	South Korea	4,556	3%	83%	2,601	244	1,711
7	Thailand	3,938	3%	86%	3,860	78	-
8	Micronesia (Fed. States)	2,948	2%	88%	1,061	1,675	212
9	Singapore	1,814	1%	89%	951	-	863
10	Fiji	1,557	1%	91%	961	-	597
>10	Others	13,298	9%	100%	8,141	2,993	2,163
<b>Total</b>		<b>141,257</b>			<b>50,651</b>	<b>37,093</b>	<b>53,513</b>

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

*Export Level**Japan's Exports of Raw Frozen Skipjack Tuna*

Japan exports almost no processed tuna (only 1,021 mt in 2019). The country did, however, export 28,067 mt of frozen tuna to the world in 2019, and 82 percent of this was skipjack tuna. Thailand absorbed 22,547 mt or 80

<sup>240</sup> About 8 percent of this total came from the Seychelles in the Indian Ocean, plus a small amount of the "Others" category was caught in the Indian Ocean, but over 90 percent of total imports were from the Pacific.

percent of Japan's total raw frozen tuna exports, and 83 percent (18,804 mt) of this was skipjack. Table 64 shows Japan's tuna exports of frozen skipjack.

**Table 64. Japan: Exports of Raw Frozen Tropical Tunas by Importing Country, 2019 (mt of product weight)**

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Thailand	22,547	80%	80%	3,358	18,804	385
2	Philippines	2,031	7%	88%	38	1,993	-
3	Indonesia	1,354	5%	92%	328	1,025	-
4	Vietnam	1,117	4%	96%	246	871	-
5	USA	385	1%	98%	0	1	384
6	South Korea	114	0%	98%	62	-	52
7	China	110	0%	99%	-	110	-
8	Spain	98	0%	99%	1	0	97
9	China, Hong Kong SAR	67	0%	99%	16	2	48
10	Fiji	58	0%	99%	-	58	-
>10	Others	187	1%	100%	56	124	7
<b>Total</b>		<b>28,067</b>			<b>4,105</b>	<b>22,989</b>	<b>974</b>

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

## Mexico

In the IATTC convention area, Mexico is the second most important tuna-catching and processing country after Ecuador. In 2019, the Mexican tuna purse seine fleet, composed of 53 vessels, caught 126,044 mt. Unlike the Ecuadorian tuna fleet, the Mexican tuna fleet catches mostly yellowfin tuna in association with dolphins,<sup>241</sup>

<sup>241</sup> In the Eastern Pacific and within the IATTC convention area, tunas and dolphins tend to associate. Dolphins swimming on the ocean surface attract large yellowfin tuna, which swim right below the dolphins. Mexican fishermen locate the schools of tuna by searching for the dolphins that swim right above them. Once found, the tuna vessels set their nets around both the dolphins and the schools of tuna. They close the net at the bottom and proceed to draw the net back to the purse seine vessel. Once two-thirds of the net is on board and the tuna and the dolphins remain in the water, the tuna vessels reverse direction, engaging in a back-down procedure. This creates a channel with the net that forces the dolphins, with the aid of fishermen, to go into the channel and jump outside the net, releasing all the dolphins alive out of the net. Once all dolphins have been released, the remaining one-third of the net is brought close to the vessel, and the tunas are brailled onto the vessel deck and through shunts into the fish wells.

which is different than how most purse seine fleets operate.<sup>242</sup> Historically, the catches of the Mexican tuna fleet have been processed into canned tuna to supply the domestic market. Only in the last five years or so has Mexico started to export yellowfin tuna to the E.U. and import skipjack tuna to satisfy its own domestic market needs. In 2019, Mexico imported 22,085 mt and exported 19,144 mt of tropical tuna. Mexican exports of processed tuna have, historically, also be limited. In 2019, Mexico exported 10,481 mt of processed tuna.

## Harvest Level

### *Mexico's Tuna Purse Seine Catch*

Mexico's entire purse seine tuna catch takes place within the IATTC convention area and much of the catch occurs within the Mexican EEZ and adjacent areas. As mentioned, the Mexican tuna fleet caught 126,044 mt in 2019. Of that, yellowfin comprised 105,426 mt, skipjack 19,656 and bigeye tuna 962. In general, the composition of the catches by species harvested by Mexico follows this pattern. However, skipjack catches for 2019 were unusually high, since they normally are around 9,000 mt per year. The prevalence of yellowfin in the Mexican tuna catch is due to the association of large individuals of yellowfin swimming with dolphins.

### *Mexico's Tuna Purse Seine Fleet*

Mexico's tuna fleet was developed in the late 70s and early 80s when, supported by a Mexican government fisheries development plan, new vessels were constructed around the world for Mexico. The development of the Mexican tuna fleet was also accompanied by significant investments in land-based processing facilities along Mexico's Pacific coast, where at the end of the 1990s, there were about 10 tuna processing plants from Ensenada, Baja California close to the border with the U.S., to Puerto Madero, Chiapas, on the border with Guatemala.

The economic crisis endured by Mexico during the mid-90s, combined with the privatization of many of the State-owned tuna processing plants and other associated policies, resulted in the consolidation of the Mexican tuna industry. Today, the 53 tuna purse seine vessels currently in operation are in the hands of four major vertically integrated groups: Pesca Azteca, Grupo Mar, Grupo Procesa, and MT Pesca. Table 65 presents company profiles and the level of vertical integration of the Mexican tuna fleet and processing industry as of March 2023.

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<sup>242</sup> Other fleets use FADs to catch tunas. FADs are man-made floating objects that are deployed by the tuna vessels in the ocean for the purpose of attracting tunas over time. The FADs start aggregating small organisms and fishes and eventually tuna come and gather around the FAD. Each FAD has a satellite buoy attached that allows the fishermen to track the location of the FAD by GPS. The buoy also allows the fishermen, using an echosounder, to determine how many fish has gathered underneath the FAD. Once there is enough fish, the fishing vessel goes to the FAD, sets its net around it (just like the Mexican vessels set their net around the dolphins), retrieves the tuna, usually also retrieving bycatch species. The FAD is left behind to attract another round of fish.

**Table 65. Mexico: Company Profiles and Vertical Integration of the Mexican Tuna Fleet and Processing Industry, March 2023**

Company	Number of Tuna Vessels	Associated Tuna Processing Company	Estimated Daily Tuna Processing Capacity	Location of the Plant	Major Domestic Brands and Market Share	Export Focus
Pesca Azteca S.A, a privately held company owned by Mr. Eleovigildo Carranza	22	Pescados Industrializados S.A. (PINSA) a privately held company owned by Mr. Eleovigildo Carranza	375 mt/day canned/ pouched tuna and process frozen loins	Mazatlán, Sinaloa	Dolores, Mazatun with a 60% market share	Exports frozen loins to Spain
Grupo Marítimo Industrial (Grupo Mar) a holding privately held company owned by Mr. Antonio Suarez	6	Compañía Mar Industrias.	150 mt/day, canned/ pouched tuna	Manzanillo, Colima.	Tuny, Domestic market with 11% market share	Some exports into central and south America.
Grupo Procesa, 100% Mexican owned, by Mr. Alejandro Chaljub	5	Procesamiento Especializado de Alimentos SAPI de CV	170 mt/day	Puerto Madero, Chiapas	Marina Azul, Nair 9 % market share.	Exports to US
MT Pesca Industrial Privately held company owned by Mr. Mandujano	7	Gran Pesca SA de CV	120 mt/day	Mazatlán, Sinaloa	Maria Antonieta, SeaBoy, Bonatun	Domestic Market
Baja Aqua Farms (Vertically integrated Bluefin tuna farming operation)	2	Baja Aqua Farms (Bluefin Tuna Farming.		Ensenada, Baja California	Baja Aqua Farms	Exports fresh bluefin tuna to U.S. and Japan
Camatun S.A. (Fishing only)	3	Affiliated to PINSA		Mazatlán, Sinaloa		
Pesca Industrial Atunera de Altura (Fishing only)	3	Sells on open market		Mazatlán, Sinaloa		
Pesquera Mazcu I SA de CV (Fishing only)	1	Affiliated with Gran Pesca		Mazatlán, Sinaloa		
Productos Pesqueros de Altura SA (Fishing only)	1	Sells on open market		Mazatlán, Sinaloa		
Atunes y Sardinas de Mexico SA de CV (Fishing only)	1	Sells on open Market		Mazatlán, Sinaloa		
Naviera y Pesquera del Pacifico SA de CV (Fishing only)	1	Fishing in Ecuador				
Total	52		815 mt/day			

Company	Number of Tuna Vessels	Associated Tuna Processing Company	Estimated Daily Tuna Processing Capacity	Location of the Plant	Major Domestic Brands and Market Share	Export Focus
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Sources: Professional industry knowledge of Guillermo Gomez, GHA and IEc/GHA Vessel Compilation Analysis.

The tuna purse seine vessels belonging to Pesca Azteca, Grupo Mar, and Procesa Chiapas (31 vessels) were certified by the MSC until recently.<sup>243</sup>

### Processing Level

The Mexican tuna fleet directly unloads its catches at the tuna processing facilities, so Mexican tuna vessels do not transship their catches. There are very few vessels that operate in the open market selling their catches based on spot market prices.

The Mexican tuna processing sector is very modern and has in place state-of-the-art technologies. Pescados Industriales, S.A. (PINSA) is the dominant tuna processor, because of its large fleet of 22 tuna vessels plus the additional affiliation with other vessel owners for receiving their fish. PINSA has a share of the domestic market estimated at about 60 percent under the Dolores brand.<sup>244</sup>

The Tuny brand, owned by Grupo Mar from Manzanillo, Colima, occupies the second place in the domestic market, with an approximate domestic market share of 11 percent. The brands Marina Azul and Nair, owned by Grupo Procesa, from Chiapas, Mexico, have about a nine percent share of the domestic market. The remainder of the domestic market consists primarily of private label product processed by these same companies, plus small amounts by other producers.

For many years, Mexican canned tuna products had difficulty entering export markets because the Mexican fleet catches tuna in association with dolphins; retailers were reluctant to sell products that were not considered by some environmental groups as “dolphin-safe”.<sup>245</sup> This situation has changed somewhat, with some buyers now willing to purchase Mexican tuna regardless of its association with dolphins.

### Imports of Raw Frozen Tropical Tunas to Supply Mexico's Tuna Processing Plants

As previously mentioned, the Mexican tuna processing industry has relied until recently on the production of its own vertically integrated fleet. As markets have recently opened in Spain for frozen yellowfin tuna fillets and steaks, Mexican processors started to import skipjack tuna to process for the domestic market to substitute for increased exports of yellowfin caught by their own fleet. As a result, in 2019, Mexico imported 22,085 mt of tuna.

Table 66 shows Mexico's imports of frozen tropical tuna in 2019. Korea and Spain were the main suppliers of tuna for Mexico's processing industry in 2019. Mexican tuna industry representatives enjoy a very long-term

<sup>243</sup> The MSC suspended the certificate on March 3, 2023. These vessels are members of the Pacific Alliance for Sustainable Tuna and are in transition to become re-certified.

<sup>244</sup> GHA personal Communication with PINSA principal, March 9, 2023.

<sup>245</sup> The IATTC issues “dolphin-safe” certificates to boat owners when no incidental deaths of dolphins occur during the fishing operation of a vessel.

relationship with Tri-Marine, so most of the recent Mexican imports of frozen tropical tunas have been handled by Tri-Marine.<sup>246</sup>

**Table 66. Mexico: Imports of Raw Frozen Tropical Tunas by Exporting Country, 2019 (mt of product weight)**

FROZEN TROPICAL			
Rank	Exporter	Total	Percent
1	South Korea	12,507	57%
2	Spain	7,818	35%
3	Other Asia, nes (Taiwan)	924	4%
4	Indonesia	475	2%
5	China	200	1%
6	Ghana	154	1%
7	USA	7	0%
Total		22,085	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

## Export Level

### *Mexico's Exports of Raw Frozen Tuna*

In 2019, Mexico exported 19,144 mt of frozen tuna, the majority of which involves exports of yellowfin tuna and most of them went to Spain (17,266 mt). These fish were mainly purchased by a Barcelona-based tuna processing company, FRIME, which processed them into loins/steaks for the domestic Spanish market.<sup>247</sup>

### *Mexico's Exports of Tropical Tuna Processed Products*

Just as the E.U. market recently opened for Mexican tuna, despite the dolphin-safe considerations, the U.S. market has also begun to import Mexican processed tuna products and canned and pouched tuna products. Some of the well-known Mexican brands like Dolores are being imported and sold in the U.S., primarily to ethnic

<sup>246</sup> GHA personal communication with two Mexican tuna processors, February 2023. Furthermore, three of the U.S. flag purse seine vessels currently operating in the IATTC convention area have directly delivered their catches to Mazatlán and Manzanillo processing facilities. These vessels are owned by the former owner of Tri-Marine.

<sup>247</sup> Professional industry knowledge of Guillermo Gomez, GHA; Datamyne also confirms this information, with the company FRIME identified as the main importer of frozen tuna from Mexico.

Mexican communities. In addition, Walmart has begun importing Mexican canned tuna products under its Great Value label.<sup>248</sup> Table 67 shows Mexico's exports of processed tuna products in 2019.

**Table 67. Mexico: Exports of Processed Tuna Products by Importing Country, 2019 (mt of product weight)**

PROCESSED				
Rank	Importer	Total	Percent	Cum. Percent
1	USA	7,072	67%	67%
2	Costa Rica	3,124	30%	97%
3	Belize	124	1%	98%
4	Nicaragua	71	1%	99%
5	Poland	41	0%	100%
6	Guatemala	20	0%	100%
7	Spain	19	0%	100%
8	Honduras	6	0%	100%
9	El Salvador	3	0%	100%
10	France	1	0%	100%
>10	Others	0	0%	100%
Total		10,481		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

### Major Tuna Companies in Mexico

As mentioned, four major vertically integrated groups dominate the Mexican tuna industry: Pesca Azteca, Grupo Mar, Grupo Procesa, and MT Pesca. Pesca Azteca/PINSA represents the single most important player in the Mexican tuna industry. The strength of the company, which is based on the dominance of a well-run fleet and canned tuna processing operations, in addition to a well-organized and managed participation in the domestic market, makes this company a potentially attractive acquisition to some of the global tuna actors (i.e., Bolton Group, Thai Union, Dongwon). However, there would be risk associated with a possible merger or acquisition of this Mexican tuna producer because of the politics associated with the well-known link between Mexican tuna production and dolphins.

<sup>248</sup> Professional industry knowledge of Guillermo Gomez, GHA.

As the Mexican population continues to increase and with it the domestic canned tuna market, there will continue to be a need for additional supplies of raw frozen tuna which could come from an expansion of the operation of the Mexican tuna fleet in the WCPFC convention area, or via increasing imports of whole frozen tuna or pre-cooked tuna loins from other countries across the Pacific (e.g., PNG, Vietnam, China). This is the main significance that Mexico plays currently and in the future in the tuna trade flows from the Pacific.

## United States

As previously mentioned, the U.S. represents the single largest canned tuna market in the world, absorbing approximately 550,000 mt of tuna yearly from around the world but mainly originating from the Pacific. As such, the primary companies supplying this market occupy an important position in the trade of Pacific tuna that could be leveraged to affect the management of these fisheries.

At one time, in the early 1980s, the U.S. had a large tuna purse seine fleet of about 217 purse seine vessels based in San Diego.<sup>249</sup> The fleet operated mainly in the IATTC convention area, and the vessels traveled back to the tuna processing plants in San Diego and Los Angeles to deliver their catches. In the mid-1980's, all of the tuna processing plants in California and Puerto Rico, where the major brands of Starkist, Chicken of the Sea, and Bumble Bee were produced<sup>250</sup>, closed down. The U.S. tuna fleet was displaced from the Eastern Pacific by the growth of the Mexican fleet. A conflict between Mexico and the U.S. based on U.S. marine mammal regulations resulted in an embargo on U.S. imports of Mexican tuna and a retaliatory exclusion of the U.S. fleet from Mexican waters. Many U.S. vessels switched flags to other Latin American countries to avoid the U.S. regulations. Eventually, the remaining vessel owners sought out new fishing grounds in the Western Pacific, assisted by the U.S. government, which negotiated access agreements with PICs on very favorable terms.

With the decline of its fleet and processing capacity, the U.S. is thus now dependent upon imports of canned and pouched tuna and tuna loins from foreign producers to satisfy its substantial market demand for these products.

## Harvest Level

### *U.S. Tuna Purse Seine Catch*

In 2019, the U.S. purse seine fleet in the Pacific recorded catches of 195,228 mt of tuna, mostly caught in the WCPFC convention area. In 2021, their estimated catches were down over 100,000 mt to 94,000 mt, with 33,811 mt caught in the IATTC convention area and 60,198 mt in the WCPFC area.<sup>251</sup> This downward trend in the size and catches of the U.S. fleet is likely to continue.<sup>252</sup>

### *U.S. Tuna Purse Seine Fleet*

As of 2021, the U.S. tuna purse seine fleet had dwindled from its high of 217 vessels in the 1980s to only 23 vessels. These vessels operated mostly in the WCPFC convention area in 2021. At the present time (March

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<sup>249</sup> Professional industry knowledge of Guillermo Gomez, GHA.

<sup>250</sup> Using fish primarily from the Pacific Ocean.

<sup>251</sup> IATTC catches 2021 (IATTC. 2023b. Cumulative Catches. Viewed at <https://www.iattc.org/en-US/Data/Cumulative-catch>, on March 22; and WCPFC Annual Catch Estimates 2021 (WCPFC. 2023b. Data files viewed at <https://www.wcpfc.int/doc/annual-catch-estimates-2021-data-files>, March 22).

<sup>252</sup> Professional industry knowledge of Guillermo Gomez, GHA.



2023), the number of U.S. tuna vessels has declined further to 13 vessels.<sup>253</sup> At the end of 2019, 14 vessels were owned by South Pacific Tuna Corporation (SPTC), a U.S. company affiliated with FCF Fishery Co. of Taiwan, but currently, most of the vessels owned by SPTC are no longer registered under the U.S. flag. Inter-Oceanic Inc., a holding company owned by Renato Curto, former CEO of Tri-Marine, currently owns and manages six purse seine vessels under Cape Holdings, a Tri-Marine subsidiary; the remaining vessels were owned by individual U.S. boat owners.<sup>254</sup>

Some vessels unload and deliver their catch to the Starkist processing plant in American Samoa, while some fish is transshipped to Thailand. Some other vessels have moved their operations to the overlapping area between the WCPFC and IATTC convention areas, often directly delivering their catches to tuna processors in Ecuador and Mexico.

As the U.S. tuna purse seine fleet gets smaller and smaller and there seems to be little interest on the part of current and former tuna boat owners to build new vessels, it is likely that the contribution of the U.S. tuna fleet catch in the Pacific in the coming years will come to an end or will be limited to a relatively small tonnage.

## Processing Level

### *U.S. Tuna Processing Capabilities*

The U.S. currently has three processing facilities where tuna, destined for the U.S. market, are processed. Starkist, owned by the Korean group Dongwon, has a tuna processing facility in American Samoa with a processing capacity of 550 mt/day. However, the plant has operated at half of its capacity for the past few years. Starkist recently shut the plant for major maintenance, and it is not clear when it will resume operations.<sup>255</sup>

Bumble Bee, owned by FCF Fishery Co. Ltd., operates a tuna processing plant in Santa Fe Springs, California, and Chicken of the Sea, owned by Thai Union, operates a tuna processing plant in Lyons, Georgia. Together, these plants processed approximately 850 mt/day of pre-cooked tuna loins into canned product.<sup>256</sup> The Chicken of the Sea Georgia plant produces 7 million cans of tuna per year.<sup>257</sup> These two facilities use imported pre-cooked tuna loins that are processed into canned tuna products (the sources of these loins are described in the following section). Because of the relatively high price of labor in the U.S., these processing facilities and operations are designed to bypass the most labor-intensive stages of canned tuna production, which are thawing the frozen fish, butchering, raking, cooking, and cleaning the fish to produce the pre-cooked tuna loins. By importing pre-cooked loins for canning from countries with lower labor costs, the total cost of production is reduced.

Coincidentally, by bypassing these labor-intensive stages, these plants also avoid significant costs associated with environmental regulations related to with odor emissions and treatment of wastewater used in the loining

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<sup>253</sup> GHA personal communication with Bob Pringle, Pringle Enterprises, March 18, 2023.

<sup>254</sup> GHA personal communication with Bob Pringle, Pringle Enterprises, March 24, 2023.

<sup>255</sup> Atuna. 2023c. "Starkist Samoa Temporarily Suspends Operations." March 21.

<sup>256</sup> Havice and Campling. 2018. Op cit., pg. 15.

<sup>257</sup> Georgia Tech/Georgia Manufacturing Extension Partnership. 2023. Success Story: Chicken of the Sea. Viewed at <https://gamep.org/success-story-chicken-of-the-sea/>, March 21, 2023.

process. Using pre-cooked tuna loins makes for a relatively “clean,” automated operation that consists of placing the pre-cooked loins in a conveyor that fills the can with tuna, adds water or vegetable oil, closes the can, sterilizes the product, labels, and cases the cans, and palletizes the finished product, using very little labor.

#### *U.S. Imports of Processed Tuna*

In 2019, according to BACI data, the U.S. imported 213,738 mt of processed tuna, which includes canned and pouch tuna products as well as pre-cooked tuna loins utilized by the two processing plants of Bumble Bee and Chicken of the Sea. Tuna products processed in American Samoa enter the continental U.S. without any duties and are considered domestic production and not imports.

Table 68 shows the countries exporting processed tuna products to the U.S. in 2019, according to BACI data.

**Table 68. United States: Imports of Processed Tuna Products by Exporting Country, 2019 (mt of product weight)**

PROCESSED				
Rank	Exporter	Total	Percent	Cum. Percent
1	Thailand	104,952	49%	49%
2	Ecuador	22,038	10%	60%
3	Vietnam	21,523	10%	70%
4	Indonesia	14,533	7%	76%
5	Fiji	9,581	4%	81%
6	Senegal	8,402	4%	85%
7	Philippines	7,747	4%	88%
8	Mauritius	7,450	3%	92%
9	Mexico	7,072	3%	95%
10	China	2,677	1%	97%
>10	Others	7,402	3%	100%
<b>Total</b>		<b>213,378</b>		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Data collected and reported by NMFS report total U.S. imports of processed tuna (HS Code 1604.14, inclusive of both canned/pouched and tuna loins) in 2019 as 210,173 mt, similar to the BACI data. According to NMFS, 32,314 mt (15.4 percent) of processed tuna imports were albacore and 177,859 mt (84.6 percent) were tropical tuna. Assuming the relative proportion of tropical tuna-based products to albacore products is consistent, of the 213,278 mt of tuna imports recorded by BACI, approximately 180,000 mt were tropical tuna. As previously

noted, unlike NMFS data, BACI do not report separate volumes of canned/pouched tuna products vs. tuna loins under HS Code 1604.14. Of the tropical tuna imports reported by NMFS, canned/pouched tuna products accounted for 129,138 mt or 73 percent, and pre-cooked tuna loins amounted to 48,721 mt or 27 percent. Table 69 and Table 70 show the 2019 imports of canned/pouched tuna and tuna loins and the main countries supplying these products to the U.S. markets.<sup>258</sup> Most of these imports are from the Pacific Ocean.<sup>259</sup>

**Table 69. United States: Imports of Canned and Pouched Tuna by Exporting Country, 2019 (mt of product weight)**

Exporting Country	Quantity (mt)	Percent
Thailand	85,867	53.2%
Ecuador	20,515	12.7%
Indonesia	11,224	7.0%
Vietnam	15,190	9.4%
Philippines	6,264	3.9%
Others	22,392	13.9%
<b>Totals</b>	<b>161,452</b>	<b>100.00%</b>

Source: NMFS Fishery Product Trade data.

Note: Includes all tuna products not in airtight containers and not in oil (HS Codes 1604.14.40, 1604.14.50) including Tropical Tunas, Albacore, and Tuna-Like Species.

<sup>258</sup> These data exclude canned/pouched albacore.

<sup>259</sup> Imports from Mauritius, potentially some from Indonesia, and possibly some from the “Others” category would be from the Indian Ocean, but these add up to a small percentage of the total imports.

Table 70. United States: Imports of Tuna Loins by Exporting Country, 2019 (mt of product weight)

Exporting Country	Quantity (mt)	Percent
Thailand	18,198	37.4%
Fiji	9,578	19.7%
Mauritius	7,629	15.7%
Vietnam	6,518	13.4%
China	1,678	3.4%
Ecuador	1,539	3.2%
Philippines	1,381	2.8%
Indonesia	838	1.7%
Colombia	708	1.5%
Solomon Is.	481	1.0%
Others	174	0.4%
<b>Total</b>	<b>48,721</b>	<b>100.0%</b>

Source: NMFS trade data

Note: Includes prepared and preserved fish preparations (HS Code 1604.14) specified under sub-codes identifying them as canned or pouched tuna (tunas in airtight containers).

### Major Tuna Companies in the U.S.

Datamyne identifies the key U.S. importing companies for processed tuna products. The top 10 companies importing these products are shown in Table 71. The top companies identified as importing processed tuna products correspond to the main U.S. canned tuna national brands, Starkist, Chicken of the Sea, and Bumble Bee.

**Table 71. United States: Top Importing Companies by Volume of Processed Tuna, 2019 (mt of product weight)**

Rank	Top Importing Companies	Quantity (mt)
1	Chicken of the Sea International	26,381
2	Starkist Co.	21,456
3	Starkist Co. C/O DSC Logistics	18,705
4	Bumble Bee Foods LLC	12,995
5	J A Kirch Corp	7,728
6	Starkist Co.	6,533
7	Ocean S Brands Gp.	6,414
8	The Tuna Store	4,537
9	Mexilink, Incorporated	4,142
10	Acme Food Sales Inc.	2,441

Source: Datamyne

Note:

1. As a point of reference, BACI data report that the U.S. imported approximately 213,000 mt of frozen tropical tuna in 2019. (See Table 68).
2. Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Table 72 shows the main companies in Thailand, Ecuador, and Vietnam that supplied processed tuna products to the U.S. in 2019. These companies supplied over half of the processed tuna imported into the U.S.; Galapessa in Ecuador and Thai Union in Thailand were the dominant suppliers.

**Table 72. United States: Main Tuna Companies by Volume Supplying Processed Tuna Products to the U.S, 2019 (mt of product weight)**

TOP EXPORTING COMPANIES					
Thailand	Qty (mt)	Ecuador	Qty (mt)	Vietnam	Qty (mt)
Thai Union Group Public Company Lim	18,358	Galapesca S.A.	25,238	Yueh Chyang Canned Food Company Lim	4,165
Chotiwat Manufacturing Co. Ltd	6,418	Galapesca S A	2,514	Vif Co., Ltd	2,619
Unicord Public Company Limited	6,359	Tecnica Y Comercio De La Pesca C.A. Tecopesca	1,508	Highland Dragon Enterprise	2,344
Thai Union Manufacturing Company	6,045	Tecnica Y Comercio De La Pesca	1,452	Tna Vietnam Company Limited	1,450
R S Cannery Co. Ltd	4,895	Eurofish S A	668	Hai Vuong Co. Ltd	1,035
Mmp International Co Ltd	4,727	Eurofish S.A.	573	Kien Giang Trading Joint Stock Comp	935
Tropical Canning Thailand Public	3,937	Salica Del Ecuador	525	Halong Canfoco Danang Co. Ltd	303
Golden Prize Canning Co. Ltd	3,227	Paxicon As Agent For Galapesca S A	436	Tin Thinh Co. Ltd	166
I S A Value Co. Ltd	2,955	Salica Del Ecuador S.A.	350	Xi Nghiep Che Trai Cay Foodtech	119
Pataya Food Industries Ltd	2,394	Marbelize S.A.	256	Ky Lan Seafood Processing Joint	81
<b>Total: Top 10 Thailand</b>	<b>59,315</b>	<b>Total: Top 10 Ecuador</b>	<b>33,520</b>	<b>Total: Top 10 Vietnam</b>	<b>13,217</b>

Source: Datamyne

Notes:

1. As a point of reference, BACI data report that the U.S. imported approximately 105,000 mt of processed tuna from Thailand in 2019; 22,000 mt from Ecuador; and 21,500 mt from Vietnam. (See Table 68.)
2. Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.
3. As discussed previously, this analysis did not include reconciliation of instances in which company names are entered in multiple ways within the data. As such, some company names are listed more than once here, and the total quantities listed would be additive between those entries.

## Countries Focused Primarily on Fishing and/or Transshipping Purse Seine Caught Tropical Tuna

### Taiwan

Taiwan (Chinese Taipei) is an important participant in Pacific tuna trade flows, not because it has a significant processing sector, which it does not, but precisely because it lacks one. Taiwan is a significant catcher, and the single largest exporter of frozen tropical tunas in the world, occupying an important position in the international trade flows serving the canned tuna markets.<sup>260</sup>

According to the WCPFC, the Taiwanese fleet included 31 tuna purse seine vessels operating under its flag. In 2019, the reported catch of tropical tunas was 240,667 mt. According to BACI data, Taiwan exported 195,640 mt of tropical tunas in raw, frozen form.

### Harvest Level

#### *Taiwan's Tuna Purse Seine Catch*

Based on 2019 catches, Taiwan (under its own flag) has the fourth largest tonnage of tropical tuna catches in the Pacific (after Ecuador, Korea, and PNG/Philippines), with a catch of 240,667 mt.

#### *Taiwan's Tuna Purse Seine Fleet*

Taiwan's catch was made by its tuna purse seine fleet of 31 vessels under its own flag, but in reality, Taiwan has a larger tuna purse seine fleet than that recorded by the WCPFC. In fact, at least 29 additional Taiwanese beneficially owned purse seine vessels are operating under different flags in the WCPFC convention area alone.<sup>261</sup> Together, this puts the effective Taiwanese Pacific tuna purse seine fleet at 60 vessels.

Ownership of the Taiwanese tuna purse seine fleet is spread among several companies and individuals. Four companies and one family own 30 Taiwanese-flag purse seiners. These companies are Fong Kuo, which is part of the trading company FCF Fishery Co. Ltd. (six vessels); Fair Well (five vessels); Jih Yu (five vessels) and Win Far (four vessels). In addition, these companies also have licenses to build new vessels to replace six older vessels. In addition, one family owns four additional vessels that are not under a company umbrella.<sup>262</sup>

As noted, the Taiwanese fleet also consists of nearly as many vessels that fish under different flags. Table 73 lists the beneficially owned Taiwanese companies that have tuna purse seine vessels flagged to PICs in 2019, mainly operating in the WCPFC convention area.

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<sup>260</sup> Taiwan is also significant in the trade flows that serve the Japanese sashimi market, which is described in detail in Chapter 7.

<sup>261</sup> Havice et al. 2019. Op cit. and professional industry knowledge of Guillermo Gomez, GHA. In addition, Taiwan has three additional purse seine vessels fishing in the Atlantic and Indian Oceans

<sup>262</sup> Havice et.al. 2019. Op. cit.

Table 73. Taiwan: Beneficially Owned Vessels Flagged to Pacific Island Countries, 2019

Parent Company	Foreign Flag (Number of Vessels)	Also Owns Taiwan-Flag Purse Seiners (Y/N)
Fair Well	Vanuatu (3)	Y
Yuh Yow	Solomon Islands (3)	Y
Koo's	Marshall Islands (4)	N
Koo's	FSM (4)	N
Jong Shyn	FSM (4)	N
Lung Soon	FSM (2)	N
Fong Kuo	PNG (3)	Y
Shun He	PNG (2)	N
Others*	PNG (4)	Y
<b>Total</b>	<b>29</b>	

Source: Havice et al. 2019. Op. cit., pg. 17

Note: Some of the companies identified as key owners of vessels fishing under the Taiwanese flag are included in this category.

Eighteen of the 29 vessels in Table 73 were formerly flagged under Vanuatu's flag, which is not a member of the PNA; however, with the implementation of the VDS by the PNA, many of the Taiwanese-controlled Vanuatu flag vessels changed flags to PICs that are members of the PNA. Under these flags, the Taiwanese vessels benefit by reducing the cost of fishing through lower VDS fees and not having to abide by many of the CMMs implemented by the WCPFC, including not having to stop fishing on FADs during the Fish Aggregation Devices (FADs) closure.

Whether the purse seine vessels operate under the Taiwanese flag or another country's flag, the Taiwanese tuna fleet does not deliver any of its catch directly to a tuna processing facility. All Taiwanese vessels transship their catches to reefer vessels owned by the fishing company itself or to a reefer carrier owned by the major tuna trading companies Tri-Marine, Itochu, and/or FCF Fishery Co. Ltd.<sup>263</sup>

Taiwanese vessel owners have developed strong relationships with the tuna trading companies. FCF Fishery, Co. Ltd., which is Taiwanese owned, has approximately 60 purse seine vessels (not only Taiwanese but from other countries as well) from which it sources tuna. Of these vessels, 40 always sell their catches to FCF Fishery Co Ltd. and 20 others sell their fish to them on a "spot market" basis. Itochu, which annually trades about

<sup>263</sup> MRAG Asia Pacific. 2019. Op. cit.



200,000 mt of tuna, sources 75 percent of its fish from Taiwanese beneficially owned vessels.<sup>264</sup> Taiwanese purse seine vessels also work with Tri-Marine.

### Export Level

According to BACI, Taiwan exported 195,640 mt of raw frozen tropical tuna in 2019.

Table 74 lists the top ten buyers of Taiwanese frozen tropical tuna in 2019. Of the tropical tuna exported by Taiwan, nearly 50 percent went to Thailand; Vietnam and China were also substantial importers of Taiwan's purse seine caught fish. Although Japan was the importing country of nearly a quarter of that fish, it is likely that a substantial portion of those imports were not purse seine-caught fish destined for canning.<sup>265</sup> Datamyne data did not provide coverage of Taiwanese companies trading tuna.

**Table 74. Taiwan: Exports of Raw Frozen Tropical Tunas by Importing Country, 2019 (mt of product weight)**

FROZEN TROPICAL			
Rank	Importer	Total	Percent
1	Thailand	90,017	46%
2	Japan	46,118	24%
3	Vietnam	24,246	12%
4	China	20,115	10%
5	Philippines	8,232	4%
6	Solomon Islands	1,292	1%
7	Mexico	924	0%
8	Spain	720	0%
9	South Korea	646	0%
10	Indonesia	579	0%
>10	Others	2,750	1%
<b>Total</b>		<b>195,640</b>	

Source: BACI

<sup>264</sup> MRAG Asia Pacific. 2019. Op. cit.

<sup>265</sup> Taiwan has a large longline fleet that targets tropical tunas that are aimed at the Japanese sashimi-grade market. BACI data do not distinguish between sashimi grade vs. cannery grade exports of frozen tuna. However, given that most countries are not significant consumers of sashimi-grade tuna, it is reasonable to assume that, except for exports to Japan, most of Taiwan's frozen tropical tuna exports involve cannery grade tuna associated with purse seine catches. Taiwan's exports to Japan represented approximately 24 percent of their total exports of raw frozen tropical tuna, as shown in Table 71; an unknown quantity of these exports would be sashimi-grade purse-seine caught tropical tuna.

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Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

### Major Taiwanese Tuna Companies

The main Taiwanese tuna companies that may have leverage to effect change at the RFMOs include:

- Fong Kuo Fishery Group (FCF Fishery Co. Ltd.) is a major trader with close commercial linkages to about 40 Taiwanese-controlled purse seiners. While Taiwan has no in-country domestic tuna processing capacity, the Taiwanese tuna purse fleet continues to be a dominant player as an exporter of raw frozen tuna for canning and FCF Fishery Co. Ltd has extensive interests in and influence over processing in other countries in the Pacific region. The fleet is closely linked to the operation of FCF Fishery Co. Ltd.<sup>266</sup>
- Fair Well Fishery Group is a major fishing company in Taiwan with purse seine vessel fishing under the flags of Taiwan and other PICs.<sup>267</sup>
- The Koo's Group appears to own eight purse seine vessels: four in the Marshall Islands (Koo's 101, 102, 107, and 108) and four in FSM (Micronesia 101, 102, 103, and 106), but no website could be found for this company. Its base of operations is in Majuro through Koo's Fishing Co. Ltd and Marshall Islands Fishing Co.; in FSM, its fleet is managed through two subsidiaries, Kasar Fishing Corporation and Pohnpei Shipping Company Inc in FSM.<sup>268</sup>

### Pacific Island Countries

Increasingly, in the WCPFC, a cadre of PICs have emerged as tuna suppliers via the transfer of flags and switching of tuna purse seine fleets from traditional DWFNs such as Japan, Korea, Taiwan, China, the Philippines, and the U.S., to certain PICs. Within the PICs two groups can be identified. The first group consists of the Federated States of Micronesia (FSM), the Marshall Islands, Solomon Islands, and Kiribati, which have had more historical participation in acquiring tuna vessels, entering into joint venture agreements, or establishing chartering schemes. The second group of PICs, which have become particularly active in the past five years or so, includes countries such as Nauru, Tuvalu, Cook Islands, and Vanuatu. The reasons why a DWFN would choose to re-flag its tuna purse seine vessel under the flag of a particular PIC or why a particular PIC would choose to accept a vessel from a particular DWFN under its flag or as a locally based foreign chartered vessel are presented later in this section.

Table 75 shows the evolution of the tuna purse seine fleets re-flagged under key PICs and their corresponding catches for the period 2010 – 2019. Even though we have separately discussed PNG, we include the evolution of the tuna purse seine fleet for this country, since in the recent past, vessels flagged under PNG have switched to other flags.

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<sup>266</sup> Additional information about the company can be found at <https://fcf.com.tw/our-history/>.

<sup>267</sup> Additional information can be found at: <http://www.fairwell.com.tw/edcontent.php?lang=en&tb=3&id=23>.

<sup>268</sup> Additional information can be found at: MRAG Asia Pacific. 2019. Op. cit.

It is worth noting that in 2010, there were 102 tuna purse seine vessels flagged to 10 PICs and the combined catches totaled 357,452 mt. Of this, PNG had 48 tuna purse seine vessels and a total catch of 205,184.<sup>269</sup> By 2019, the number of purse seine vessels flagged to PICs had grown to 124 purse seiners and the catch had more than doubled to 864,061 mt. Of this catch, PNG contributed 265,389 mt (about 60,000 mt more than in 2010) with two additional vessels.

The catches of the remaining PICs have almost quadrupled over the 10-year period; in 2019, the combined catches of the PICs (excluding PNG) were 588,672 mt compared to the 2010 catch which was only 152,268 mt. The number of vessels flagged under the PICs (other than PNG) had grown from 54 in 2010 to 75 by 2019. The effects of vessels being re-flagged to PICs are undoubtedly impacting tuna trade flows in the Pacific. Countries that in 2010 never showed up on the Pacific tuna trade flow radar are major participants today.

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<sup>269</sup> Ruaia, T., S. Gu'urau and C. Reid. 2020. Economic and Development Indicators and Statistics: The fisheries of the Western and Central Pacific Ocean. Forum Fishery Agency, Solomon Islands. Downloaded from <https://www.ffa.int/system/files/FFA%20Economic%20Development%20Indicators%20and%20Statistics%202020.pdf>, April 26, 2023.

Table 75. Evolution of the Tuna Purse Seine Fleets Re-Flagged under Key Pacific Island Countries and Corresponding Catches

EVOLUTION OF THE TUNA PURSE SEINE FLEETS RE-FLAGGED UNDER KEY PACIFIC ISLAND COUNTRIES AND CORRESPONDING CATCHES *																				
Country	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019	
	Vessels	Catch	Vessels	Catch	Vessels	Catch	Vessels	Catch	Vessels	Catch	Vessels	Catch	Vessels	Catch	Vessels	Catch	Vessels	Catch	Vessels	Catch
FSM	7	22,448	7	26,505	9	36,233	10	24,182	10	38,075	12	55,743	16	71,689	19	83,437	22	111,052	23	159,270
Marshall Islands	10	56,834	10	90,182	10	71,957	12	77,634	12	75,896	12	86,869	10	60,480	10	64,785	10	72,667	11	95,596
Solomon Islands	14	12,965	14	25,561	15	26,470	12	24,769	7	30,425	8	28,793	8	55,772	10	45,712	10	51,992	11	64,168
Kiribati	4	25,747	6	46,514	9	62,378	12	72,241	14	109,174	21	136,697	27	163,490	19	152,138	21	188,392	22	204,165
Nauru	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,880	-	24,885
Tuvalu	1	10,554	1	7,417	1	11,054	1	11,416	1	5,943	1	4,586	1	5,974	2	5,626	1	11,043	1	4,954
Cook Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2,169
Vanuatu	18	23,720	27	23,382	22	24,664	16	20,100	3	20,514	3	8,344	3	4,394	3	6,845	2	12,502	5	33,465
<b>Subtotal</b>	<b>54</b>	<b>152,268</b>	<b>65</b>	<b>219,561</b>	<b>66</b>	<b>232,756</b>	<b>63</b>	<b>230,342</b>	<b>47</b>	<b>280,027</b>	<b>57</b>	<b>321,032</b>	<b>65</b>	<b>361,799</b>	<b>63</b>	<b>358,543</b>	<b>66</b>	<b>456,528</b>	<b>74</b>	<b>588,672</b>
PNG	48	205,184	49	161,883	51	236,163	51	192,967	55	234,880	53	214,468	67	288,086	67	302,491	56	311,515	50	265,389
<b>Total</b>	<b>102</b>	<b>357,452</b>	<b>114</b>	<b>381,444</b>	<b>117</b>	<b>468,919</b>	<b>114</b>	<b>423,309</b>	<b>102</b>	<b>514,907</b>	<b>110</b>	<b>535,500</b>	<b>132</b>	<b>649,885</b>	<b>130</b>	<b>661,034</b>	<b>122</b>	<b>768,043</b>	<b>124</b>	<b>854,061</b>

Source: Elaborated by IEc/GHA using data from: Ruaia, T., S. Gu'urau and Chris Reid. 2020. Economic and Development Indicators and Statistics: The fisheries of the Western and Central Pacific Ocean. Forum Fishery Agency, Solomon Islands. Downloaded from <https://www.ffa.int/system/files/FFA%20Economic%20Development%20Indicators%20and%20Statistics%202020.pdf>, April 26, 2023.

\* Domestically flagged and locally based foreign charters.

## Reasons for Vessels Re-Flagging and Impacts on Tuna Trade Flows

There are several reasons why a DWFN would choose to re-flag its tuna purse seine vessel under the flag of a particular PIC or why a particular PIC chooses to accept the vessel from a particular DWFN under its flag or as a locally based foreign chartered vessel.

Some PICs require the DWFN to make tuna-related land-based investments in the country if it is to grant its flag to the DWFN vessel. Sometimes, there are crew requirements whereby, for the purpose of transferring fishing know-how, the PIC requires that the DWFN hire a certain number of its nationals on the vessels. At other times, re-flagging a vessel under a PIC means that access to the country's tuna resources within the EEZ is less expensive than fishing as an outright DWFN under its original flag.

Sometimes, flagging the vessel under a particular PIC brings additional benefits, if the PIC is a member of the PNA. In this case, reflagging provides for more flexible access outside the VDS or exempts the re-flagged vessels from requirements associated with FAD closures or from operating in High Seas areas.

Finally, changes in fishing patterns also appear to be influencing where boat owners flag their vessels. For many years, fish was abundant in PNG waters but in the recent past, the fish has been more abundant toward the west, in the waters of FSM and Kiribati. Hence, some boat owners also base their reflagging decisions on fish availability.

Whatever the circumstances are, the fact is that in the WCPFC convention area, tuna boat owners have been re-flagging vessels from one country to another, altering the equilibrium or status quo on the traditional origin of the tuna catches and the tuna trade flows. Countries that had never exported frozen tuna to major processing centers are represented in the international trade data as significant exporters of tuna. Conversely, countries that used to have major tuna catches under their flag (e.g., the Philippines), suddenly appear with half of their historical catch, because half of their tuna fleet is now operating under a different flag (in this, case, the PNG flag).

A country like Nauru, which has never registered purse seine tuna catches in its history, was identified in 2019 with a catch of 24,885 mt. As of May 2022, it appears that 20 purse seiners have been reflagged in Nauru (nine vessels previously under U.S. flag, nine vessels that were under the PNG flag, and two vessels that were under the Korean flag).<sup>270</sup> Similarly, Kiribati, which in 2010 had four tuna purse seine vessels and a registered purse seine catch of 25,747 mt, by 2019 had a tuna fleet of 10 vessels under its flag and a registered catch of 204,165 mt per that year.

## Federated States of Micronesia (FSM)

### *Harvest Level*

FSM has over the last few years been attempting to develop a tuna industry primarily through the National Fisheries Corporation, designed by the government to promote tuna development and attract foreign companies to operate in FSM.

In 2019, FSM registered a catch of 159,269 mt of which skipjack accounted for 127,864 mt. This catch was obtained by fleet of 26 vessels, operating either under FSM flag or as locally based foreign charter. There are several fishing companies, some local and some foreign, operating tuna vessels out of the FSM under these schemes. However, little information is available about the companies that manage the vessels flagged under

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<sup>270</sup> Atuna. 2023d. "Thai Processors Bought USD 1.3 billion worth of frozen Whole Rounds." January 31.

FSM. There appear to be three companies involved in tuna purse seine activities in FSM.<sup>271</sup> These include a local company, Caroline Fisheries Corporation, and two foreign-owned companies: Lianncheng Overseas Fishery FSM Corp. (Chinese owned) and the Taiwanese-owned company, LS Ocean Group, a subsidiary of Da Yang Seafoods.

FSM has granted discounts on the price of its VDS fishing days to companies that are locally owned or are based in the country. These incentives offset the costs of operation for reflagged vessels, in exchange for socioeconomic benefits such as on-shore and off-shore employment opportunities. The value of a VDS fishing day can range from \$8,000 to \$14,000. Under FSM incentives, based on an average catch of 30 tons per day, a vessel owner could get a payback of \$12,000, compared to paying full price for a VDS day.<sup>272</sup>

The purse seine vessels operating under the FSM flag mostly transship (export) their catches to reefer carrier vessels in two locations, Pohnpei and Kosrae. In Kosrae, it is also possible to unload the tuna into reefer sea containers.

FSM has no significant canning or pre-cooked loining facilities.

### Export Level

In 2019, FSM exported 85,482 mt of tropical tuna, with 68,368 mt or 80 percent of the exports going to Thailand. Table 76 shows 2019 FSM's exports of tropical tunas.

**Table 76. Federated States of Micronesia: Exports of Raw Frozen Tropical Tuna by Importing Country, 2019 (mt of product weight)**

FROZEN TROPICAL			
Rank	Importer	Total	Percent
1	Thailand	68,368	80%
2	China	9,478	11%
3	Japan	2,948	3%
4	Indonesia	2,879	3%
5	Philippines	1,681	2%
6	South Korea	76	0%
7	Peru	52	0%
Total		85,482	

Source: BACI

<sup>271</sup> Atuna. 2022c. "Three Seiner Companies Want to Extend Their MSC to Entire PNA." September 2.

<sup>272</sup> Atuna. 2019b. "FSM Government to Fishing Firms: No Proof of Investment, No VDS Discounts." February 1.

FROZEN TROPICAL			
Rank	Importer	Total	Percent

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

### *Unaccounted Balance*

No information is available to determine the fate of the FSM registered catch of 159,269 mt that was not recorded in the 85,482 mt as exported; that is, 73,787 mt. FSM does not have an internal domestic market that could absorb that quantity of fish. BACI data do not account for the difference, so it is possible that the balance between FSM catch obtained by purse seine vessels flagged under FSM or by locally based foreign chartered vessels may have been transshipped. However, it is unknown how those transshipments (exports) were recorded and to what country those exports should be attributed.<sup>273</sup>

### *Marshall Islands*

#### *Harvest Level and Processing Level*

In 2019, the Marshall Islands had 10 tuna purse seine vessels registered and recorded a purse seine catch of 95,596 mt. There are six purse seine vessels managed by Shanghai Kaichuang a Chinese-owned company. These vessels are flagged under the Marshall Islands flag. The same company owns and operates Pan Pacific Fishery, a loining plant located in Majuro. In addition, five purse seiners are owned by Koo's Holding, a Taipei-based company.<sup>274</sup>

Like FSM, the Marshall Islands have been attempting to develop their tuna industry for several years. In this regard, the country has managed to establish a tuna loin processing facility, Pan Pacific Fishery, which can process 60 mt/day.<sup>275</sup> The Marshall Islands have been instrumental in actively making Majuro a major transshipping location for purse seine tuna fleets operating in the WCPFC convention area.

#### *Export Level*

The Marshall Islands exported 66,409 mt of whole frozen tropical tunas. China and Thailand were the main trading partners, absorbing 92 percent of the Marshall Islands' total exports in 2019. China imported 38,195 mt or 58 percent of the exports and Thailand imported 22,865 mt or 34 percent.

Table 77 shows the Marshall Islands 2019 exports of whole frozen tropical tunas.

<sup>273</sup> When joint ventures are in place, the production is often attributed to the host country; however, this is not always the case and could create a misalignment with trade data.

<sup>274</sup> AFP. 2000. "Businessman eyes transshipment on Marshall Islands". Taipei Times. January 29. Viewed at <https://www.taipeitimes.com/News/local/archives/2000/01/29/0000021908>, March 20, 2023.

<sup>275</sup> The plant is in the Marshall Islands and focuses on processing skipjack and yellowfin into tuna loins and flakes. These are exported pre-cooked and raw to the U.S., Asia, and the E.U. The plant has not operated regularly for the past four years.

Table 77. Marshall Islands: Exports of Raw Frozen Tropical Tuna by Importing Country, 2019 (mt of product weight)

FROZEN TROPICAL			
Rank	Importer	Total	Percent
1	China	38,195	58%
2	Thailand	22,865	34%
3	Philippines	3,883	6%
4	Indonesia	837	1%
5	Japan	626	1%
6	Other Asia, nes (Taiwan)	4	0%
Total		66,409	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

The Marshall Islands' relevance in the Pacific tuna trade flow is more related to its importance as a transshipping location for tuna purse seine fleets than to the volumes that the country purse seine fleet and its processing plant produce and export.

### Solomon Islands

Within the context of the group of PICs, the Solomon Islands play a particular role in the Pacific tuna trade flows because of the dominance of Tri-Marine in the tuna industry.

### Harvest and Processing Level

In 2019, the Solomon Islands registered a purse seine catch of 56,976 mt caught by a fleet of 8 vessels. The purse seine fleet associated with the Tri-Marine processing operation in Noro, Solomon Islands consists of two small seiners and four larger seiners. No information is available about who owns the other five vessels.

The Solomon Islands have an important tuna processing plant in Noro; Soltai Fishing and Processing (also known as Soltuna), formerly owned by Tri-Marine, processes tuna, particularly albacore, into pre-cooked tuna loins.<sup>276</sup> The plant has the capacity to process 140 mt/day approximately. Honiara is also a major transshipping port for purse seine vessels that fish in the WCPFC convention area. National Fisheries Development, a subsidiary company of Tri-Marine, has put a new star loader into service to quickly load containers, so vessels can now unload directly into reefer containers in addition to the traditional transshipping service offered in

<sup>276</sup> Food Processing Technology, Ltd., 2023. Soltai Tuna, Processing Plant. Viewed at: <https://www.foodprocessing-technology.com/projects/soltaituna/>, August 24, 2023.



Honiara by reefer carriers. The Solomon Islands also enjoy preferential trade status under GSP with zero duty to the E.U.

### *Export Level*

In 2019, the Solomon Islands exported 21,967 mt, most of which was skipjack tuna and was exported to Thailand. Table 78 shows the Solomon Islands' 2019 exports of tropical tuna.

**Table 78. Solomon Islands: Exports of Raw Frozen Tropical Tunas by Importing Country, 2019 (mt of product weight)**

FROZEN TROPICAL			
Rank	Importer	Total	Percent
1	Thailand	16,344	74%
2	Philippines	2,863	13%
3	Indonesia	1,696	8%
4	Japan	842	4%
5	Spain	120	1%
6	Mauritius	77	0%
7	Malaysia	24	0%
8	South Korea	2	0%
<b>Total</b>		<b>21,967</b>	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

The Solomon Islands also exported 9,571 mt of processed tuna products, mainly loins going to Italy, the U.S., Fiji, and Spain. Table 79 shows the Solomon Islands 2019 exports of processed tuna products.

Unlike other PICs, the Solomon Islands do not seem eager to promote re-flagging of vessels from DWFN under the Solomon Islands flag. The catch obtained by the current purse seine fleet and the catch of a few pole-and-line vessels (also owned by Tri-Marine) seem to be sufficient to keep the plant running. To supplement its raw material needs, the plant imports albacore from longline vessels that directly deliver the fish to the plant.

Strategically, the Solomon Islands have abundant tuna in their 200-mile EEZ and serve as a preferred transshipping port in the WCPFC area, especially now the country can offer fast unloading and loading of containers.

Table 79. Solomon Islands: Exports of Processed Tuna Products by Importing Country, 2019 (mt of product weight)

PROCESSED			
Rank	Importer	Total	Percent
1	Italy	8,619	90%
2	USA	481	5%
3	Fiji	244	3%
4	Spain	128	1%
5	France	51	1%
6	United Kingdom	26	0%
7	Greece	22	0%
Total		9,571	

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

### Kiribati

Since 2010, Kiribati is one of the PICs that shows the most activity with regards to the number of purse seine tuna vessels being incorporated into its fleet and the increases in its recorded tuna purse seine catches. Kiribati has no significant canning or pre-cooked loining facilities.

### Harvest Level

Kiribati's registered purse seine fleet consists of 10 purse seiners. In 2019, Kiribati's purse seine fleet reported a catch of 227,777 mt. The number of purse seine vessels and harvest under Kiribati flag has changed over the past few years. In 2018, there were 21 vessels registered under its flag and they produced a catch of 189,432 mt.<sup>277</sup>

Over the years, many vessels operating under Kiribati flag or as locally based foreign charters involved Taiwanese vessels, but a recent trade publication indicated that Kiribati has switched diplomatic alliances from Taiwan to China, and the company Zhejiang Ocean Family has become a major player in Chinese tuna

<sup>277</sup> WCPFC. 2022k. Scientific Committee Eighteenth Regular Session. Annual Report to the Commission. Part 1: Information on Fisheries, Research and Statistics. WCPFC-SC18-AR/CCM -11 (Rev. 01), Ministry of Fisheries and Marine Resources Development. Kiribati. July.

processing and distribution.<sup>278</sup> In addition, several Korean purse seine vessels are registered under Kiribati flag.<sup>279</sup>

### Export Level

With a 2019 purse seine catch of 204,165 mt, Kiribati registered exports of 48,176 mt. Thailand imported 36,303 or 75 percent of Kiribati's total exports, followed by the Philippines with 7,450 mt or 15 percent of the total exports. The catches taken by vessels under the Kiribati flag tend to transship their catches in port, either in Tarawa or Kiribati. Table 80 shows Kiribati's 2019 exports of tropical tuna.

**Table 80. Kiribati: Exports of Raw Frozen Tropical Tunas by Importing Country, 2019 (mt of product weight)**

FROZEN TROPICAL			
Rank	Importer	Total	Percent
1	Thailand	36,303	75%
2	Philippines	7,450	15%
3	China	1,471	3%
4	South Korea	1,131	2%
5	Japan	1,007	2%
6	Ecuador	785	2%
7	USA	28	0%
Total		48,176	

Source: BACI

Note: Raw frozen tropical tuna products include HS Codes 0303.42, 0303.43, and 0303.44.

### Unaccounted Balance

No information is available to determine the fate of Kiribati's registered catch of 204,165 mt minus the 48,176 mt of registered exports; that is, 155,989 mt of unaccounted for tuna. Kiribati does not have an internal domestic market that could absorb that quantity of fish, and although catch made by joint ventures could, in theory, result in catch being attributed to Kiribati that is reported by the partner country as exports, there are few or no joint venture arrangements in place.

<sup>278</sup> Seafood Source. 2022. "Study of Kiribati economy finds it is over-reliant on tuna fishery. August. Viewed at <https://www.seafoodsource.com/news/environment-sustainability/study-of-kiribati-economy-finds-it-is-over-reliant-on-tuna-fishery>, March 29, 2023.

<sup>279</sup> GHA personal communication, Maurice Brownjohn, March 20, 2023.

BACI data does not account for the difference, so it is possible that the balance of the Kiribati catch by purse seine vessels flagged under Kiribati or by locally based foreign chartered vessels may have been transshipped. However, it is unknown how those transshipments (exports) were recorded and to what country those exports should be or were attributed. It is also acknowledged within the industry that catch and other data reported by Kiribati may be unreliable.<sup>280</sup>

### Nauru, Tuvalu, and Cook Islands

In 2021, Nauru had eight registered tuna purse seine vessel and a purse seine catch of 24,885 mt. Tuvalu had six purse seiner and a catch of 4,954 mt and Cook Island had one purse seiner and a catch of 2,169 mt (Table 75). By 2022 Nauru had 20 vessels in its tuna purse seine fleet; no catch data are available for that year. None of these PICs have major tuna processing infrastructure and their consumption of purse seine caught tuna is probably very limited, but in 2023, the catches obtained under Nauru's flag will likely be significant and will probably be exported to Thailand. Traditional DWFN have reflagged their purse seine vessels in Nauru for one or more of the reasons explained earlier or for others not mentioned, such as the freedom associated with the lack of monitoring, control, or surveillance that a government such as that of Nauru could effectively exercise over the day-to-day operations of 20 tuna purse seine vessels in the Pacific.

None of these countries has significant canning or pre-cooked loining facilities.

### Vanuatu

In 2019, Vanuatu registered seven purse seine vessels under its flag and a catch of 33,465 mt. Vanuatu's loss of tuna purse seine vessels flagged under its register since 2010, after reaching a maximum of 27 purse seine vessels in 2011, is a sign of how the once favorite "flag of convenience" available within the WCPFC ceased to be useful when VDS, with its many advantages, was put into place. Vanuatu is not a member of the PNA, nor is it part of the VDS, so from the perspective of a tuna boat owner, the Vanuatu flag lacks the comparative advantages of the PNA countries on fish access agreements and conditions.

The recent flagging and re-flagging of purse seine vessels in the tuna fisheries of the West-Central Pacific region are creating a significant level of uncertainty. Important investments in PNG tuna processing infrastructure are being underutilized because fish to be processed in those canneries is lacking. Vessels that were once flagged under PNG are re-flagging to other countries and the original commitment to delivering fish in exchange for favorable access conditions that once existed are no longer as relevant. As one industry observer very familiar with the PNA and all things tuna in the WCPFC fishery stated under the condition of anonymity: "These new "flags of inconvenience" are going to end up hurting the Pacific Island States."

In general, tuna industry actors from all countries adjust to changing conditions much faster than governments or international management organizations do. These continued flag changes in the fishery will produce short-term benefits for some of these players. In this process, the stability of tuna trade flows will change, and some players will capitalize on and gain from the changes, while others will have to adjust to maintain their relevance.

### Latin American Countries

Similar to several PICs in the WCPFC convention area, four Latin America countries in the IATTC convention area have also offered themselves as flags of convenience that affect tuna trade flows in the Pacific.

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<sup>280</sup> GHA personal communication, Maurice Brownjohn, March 20, 2023.

## Panama

Panama is a flag of convenience State where tuna boat owners from DWFNs register their vessels to reduce their financial or operational exposure to stricter monitor, control, and surveillance systems than those they could experience if they flag their vessels under their own flag. As of 2021, there are 22 active purse seine vessels registered under Panama's flag. These vessels are controlled by or beneficially owned by tuna industry players in Spain, Ecuador, Venezuela, and Colombia, among others. Panama has no tuna processing plants.

A looser monitor, control, and surveillance environment can, however, backfire and become detrimental to some of these tuna boat owners. In 2022, the tuna purse seine fleet under Panama's flag caught approximately 92,000 mt. Currently, the E.U. has yellow-carded Panama for not addressing issues associated with IUU fishing and is about to yellow-card Panama again, which may ultimately lead to a Red Card for the country. Should that occur, the tuna caught by these Panamanian flag purse seiners would have difficulty finding markets. Many of these vessels currently sell their fish to Ecuador. If Ecuador was not able to take these Panamanian-caught tuna, tuna trade flows in the Pacific could be impacted.

## El Salvador

Grupo Calvo from Spain, partially owned by the Bolton Group, has three tuna purse seine vessels registered in El Salvador. Grupo Calvo has also a processing plant in Puerto La Union, San Salvador, where it processes tuna loins that are shipped to its main tuna processing facility in Carballo, Galicia, Spain.<sup>281</sup> The expansion of Grupo Calvo's plant in El Salvador has been halted by the recent increase in violence in that country, but Grupo Calvo has considered this facility as a potential location from which it could launch efforts to penetrate the U.S. canned tuna market. While things today appear to be at a standstill, a major expansion in the direction of the U.S. market by the Calvo Group together with the Bolton Group could alter the existing equilibrium in the IATTC region.<sup>282</sup> Should this expansion occur, it is possible that both the WCPFC region and the IATTC region could experience a significant increase in the presence of Spanish vessels. This type of change in this status quo would undoubtedly impact tuna trade flows.<sup>283</sup>

## Colombia

Colombia is a relatively minor participant in the tropical tuna purse seine fisheries in the IATTC convention area. Most of its catches are landed in Ecuador and transshipped to Colombia for processing into pre-cooked loins and canned products. Colombia has commercial links with the Italian tuna processing industry, supplying the loins for canning to serve the Italian market.

Colombia, like Mexico, catches tuna on dolphins, but also uses FADs. Colombia and Ecuador often conflict in their positions on regional management policies in the IATTC; this represents a possible risk to the stability of tuna trade flows and the fishery as a whole.

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<sup>281</sup> Grupo Calvo. 2023. Company Website. Viewed at <https://www.grupocalvo.com/who-we-are/donde-estamos/>, April 26, 2023.

<sup>282</sup> Atuna. 2012. "Bolton buys 40% of Calvo but nothing will change." April 24.

<sup>283</sup> Professional industry knowledge of Guillermo Gomez, GHA.

## CHAPTER 7 | Analysis of the Tropical Tuna Longline Fishery

Trade flows for longline-caught tropical tuna are oriented primarily around the Japanese sashimi-grade market, as well as emerging markets where the prevalence of Japanese-style restaurants is expanding. The total longline catch of tropical tuna in the Pacific Ocean has remained relatively consistent in recent years, ranging from approximately 160,000 mt to 220,000 mt between 2016 and 2020; in 2019, this longline catch represented 4.7 percent of the total global catch of tropical tuna. South Korea, Taiwan, Japan, and China consistently represent the key harvesting countries in this fishery. This section describes the trade flows, markets, key actors, and primary factors driving the movement of these products across the globe.

### Summary of Trade Flows and Key Actors in the Longline Fishery for Tropical Tuna

The longline fishery for tropical tunas is focused primarily on the Japanese sashimi-grade market and involves two main species: bigeye and yellowfin tuna. The size of this market continues to contract, as younger generations of Japanese consumers have reduced their consumption of sashimi tuna in favor of beef. Meanwhile, as the Japanese market contracts, Japanese-style restaurants serving sashimi-grade tuna are becoming more and more common in other parts of the world. In addition to the sashimi-grade tuna markets in Japan and elsewhere, some longline tropical tuna is marketed as either fresh or fresh/frozen (i.e., previously frozen fish that is sold as fresh) to be consumed as grilled tuna at home or in restaurants, both in the U.S. and the E.U.

The fleets of four countries -- Korea, Taiwan, Japan, and China -- caught over half of the total longline catches of tropical tuna in 2019, and these countries dominate the tropical tuna longline trade flows that feed the sashimi-grade and fresh/previously frozen tuna markets. As the markets evolve, so have the fishing and tuna processing strategies followed by each of these fleets, in turn shaping the trade flows that support the movement of longline tuna into the markets.

Japan's strategy seems to be oriented toward capitalizing on the higher quality reputation among Japanese tuna consumers of the products caught by the country's own fleet; increasingly, Japanese longline catches of tropical tuna are delivered directly to their home ports. This has reduced the number of High Seas tuna transshipments by Japanese longliners which, in the absence of substantial observer coverage, was raising doubts as to whether the fleets of Japan as well as other DWFNs followed RFMO requirements for at-sea transshipments. The catches of sashimi-grade tuna produced by the Japanese fleet are not subject to the same entry requirements that those of Taiwan, Korea, and China must meet to gain access to the Japanese market.

Interested organizations may want to closely follow these strategies and work with the Japanese government and OPRT to promote a reduction in High Seas tuna transshipments and closer monitoring and observation of operations on both longline vessels and reefer carrier vessels. This could result in WCPFC improvements in traceability and transparency in the operations of longline vessels and reefer carriers.

Japanese supermarket chains and trading companies engaged in sashimi-grade tuna importing, processing, and distribution, are moving away from relying on traditional wholesaler producer and consumer markets where fresh and frozen sashimi-grade, longline-caught tuna is normally auctioned. These supermarkets are increasingly buying directly from tuna producers and bypassing some of the traditional distributional channels historically used to move sashimi-grade tuna into the market.

Large trading companies that exert control over much of the frozen sashimi-grade tuna supply and therefore deserve attention include the Mitsubishi subsidiary Toyo Reiz, as well as Try Sangyou, Fukuichi Fishery Co.

Ltd., and Yamafuku Suisan Co. Ltd.<sup>284</sup> In addition, the wholesale producers and wholesale consumer markets where sashimi-grade tuna markets were traditionally auctioned appear to be changing. Major Japanese trading companies and supermarket chains, such as Aeon, are increasingly more directly involved with tuna producers. Interested organizations may consider approaching Aeon to learn more about their current sustainability sourcing requirements and ways to engage this major supermarket chain in the tuna management discussion within the context of the WCPFC and the IATTC.

The Korean longline fleet strategy appears to be moving in the direction of transshipping most of their catches back to Busan, South Korea, where the industry has developed processing facilities that can handle ultra-frozen tuna at minus 60 degrees Celsius to produce high-quality, sashimi-grade, value-added products for the Japanese market and their own growing Korean market. Trade in processed sashimi-grade products such as loins, fillets, blocks, and Saku-blocks is increasing. As a result, new tuna trade flows appear to be emerging for value-added, sashimi-grade, processed products, replacing trade flows that involved whole and gilled-and-gutted tropical tuna. The Korean use of their own reefer carriers limits the use of third-party tuna trading companies in handling this segment of the tropical tuna trade flows. In Korea, two companies that interested organizations should consider contacting are Dongwon Fisheries, which not only have a considerable longline fleet but also a facility where sashimi-grade products are processed for export, and Sajo Group.

The Taiwanese longline fleet does not appear to be making any significant changes to its modus operandi; they continue to limit their efforts to simply catching sashimi-grade tuna and not currently involved in turning their catches into value-added, sashimi-grade products. Two features of the Taiwanese strategy to reduce the cost of accessing fishing grounds has been to increase their operations in the High Seas areas where no fishing fees are required and entering into charter arrangements or reflagging when circumstances are favorable. Taiwan continues to rely heavily on transshipping operations on the High Seas, which represents a weakness given the increasing pressure exerted by NGOs and RFMOs to closely limit such transshipping activities. The Taiwanese trade flows are not likely to change much in the short term, but if Taiwan increasingly becomes a supplier of emerging sashimi-grade markets in the U.S. and E.U., this flow could change. The Taiwanese tropical tuna longline industry continues to be dominated by FCF Fishery Co., which represents a key actor on multiple levels and therefore could be an effective focus of engagement efforts.

China's longline fleet strategy appears to focus on establishing bases for operations in some key PICs, from which it can support fresh as well as deep-frozen, sashimi-grade tuna operations. The fresh sashimi-grade tuna operations are supported by air shipments from key locations (the Marshall Islands, FSM, etc.) where air reliable connections to Japan and other markets are available. The deep-frozen tuna longline operations are combined with transshipments that bring the fish back to China for further processing into sashimi-grade, value-added products. In China, key actors include two private companies, Luen Thai Fishing Venture, which is part of an industrial conglomerate, and Pingtairong Ocean Fishery Group, which is a family-owned operation; both are involved in tuna fishing and processing.<sup>285</sup>

Indonesia and Vietnam continue to play a relevant role in the supply of value-added frozen tuna products treated with carbon monoxide to maintain their red color. These products are entering the U.S. market, used at Japanese-style restaurants as sashimi-grade tuna or sold as fresh/previously frozen tuna for grilling by food service and retail markets. Carbon monoxide-treated products are not allowed to be sold in the E.U. markets.

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<sup>284</sup> Havice et al. 2022. Pg. 37.

<sup>285</sup> Campling et al. 2017. Pg. 180.

## Tropical Tuna Longline Fishery Dynamics and Markets

The longline fishery for tropical tuna in the Pacific Ocean currently catches approximately 7.5 percent of all tropical tuna caught in the Pacific and 5.6 percent of all tropical tuna caught in the world.

In 2019, the estimated longline catch of tropical tunas (bigeye and yellowfin) in the WCPFC and IATTC convention areas was 221,568 mt, of which 189,869 mt or 85 percent of the catch was taken by nine countries. South Korea, Taiwan, Japan, and China accounted for 59.3 percent of the total longline catches of tropical tunas in 2019. Indonesia, Vietnam, the U.S., the Federated States of Micronesia, and the Solomon Islands accounted for an additional 25 percent of the total, and the remainder was caught by a variety of other countries. Table 81 show the catches of tropical tuna by the main catching countries.<sup>286</sup>

**Table 81. Pacific Longline Catches of Tropical Tuna, 2019 (mt)**

Country	Catch (mt)	Percent of Fishery Catch	Cumulative Percent of Fishery Catch
South Korea	35,936	16.2%	16.2%
Taiwan	34,998	15.8%	32.0%
Japan	32,531	14.7%	46.7%
China	27,854	12.6%	59.3%
Indonesia	17,170	7.8%	67.0%
Vietnam	16,207	7.3%	74.3%
United States of America	9,989	4.5%	78.8%
Micronesia (Fed. States)	8,583	3.9%	82.7%
Solomon Islands	6,601	3.0%	85.7%
Subtotal	189,869	85.7%	85.7%
Others	31,699	14.3%	14.3%
<b>Total</b>	<b>221,568</b>	<b>100.0%</b>	<b>100.0%</b>

Source: RFMO catch data.

<sup>286</sup> Japan's longline catches reported to the Pacific RFMOs total 32,531 mt. However, other data sources report much higher Japanese longline catches. Havice et al. 2022 reports longline catches in 2019 of 197,869 mt, with a source of the Japanese Ministry of Finance (Havice et al. 2022. Op. cit.). Similarly, Shima, K. and T. Kawamoto. 2010. Japanese Market for Tuna Products. INFOFISH Tuna Conference, Bangkok, Thailand. Sept 13-15, 2010, and Kawamoto. 2016. Op. cit. both reported comparably high tuna longline catches for the years they analyzed. No information is available to explain the scale of this difference.



This fishery is primarily geared towards the production of sashimi-grade tuna, which includes bigeye and yellowfin tuna that is consumed raw in the Japanese market.<sup>287</sup> This fishery also contributes to sashimi-grade markets in other countries such as the U.S. and the E.U., where Japanese-style restaurants have developed in recent decades. Longline-caught tuna can be traded under three different categories: fresh/chilled (HS codes beginning with 0302.3), whole frozen (HS codes beginning with 0303.4), or as a frozen, processed product under the “other” category (HS codes 0304.87 and 0303.49). Note that longline tuna frozen onboard the fishing vessel may be defrosted and sold as a fresh/chilled product in major markets.

The Japanese sashimi market has been contracting over the past several decades.<sup>288</sup> In 2010, the size of this market was estimated at 527,000 mt.<sup>289</sup> In 2019, the total supply of sashimi-grade tuna to Japan was estimated at 382,372 mt, of which domestic landings (both fresh and frozen) represented approximately half (197,869 mt) and imports representing the other half (184,504 mt).<sup>290</sup> Other countries participate in the sashimi market by exporting fresh sashimi-grade tropical tunas, such as Indonesia, Philippines, Pacific Island states, etc.

As the Japanese market contracts, the number of Japanese-style restaurants serving sashimi-grade tuna in other parts of the world appears to be on the rise. According to the Ministry of Agriculture, Forestry and Fisheries of Japan, in 2017, the number of overseas Japanese-style restaurants was 117,568; this represented an average 30 percent increase over 2015.<sup>291</sup> Figure 45 depicts the number of Japanese-style restaurants outside of Japan and the change over the 2015 - 2107 period.

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<sup>287</sup> Skipjack is also a tropical tuna, but skipjack is caught mainly by purse seine and pole-and-line vessels. Skipjack catches by longline gear are marginal and are therefore excluded from this analysis.

<sup>288</sup> The contraction of the Japanese sashimi market has been attributed to a generational change in consumption patterns where the younger population has switched from consuming sashimi to consuming beef.

<sup>289</sup> Shima et al. 2010. Op. cit.

<sup>290</sup> Havice et al. 2022. Op. cit., pg. 30.

<sup>291</sup> Nippon.com. 2018. Number of Overseas Japanese Restaurants Tops 100,000. June 15. Viewed at <https://www.nippon.com/en/features/h00218/>, April 28, 2023.

## Japanese Restaurants Overseas on the Increase

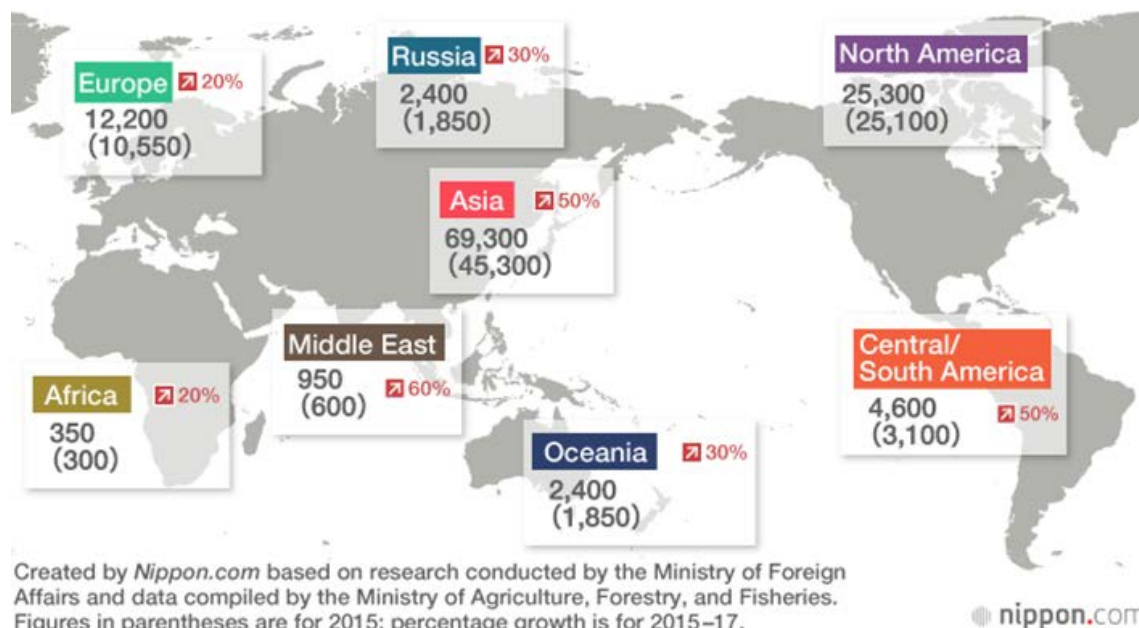


Figure 45. Number of Japanese-Style Restaurants outside Japan in 2015 to 2017

Source: Nippon.com. 2018. Number of Overseas Japanese Restaurants Tops 100,000. June 15. Viewed at <https://www.nippon.com/en/features/h00218/>, April 28, 2023.

The growth in the number of Japanese-style restaurants is providing new market opportunities for the longline fleets operating in the Pacific.

In addition to the sashimi-grade tuna markets in Japan and elsewhere, a second market absorbs some longline tropical tuna marketed as either fresh or fresh/frozen (i.e., previously frozen fish that is sold as fresh) to be consumed as grilled tuna at home or in restaurants, both in the U.S. and the E.U. Tropical tuna for the fresh/previously frozen market (also called the fresh/chilled market) is caught not only with longlines, but also using other gears, including handlines, troll lines, gillnets, and pump boats. The fish caught by these other gears often coincide with longline-caught fish in the marketplace and it is difficult to identify the gear type used in the import-export data for the relevant product types.

Longline vessels that target tropical tunas are designed either: (1) to keep the fish fresh on ice, making relatively short fishing trips, and selling the fish fresh at the landing ports; or (2) to freeze the fish on board, often at ULT (minus 60 degrees Celsius) with the intent to supply the sashimi-grade markets. Vessels that keep fish on ice make 15 to 20-day fishing trips, whereas vessels that freeze the fish can make trips that last up to 18 months. Vessels equipped with freezing equipment stay on the fishing grounds, are resupplied with fuel, provisions, bait, etc. by other vessels, and transship their catches to “reefer carriers” that take the frozen fish to processing centers or to the destination markets.

This report focuses solely on the flows of catches taken by longline fleets that target tropical tunas and are the primary source for the sashimi-grade markets or the fresh/previously frozen markets; it does not directly address the catches taken by other gear types that may enter the same markets.

## Governmental and Private Controls on the Pacific Tropical Tuna Longline Fishery

All of the Pacific tuna fisheries are under local or regional management regimes, however, some longline fleets fishing for Pacific tropical tuna currently experience other restrictions that affect the trade flows into the major markets. In addition to tariff and trade barriers in the major market countries (such as those discussed in Chapter 6 for products destined for the canned markets), trade flows of longline-caught tropical tuna are affected by management measures such as catch limits, market barriers designed to protect domestic producers, and other restrictions, as described below.

### Bigeye Tuna Catch Limits

At the present time, the WCPFC and IATTC have not established catch limits for yellowfin tuna. However, because of the poor condition of the bigeye tuna resources on both sides of the Pacific, both the WCPFC and IATTC have adopted measures to limit catches of bigeye tuna by the main catching nations in their corresponding jurisdictional areas. Table 82 shows the current catch limits for bigeye tuna established for each of the major longline tuna fishing countries in the two convention areas, according to the WCPFC's CMM 2021-01 and the IATTC's Resolution C-21-04.<sup>292</sup>

**Table 82. Current Bigeye Catch Limits in WCPFC and IATTC Convention Areas (mt)**

Country	WCPFC Catch Limit	IATTC Catch Limit	Total
China	8,224	2,507	10,731
Japan	18,265	32,372	50,637
Korea	13,942	11,947	25,889
Taiwan	10,481	7,555	18,036
Indonesia *	5,889	Not Applicable	5,889
USA	3,554	750	4,304
Total	60,355	55,131	115,486

Source: Prepared by IEC/GHA prepared using WCPFC (2021) (CMM 2021-01) and IATTC (2021) (Resolution C-21-04)

Note: \* Provisional

It should be noted that longline vessels under the flags of PICs or Latin American coastal states fishing in the WCPFC and/or IATTC convention areas are not currently subject to such catch restrictions.

<sup>292</sup> For WCPFC, WCPFC. 2021. Conservation and Management Measures for Bigeye, Yellowfin, and Skipjack Tuna in the Western and Central Pacific. CMM 2021-01. Commission 18<sup>th</sup> Regular Session: Electronic Meeting, 1-7 December, 2021. Downloaded from <https://cmm.wcpfc.int/measure/cmm-2021-01>, April 13, 2023; for IATTC, IATTC. 2021. Conservation Measures for Tropical Tunas in the Eastern Pacific Ocean During 2022-2024. Resolution C-21-04. Viewed at [https://www.iattc.org/GetAttachment/e3dc0a7e-e73c-4b8e-889e-a4cd2cdd7b8b/C-21-04-Active\\_Tuna-conservation-in-the-EPO-2022-2024.pdf](https://www.iattc.org/GetAttachment/e3dc0a7e-e73c-4b8e-889e-a4cd2cdd7b8b/C-21-04-Active_Tuna-conservation-in-the-EPO-2022-2024.pdf), April 13, 2023

### Additional Considerations Influencing Longline Fisheries for Tropical Tunas

In addition to the catch limitations established by both tuna RFMOs for bigeye tuna, longline vessels wishing to sell tropical tuna in the Japanese sashimi-grade market need to belong to the Organization for the Promotion of Responsible Tuna Fisheries (OPRT) and abide by its charter.<sup>293</sup>

Other considerations have to do with licenses to fish, vessel tracking requirements, labor and sanitary processing standards, and other limitations on access to the major markets for longline caught tunas in Japan, the U.S., and the E.U.

Figure 46 provides a schematic description of the main forms of public and private regulations affecting the Pacific longline industry, which are key variables affecting the longline catching and marketing (and therefore the trade flows) of Pacific tuna destined for the main markets.<sup>294</sup> It should be noted that some of the entry regulations into the Japanese market do not apply to the Japanese longline fleet.

Finally, it should be noted that all DWFNs' longline fleets have benefited and continue to benefit from subsidies, which in the past few years have been scrutinized. The claim that subsidies are contributing to the overfishing of certain tuna stocks has placed some of these fleets in the crosshairs of public opinion. This situation is likely to continue and could have an impact on current trade flows, particularly if High Seas transshipping tuna operations become heavily regulated or banned.

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<sup>293</sup> OPRT is an international Non-Governmental Organization that promotes responsible tuna fisheries with the aim of sustainable use of tuna resources. OPRT represents all types of stakeholders in tuna fisheries, including major tuna fishing operators in the world, as well as traders, distributors, and consumers in Japan. The NGO was created to organize the Japanese sashimi-grade market and prevent entry into the market from fishing companies and/or countries that engaged in IUU tuna fishing operations and were causing disruptions in the market. (OPRT. 2023a. About OPRT. Viewed at <http://oprt.or.jp/eng/about-oprt/>, April 13, 2023).

<sup>294</sup> The figure is oriented toward the Western Central Pacific longline fishery, but also applies to the longline fleets fishing in the Eastern Pacific for tuna destined for the main markets (Japan, the U.S., and the EU).

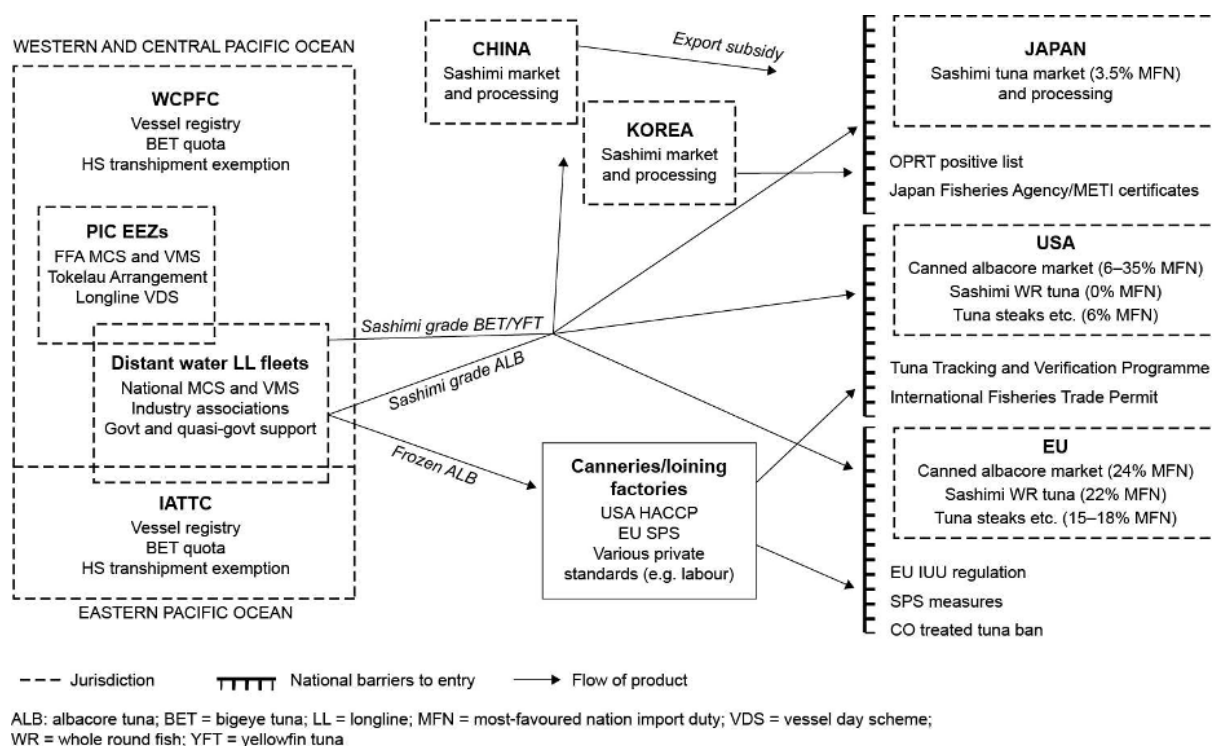


Figure 46. Schematic of the Main Forms of Public and Private Regulations of Western Central Pacific Ocean Longline Industry<sup>295</sup>

Source: Campling et al. 2017. Op. cit., Pg. 37.

## High Seas Transshipping in the Pacific Tropical Tuna Longline Fishery

As previously noted, longline vessels, particularly those that can ultra-freeze the fish on board at -60 degrees Celsius for the sashimi markets, usually engage in long fishing trips that can last up to 18 months at a time, and therefore rely on transshipping services. This is true for all the longline fleets of the major fishing countries except Japan, whose longline vessels call at Japanese ports more often than the fleets of China, Taiwan, and South Korea. Because the Japanese vessels often directly unload their catches at Japanese ports, they do not transship tropical tuna to carriers on the High Seas as much as other tuna longline fleets from other countries.<sup>296</sup>

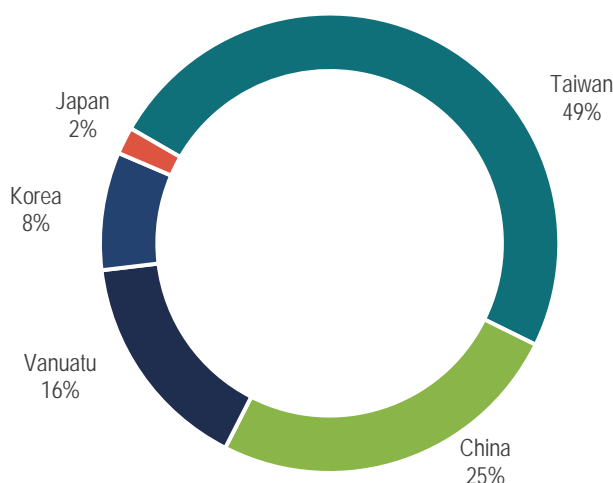
Of the 18 countries flagging longline vessels in the WCPFC convention area, only six have authorized their vessels to transship on the High Seas: China, Japan, Korea, Taiwan, the U.S., and Vanuatu. Some countries transship even though they do not have authorization from their respective flag state. Together, Taiwanese,

<sup>295</sup> Note that some parts of the figure refer specifically to longline fisheries for albacore, which is not a tropical tuna. In this report, the albacore fisheries are addressed in Chapter 8.

<sup>296</sup> The two of the reasons for this are: (a) there is a limited number of ULT reefer carrier vessels available to serve the ULT longline vessels; and (b) delivering the ultra-low temperature fish directly to land-based, dockside, cold storage facilities designed to receive the fish minimizes risks of temperature increases that may be associated with transshipping the fish.

Chinese, and Japanese longline vessels represent 83 percent of all longline vessels permitted to transship on the High Seas.<sup>297</sup>

In 2017, tuna longline fishing nations reported a total of 1,084 transshipment events in the WCPFC convention area. Figure 47 shows the number of transshipping operations by the main authorized tuna longline fleets in the WCPFC convention area in 2017. Taiwan conducted 532 transshipments, representing 48.9 percent of all tuna longline transshipments in the WCPFC convention area. China conducted 273 transshipments (25.2 percent), Vanuatu had 169 transshipping events (15.6 percent), Korea had 87 transshipments (8.3 percent), and Japan had only 21 transshipping events (1.9%).<sup>298</sup>



**Figure 47. Reported High Seas Tuna Longline Transshipping Events in the WCPFC Convention Area, 2017**

Source: MRAG Asia Pacific. 2019. Op. cit., pg. 53.

Many companies are involved in transshipping and handling sashimi-grade longline tropical tunas, including:

- In Japan: Mitsubishi Corporation, through its subsidiary Toyo Reizo Co. Ltd. (the leading sashimi trading company in Japan), Toei Reefer Line, and Hayama Shipping.
- In Korea: SEoIL Agency, Green World, Dongwon, and Sajo.
- In Taiwan: FCF Fishery Co. Ltd., Lung Soon Group, Tunago Shipping Co. Ltd., and Hon Shun Fishery Co. Ltd.

<sup>297</sup> MRAG Asia-Pacific. 2019. Op. cit., pg. 53. According to this source, in 2019 there were 2,581 longline vessels on the WCPFC vessel register. Of these, 2050 (79 percent) were authorized by their flag State to conduct transshipment operations on the High Seas within the WCPFC convention area; 490 vessels were not authorized to do so, and no High Seas authorization status was recorded for 41 vessels (mainly from the EU).

<sup>298</sup> MRAG Asia Pacific. 2019. Op. cit., pg. 53.

- In China: Ping Tai Rong Ocean Fishery Group Co Ltd. and Fujian Province Changfu Fishery Co. Ltd.
- Tri-Marine and Itochu also participate, but the degree of specialization and the ultra-low temperatures required make their participation in the transshipping of longline tropical tuna more limited.

Unlike in purse seine tuna transshipping, where the major tuna trading companies purchase the fish from the fishing vessels, the reefer carriers owned by the previously mentioned companies do not take ownership of the fish they transport to the processing/packaging or market destinations in Japan, Korea, China, or Taiwan. The transshipping companies charge a commission for transporting the frozen fish to the different destinations and for bringing in provisions and supplies (food, bait, crew replacements, spare parts) and refueling.

These companies coordinate with the fishing fleets and position the reefer carriers where the fishing is taking place. Longline vessels may only transship 200 to 400 mt at a time or may be limited to this amount per year.<sup>299</sup>

When longline-caught tuna arrives in Japan for sashimi, whether landed directly or transshipped, it is received for auction “on consignment.” This means that the final price received by the fishermen is not determined until after the fish is sold at either wholesale producers’ markets or wholesale consumers’ markets. Each individual fish is graded and assessed by the experts who will be auctioning the fish. The final price depends on several factors, including the intrinsic quality of the fish, the levels of inventory of similar tuna, and other the supply and demand conditions on the day on which the fish is auctioned.

Tunas that do not meet the high-quality standards required for the sashimi-grade market in Japan or elsewhere are often diverted into the fresh grilled/chilled markets. Fish that directly goes to the fresh/grilled market is often shipped by air to the destination market.

## Major Tropical Tuna Longline Catching Countries

The major catching countries and companies supplying longline-caught tropical tuna to the primary world sashimi and fresh/previously frozen markets are (in order of their catches) South Korea, Taiwan, Japan, and China; these countries account for about 60 percent of the Pacific longline catch of tropical tuna. Five additional countries (Indonesia, Vietnam, the U.S., FSM, and the Solomon Islands) account for an additional 26 percent. These countries’ longline fisheries for tropical tuna species are analyzed below, beginning with Japan, because of its market dominance.

### Japan

#### The Japanese Domestic Tuna Market

Japan is the largest single market for tuna in the world, absorbing approximately 751,000 mt of tuna in 2016.<sup>300</sup> The market is supplied by domestic catches and imports. Figure 48 broadly depicts the size and characteristics

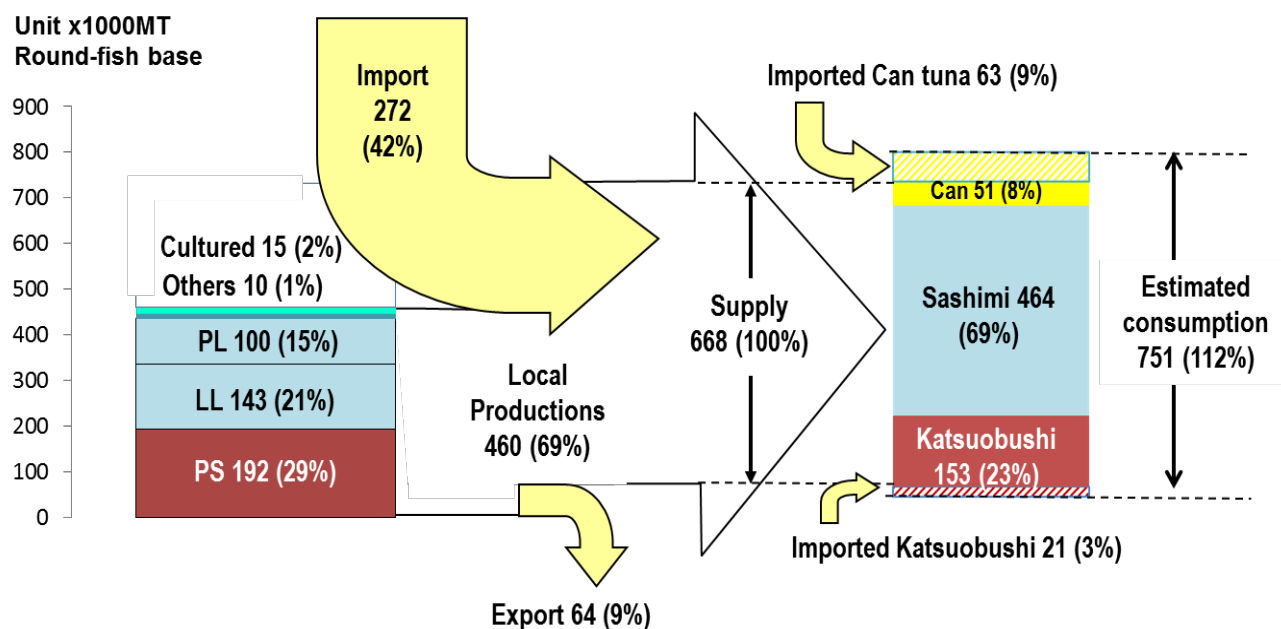
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<sup>299</sup> For a very good description and analysis of the main companies involved in trading and transshipping sashimi-grade tuna and to see the number of carrier vessels each of these main companies has, please see MRAG Asia-Pacific. 2019. Op. cit.

<sup>300</sup> Kawamoto. 2016. Op. cit.



of the Japanese tuna market, identifying the sources of the fish (domestic catches by different gear types), imports, and exports.<sup>301</sup>



**Figure 48. Characteristics of the Japanese Tuna Market**

Note: The estimated consumption may include previous years' inventories.

Source: Kawamoto, Taro. 2016. Tuna Market in Japan, Current Status, Challenges, and Prospects. 14<sup>th</sup> INFOFISH World Tuna Trade Conference and Exhibition, 23-25, 2016. Bangkok, Thailand.

The Japanese consume tuna in three basic forms. Most of the fish is consumed in its raw form as sashimi. Approximately 464,000 mt or 69 percent of Japanese tuna consumption was of sashimi-grade tuna. All tuna species can be consumed as sashimi, but the market is dominated by bluefin tuna and to a lesser extent, bigeye, yellowfin, and albacore; skipjack is the least preferred tuna species for sashimi. The second way Japanese eat tuna is as katsuobushi, a dried/fermented product for which skipjack tuna is used. The size of this market in 2016 was estimated at 153,000 mt or 23 percent of the Japanese market. Finally, Japanese consumers also consumed canned tuna. The size of this market segment in 2016 was estimated at 51,000 mt or 8 percent of the total Japanese tuna market.<sup>302</sup> This chapter focuses on the market for sashimi, which is supplied by the longline fishery for tropical tunas. The markets and fisheries associated with the other described products are addressed in Chapter 6 and Chapter 8.

<sup>301</sup> This diagram provides data on the market in 2016. The market has changed, and the overall size of the Japanese market is probably down by about 100,000 mt at the present time.

<sup>302</sup> Kawamoto. 2016. Op. cit.



As previously noted, the size of the Japanese market has declined, mainly in the sashimi sector. In 2021, the estimated size of this segment is around 380,000 mt.<sup>303</sup> The main reason given for the reduction in sashimi-grade tuna consumption is a change in younger generations' preference to consume beef as opposed to fish. Other arguments suggest that the continued downturn in the Japanese tuna fleet has affected the market.

## Harvest Level

### *Japan's Tuna Longline Catch*

In 2019, Japan reported a longline catch of tropical tuna of 32,531 mt, which was seven percent more than the average catch for this fleet reported during the 2016 - 2020 period of 30,209 mt. Most of the Japanese longline catches are reported as coming from the High Seas areas in both the WCPFC and IATTC convention areas; however, within the WCPFC convention area, the Japanese fleet has traditionally operated off the waters of FSM, Palau, the Solomon Islands, Nauru, the Marshall Islands and to a lesser extent, in Kiribati waters.<sup>304</sup>

### *Japan's Tuna Longline Fleet*

The Japanese longline fleet can be classified into three categories- coastal, offshore, and distant water, based on the areas in which the vessel fishes and the vessel size.

Coastal longliners (1 to 20 GRT) fish only within Japan's EEZ. Offshore longliners fall under two categories based on their size: small offshore vessels (10 to 20 GRT) and offshore longliners (20 to 120 GRT). These two categories are allowed and able to fish beyond Japan's EEZ; they fish in both the WCPFC and IATTC convention areas, but some of the small offshore vessels (those that keep their catch on ice) only engage in trips that last up to one month. Finally, the third category is that of the distant water longliners, which are vessels larger than 120 GRT and can freeze the fish at -60 degree Celsius (ultra-low temperature).<sup>305</sup>

In 2019, the Japanese fleet was made up of 393 vessels. In 2017, the offshore and distant-water longliners in this fleet (368 longline vessels at the time, including 229 offshore vessels and 108 distant-water vessels) caught about 73 percent of the total Japanese longline catch of tropical tuna and albacore; the remainder was caught by small offshore vessels.<sup>306</sup>

The Japanese longline fleet is authorized to undertake High Seas transshipments in both the WCPFC and IATTC convention areas. However, Japanese vessels typically return to Japan at the end of their trips.<sup>307</sup>

There are three main associations that group Japanese tuna longline vessel owners: the Japan Tuna Fisheries Cooperative Association (known also as Nikkatsukyo), the National Offshore Fisheries Association of Japan (Kinkatsukyo), and the National Ocean Tuna Fishing Association (Enkatsukyo). Most of the owners of smaller offshore and distant water longline vessels belong to Nikkatsukyo, with the remaining vessels belonging to

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<sup>303</sup> Havice et al. 2022. Op. cit., pg. 30.

<sup>304</sup> Campling, L. A. Lewis, and M. McCoy. 2017. The Tuna Longline Industry in the Western and Central Pacific Ocean and its Market Dynamics. Forum Fisheries Agency, Honiara, Solomon Islands. October., pg. 128.

<sup>305</sup> MRAG Asia-Pacific. 2019. Op. cit.

<sup>306</sup> MRAG Asia-Pacific. 2019. Op. cit., pg. 55.

<sup>307</sup> Campling et al. 2017. Op. cit., pp. 128-129. In 2016 only 10 percent of the Japanese longline catch of tropical tunas and albacore was transshipment.

Kinkatsuyo. Only about 10 longline distant water longline vessels belong to Enkatsuyko.<sup>308</sup> An estimated 122 Japanese companies owned the 235 distant water/offshore longline vessels registered in 2016, with the number of vessels per company owned ranging from one to a maximum of six and 78 percent of the companies owning just one or two vessels; multiple companies may be financially interlocking, however.<sup>309</sup> Companies may be owner-operators with one offshore boat, specialized longlining companies that own four to six vessels, seafood multinationals such as Nippon Suisan Hyakunen that handle many seafood products including some sashimi, or giant holding companies such as Mitsubishi.<sup>310</sup>

Table 83 shows the companies owning and operating four or more offshore or distant water longline vessels. This table also describes the location and Prefecture where the longline vessels are home ported. No information is available to identify the extent to which these vessels focus on tropical tunas versus albacore.

**Table 83. Japan: Companies Owning and Operating Four or More Offshore/Distant Water Longline Vessels**

Company	No. of Vessels	Company Base/ Registered Port	Prefecture
<b>TOHOKU REGION (7 COMPANIES, 32 VESSELS)</b>			
Hamako Suisan Co. Ltd.	6	Kamaishi	Iwate
Koue Gyogyo Co. Ltd.	4	Kamaishi	Iwate
Kabushiki Kaisha Usufuku Honten	6	Kesennuma	Miyagi
Kaigata Suisan Kabushiki Kaisha	4	Kesennuma	Miyagi
Katsukura Gyogyo Kabushiki Kaisha	4	Kesennuma	Miyagi
Sato Gyogyo Kabushiki Gaisha	4	Shiogama	Miyagi
Marukichi Co. Ltd.	4	Hachinohe	Aomori
<b>KYUSHU REGION (5 COMPANIES, 23 VESSELS)</b>			
Kushikino Maguro Kabushiki Kaisha	6	Ichikikushikino	Kagoshima
Maruwaka Suisan Kabushiki Kaisha	5	Ichikikushikino	Kagoshima
Kabushiki Kaisha Ushio	4	Ichikikushikino	Kagoshima
Kanzaki Suisan Kabushiki Kaisha	4	Ichikikushikino	Kagoshima
Shimabira Daiichi Gyogyo Seisan Kumiai	4	Ichikikushikino	Kagoshima
<b>KANTO REGION (3 COMPANIES, 15 VESSELS)</b>			

<sup>308</sup> Campling et.al. 2017. Op. cit., pg. 124.

<sup>309</sup> Campling et al. 2017. Op. cit., pg. 130.

<sup>310</sup> Campling et.al. 2017. Op. cit., pg. 131.

Company	No. of Vessels	Company Base/ Registered Port	Prefecture
Sumiyoshi Gyogyo Kabushiki Kaisha	6	Miura	Kanagawa
Kotoshiro Gyogyo Kabushiki Kaisha	5	Miura	Kanagawa
Nanyo Suisan Kabushiki Kaisha	4	Miura	Kanagawa
<b>Chubu Region (3 companies, 14 vessels)</b>			
Fukukyu Gyogyo Kabushiki Kaisha	5	Yaizu	Shizuoka
Kabushiki Kaisha Fukuseki Maru	5	Yaizu	Shizuoka
Ogino, Seichi	4	Tonami	Toyama
<b>OTHER REGION (1 COMPANY, 5 VESSELS)</b>			
Chokyu Maru Co. Ltd	5	Owase	Mie
TOTAL	(89)		

Source: Campling et al. 2017. Op. cit, pg. 132.

### *Japanese Transshipment of Pacific Longline-Caught Tropical Tuna*

The catches by coastal longline ice-vessels that operate only within the Japanese EEZ are typically landed directly at Japanese ports and are sold for the fresh sashimi market. The offshore and distant water longline vessels equipped with ultra-low temperature systems also tend to land their catches in Japanese ports, but some do transship their catches. In the WCPFC in 2017, 13 transshipments were recorded inside the WCPFC convention area and eight transshipments were recorded outside of the convention area. The total quantity of tuna transshipped was around 700 mt.<sup>311</sup>

### *Import Level*

As discussed before, the Japanese market is supplied by the domestic catches of tuna and by imports. Japan imports fresh/chilled tuna, frozen whole tuna (usually gilled and gutted), and sashimi-grade frozen processed tuna (loins or fillets, frozen blocks and Saku blocks).

### *Japanese Imports of Pacific Longline-Caught Tropical Fresh/Chilled Tuna*

In 2019, Japan imported 4,936 mt of fresh/chilled tuna from several countries around the world, some located in the Pacific Ocean basin, and some from other ocean areas. Yellowfin and bigeye tunas were the main species imported with yellowfin accounting for 3,013 mt and bigeye for 1,923 mt. Two countries were the main contributors to Japan's imports, Palau with 1,395 mt and Indonesia with 1,384 mt. These two countries represented more than one-half of Japan's total imports of fresh/chilled tropical tunas. BACI data do not report gear types or ocean areas of catch, so these imports may have been the result of catches using longline, handline, troll, or other fishing gears, originating in the Pacific, Atlantic, or Indian oceans. Table 84 shows the 2019 imports of Japanese fresh/chilled tropical tunas.

<sup>311</sup> MRAG Asia Pacific. 2019. Op. cit., pg. 56.

Because of the highly perishable nature of the product being traded, most of these imports were air shipments to Japan.<sup>312</sup>

In the case of Japanese imports from Palau, based on professional industry knowledge of Guillermo Gomez, GHA, it is very likely that the tuna originating in Palau was longline caught, but it is not possible to determine if the fish was caught by Palau longline vessels or were deliveries of catches under other countries' flags. Indonesia poses a further difficulty because Indonesia catches tropical tunas by different gears, and in both the Pacific and in the Indian Oceans. Therefore, without further studies, no further conclusions can be drawn regarding these tuna imports.

Table 84. Japan: Imports of Fresh/Chilled Tropical Tunas, 2019 (mt of product weight)

FRESH TROPICAL					0302.32	0302.33	0302.34
Rank	Exporter	Total	Percent	Cum. Percent	Fresh / Chilled Yellowfin	Fresh / Chilled Skipjack	Fresh / Chilled Bigeye
1	Palau	1,395	28%	28%	910	-	485
2	Indonesia	1,384	28%	56%	741	-	643
3	Other Asia, nes (Taiwan)	369	7%	64%	352	-	17
4	Australia	369	7%	71%	253	-	116
5	Micronesia (Fed. States)	259	5%	76%	110	-	149
6	Marshall Islands	224	5%	81%	79	-	145
7	New Caledonia	223	5%	86%	214	-	10
8	South Africa	188	4%	89%	30	-	158
9	Sri Lanka	154	3%	92%	131	-	23
10	Philippines	106	2%	95%	73	-	33
>10	Others	265	5%	100%	119	0	146
Total		4,936			3,013	0	1,923

Source: BACI

Note: Fresh/Chilled tropical tuna includes HS Codes 0302.32, 0302.33, and 0302.34

<sup>312</sup> Typically, the fish is gilled, gutted, individually placed in a Styrofoam box with gel-ice, and placed in a waxed, more protective box (also known as a “tuna coffin”) that is air shipped. Typically, when the fish is first landed, Japanese personnel will grade the quality of the fish and its suitability for the Japanese sashimi market. If the fish meets the grade, the buyer arranges for its air shipment to the final destination, Japan. The fish is sent on consignment to Japan to be auctioned in the marketplace. Once sold, the associated costs and commissions are deducted from the final sales price and the fishing vessel's owner is then paid for the fish.

The other suppliers of fresh/chilled tropical tunas located in the Pacific Basin have regularly scheduled flights (Australia, New Caledonia) or connecting flights (FSM and Marshall Islands) to Japan, so it is likely that the fish shipped by these countries was caught in the Pacific. However, it may or may not have been caught by longline gear (as opposed to handline, troll, or other fishing gears).

Japanese imports from Taiwan could potentially be the result of direct deliveries of fresh fish by some Taiwanese ice-vessels or air shipments originating in Taiwan to Japan. In the case of the Philippines, the Japanese imports were likely air shipments of fresh/chilled yellowfin or bigeye. However, in the case of the Philippines is not clear if these exports are the result of catches by longline, handlines, or pump boats. Clearly, imports from South Africa and Sri-Lanka did not originate in the Pacific.

#### *Japanese Imports of Frozen Tropical Tunas*

In 2019, Japan imported 141,257 mt of frozen whole tropical tunas. Broken down by species, 50,651 mt were yellowfin, 37,093 mt were skipjack, and 53,513 mt were bigeye tuna, as shown in Table 85.

Indonesia and FSM mostly supplied Japan with skipjack tuna, which is unlikely to have been caught by longline gear in the Pacific, but rather by purse seine. Taiwan, China, Vanuatu, and Korea contributed approximately 74,286 mt or 53 percent of Japan's imports of whole frozen tropical tuna.

It is not possible to determine how much of these volumes corresponded to fish caught by longline gear. It is likely that a portion of this catch could be sashimi-grade tuna caught by the Taiwanese, Chinese, Vanuatu, and Korean longline fleets but it is not possible to determine with any degree of precision.

FSM and Fiji contributed 4,505 mt. These exports to Japan are likely the result of longline catches of vessels owned or controlled by Taiwan or Korea but flagged in FSM and Fiji. Japanese imports from the Seychelles derived from the Indian Ocean. Yellowfin imports from Thailand were likely higher quality fish that was worth exporting to Japan rather than being sent to the canned market.

Only a very small proportion of the total reported imports of frozen tropical tunas are represented in the Datamyne data. As such, we are not able to reliably identify the primary Japanese companies involved in the imports of these products.

Table 85. Japan: Imports of Whole Frozen Tropical Tuna, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Exporter	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Other Asia, nes (Taiwan)	46,118	33%	33%	17,176	154	28,788
2	Indonesia	31,694	22%	55%	51	31,594	50
3	China	17,669	13%	68%	6,333	204	11,132
4	Seychelles	11,721	8%	76%	7,856	151	3,714
5	Vanuatu	5,943	4%	80%	1,660	-	4,284
6	South Korea	4,556	3%	83%	2,601	244	1,711
7	Thailand	3,938	3%	86%	3,860	78	-
8	Micronesia (Fed. States)	2,948	2%	88%	1,061	1,675	212
9	Singapore	1,814	1%	89%	951	-	863
10	Fiji	1,557	1%	91%	961	-	597
>10	Others	13,298	9%	100%	8,141	2,993	2,163
Total		141,257			50,651	37,093	53,513

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

*Japan's "Other" Frozen Tuna Imports*

In 2019, Japan also imported 54,247 mt of "Other" frozen tuna. Specifically, under HS Code 0304.87 (Tuna, non-specific, fillets, frozen) Japan imported 51,675 mt, and under HS Code 0303.49 (Tuna, Other, Frozen) Japan imported 2,572 mt. China was the main supplier of Japan with 11,273 mt. Table 86 shows Japan's 2019 imports of "Other" frozen tuna. Other countries supplying Japan with "Other" frozen tuna were South Korea, Malta, and Spain.

Table 86. Japan: Imports of “Other” Frozen Tuna Products, 2019 (mt of product weight)

OTHER					0304.87	0303.49
Rank	Exporter	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	China	11,273	21%	21%	11,267	6
2	South Korea	9,059	17%	37%	9,024	35
3	Malta	8,312	15%	53%	8,312	-
4	Spain	3,433	6%	59%	3,433	-
5	Indonesia	3,301	6%	65%	2,313	988
6	Turkey	3,132	6%	71%	3,132	-
7	Croatia	2,293	4%	75%	2,293	-
8	Vietnam	1,675	3%	78%	906	769
9	Other Asia, nes (Taiwan)	1,648	3%	81%	1,648	-
10	Morocco	1,592	3%	84%	1,592	-
>10	Others	8,528	16%	100%	7,754	774
	<b>Total</b>	<b>54,247</b>			<b>51,675</b>	<b>2,572</b>

Source: BACI

Note: “Other” tuna includes HS Codes 0304.87 and 0303.49

Without additional details on these imports, it is impossible to determine what percentage of these products was sashimi-grade tropical tuna originating from longline vessels in the Pacific as opposed to tuna caught by other gears or in different ocean regions. However, it is possible that Japan’s imports from China were associated with China’s longline operations for sashimi-grade tuna.

## Export Level

### *Japanese Exports of Sashimi-Grade, Longline-Caught Pacific Tropical Tuna*

Japan, with its long-standing global trading history, exports tuna products to the rest of the world, including tropical tuna products. As such, Japan exports fresh/chilled, whole frozen, and “other” frozen tuna.

In the fresh/chilled category, in 2019, Japan recorded exports of 1,197 mt. Of this, nearly all (1,128 mt) were exported to Guam, including fresh yellowfin (394 mt) and bigeye (743 mt).<sup>313</sup> This volume represented 94 percent of all Japanese exports of fresh/chilled tropical tuna to the world.<sup>314</sup>

In the whole frozen category, Japan exported 28,067 mt of tropical tuna in 2019. Thailand was the recipient of 22,547 mt or 80 percent of Japan's exports under this category.<sup>315</sup> Most of the fish was skipjack that was used for canning, and which was likely produced by the Japanese purse seine fleet as opposed to its longline fleet. The other main importers of Japanese frozen tuna were the Philippines, Indonesia, and Vietnam. As in the case of Thailand, most of these exports were probably associated with Japan's tuna purse seine catches in the Pacific. For this reason, we do not consider these products or the companies involved any further in this analysis of longline fisheries.

Finally, under the "Other" frozen tuna category in 2019, Japan exported 2,558 mt of frozen products. Most of these exports fell under HS code 0304.87 (Tuna, non-specific, fillets, frozen). Several countries were the recipients of these exports, with the U.S. taking the largest share with 725 mt or 28 percent of the total Japanese exports. Table 87 shows Japan's 2019 exports under this category.<sup>316</sup> It is not possible to determine if these "other" products are associated with Japanese longline catches of tropical tuna. However, professional industry knowledge suggests that some of these exported Japanese products probably represent high-quality, sashimi grade products destined for Japanese-style markets in many of the countries importing them, including the U.S., Fiji, Vietnam, Hong Kong, France, Spain, and the Netherlands. We thus present further detail on these products.

Table 87. Japan: Exports of "Other" Frozen Tuna Products, 2019 (mt of product weight)

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	USA	725	28%	28%	725	-
2	Fiji	328	13%	41%	100	228
3	Vietnam	311	12%	53%	16	295
4	China, Hong Kong SAR	266	10%	64%	98	168

<sup>313</sup> BACI data.

<sup>314</sup> Japan exported small amounts of fresh/chilled tropical tuna to Guam. This likely represents direct deliveries of fresh tropical tuna by Japanese vessels associated with a Seattle-based company, Transpac, which air ships fresh tuna from Guam, Micronesia, and the Marshall Islands and sells the product mainly to Costco. Although we cannot confirm that these Japanese exports followed this path, our industry knowledge suggests that these may be tuna that do not satisfy sashimi-grade "A" level (highest quality level) but that is suitable to meet the U.S. standard for selling this fish for sashimi markets in the U.S. or be sold for the fresh/grill markets.

<sup>315</sup> BACI data.

<sup>316</sup> BACI data.



OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
5	France	160	6%	70%	160	-
6	South Korea	132	5%	75%	118	15
7	Spain	132	5%	80%	132	-
8	Netherlands	118	5%	85%	118	-
9	Malaysia	93	4%	89%	0	92
10	Singapore	75	3%	92%	68	7
>10	Others	217	8%	100%	201	16
Total		2,558			1,735	822

Source: BACI

Note: "Other" tuna includes HS Codes 0304.87 and 0303.49

The Japanese companies exporting "Other" frozen tuna products are listed in the Table 88.

**Table 88. Japan: Top Ten Japanese Companies Exporting "Other" Frozen Tuna Products, 2019 (mt of product weight)**

EXPORTS FROM JAPAN - OTHER TUNA		
Rank	Top Exporting Companies	Quantity (mt)
1	Kyokuyo Co Ltd	90
2	Kaijin Trading Co Ltd	76
3	Fukuichi Fisheries Co Ltd	56
4	Fukusui Shoji Ltd	28
5	Kohyo Co Ltd	17
6	Delica Factory Tokachi Co.,Ltd	3
7	Delica Factory Tokachi Co.Ltd	3
8	Big Two,Inc	2
9	Big Twoinc	2
10	Goshoku Co., Ltd	1

Source: Datamyne

Notes:

1. As a point of reference, BACI data report that Japan exported approximately 2,600 mt of "other" frozen tuna products in 2019. (See Table 87.)
2. "Other" tuna includes HS Codes 0304.87 and 0303.49

The U.S Companies importing "Other" frozen tuna products from Japan in 2019 are shown in Table 89.

**Table 89. Japan: Top Ten U.S. Importing Companies of Japanese Exports of "Other" Frozen Tuna Products, 2019 (mt of product weight)**

TOP IMPORTING COMPANIES	
USA	Quantity (mt)
Kyokuyo America Corporation	90
P&Z Fine Foods LLC	65
Osamu Corporation	56
Angel Seafood Ltd	28
Nichirei Foods Inc	28
Kohyo America Inc	17
Nippon Foodstuff Co. Inc.	5

Source: Datamyne

Notes:

1. As a point of reference, BACI data report that Japan exported approximately 2,600 mt of "other" frozen tuna products in 2019. (See Table 87.)
2. "Other" tuna includes HS Codes 0304.87 and 0303.49

### Tuna Trade Flows of Sashimi-Grade, Longline-Caught Tuna, and Future Challenges

Japan, as the single largest market for sashimi-grade tropical tuna caught by longline gear, plays a major role in the Pacific tuna trade flows for these species. The downward trend in Japanese consumption of sashimi poses a challenge for both the Japanese longline fleet that supplies part of the demand and for the fleets of other countries, such as Korea, Taiwan, and China, which supplement Japanese catches to meet this market demand. The fact that most of the longline fleets targeting tropical tuna have implemented ultra-low temperature freezing systems on board suggests that, in the future, more processing of frozen loins, fillets, blocks, and Saku blocks will be done in countries like Korea, Taiwan, China, Vietnam or elsewhere. It is unclear if the Japanese trading companies and major market players will embrace increased participation of these products in the Japanese market at the expense of less participation of gilled and gutted, deep-frozen bigeye and yellowfin products auctioned in the traditional markets.

In addition, the increased number of Japanese-style restaurants in other market regions (the U.S. and E.U.) could result in increased demand for catches by the Pacific longline fleets targeting tropical tuna. Therefore, over time, one should expect changes in the current tuna trade flows for tropical tuna from the Pacific.

## South Korea

### Harvest Level

#### *Korea's Tuna Longline Catch*

In 2019, Korea reported a longline catch of 35,936 mt of tropical tuna in the Pacific. This catch was approximately five thousand mt more than the average catch of 30,790 mt for the 2016 - 2020 period.

#### *Korea's Tuna Longline Fleet*

The size of the Korean longline fleet has experienced a general downward trend over the past several decades. The fleet size peaked in 1980 with 472 vessels, dropping to 276 in 1990, and 197 in 2000, and stabilizing at 145 vessels in 2015.<sup>317</sup> In 2021, the Korean longline fleet fishing in the Pacific Ocean consisted of 102 vessels. The companies owning these vessels are members of the Korean Overseas Fisheries Association, which acts on behalf of this fleet.<sup>318</sup>

The Korean longline fleet targets primarily tropical tuna (primarily bigeye and yellowfin tuna). However, incidental catches of albacore occur, and some vessels occasionally target albacore.<sup>319</sup> Several vessels are homeported in Busan, but some of the vessels operate using foreign bases (e.g., Solomon Islands and Kiribati).

The Korean vessels typically engage in trips that last between 18 and 24 months before they return to the port of Busan, Korea. During these long trips, the vessels are re-supplied with fuel, provisions, and bait. For the most part, Korean longline vessels transship their catches to reefer carriers that brings the catches to Busan or, when their trips are completed, they come back to Busan to unload. Transshipment takes place both at ports and on the High Seas. In 2015, about 70 percent of the Korean longline catch was transshipped. Only about 10 percent of the Korean catch is directly delivered and unloaded in Japanese ports by Korean vessels.<sup>320</sup>

In 2017, four companies dominated the Korean Longline fleet fishing in the Pacific. The Sajo Group had 51 vessels (Sajo Industries (34), Sajo Seafood (4) Sajo Oyang (7), and Sajo Daerim (6)); Dongwon Industries had 15 vessels; Dongwon Fisheries had 12 vessels; and, Silla Co. had 11 vessels. Together, these four companies owned 89 or 75 percent of the 120 longline vessels registered to Korea in 2017.<sup>321</sup>

The ownership distribution for the Korean longline fleet in 2021, based on the WCPFC and IATTC vessel registers, is shown in Table 90. A more detailed discussion of these companies follows.

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<sup>317</sup> Campling et.al. 2017. Op. cit., pg. 152.

<sup>318</sup> Campling et al. 2017. Op. cit., pg. 152.

<sup>319</sup> For additional details, please see Chapter 8, which deals with Pacific albacore.

<sup>320</sup> Campling et al. 2017. Op. cit., pg. 156.

<sup>321</sup> Campling et al. 2017. Op. cit., pg. 159.

Table 90. South Korea: Ownership of Korean Longline Fleet, 2021

Company	Number of Vessels
Sajo Industries Company, Ltd.	26
Dong Won Fisheries Company, Ltd.	14
Dongwon Industries Company, Ltd.	12
SILLA Co., Ltd	9
Dae Hae Fisheries Company, Ltd.	8
Kyung Yang Fisheries Company, Ltd.	8
Sea Sky Mulsan Company, Ltd.	7
3T Ocean Company, Ltd.	5
Agnes Fisheries Company, Ltd.	4
Hansung Enterprise Company, Ltd.	4
Oyang Corporation	3
Sajo Seafood Company, Ltd.	2
<b>Total</b>	<b>102</b>

Source: IEC/GHA Vessel Compilation analysis

Sajo Group longline fleet is the world's largest sashimi longline fleet owned by a single company. As discussed in the purse seine section, the company has purse seine vessels, a canned tuna processing facility, and an approximate 14 percent share of the Korean canned tuna market.<sup>322</sup>

Dongwon Industries, although with a smaller longline fleet, is the most powerful industrial group of the four. The company is diversified and is also involved in purse seine tuna fishing and tuna canning. Dongwon has 72 percent of the canned tuna market in Korea and has the number one brand of canned tuna (light meat) in the U.S., Starkist.<sup>323</sup>

Dongwon Fisheries is an entirely independent entity of Dongwon Industries. Dongwon owns two processing facilities in Busan, where it produces sashimi-grade products for Japan; it also owns two cold stores, one at 21 to 25 degrees Celsius and one for handling Ultra-Low Temperature products. The company has two processing facilities in China and a cold storage in New Zealand, as a part of a joint venture with one of New Zealand's largest seafood companies, Sanford Ltd.<sup>324</sup>

<sup>322</sup> Campling et.al. 2017. Op. cit., pg. 160.<sup>323</sup> Campling et.al. 2017. Op. cit., pg. 160.<sup>324</sup> Campling et.al. 2017. Op. cit., pg. 160.

In addition to owning nine tuna longline vessels, the Silla Group is involved in tuna purse seining and in other trawling fishing operations in the North Pacific. The company owns a sashimi restaurant in Seoul.<sup>325</sup>

## Processing Level

### *Korean Sashimi Processing*

Most of the Korean vessels' refrigeration systems have been upgraded to freeze fish at ultra-low temperatures of minus 60 degrees Celsius; these systems can handle between 8 and 10 mt per day. The catches of these vessels usually meet Japanese sashimi-grade standards. At temperature-controlled, land-based facilities in Korea, the gilled and gutted fish (yellowfin and/or bigeye) is processed while frozen solid. Precise band saws are used to process the fish, making specific cuts. Three types of ultra-low temperature sashimi-grade products are obtained from the process: tuna loins, tuna blocks, and Saku blocks.<sup>326</sup> These high-quality, sashimi-grade products (bigeye and yellowfin) are then exported to Japan.

## Export Level

### *Markets for Korean Longline-Caught, Sashimi-Grade, Tropical Tuna*

BACI data does not allow for a determination as to whether Korean exports of yellowfin or bigeye tuna were caught by purse seine or longline vessels, or if the intrinsic quality of the fish was suitable for the canning or sashimi grade markets. Identifying Korean exports associated with longline catches of sashimi-grade tropical tuna is not easy or precise.

For our analysis IEc/GHA have determined that the "Other" frozen tuna category, which includes the HS codes 0304.87 (Tuna, non-specific, fillets, frozen), and/or 0303.49 (Tuna, other, frozen) is the best "proxy" under which sashimi-grade tropical tuna exported by Korea can be analyzed. Table 91 shows the 2019 Korean exports of "Other" frozen tuna products which is likely to correspond to the actual Korean exports of sashimi-grade tropical tunas to the world.

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<sup>325</sup> Campling et.al. 2017. Op. cit., pg. 160.

<sup>326</sup> The fish is cut into quarters, with two upper loins produced. The loins can be cut into blocks (basically slicing the loins into four or five pieces of about 1.5-2.0 kilos). The loins can also be cut into steaks, or be further processed into Saku blocks, which are rectangular pieces of tuna weighing about 1/2 pound (Professional industry knowledge of Guillermo Gomez, GHA).

Table 91. South Korea: Exports of “Other” Frozen Tuna Products, 2019 (mt of product weight)

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	Japan	9,059	52%	52%	9,024	35
2	France	2,900	17%	69%	2,900	-
3	Italy	1,321	8%	77%	1,321	-
4	China	891	5%	82%	883	8
5	Philippines	705	4%	86%	628	77
6	United Kingdom	476	3%	89%	476	-
7	USA	337	2%	91%	337	-
8	Spain	309	2%	93%	309	-
9	Vietnam	255	1%	94%	231	24
10	Netherlands	227	1%	95%	227	-
>10	Others	783	5%	100%	424	359
Total		17,263			16,760	502

Source: BACI

Note: “Other” tuna includes HS Codes 0304.87 and 0303.49

In 2019, Korea exported 17,263 mt of “Other” frozen tuna, which for the purposes of this report, we assume corresponded to exports of sashimi-grade tropical tuna. Of this, 16,760 mt corresponded to “Tuna, non-specific, frozen fillets”; 502 mt corresponded to “Tuna, Other, Frozen”, Japan was the main importer of Korean sashimi-grade tropical tuna, with 9,059 mt of “Other Frozen Tunas” or 52 percent of Korea’s total exports under this category. Most of Japan’s imports were for “Tuna, non-specified frozen fillets” (9,024 mt).

Several E.U. nations together imported about 27 percent of Korea’s exports of sashimi-grade tropical frozen tuna, with France alone accounting for about 2,900 mt or 17 percent. The products exported to the E.U. are of lower quality and value than those exported to Japan or those domestically consumed in Korea.<sup>327</sup> Korea and the E.U. have a free trade agreement that has reduced the previous 18 percent duty applied to Korea’s longline tuna

<sup>327</sup> Campling et.al. 2017. Op. cit., pg. 163.

under the Most Favored Nation status (back in 2011) to a 3 percent duty today.<sup>328</sup> This duty applies to E.U. imports of ultra-low temperature frozen sashimi blocks and there appears to be a preference for yellowfin as opposed to bigeye tuna blocks.<sup>329</sup>

## Taiwan

### Harvest Level

#### *Taiwan's Tuna Longline Catch*

In 2019, Taiwan reported a catch of 34,998 mt, which is slightly higher than the 2016 - 2020 average of 32,737 mt. The Taiwanese longline fleet in 2021 comprised 573 vessels.

#### *Taiwan's Tuna Longline Fleet*

The Taiwanese tuna longline fleet is regulated by Taiwan Fisheries Agency. There are two longline tuna fishing associations: The Taiwan Tuna Association (representing large-scale longliners larger than 100 GRT) and the Taiwan Tuna Longline Association (representing owners of vessels of between 20 and 99 GRT).<sup>330</sup> Taiwanese government regulations require that companies that are members of the Taiwan Tuna Association (larger vessels) incorporate each vessel into its own individual company.<sup>331</sup> It is likely that the Taiwanese Fisheries Agency supports this practice in order to have better control of the fleet via the Vessel Monitoring System.

In 2017, the Taiwan Tuna Longline Association had 466 members;<sup>332</sup> Seventy percent of them were homeported in Donggang, 15 percent in Kaohsiung, and 15 percent elsewhere. There are three types of vessels in this association: (a) the majority, between 200 and 300 GRT, which have minus 35-degree Celsius freezers; those with between 100 and 150 GRT, which have ultra-low temperature (- 60 Degree Celsius) freezers; and fresh boats (ice and refrigerated sea water) which are the minority.<sup>333</sup>

The Taiwan Tuna Longline Association (smaller vessels) had 1,300 vessels active in the WCPFC convention area in 2015; the Taiwan Tuna Association (larger vessels) had 76 vessels active in this area in the same year (about 50 targeting exclusively tropical tunas, and 26 vessels targeting albacore). Most of the vessels in this association are homeported in Kaohsiung. The Taiwan Fisheries Agency identifies tuna longliners as small scale STLL or large scale LTLL.<sup>334</sup>

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<sup>328</sup> Note: member companies may have multiple vessels. Source: Free Trade Agreement between the European Union and its Members, on the one part, and the Republic of Korea. Official Journal of the European Union L127, Volume 54, Legislation 14, May 2011. Downloaded from [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22011A0514\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22011A0514(01)), May 26, 2023.

<sup>329</sup> Campling et.al. 2017. Op. cit., pg. 163.

<sup>330</sup> For a detailed analysis of the structure of the Taiwanese fishing associations, see Campling et.al. 2017. Op. cit.

<sup>331</sup> Campling et.al. 2017. Op. cit., pg. 137.

<sup>332</sup> Members in this association operate may more than one vessel although each vessel is individually incorporated in a separate company.

<sup>333</sup> Campling et.al. 2017. Op. cit., pg. 138.

<sup>334</sup> Campling et.al. 2017. Op. cit., pg. 139.

Most of the Taiwanese longline fleet is registered in Taiwan, but some owners have their vessels registered under the Vanuatu flag (a flag of convenience). Similarly, some of the Taiwanese companies have re-flagged or operate their vessels under charter arrangement with PICs. Besides gaining access to these countries' tuna resources, re-flagging their vessels in these countries also provides benefits with regard to avoiding bigeye catch limits, since these countries are not subject to such catch limits.

### *Large Scale Tuna Longline Fleet (LTLL)*

Most of the fleet under this category has the capability to freeze tropical tunas at -60 degrees Celsius. The fish is usually gilled and gutted before freezing it. Eighty percent of LTLL vessels in the Taiwanese fleet are authorized to transship fish in the High Seas and none of the vessels in this category are under charter to a particular Pacific Island country. In 2015, the LTLL fleet caught an estimated 8,179 mt of tropical tunas (5,331 mt of bigeye and 2,848 mt of yellowfin). Much of the catch was taken on the High Seas and in the jurisdictional areas of Kiribati and the Solomon Islands.<sup>335</sup>

### *Small Scale Tuna Longline Fleet (STLL)*

The STLL ice vessels target yellowfin and bigeye for the fresh sashimi markets. Vessels with freezing capacity (in addition to the ability to keep fish on ice) target tropical tuna as well as swordfish and albacore, opportunistically switching fisheries depending on seasonality and market conditions. The catch breakdown by species for this fleet over the 2011 - 2015 period was 47 percent yellowfin; 20 percent bigeye; and 33 percent albacore and billfishes. Most of the catch was taken in the Solomon Islands, Palau, and the Federated States of Micronesia.<sup>336</sup>

In 2015, the STLL fleet reported a catch of 11,483 mt, of which 8,564 mt corresponded to yellowfin and 2,919 mt to bigeye tuna.<sup>337</sup>

Between the LTLL and STLL fleets, in 2015, Taiwan reported transshipping 12,542 mt of tuna and conducted 155 High Seas transshipments and 405 transshipments at a port.<sup>338</sup>

### *Major Taiwanese Longline Companies*

Even though each of Taiwanese longline vessels is required to be incorporated into an individual company by government regulations, according to Campling et.al. (2017), "...70 - 80 vessels of the LTLL fleet fishing in the WCPFC are controlled by about 30 companies.... 2 companies have 9 vessels and share the same address in the WCPFC vessel register."<sup>339</sup>

It is important to emphasize that there are very strong linkages between the owners of longline vessels in the Taiwanese fleet and other main actors involved in trading, processing, and cold chain logistics. There are often financial relationships between the boat owners and these other actors, as described below.

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<sup>335</sup> Campling et.al. 2017. Op. cit., pg. 144.

<sup>336</sup> Campling et.al. 2017. Op. cit., pg. 145.

<sup>337</sup> Campling et.al. 2017. Op. cit., pg. 146.

<sup>338</sup> Campling et.al. 2017. Op. cit., pg. 146. Note that the total amount of transshipments may include albacore.

<sup>339</sup> Campling et.al. 2017. Op. cit., pg. 148.



FCF Fishery Co. Ltd. is believed to handle approximately 600,000 to 900,000 mt of tuna worldwide per year, most of which is purse seine fish. FCF's trade in longline tuna is estimated at about 80,000 mt, of which 50,000 mt are associated with cannery grade albacore and 30,000 mt with sashimi-grade bigeye and yellowfin tuna. The company enjoys long-lasting relationships with owners of both Taiwanese and Vanuatu flag vessels.<sup>340</sup>

Other companies linked to the Taiwanese longline fleet are Ming Dar Fishery (Vanuatu) Co.; Ltd; Yuh Yow Fishery Co. Ltd.; and Lung Soon Fishery Co. Ltd.

Ming Dar Fishery represents the interest of 31 Taiwanese owners of 41 longline vessels under Vanuatu's flag and the company sits on the Vanuatu delegations in negotiations before the WCPFC, the IATTC and even in advancing the interests of its members with OPRT in marketing its tropical tuna catches in the Japanese sashimi market.

Yuh Yow Fishery Co. Ltd. manages 19 STLL fiberglass vessels, of which 4 vessels operate under the Taiwanese flag and 15 under the flags of companies registered in Vanuatu, Samoa, Cook Island, and Kiribati. Six of these vessels have freezing capabilities of -60 degrees Celsius while the others only to -35 degrees.

Lung Soon Fishery Co. Ltd. manages 14 LTLL with ultra-low temperature capabilities, has its own 5,000 mt ultra-low temperature reefer carrier, and a 2,000 mt ultra-low temperature land-based cold storage/processing facility in Kaohsiung, Taiwan.<sup>341</sup>

## Export Level

### *Taiwan's Exports of Fresh/Chilled Tropical Tuna*

In 2019, Taiwan exported 5,656 mt of fresh/chilled tropical tuna under HS Codes 0302.32 (fresh yellowfin; 2,701 mt) and HS Code 0302.34 (fresh bigeye; 2,955 mt). Indonesia, Palau, and the Philippines were the top three recipients of these exports, accounting for 75 percent of the total volume exported. Mauritius, Japan, the U.S., and the Federated States of Micronesia accounted for 23 percent of the exports. Table 92 shows Taiwan's 2019 exports of fresh/chilled tropical tuna.

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<sup>340</sup> Campling et.al. 2017. Op. cit., pg. 149.

<sup>341</sup> Campling et.al. 2017. Op. cit., pg. 150.

Table 92. Taiwan: Exports of Fresh/Chilled Tropical Tunas, 2019 (mt of product weight)

FRESH TROPICAL					30232	30233	30234
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Yellowfin	Fresh / Chilled Skipjack	Fresh / Chilled Bigeye
1	Indonesia	2,301	41%	41%	717	-	1,584
2	Palau	1,141	20%	61%	857	-	284
3	Philippines	788	14%	75%	57	-	731
4	Mauritius	770	14%	88%	502	-	267
5	Japan	369	7%	95%	352	-	17
6	USA	102	2%	97%	101	-	1
7	Micronesia (Fed. States)	85	2%	98%	37	-	48
8	Sri Lanka	64	1%	99%	62	-	2
9	Guam	26	0%	100%	8	-	18
10	Thailand	5	0%	100%	4	-	1
>10	Others	6	0%	100%	5	-	1
Total		5,656			2,701	-	2,955

Source: BACI

Note: Fresh/Chilled tropical tuna includes HS Codes 0302.32, 0302.33, and 0302.34

Based on professional industry knowledge of Guillermo Gomez, GHA, Indonesia's imports of Taiwanese tropical tuna are likely destined for processing and exporting into portion-controlled, vacuum-packed frozen products. The quality of the product imported by Indonesia probably did not meet the Japanese sashimi grade-standard and so was sold to Indonesia. Indonesia would likely export such processed products, in turn, to markets such as the U.S. This is also the probable explanation for the Taiwanese fresh tuna exports to the Philippines, which in turn exports large amounts of frozen tuna product to the U.S. market.

The relatively high volume of imports by Palau, based on industry knowledge, suggests that this represents an ongoing operation where the Taiwanese fishing vessel lands its catch in Palau and a Palau-based partner company grades the fish and, if suitable, re-packages it for immediate air shipment to the Japanese sashimi market. As discussed in the section of this report on Japanese imports of tropical tuna, Palau is a major supplier to this market. Palau has regular flights to Japan, which are necessary to sustain an operation of this type.

Again, based on professional industry knowledge of Guillermo Gomez, GHA, the fact that Mauritius imports fresh/chilled tuna from Taiwan suggests that this tuna was the result of Taiwanese longline vessels targeting

topical tuna but fishing in the Indian Ocean. These are likely direct deliveries of fresh fish to Mauritius companies that could use the fish for processing aimed at canned tuna markets.

The relatively small volumes of fresh/chilled exports to Japan could be the result of direct landings by a few Taiwanese longline vessels into Yaizu, a major Japanese port where fresh tunas are traded. For both the U.S. and also the Federated States of Micronesia, industry knowledge suggests that these could be the result of air shipments of sashimi-grade tuna.

#### *Taiwanese Exports of Frozen, Sashimi-Grade, Tropical Tuna*

BACI data do not identify if the tuna traded under a specific HS Code corresponds to fish caught by longline gear, nor the geographical location from which such fish originates (i.e., which particular ocean). In 2019, Taiwan exported 195,640 mt of frozen tropical tuna. This amount is significantly larger than Taiwan's 2019 longline catches in the Pacific (34,998 mt). Therefore, Taiwan's reported exports of frozen tropical tuna are expected to include the country's exports aimed at the canned tuna markets, suggesting they originated primarily from the purse seine, rather than the longline fishery. A closer look at these exports may provide a clearer view to this issue.

Table 93 shows Taiwan's 2019 exports of frozen tropical tuna. Four countries account for 92 percent of the total Taiwanese exports of frozen tropical tuna in that year. Thailand alone accounted for 90,017 mt or 46 percent of the total exports. It should be noted that 77,336 mt of Thailand's imports from Taiwan corresponded to skipjack tuna, which was most of the fish imported by Thailand. Because Thailand is mainly an importer of cannery-grade tropical tuna and skipjack is not commonly caught by longline, one can safely argue that most of Thailand's imports from Taiwan came from its purse seine fleet, not its longline fleet.

After Thailand, Japan is the next most important importer of Taiwanese frozen tropical tuna, with 46,118 mt or 24 percent of Taiwan's total exports. Unlike Thailand, Japan is not a significant canned tuna processor, as discussed in Chapter 6 of this report. A careful look at import data shows that Japan imported 28,788 mt of bigeye tuna and 17,176 mt of yellowfin tuna. These imports are very probably imports of sashimi-grade, longline-caught tuna caught by Taiwanese longline vessels. What it is not clear (and cannot be ascertained from the data) is how much of these sashimi-grade Japanese imports from Taiwan were the result of Taiwanese longline catches in the Pacific versus the Atlantic or Indian Ocean.

Vietnam imported 24,246 mt of frozen tropical tunas from Taiwan in 2019. There are good reasons to believe that these imports of frozen tropical tuna were caught by Taiwanese purse seine vessels rather than Taiwanese longline vessels. First, the overall Taiwanese longline catch of tropical tunas was around 35,000 mt and given that Taiwan is the major supplier of sashimi-grade tuna of Japan, it is unlikely that Taiwan would export a significant part of their longline catch to Vietnam instead of to Japan. The second reason is that Vietnam has become a major player in the production of pre-cooked tuna loins, for which the purse seine caught Taiwanese tuna would be desirable. Hence, we conclude that Vietnam imports from Taiwan are not associated with longline sashimi-grade Taiwanese catches. A similar argument applies to China, which imported 20,115 mt of frozen tropical tunas from Taiwan. Again, these imports are probably related to Taiwanese purse seine, rather than longline fishing activities.

Table 93. Taiwan: Exports of Frozen Tropical Tunas, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Thailand	90,017	46%	46%	10,932	77,336	1,749
2	Japan	46,118	24%	70%	17,176	154	28,788
3	Vietnam	24,246	12%	82%	14,559	8,862	825
4	China	20,115	10%	92%	2,012	17,165	938
5	Philippines	8,232	4%	96%	1,138	6,942	152
6	Solomon Islands	1,292	1%	97%	961	67	264
7	Mexico	924	0%	98%	30	878	16
8	Spain	720	0%	98%	720	-	-
9	South Korea	646	0%	98%	180	49	417
10	Indonesia	579	0%	99%	26	552	1
>10	Others	2,750	1%	100%	1,052	1,446	252
	<b>Total</b>	<b>195,640</b>			<b>48,786</b>	<b>113,451</b>	<b>33,403</b>

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

*Taiwanese Exports of “Other” Frozen Tuna*

As mentioned earlier, Lung Soon Fishery Co. Ltd. manages a longline fleet of 14 vessels with ultra-low temperature capabilities and operates a 2,000 mt ultra-low temperature, land-based cold storage/processing facility in Kaohsiung. Hence, it is possible that some of the Taiwanese longline sashimi-grade tropical tuna is processed into frozen tuna loins, tuna blocks or Saku blocks in Taiwan and that such products are then exported. In 2019, under “Other” frozen tuna” (HS codes 0304.87 and 0303.49), Taiwan exported 4,563 mt of product.

Three countries that were the recipients of these exports accounted for 81 percent of the total exports under this category. Japan imported 1,648 mt (36 percent), the U.S. 1,373 mt (30 percent), and South Korea 676 mt (15 percent) from Taiwan. It is possible that these Taiwanese exports involved sashimi-grade tropical tuna caught by its longline fleet, but it is not possible to establish this from the trade data, nor is it possible to determine if these catches came from the Pacific or from other ocean regions. Table 94 shows Taiwan’s 2019 exports of “Other” frozen tuna.

Table 94. Taiwan: Exports of “Other” Frozen Tuna Products, 2019 (mt of product weight)

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cumulative Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	Japan	1,648	36%	36%	1,648	-
2	USA	1,373	30%	66%	1,371	2
3	South Korea	676	15%	81%	628	48
4	Vietnam	265	6%	87%	0	265
5	Mauritius	258	6%	92%	-	258
6	Philippines	108	2%	95%	5	103
7	Netherlands	51	1%	96%	51	-
8	Canada	50	1%	97%	26	24
9	Malaysia	48	1%	98%	-	48
10	Sri Lanka	15	0%	98%	-	15
>10	Others	71	2%	100%	60	11
	<b>Total</b>	<b>4,563</b>			<b>3,790</b>	<b>773</b>

Source: BACI

Note: “Other” tuna includes HS Codes 0304.87 and 0303.49

## China

### Harvest Level

#### *China's Tuna Longline Catch*

In 2019, the Chinese longline fleet caught 27,854 mt tropical tunas in the Pacific, which was close to average for the 2016 - 2020 period. The 2019 catch was evenly distributed between bigeye tuna (14,016 mt) and yellowfin (13,382 mt), with only a small longline catch of skipjack tuna (456 mt). In 2019, 19,110 mt tons were harvested in the WCPFC convention area, with only 8,744 mt caught in the IATTC convention area.<sup>342</sup>

<sup>342</sup> It appears that China's catch limits for bigeye tuna, which were set at 8,224 mt in the WCPFC and 2,507 mt in the IATTC, were exceeded. The reported Chinese catch for these species in 2019 was 8,644 mt and 5,372 mt respectively.

### *China's Tuna Longline Fleet*

In 2021 the Chinese longline fleet was made up of 296 vessels registered as “tuna longline vessels” and an additional 225 vessels registered as “longline vessels”, which together total 521 vessels.<sup>343</sup> Of the traditional DWFNs, the Chinese longline fleet is the most modern, with the average construction occurring in 2007.<sup>344</sup> The Chinese longline fleet is regulated by the Ministry of Agriculture of China, but the liaison between vessel owners and the Chinese government takes place via the China Overseas Fishery Association. All longline vessels are required to be members of this association.<sup>345</sup>

There are two main types of Chinese longline operations, those conducted by “Ice-Fresh Longline” (IFLL) vessels, and those conducted by deep-frozen longline vessels (DFLL).

In 2017, there were 365 IFLL vessels and 91 DFLL vessels.<sup>346</sup> Most DFLL vessels target bigeye tuna on the High Seas and in the EEZs of Pacific Islands countries, while the IFLL fleet operates mainly in the EEZ of these Island countries, particularly in the Solomon Islands and the Marshall Islands.<sup>347</sup>

Within the IFLL category, there are two main types. The first type consists of Pacific Island-based vessels that use ice only and target bigeye and yellowfin tuna. These vessels make relatively short trips and land their catch at their Pacific Island base countries. Some of the fish is air shipped to Hawaii, Guam, and FSM for final delivery in Japan or other markets. The second type of IFLL vessels, a much larger category, are vessels that have both ice-fresh and deep-freezing capability and that target cannery-grade albacore as well as tropical tuna. This second category tends to operate more on the High Seas than in the EEZs of the PICs. The catches of both IFLL and DFLL vessels are usually transshipped.<sup>348</sup> Figure 49 provides a schematic description of the Chinese longline fleet that operates in the WCPFC area.<sup>349</sup>

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<sup>343</sup> IEC/GHA Vessel Compilation data.

<sup>344</sup> Campling et.al. 2017. Op. cit., pg. 171.

<sup>345</sup> One peculiar and unique aspect of the Chinese longline fleet is that since 2013, the government has required that distant water vessels register annually and pay a bond of around \$5 million to cover up to six vessels or up to 6000 GRT. This requirement has forced smaller companies to come together and pool their resources to meet government requirements. From the government's perspective, this provides better oversight of the fleet. If one vessel in the group is contravening any government requirement, all other vessels must stop operations (Campling et.al. 2017. Op. cit., pg. 167).

<sup>346</sup> Campling et.al. (2017), pg. 171 states that China had 365 IFLL vessels and 91 DFLL vessels in 2017, which totals 456 vessels (note that Figure 49 shows 92 DFLL, not 91). The same report states (page 169) that the Chinese longline fleet had 516 vessels registered in the WCPFC in 2015 and 429 were actively operating in the WCPFC convention area. It is not clear how many vessels were fishing in the IATTC region (see page 169).

<sup>347</sup> MRAG Asia Pacific. 2019. Op. cit., pg. 58.

<sup>348</sup> MRAG Asia Pacific. 2019. Op. cit. pg. 57.

<sup>349</sup> Campling et.al. 2017. Op. cit., pg. 171. The total number of vessels does not match exactly other vessel counts reported on the same page of Campling et al. (2017).

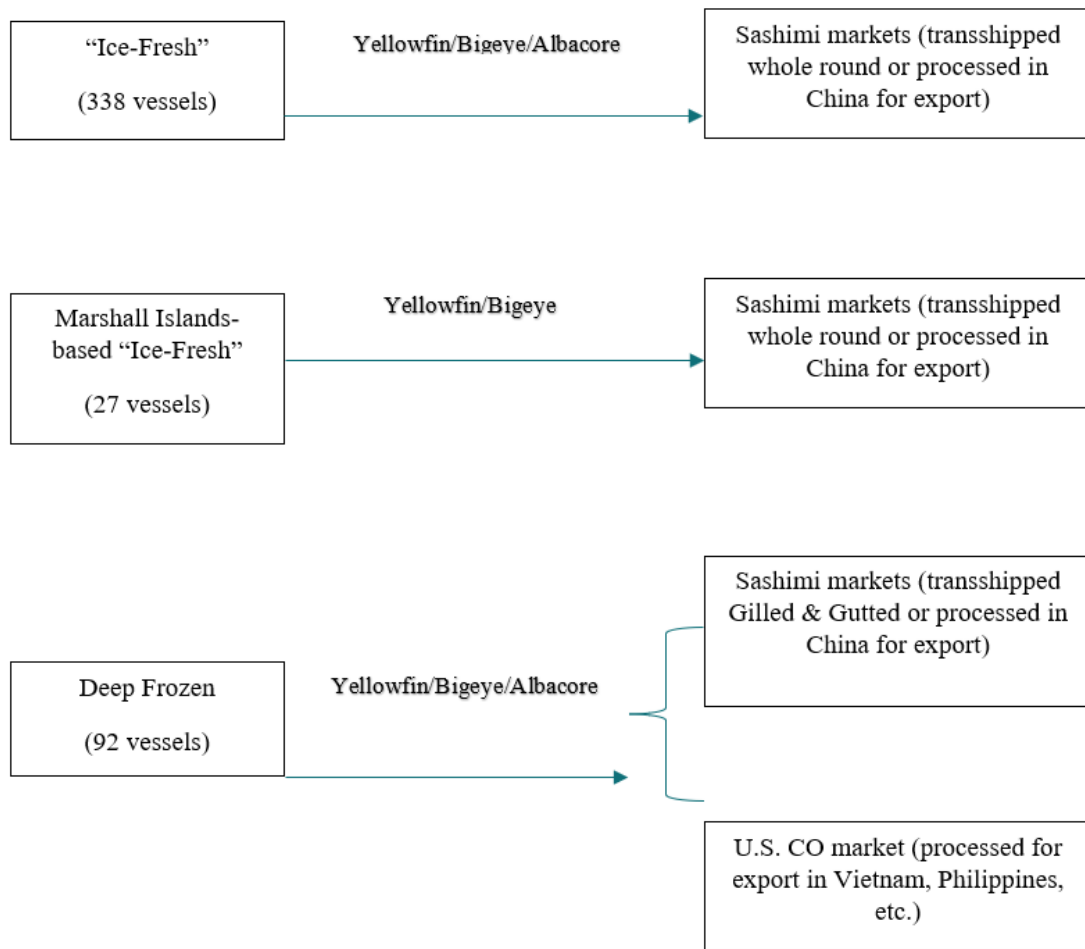


Figure 49. Schematic of China Longline Industry Operating in the WCPFC

Source: IEc/GHA adapted from Campling et.al. 2017. Op. cit., pg. 171.

Of note are the Chinese longline operations in the Marshall Islands. There are 27 IFLL vessels based in Majuro, Marshall Islands that target yellowfin and bigeye tuna. These vessels belong to two subsidiaries of Luen Thai Fishing Venture, although the chartering company for these vessels is registered in FSM. The operation consists of fishing in the Marshall Islands EEZ and neighboring areas and keeping the fish on ice; trips are usually 10 days or slightly longer. Once the fish is landed, it is prepared for air-shipping via Asia Pacific Airlines to Hawaii and Guam with a final market destination in Japan or the U.S.<sup>350</sup>

<sup>350</sup> Luen Thai Fishing Venture, through its sister company Asia Pacific Airlines, operates three Boeing 727 aircraft to ensure reliable air freight and transshipment service to export chilled tuna. (Luen Thai Fishing Ventures Ltd. 2023. Services. Viewed at <http://154.85.53.64/page.asp?id=7>, April 17, 2023).

It is also worth noting that for deep frozen bigeye and yellowfin tuna, Vietnam has become a significant processor of ultra-low temperature frozen tuna, making loins, fillets, tuna blocks and saku blocks for the Japanese and other markets.

As previously mentioned, China had 516 longline vessels registered at the WCPFC in 2017. Of these, 133 vessels were chartered and flagged to PICs. Most of these chartered/flagged vessels were registered in the Marshall Islands, Solomon Islands, and Kiribati. Table 95 shows the number of Chinese longline vessels chartered or flagged in PICs in 2017 and the names of the chartering companies.<sup>351</sup>

**Table 95. China: Number of Chinese Longline Vessels Chartered or Flagged in Pacific Island Countries by Chartering Company, 2017**

Number of Vessels	Charterer	Location of Chartering Company
8	Huanan Fishery Co Ltd	Cook Islands
19	Liancheng Overseas Fisheries (FSM)	FSM
27	Marshall Islands Fishing Venture	Marshall Islands
1	Luen Thai Fishing Venture (FSM)	FSM
2	Global Fishery Ltd	Solomon Islands
31	Solong Seafood Development Ltd	Solomon Islands
2	Southern Seas Investment Ltd	Solomon Islands
2	Win Full Fisheries Co Ltd	Fiji
4	Gonedau Enterprises	Fiji
1	Yavusa Tonga Holdings	Fiji
2	Kaiwaitui Co Ltd	Fiji
33	Kiribati Fish Ltd	Kiribati
1	MFMRD	Kiribati

Source: Campling et al. 2017. Op. cit., pg. 172.

#### *Transshipments from the Chinese Longline Fleet*

In 2017, Chinese vessels reported 274 transshipments; 273 occurred on the High Seas, and one took place at a port. The total quantities of tuna transshipped in 2017 was 20,832 mt, of which 8,873 corresponded to albacore and 9,011 mt to gilled and gutted bigeye and yellowfin tuna. Gilled and gutted tropical tunas are strung together by their tails to move from the longline vessel to the carrier vessel.

<sup>351</sup> Campling et.al. 2017. Op. cit., pg. 172.



*Ownership Structure of the Chinese Longline Fleet*

Chinese longline companies with more than 10 vessels authorized to fish within the WCPFC convention area in 2015 are listed in Table 96.

**Table 96. China: Chinese Longline Companies with More than 10 Vessels Authorized to Operate in the WCPFC Convention Area (2015)**

Company (Number of Vessels)	Total No. of Vessels	Company Base	Registered Port
CNFC Overseas Fishery Co. Ltd. (49)	72	Beijing	Yantai, Zhanjiang
Zhongyu Global Seafood Corp. (23)		Beijing	Qinhuangdao
Liancheng Overseas Fishery (Shenzhen) Co. Ltd. (30)	53	Shenzhen	Shekou
China Southern Fishery Shenzhen Co. Ltd. (23)		Shenzhen	Shekou
Rongcheng Ocean Fisheries Co. Ltd.	29	Rongcheng	Shidao
Pingtairong Ocean Fishery Group Co. Ltd.	24	Zhoushan	Zhoushan
Zhejiang Ocean Family Co. Ltd. (10)	21	Hangzhou	Zhoushan
Zhoushan Pacific Tuna Pelagic Fishery Co. Ltd. (11)		Zhoushan	Zhoushan
Dalian Ocean Fishing Co. Ltd.	17	Dalian	Dalian
Shandong Lidao Ocean Technology Co. Ltd.	16	Roncheng	Shidao
Weihai Changhe Fishery Co. Ltd.	16	Weihai	Weihai
Shenzhen Shengang Overseas Industrial Co. Ltd.	15	Shenzhen	Shenzhen
Qindao Furui Fisheries Co. Ltd.	14	Qingdao	Qingdao
Rongcheng City Rong Yuan Fishery Co. Ltd.	14	Rongcheng	Shidao
Shanghai Deepsea Fisheries Co. Ltd.	14	Shanghai	Shanghai
Fujian Changfeng Fishery Co. Ltd.	12	Fuzhou	Fuzhou
Rongcheng Mashan Ocean Fishery	12	Rongcheng	Shidao
Zhejiang Xinlong Ocean Fishery Co. Ltd.	12	Zhejiang	Zhoushan
Zhoushan Haixing Ocean Fisheries Co. Ltd.	10	Zhejiang	Zhoushan
Total	351		
Source: Campling et al. 2017. Op. cit.			

The 351 vessels owned by these 19 companies represented 68 percent of all the authorized Chinese longline vessels and 82 percent of the number reported active in 2015.<sup>352</sup>

The largest component of the fleet (72 vessels) belongs to two sister companies: CNFC Overseas Fishery Co. Ltd., and Zhongyu Global Seafood, which are State-controlled. Jointly, two private companies, Liancheng Overseas Fishery (Shenzhen) Co. Ltd. and China Southern Fishery Shenzhen Co. Ltd, controlled an additional 53 longline vessels. These two companies represent components of the privately held Luen Thai Fishing Venture.<sup>353</sup>

Rongcheng Ocean Fisheries is an umbrella company from the Rongcheng municipal government covering operators of 29 vessels; Pingtairong Ocean Fishery Group Co. Ltd has 24 vessels; and, two sister companies, Zhejiang Ocean Family (10 vessels) and Zhoushan Pacific Tuna Pelagic Fishery Co. Ltd (11 vessels) are privately owned companies.<sup>354</sup>

A detailed analysis of the top six Chinese longline companies listed in Table 96 can be found in Campling et al. (2017). Suffice it to indicate that CNFC Overseas Fishery Co. Ltd, has ultra-low temperature facilities in which tropical tunas are being processed into loins, blocks, and Saku products for the domestic and export market. Some other companies such as Liancheng Overseas Fishery Co Ltd. also process longline-caught tuna.

## Import Level

### *Chinese Imports of Raw Frozen Tropical Tunas*

The Chinese domestic market for sashimi-grade tuna has been developing in recent years and estimates of its current size range from 6,000 to 10,000 mt per year.<sup>355</sup> This market is supplied by both Chinese catches and imports, but most of China's imports are re-exported after processing.<sup>356</sup>

In 2019, China imported 102,991 mt of frozen tropical tunas, as shown in Table 97. The main exporting country of frozen tropical tunas to China was the Marshall Islands, with 38,195 mt or 37 percent of China's total imports under this category. Of this volume, 35,383 mt corresponded to skipjack tuna and 2,812 to yellowfin tuna. Since China's reported longline catches of skipjack in the Pacific were only 456 mt, it is possible that these 35,383 mt are related to possible transshipments of purse seine-caught skipjack taking place in Majuro. As discussed in previous sections, some Chinese companies have vessels chartered in the Marshall Islands, so these imports of yellowfin could be related to those operations.

Taiwan and Korea were the next most significant exporting countries of raw frozen tropical tunas to China, with a combined total imported volume of 30,343 mt. Again, these exports corresponded mostly to skipjack tuna, which could be the result of imports of this species being converted into pre-cooked tuna loins for re-export to

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<sup>352</sup> Campling et.al. 2017. Op. cit., pg. 179.

<sup>353</sup> This company has successfully obtained MSC certification for its longline fleet targeting albacore, bigeye and yellowfin (GHA personal communication with Bill Holden, MSC tuna representative, March 13, 2023).

<sup>354</sup> Campling et.al. 2017. Op. cit., pg. 179.

<sup>355</sup> Campling et.al. 2017. Op. cit., pg. 188.

<sup>356</sup> Asche, F, B. Yang, J. Gephart, M. Smith, J. Anderson, E. Camp, T. Garlock, D. Love, A. Oglend, and H. Straume. 2022. China's seafood imports – Not for domestic consumption? Science Vol. 375 (6579): 386-388.

canning facilities around the world. Noticeably, China registers imports of frozen tropical tunas from FSM, PNG, Vanuatu, Fiji, and Kiribati, all locations where Chinese longliners have some sort of charter or flagging arrangement. Therefore, these imports seem consistent with the Chinese longline fleet operation strategy of having bases in PICs and then shipping or transshipping their catches from those locations back to China for further processing and export. Table 97 shows China's 2019 imports of frozen tropical tuna.

**Table 97. China: Imports of Frozen Tropical Tunas, 2019 (mt of product weight)**

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Exporter	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Marshall Islands	38,195	37%	37%	2,812	35,383	-
2	Other Asia, nes (Taiwan)	20,115	20%	57%	2,012	17,165	938
3	South Korea	10,228	10%	67%	1,171	8,929	127
4	Micronesia (Fed. States)	9,478	9%	76%	958	8,395	125
5	PNG	5,930	6%	82%	477	5,453	-
6	Ghana	5,442	5%	87%	1,864	3,577	-
7	Vanuatu	4,059	4%	91%	137	3,915	7
8	USA	2,586	3%	93%	117	2,394	75
9	Fiji	1,612	2%	95%	373	62	1,177
10	Kiribati	1,471	1%	96%	51	1,420	-
>10	Others	3,877	4%	100%	2,869	878	130
<b>Total</b>		<b>102,991</b>			<b>12,840</b>	<b>87,571</b>	<b>2,580</b>

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

### *China's Imports of "Other" Frozen Tuna*

As previously explained, BACI data do not allow us to determine what specific products conform to the "other" frozen tuna category. However, in 2019, China imported 38,778 mt of products under this category. Vietnam supplied the largest volume, with 12,562 mt or 32 percent of the total imports, and Indonesia supplied 8,531 mt or 22 percent. Jointly, these two countries accounted for more than half of China's total imports under this category. It is difficult to determine if the imports from Vietnam constituted a finished product for domestic consumption or a product that may have been processed under a toll-packing contract by a Vietnamese company for a Chinese client, which in turn was sold/exported to an importer in the U.S.

## Export Level

*China's Exports of Raw Frozen Tropical Tunas*

Japan is the main recipient of China's frozen tropical tuna exports. In 2019, Japan imported 17,669 mt, including 11,132 mt of bigeye and 6,333 mt of yellowfin tuna. Japan absorbed 27 percent of China's total exports under this category. The Japanese imports are likely the result of catches by China's longline fleet. Because most of China's longline tuna operations for tropical tunas take place in the Pacific, the exports to Japan are likely to have come from this ocean area. However, information to corroborate this assumption is not available.

Chinese exports to Thailand and the Philippines represented an additional combined 32 percent of the country's exports of frozen tropical tuna. Both countries have major canning interests, so it is highly likely that these Chinese exports were purse seine fish destined for canning, especially because skipjack, which is most commonly canned, was the primary species exported to these countries. Table 98 shows China's 2019 exports of frozen tropical tunas.

Table 98. China: Exports of Frozen Tropical Tunas, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Japan	17,669	27%	27%	6,333	204	11,132
2	Thailand	11,887	18%	44%	4,819	5,602	1,466
3	Philippines	9,286	14%	58%	319	8,440	528
4	Iran	7,889	12%	70%		7,889	-
5	Spain	6,688	10%	80%	5,693	995	-
6	Vietnam	5,972	9%	89%	3,562	2,344	66
7	Indonesia	2,826	4%	93%	1,899	927	-
8	South Korea	1,035	2%	95%	53	71	911
9	Russian Federation	430	1%	96%	-	430	-
10	Malaysia	335	1%	96%	2	333	-
>10	Others	2,527	4%	100%	574	1,675	278
Total		66,543			23,254	28,909	14,380

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

*China's Exports Under "Other" Frozen Tuna Category*

Under the category of "Other" frozen tuna, China exported 22,738 mt of frozen tuna products in 2019. Japan, again, was the main importing country, with 11,273 mt or 50 percent of China's total exports. One-third of those imports (11,267 mt) corresponded to HS Code 0304.87 (Tuna, non-specific, fillets, frozen), and only (6 mt) fell under HS Code 0303.49 (Tuna, Other, Frozen).

It is not possible to determine what type of products these exports represented, but it is likely that they included some sashimi-grade blocks or saku blocks for which longline caught yellowfin and/or bigeye tuna was used.

Other countries importing frozen tuna under the "Other" frozen tuna category included the Russian Federation (3,686 mt) and Thailand (2,029mt). Again, it is possible that these exports were associated with sashimi-grade longline-caught tropical tuna, but no information is available to corroborate this assumption. Table 99 shows China's 2019 exports of Other Frozen Tuna products.

**Table 99. China: Exports of "Other" Frozen Tuna Products, 2019 (mt of product weight)**

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	Japan	11,273	50%	50%	11,267	6
2	Russian Federation	3,686	16%	66%	3,686	-
3	Thailand	2,029	9%	75%	316	1,713
4	Vietnam	784	3%	78%	70	714
5	South Korea	643	3%	81%	618	24
6	Turkey	583	3%	84%	583	-
7	USA	527	2%	86%	527	-
8	Costa Rica	500	2%	88%	-	500
9	Côte d'Ivoire	468	2%	90%	-	468
10	Fiji	463	2%	92%	27	436
>10	Others	1,783	8%	100%	1,363	420
<b>Total</b>		<b>22,738</b>			<b>18,458</b>	<b>4,280</b>

Source: BACI

Note: "Other" tuna includes HS Codes 0304.87 and 0303.49

*Tuna Trade Flows for China's Longline, Sashimi-Grade, Pacific Tropical Tuna Fishery*

China's place in the Pacific longline fishery for tropical tunas is unique. As the last player to enter the fishery, it currently has the newest longline fleet of all the major DWFNs. Like most other longline DWFNs, the Chinese

fleet received, and probably continues to receive, significant subsidies from the central government (e.g., for fuel), and low labor costs, which places China's longline fleet at a competitive advantage with the Japanese, Korean, and perhaps even the Taiwanese fleet.<sup>357</sup>

China's approach of locally basing part of its ice-fresh longline fleet in key PICs offers opportunities to participate in the Japanese fresh-sashimi markets, which other DWFN nations do not appear to be doing presently. In this way, China is actively participating in the Pacific trade flow for the fresh, sashimi-grade Japanese market.

China, like Korea and to a lesser degree Taiwan, is positioning itself to increasingly process ultra-low temperature-sashimi grade bigeye and yellowfin tuna. The production of loins, fillets, blocks, and saku blocks provides market leverage to China and Korea over Japan's traditional control of the whole frozen, sashimi-grade market. In the past and now, major Japanese trading companies held inventories of ultra-low temperature tuna in Japan and controlled the flow and availability of the product of sashimi-grade tuna auctioned in wholesale markets. Today, with processed sashimi-grade tuna products more readily available, Japanese supermarkets and major distributors have access to a wider source of supply.

Under these circumstances, as Japan's consumer demand for sashimi-grade tuna continues to contract, the Japanese longline fishing sector will likely continue to attempt to protect its market share for domestically caught sashimi-grade tuna. The shares of imports among the other distant water longline fishing fleets and the nature of the products they will supply in the future will impact the current tuna trade flows for whole frozen and gilled and gutted sashimi-grade tropical tuna.

## Indonesia

Indonesia is a major tuna-producing country. Its archipelagic waters and vast EEZ in both the Pacific and Indian oceans are rich in tropical tunas that are caught by artisanal fishermen all along its coasts. Tuna is a significant resource for food security and constitutes a major component of the daily diet of the Indonesian population. Most of Indonesia's catch is domestically consumed, although there is no reliable source of data assessing the size of this market.

Fishermen in Indonesia catch tropical tunas in both the Pacific and Indian oceans with many types of fishing gear, from handlines to gillnets, from pole-and-line to longline, and from purse seine to troll. Most tuna landings take place in small villages all along the coasts; landings at ports are less common. Consequently, accurate documentation of catch statistics is problematic in Indonesia, although major efforts have been conducted in the recent past to improve the information available.

Over the years, Indonesia has tried to develop tuna processing infrastructure to both can tuna and produce frozen, portion-controlled tuna products. These efforts have had mixed results, mainly because of the lack of

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<sup>357</sup> Recent studies funded by the U.S. and the E.U. have determined that the longline tuna fleets of Japan, Taiwan, Korea, and China have received and continue to receive subsidies, particularly for fuel, but also for other related activities (i.e., transshipping, re-supplying fishing vessels, etc.). See: (1) Delegation of the United States to the WTO 2016. Request from the United States to China pursuant to Article 25.10 of the Agreement [on Subsidies and Countervailing Measures], 15 April 2016 and (2) European Commission, Directorate-General for Maritime Affairs and Fisheries., 2016. Study on the subsidies to the fisheries, aquaculture, and marketing and processing subsectors in major fishing nations beyond the EU – , Publications Office, 2017, <https://data.europa.eu/doi/10.2771/812134>. Downloaded from <https://op.europa.eu/en/publication-detail/-/publication/45f78bf8-d24b-11e6-ad7c-01aa75ed71a1/language-en>, April 27, 2023.

quality consistency in the catches available for processing.<sup>358</sup> There are a few canneries (one of which has included the involvement of Thai and Japanese interests) and an emerging sector of small companies that are processing mainly yellowfin tuna into frozen products, such as loins, fillets, and steaks.

While the processing sector is small, one of the roles that Indonesia has played has been to supply the Japanese market with sashimi-grade yellowfin and, to a lesser degree, bigeye tuna. In addition, other countries like the U.S. are also importing fresh/chilled tropical tuna from Indonesia where airline connections to the U.S and Japan are available, primarily from Bali.

Finally, whole tuna or tuna fillets that would not likely be suitable for export as a fresh product to the Japanese sashimi market are domestically processed into portion-controlled products, primarily for the U.S. and European markets. In the case of the U.S. market, these products are treated with carbon monoxide to preserve the bright red color of the flesh. Adding carbon monoxide to tuna is permitted in the U.S. market, but not in other markets like the E.U. or Japan.

## Harvest Level

### *Indonesia's Longline Catch of Tropical Tuna*

To put Indonesia's catches in context, note that the average tuna catches by Indonesia of tropical tuna by all gear types in the WCPFC convention area over the 2015 - 2021 period averaged 508,470 mt. Skipjack catches have accounted for approximately 58 percent, yellowfin for 38 percent, and bigeye for four percent of this total. Table 100 shows Indonesia's estimated tuna catches by all gears within the WCPFC Statistical Area as reported by the Indonesian Government.

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<sup>358</sup> Most Indonesian artisanal and semi-industrial boats lack refrigeration systems on board. This causes the fish to quickly develop high histamines, which makes the fish unsuitable for canning and/or other tuna processes aimed at human consumption. Some Indonesia-based tuna processing companies import frozen tuna rather than use available domestic supplies to produce canned tuna products.

Table 100. Indonesia: Estimated Tuna Catches by All Gears Within the WCPFC Statistical Area (2015 - 2021)

ALL GEAR (WCPFC STATISTICAL AREA)				
Year	Estimated Tuna Catch (mt)			
	Skipjack	Yellowfin	Bigeye	Total Tuna
2015	262,927	146,196	22,953	432,076
2016	336,455	160,092	28,344	524,891
2017	332,628	134,290	12,095	479,013
2018	291,442	215,460	19,573	526,475
2019	296,743	219,178	19,163	535,084
2020	258,169	233,451	22,899	514,519
2021	272,568	252,049	22,618	547,235
Average	292,990	194,388	21,092	508,470
Percentage	57.6%	38.2%	4.1%	100.0%

Source: IEC/GHA using data from WCPFC. 2022d. Scientific Committee Eighteenth Regular Session, Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. WCPFC-SC18-AR/CCM-09 (Rev.01). Report submitted to the WCPFC by the Ministry of Marine Affairs and Fisheries, The Republic of Indonesia, 2022.

In 2019, out of its total Pacific tuna catch by all gears of 535,084 mt, Indonesia reported a catch of only 17,170 mt by longline vessels, a slight increase from its average catch of 15,467 mt over the period 2016 - 2020. The 2019 longline catch breakdown by species was 9,953 mt for yellowfin, 4,976 mt for bigeye, and 2,241 mt for skipjack tuna. This breakdown is generally consistent with the breakdown of the average catch by all gear types over the referred period shown in Table 100.

### *Indonesia's Longline Fleet*

Despite having recorded longline catches of tropical tuna within the WCPFC convention area for 2019, the WCPFC vessel register does not include a single Indonesia longline vessel since 2015, as shown in Table 101.<sup>359</sup>

<sup>359</sup> Indonesia became a contracting party to the WCPFC in 2013. In 2014, Indonesia had 159 tuna longline vessels fishing in Fisheries Management Areas - 716 (IEEZ Sulawesi Sea) -717 (IEEZ Pacific Ocean) within the Indonesia EEZ; both fall within WCPFC convention area. However, for reasons that are unclear, Indonesia has not had any longline vessels registered in the WCPFC Vessel Register since 2016 (WCPFC. 2022c. Op. cit.).



Table 101. Indonesia: Number of Indonesian Vessels by Gear and Type Registered in the WCPFC 2015 - 2021

FLEET	2015	2016	2017	2018	2019	2020	2021
Tuna Longliner and Longliner	153	0	0	0	0	0	0
Purse Seiner	124	4	6	8	17	9	11
Pole-and-Liner	28	7	9	13	0	13	2
Gillnetter	2	0	0	0	0	0	0
Handliner	4	0	0	0	2	0	0
Support Vessel	55	0	0	0	0	0	0
Non-specified Vessel	2	0	0	0	0	0	0
Fish Carrier	26	0	0	0	0	0	0
<b>Total</b>	<b>394</b>	<b>11</b>	<b>15</b>	<b>21</b>	<b>19</b>	<b>22</b>	<b>13</b>

Source: WCPFC. 2022c. Op. cit.

### Import Level

Because of its large tuna catches, Indonesia does not have significant imports of tuna, but in 2019, Indonesia imported a total of 28,024 mt of frozen tropical tuna. The Seychelles (9,655 mt) and Spain (3,630 mt) were the main exporters of frozen tropical tuna to Indonesia; jointly they supplied 47 percent of Indonesia's total frozen tuna imports. Given that these suppliers are engaged in purse seine fishing primarily in the Indian Ocean, the imported product is not likely to be of Pacific origin and is probably related to processing needs from Indonesian tuna canneries. Other suppliers more likely to be providing tuna from the Pacific Ocean are FSM, China, the Solomon Islands, Japan, and Korea.

It is important to note that of the total imports of 28,024 mt, 19,247 corresponded to skipjack tuna and only 6,799 mt to yellowfin tuna. This suggests, again, that these imports were related to the canning industry in Indonesia and probably not longline-caught tuna. These imports are discussed in detail in Chapter 6.

Table 102 shows Indonesia's 2019 imports of frozen tropical tuna.

Table 102. Indonesia: Imports of Frozen Tropical Tuna, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Exporter	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Seychelles	9,655	34%	34%	1,427	6,833	1,394
2	Spain	3,630	13%	47%	1,032	2,302	296
3	Micronesia (Fed. States)	2,879	10%	58%	209	2,664	6
4	China	2,826	10%	68%	1,899	927	-
5	Solomon Islands	1,696	6%	74%	261	1,426	9
6	Japan	1,354	5%	79%	328	1,025	-
7	South Korea	1,010	4%	82%	27	956	27
8	Marshall Islands	837	3%	85%	64	766	8
9	Samoa	793	3%	88%	36	752	5
10	Malaysia	716	3%	91%	499	27	190
>10	Others	2,629	9%	100%	1,018	1,569	42
Total		28,024			6,799	19,247	1,977

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

Indonesia's imports of processed tuna and "Other" frozen tunas" are very limited (819 mt and 1,769 mt respectively in 2019).<sup>360</sup>

### Export Level

#### *Exports of Indonesia's Fresh/Chilled Tropical Tuna*

In 2019, Indonesia exported 1,747 mt of fresh/chilled tropical tunas. Yellowfin comprised 1,065 mt and bigeye 678 mt. Japan imported 1,384 mt or 79 percent of Indonesia's total exports of fresh/chilled tropical tuna. China (157 mt), the U.S. (83 mt) and the United Arab Emirates (40 mt) were the next major importing countries. It is not possible to determine if these exports were caught by Indonesia's vessels using longline gear or any other gear and also if these exports were the result of catches in the Pacific or Indian oceans. Table 103 shows Indonesia's 2019 exports of fresh/chilled tropical tunas.

<sup>360</sup> BACI data.

Table 103. Indonesia: Exports of Fresh/Chill Tropical Tuna, 2019 (mt of product weight)

FRESH TROPICAL					30232	30233	30234
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Yellowfin	Fresh / Chilled Skipjack	Fresh / Chilled Bigeye
1	Japan	1,384	79%	79%	741	-	643
2	China	157	9%	88%	156	-	2
3	USA	83	5%	93%	56	-	27
4	United Arab Emirates	40	2%	95%	40	-	-
5	Australia	17	1%	96%	17	-	-
6	Thailand	13	1%	97%	4	3	5
7	Singapore	12	1%	98%	12	0	0
8	Malaysia	12	1%	98%	11	1	-
9	China, Hong Kong SAR	11	1%	99%	11	-	-
10	Vietnam	9	1%	100%	9	-	-
>10	Others	8	0%	100%	8	-	0
	<b>Total</b>	<b>1,747</b>			<b>1,065</b>	<b>4</b>	<b>678</b>

Source: BACI

Note: Fresh/Chilled tropical tuna includes HS Codes 0302.32, 0302.33, and 0302.34

*Indonesia's Exports of Frozen Tropical Tuna*

In 2019, Indonesia exported 57,407 mt of frozen tropical tuna, of which 46,656 mt were skipjack, 8,874 mt yellowfin, and 1,876 bigeye tunas. Japan was the most important trading partner for Indonesia's frozen tropical tuna, importing 31,694 mt or 55 percent of the total exports of Indonesia for that year; almost all of Japan's imports of frozen tropical tuna from Indonesia (31,594 mt) consisted of skipjack tuna, which were likely associated with the Japanese market for katsuobushi.

Thailand (12,215 mt), the Philippines (6,057 mt), and Vietnam (3,593 mt) are the next major importers of Indonesia's frozen tropical tuna, most likely to be processed into canned tuna products or pre-cooked tuna loins. Table 104 shows Indonesia's 2019 exports of frozen whole tropical tunas.

Little information is available to determine the extent to which these tuna are caught by longline.

Table 104. Indonesia: Exports of Frozen Tropical Tuna, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Japan	31,694	55%	55%	51	31,594	50
2	Thailand	12,215	21%	76%	4,752	6,783	680
3	Philippines	6,057	11%	87%	95	5,485	477
4	Vietnam	3,593	6%	93%	1,962	1,040	591
5	Mauritius	1,010	2%	95%	9	1,002	-
6	USA	801	1%	96%	761	-	40
7	Mexico	475	1%	97%	475	-	-
8	Spain	406	1%	98%	206	200	-
9	Italy	311	1%	99%	300	12	-
10	Portugal	198	0%	99%	-	198	-
>10	Others	647	1%	100%	265	344	38
Total		57,407			8,874	46,656	1,876

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

*Indonesia's Exports of Processed Tuna*

Indonesia exported 90,007 mt of processed tuna under HS code 1604.14, which includes canned tuna products and pre-cooked tuna loins intended for canning. Longline-caught tropical tuna are not typically used to produce canned or pouched product, so these exports are not relevant to the tuna longline fishery.

*Indonesia's Export of "Other" Frozen Tuna*

As previously discussed, Indonesia has developed a processing segment that uses lower-grade tuna not suitable to be air-shipped fresh to markets in Japan or the U.S. to produce frozen, value-added, vacuum-packed tuna products in the form of fillets, steaks, and loins. These tuna are generally shipped frozen to the final markets where the products are sold frozen or as "fresh, previously frozen." Restaurants and consumers use these products for grilling and even in some cases, as much lower quality sashimi-grade tuna in Japanese-style restaurants. These processed tuna products are associated with injecting carbon monoxide into the tuna to preserve the bright color of the flesh, which in the presence of oxygen, would render the tuna steaks or fillets brown.

Within this "Other" frozen tuna product category, Indonesia had substantial exports. In 2019, Indonesia exported 27,506 mt of "Other" frozen tuna, of which 23,402 mt corresponded to HS Code 030487 (tuna, non-specific, fillets frozen); and 4,103 mt to HS Code 030349 (Tuna, other, frozen).

The U.S. was the major importer of these products from Indonesia, with 16,482 mt or 60 percent of Indonesia's total exports under the "Other" frozen tuna category. Japan, Thailand and Vietnam absorbed 26 percent of Indonesia's exports with other countries like France, the Philippines, Australia, Malaysia, Canada and Spain importing a few hundred tons each. Table 105 shows Indonesia's 2019 exports of "Other" frozen tuna products.

Table 105. Indonesia: Exports of "Other" Frozen Tuna Products, 2019 (mt of product weight)

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	USA	16,482	60%	60%	16,482	0
2	Japan	3,301	12%	72%	2,313	988
3	Thailand	2,376	9%	81%	126	2,250
4	Vietnam	1,481	5%	86%	1,424	57
5	France	992	4%	90%	847	145
6	Philippines	501	2%	91%	180	321
7	Australia	328	1%	93%	328	0
8	Malaysia	201	1%	93%	65	136
9	Canada	191	1%	94%	182	9
10	Spain	145	1%	95%	145	-
>10	Others	1,508	5%	100%	1,310	198
Total		27,506			23,402	4,103

Source: BACI

Note: "Other" tuna includes HS Codes 0304.87 and 0303.49

Again, it is important to note that the fish used to make these products was not necessarily associated with Indonesia's Pacific longline catches of tropical tuna. Rather, the raw material sources for these products were the result of a combination of many fishing gears used in both the Pacific and Indian oceans.

## Vietnam

### Harvest Level

#### *Vietnam's Longline Catch of Tropical Tuna*

Vietnam is a Cooperating Non-Member of the WCPFC. The WCPFC does not include any Vietnamese longline vessels in its vessel register but, in 2019, Vietnam reported a longline catch of tropical tuna of 16,207 mt.

Yellowfin accounted for 14,653 and bigeye for 1,554 mt. The 2019 catch is consistent with Vietnam's yearly average catches for the period 2016 – 2020 of 16,927 mt.<sup>361</sup>

### *Vietnam's Longline Fleet*

Tunas are caught in Vietnam using various gears. There are an estimated 7,000 artisanal vessels that target tuna using gears such as handlines, gillnets, purse seines, and others, but the dominant method used to catch tuna in Vietnam is handlines, which is how small longline vessels are identified in the Vietnamese fishery data. These vessels all fish within Vietnam's EEZ and do not fish in the EEZs of other neighboring countries.

According to data provide by the Vietnamese government to the WCPFC, the total number of handline/longline vessels in 2019 was 3,248; that number has declined, and in 2021 it was 3,004 vessels. Table 106 shows the number of handline/longline vessels in the Vietnamese fleet during the 2011 to 2021 period.

**Table 106. Vietnam: Number of Handline and Longline Vessels in the Vietnamese Fleet, 2011-2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
50 – 89	156	173	9	0	1	0	0	3	87	174	23
90 – 149	142	518	169	22	8	9	5	5	244	1,007	11
150 – 249	531	742	399	201	85	89	73	70	45	8	29
250 – 399	240	270	647	687	418	407	391	395	323	115	263
> 400	33	69	505	735	1,111	1,184	1,455	1,804	2,549	1,617	2,678
<b>Total</b>	<b>1,102</b>	<b>1,772</b>	<b>1,729</b>	<b>1,645</b>	<b>1,623</b>	<b>1,689</b>	<b>1,924</b>	<b>2,277</b>	<b>3,248</b>	<b>2,921</b>	<b>3,004</b>

Source: WCPFC. 2022a. Op. cit.

In addition to the handline/longline fleet, Vietnam operates purse seine and gillnet fleets that target tuna. These two fleets mainly target skipjack tuna, swordfish, and other species.

### *Export Level*

In 2019, Vietnam exported tropical tuna in all presentations identified in the BACI data: fresh/chilled, whole frozen, processed, and products under the “Other” frozen tuna categories. Where the product code allows for identification to species, the main species exported was yellowfin tuna.

### *Vietnam's Exports of Fresh/Chilled Tuna*

Vietnam's exports of fresh/chilled yellowfin are minimal. In 2019, under the HS Code 0302.32 (Fresh/Chilled Yellowfin), Vietnam exported 230 mt, with the U.S. market absorbing 210 mt or 92 percent of all exports under this category. A few other countries such as Canada, Austria, Japan, and Singapore, imported the remaining 18 tons.<sup>362</sup>

<sup>361</sup> WCPFC. 2022j. Op. cit.

<sup>362</sup> BACI data.

*Vietnam's Exports of Whole Frozen Tuna*

Vietnam also exported 20,730 mt of whole frozen tuna. Italy imported 8,517 mt or 41 percent of the 2019 total Vietnamese exports of whole frozen tuna.<sup>363</sup> The Philippines imported 6,086 mt (29 percent) and the U.S. 2,842 mt (14 percent), of these exports. The three top importers represented 84 percent of the export volume, with the remaining 16 percent spread out among other countries such as Canada, Thailand, South Korea, Spain, and Malaysia. It is not possible to determine if these exports were associated with tuna caught in longline fisheries.<sup>364</sup>

*Vietnam's Exports of Processed Tuna*

In 2019, Vietnam exported 59,545 mt of processed tuna products (canned/pouched products and pre-cooked tuna loins) to a diverse group of countries. Of this total, the U.S. imported 21,523 mt or 36 percent of Vietnam's exports. For the same year, NMFS reported U.S. imports from Vietnam under HS code 1604.14 of 21,708 mt, which coincides well with the BACI data. The main products/presentations imported were pre-cooked loins (6,518 mt), canned albacore (7,609 mt), and other canned tuna products (7,581 mt). The remaining products included smaller volumes of canned and pouched albacore and tuna products in oil within or outside the U.S. quota. Again, it is not possible to determine if the tuna used for these products was caught using handlines/longlines. The companies involved in the production of these products are described in Chapter 6.

European countries (France, Germany, Italy, the Netherlands, and Spain) imported 11,328 mt of processed tuna products (with Spain and Germany representing the top European importers), which represented 19 percent of Vietnam's total exports under HS code 1604.14. Spain was the most important partner with 5,524 mt, of which more than 5,400 mt were pre-cooked skipjack and yellowfin tuna loins for canning.<sup>365</sup>

*Vietnam's Exports of "Other" Tuna*

Vietnam exported 31,845 mt under HS code 0304.87 (Tuna, non-specific, fillets, frozen). These exports likely represent frozen processed products (e.g., loins, fillets, blocks, saku blocks) intended for relatively lower quality sashimi-grade markets and/or to be defrosted and sold as fresh/chilled, previously frozen products. Vietnam also exported 3,740 mt of other frozen tunas (HS code 0303.49), primarily to Thailand and Japan. Again, it is not possible to determine if the Vietnamese products imported under these HS codes were derived from handline/longline catches.

In the U.S., these products are sold after being treated with carbon monoxide, which allows for the tuna product to maintain a reddish color. In fact, the U.S. imported almost half of the exports under this category (14,124 mt), with China (1,180 mt), the Russian Federation (1,813 mt), and Spain (1,010 mt) among the more important buyers of the other half of Vietnam's exports under HS code 0304.87.<sup>366</sup> Under this code, the five E.U. countries (again, France, Germany, Italy, the Netherlands, and Spain) imported 3,988 mt of Vietnamese products.

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<sup>363</sup> All of Italy's imports from Vietnam were under HS Code 0303.42, Frozen Yellowfin Tuna.

<sup>364</sup> BACI data.

<sup>365</sup> Eurostat data.

<sup>366</sup> BACI data. According to NMFS data, imports under this category were 13,990 mt in 2019.

*Vietnamese and U.S. Companies Engaged in Trade for “Other” Tuna Products*

Table 107 and Table 108 show the names of the main trading companies of “Other” tuna products being exported from Vietnam and importing into the U.S. in 2019 according to Datamyne.

**Table 107. Vietnam: Top Vietnamese Companies Exporting “Other” Tuna Products**

EXPORTS FROM VIETNAM - OTHER TUNA		
Rank	Top Exporting Companies	
1	DRAGON WAVES FROZEN FOOD FACTORY CO	2,052
2	TNA VIETNAM COMPANY LIMITED	1,939
3	HAI VUONG COMPANY LIMITED (HAVUCO)	1,686
4	BINH DINH FISHERY JOINT STOCK COMPANY	958
5	THINH HUNG COMPANY LIMITED	933
6	HONG NGOC SEAFOOD CO LTD	431
7	BASEAFOOD	379
8	JK FISH CO LTD	341
9	GOLDEN SHRIMP SEAFOOD JSC	264
10	THANH THAI FOOD COMPANY LIMITED	242

Source: Datamyne

Notes: As a point of reference, Vietnam exported approximately 31,800 mt of “other” tuna products (see section above). “Other” tuna includes HS Codes 0304.87 and 0303.49



Table 108. Vietnam: Top U.S. Companies Importing Vietnamese “Other” Tuna Products, 2019

TOP IMPORTING COMPANIES	
USA	Qty (mt)
Sea Delight	1,004
Jana Brands Inc	792
Jensen Tuna Inc	580
Fortuna Sea Products Inc	546
Long Beach Enterprise Inc	476
Mariso Food Inc	345
Beaver Street Fisheries Inc	322
Unifed Seafood Co Inc	283
Sea Delight Canada sl u c o	276
Relish Foods I nc	264

Source: Datamyne

Notes: As a point of reference, Vietnam exported approximately 31,800 mt of “other” tuna products (see section above). “Other” tuna includes HS Codes 0304.87 and 0303.49

## United States

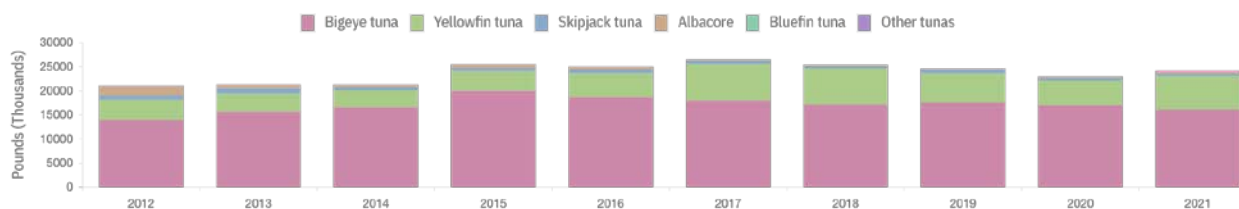
### Harvest Level

#### *U.S. Longline Catch of Tropical Tunas*

In 2019, the U.S. longline catch of tropical tuna in the Pacific was 9,989 mt, with 7,729 mt corresponding to bigeye and 1,965 mt to yellowfin. The fleet caught 295 mt of skipjack. The fleet is based almost entirely in Hawaii and lands fresh, ice-chilled (not frozen) fish. The Hawaiian longline fleet is responsible for about 55 percent of all U.S. longline swordfish landings, 60 percent of all longline yellowfin landings, and 95 percent of all bigeye yellowfin tuna landings.<sup>367</sup>

<sup>367</sup> Hawaii Longline Association. 2023. About the Hawaiian Longline Association. Viewed at <https://www.hawaiilongline.org/about>, April 22, 2023.

Figure 50 shows the Hawaiian longline catches of tuna by species in units of 1,000 pounds between 2012 and 2021. Note that although the production has fluctuated, the proportion of bigeye to yellowfin has remained relatively stable over the period.<sup>368</sup>



**Figure 50. United States: Hawaiian Tuna Longline Catches by Species, 2012 - 2021 (1,000s of pounds)**

Source: Western Pacific Regional Fishery Management Council. 2022. Annual Stock Assessment and Fishery Evaluation Report for the Pacific Pelagic Fisheries Fishery Ecosystem Plan 2021. T Remington, M Fitchett, A Ishizaki, J DeMello (Eds.). Honolulu: Western Pacific Regional Fishery Management Council.

### *U.S. Longline Fleet*

The U.S. longline fleet registered in the WCPFC convention area includes 109 tuna vessels. This number, however, is smaller than that reported by the Hawaiian Longline Association, which records 164 longline permits issued for this fleet, of which only 154 are currently active. Most of these vessels are homeported in Hawaii with only a few of them that, from time to time, have switched to Southern California.

The fishery has two components: the deep-set component that targets bigeye tuna and the shallow-set component that targets swordfish. Other retained species are yellowfin tuna, wahoo, marlins, mahi-mahi, and others. Most of the catch by this fleet occurs on the High Seas (70 percent), due to restrictions associated with the Papahānaumokuākea Marine National Monument designation of nearby waters.<sup>369</sup>

Ownership of the fleet is distributed among many owners, most of them with only one vessel; one owner has 20 vessels and another has five vessels.<sup>370</sup> Most of the Hawaiian longline fleet is dominated by fishermen of Vietnamese ethnic background. Most of the owners belong to the Hawaii Longline Association and their activities are regulated by the Western Pacific Regional Fishery Management Council.

### *Hawaii Longline Tuna Fishery Markets*

About 10,880 mt or 80 percent of the fish produced by the Hawaiian longline fleet is sold locally in Hawaii; about 2,450 mt or 18 percent are air shipped to the U.S. mainland and about 270 mt or two percent of the catch is exported to other countries.<sup>371</sup>

As one representative of the Association stated: “We do not have to export our fish, we import our market to Hawaii,” referring to the large number of tourists from Japan and many other countries visiting Hawaii who are

<sup>368</sup> Additional information and data for the Hawaiian longline fishery can be found here <https://www.wpcouncildata.org/pelagicsafereport/hawaii/5>.

<sup>369</sup> Hawaii Longline Association. 2023. Op. cit.

<sup>370</sup> GHA personal communication with Sean Martin, Principal with the Hawaiian Longline Association, April 20, 2023.

<sup>371</sup> GHA personal communication with Sean Martin, Principal with the Hawaiian Longline Association, April 20, 2023.

eager to eat Ahi (yellowfin) tuna and sashimi-grade bigeye tuna. The COVID pandemic had a major impact on the Hawaiian longline fishery due to the severe drop in tourism that occur in 2020 - 2021.

As previously mentioned, the Hawaiian longline fishery exports only about two percent or 270 mt of its catches on average.<sup>372</sup> In 2019, the U.S. recorded total exports of only 110 mt of fresh/chilled tropical tuna. Canada absorbed 46 mt or 42 percent of the total export volume. Table 109 shows the 2019 U.S. exports of fresh/chilled tropical tuna.

**Table 109. United States: Exports of Fresh/Chilled Tropical Tuna, 2019 (mt of product weight)**

Fresh Tropical					30232	30233	30234
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Yellowfin	Fresh / Chilled Skipjack	Fresh / Chilled Bigeye
1	Canada	46	42%	42%	35	-	11
2	Mexico	26	23%	65%	-	26	-
3	Japan	11	10%	75%	0	-	10
4	China, Hong Kong SAR	10	9%	84%	-	-	10
5	Peru	6	5%	89%	-	6	-
6	Dominican Rep.	4	4%	93%	4	-	-
7	Saint Maarten	2	2%	94%	-	-	2
8	Anguilla	2	2%	96%	2	-	-
9	United Kingdom	1	1%	97%	-	1	-
10	United Arab Emirates	1	1%	98%	1	-	-
>10	Others	2	2%	100%	2	0	0
<b>Total</b>		<b>110</b>			<b>44</b>	<b>33</b>	<b>34</b>

Source: BACI

Note: Fresh/Chilled tropical tuna includes HS Codes 0302.32, 0302.33, and 0302.34

<sup>372</sup> In the U.S., tunas are also caught off the Gulf of Mexico and the East Coast. No information is readily available about these catches, but as previously mentioned, the Hawaiian longline fishery plays a major role in the overall U.S. longline catches of tropical tuna.

## Federated States of Micronesia (FSM)

### Harvest Level

#### *The FSM Pacific Longline Catch of Tropical Tuna*

In 2019, the FSM longline fishery reported a catch of 8,583 mt, of which yellowfin represented 4,692 mt, bigeye represented 3,559 mt, and a small catch of skipjack tuna (332 mt). In 2021, the longline catch for the same species had declined to 729 mt for yellowfin, 1,606 mt for bigeye, and 57 mt for skipjack.<sup>373</sup>

#### *The FSM Longline Fleet for Tropical Tuna*

The FSM longline fleet in 2021 was made up of 17 vessels.<sup>374</sup> The FSM longline fleet is all chartered to one Chinese company, Liancheng Overseas Fishery (FSM) Fishery Co. Ltd.<sup>375</sup> The majority of the catch of these vessels is deep frozen on board at ultra-low temperatures, but some of the vessels in the fleet are equipped to ice-chill fish for the fresh sashimi-grade market.

Liancheng Overseas Fishery's sister company Asian Pacific Airlines has cargo services to pick up fresh fish out of FSM, Guam, Palau, and Solomon Islands, which then gets freight-forwarded to Japan and the U.S. mainland out of Hawaii. The frozen catches harvested by the FSM-chartered Chinese longline vessels is transshipped to reefer carriers and/or unloaded into sea containers for shipments to China or to Japan.

### Export Level

#### *Exports of Fresh/Chilled Tropical Tunas*

As indicated, some of the Chinese-chartered vessels operating in FSM are prepared to handle iced-chilled fresh fish. Their catches are exported exclusively to Japan and the U.S. In 2019, FSM exported 341 mt of fresh/chilled tropical tunas. Japan imported 259 mt, of which yellowfin accounted for 110 mt, and bigeye accounted for 149 mt. The U.S. imported 82 mt, which included 71 mt of bigeye, and 10 mt of yellowfin.

#### *FSM Exports of Frozen Tropical Tuna*

In 2019, FSM exported 85,482 mt of frozen tropical tuna, most of which are associated with purse seine catches. The main recipient of these exports was Thailand with 68,368 mt, (80 percent of the total FSM exports, followed by China with 9,478 mt (11 percent), and Japan with 2,948 mt (3 percent). It is possible that some of the exports to both China and Japan could have come from the longline operations of the FSM-chartered fleet of China. Table 110 shows FSM's 2019 exports of frozen tropical tuna, but again, the data do not specifically identify the proportion of these fish that were caught by longline or in the Pacific Ocean specifically.

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<sup>373</sup> WCPFC. 2022d. Scientific Committee Eighteenth Regular Session. Annual Report to the Commission. Part 1: Information on Fisheries, Research, and Statistics. Federated States of Micronesia, National Oceanic Resource Management Authority, Pohnpei, FSM. August. Downloaded from <https://meetings.wcpfc.int/node/15321>, April 26, 2023.

<sup>374</sup> IEC/GHA Vessel Compilation analysis.

<sup>375</sup> Campling et.al. 2017. Op. cit. In 2017, the company had 19 longliners chartered by the FSM. In 2019, the number has come down to 17 vessels.

Table 110. Federated States of Micronesia: Exports of Frozen Tropical Tuna, 2019 (mt of product weight)

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Thailand	68,368	80%	80%	4,535	62,277	1,555
2	China	9,478	11%	91%	958	8,395	125
3	Japan	2,948	3%	95%	1,061	1,675	212
4	Indonesia	2,879	3%	98%	209	2,664	6
5	Philippines	1,681	2%	100%	644	1,037	-
6	South Korea	76	0%	100%	-	-	76
7	Peru	52	0%	100%	52	-	-
Total		85,482			7,459	76,048	1,975

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

## Solomon Islands

### Harvest Level

#### *The Solomon Islands Pacific Longline Catch of Tropical Tuna*

In 2019, the Solomon Islands longline fishery reported a catch of 6,601 mt, of which yellowfin represented 5,094 mt, bigeye 1,398 mt, and skipjack tuna 109 mt. In 2021, the longline catch for the same species had declined to 3,289 mt for yellowfin, 649 mt for bigeye, and 29 mt for skipjack.<sup>376</sup>

#### *The Solomon Islands Tropical Tuna Longline Fleet*

The Solomon Islands longline fleet in 2021 was made up of eight vessels.<sup>377</sup> The fleet is chartered to Taiwanese companies that are allowed to fish from 36 to 200 miles from the coast within the Solomon Islands EEZ. The National Fisheries Development Ltd. of Solomon Islands has five Taiwanese vessels under charter, and the Southern Seas Investment Ltd., has three chartered vessels. Three additional Taiwanese companies appear to also have some longline vessels fishing out of the Solomon Islands under charter with Global Fishery Ltd., Will

<sup>376</sup> WCPFC. 2022e. Scientific Committee Eighteenth Regular Session. Annual Report to the Commission. Part 1: Information on Fisheries, Research, and Statistics 2021. Ministry of Fisheries and Marine Resources Solomon Islands. August. Downloaded from <https://meetings.wcpfc.int/node/15337>, April 26, 2023.

<sup>377</sup> IEC/GHA Vessel Compilation analysis.

Fish Investment Ltd., and Solong Seafood Investment Development Ltd.<sup>378</sup> All these companies engaged in transshipping operations in the Solomon Islands, including unloading products from the fishing vessels into containers. Most of the catch of these vessels is deep frozen on board at ultra-low temperatures.

The catches harvested by the Solomon Islands Taiwanese-chartered longline vessels are transshipped to reefer carriers and/or unloaded into sea containers for shipment to Thailand. It is possible that some of the catches are unloaded at Noro, Solomon Islands for initial processing into pre-cooked tuna loins before export.<sup>379</sup>

## Export Level

### *Solomon Islands Exports of Frozen Tropical Tuna*

In 2019, the Solomon Islands exported 21,967 mt of frozen tropical tuna, which is not separated by the gear type with which it was originally caught. The main recipient country of these exports was Thailand with 16,344 mt (74 percent of the total Solomon Islands exports), followed by the Philippines with 2,863 mt (13 percent), and Indonesia with 1,698 mt (8 percent). Since most of this tuna was skipjack and was directed to countries with major canning industries, it is very likely that these exports were associated with the catches of purse seine vessels flagged in the Solomon Islands, as opposed to products resulting from longline catches. Table 111 shows the 2019 Solomon Islands exports of frozen tropical tuna, some small portion of which might be attributable to the longline fishery (particularly that which was exported to Japan).

**Table 111. Solomon Islands: Exports of Frozen Tropical Tuna, 2019 (mt of product weight)**

FROZEN TROPICAL					0303.42	0303.43	0303.44
Rank	Importer	Total	Percent	Cum. Percent	Frozen Yellowfin	Frozen Skipjack	Frozen Bigeye
1	Thailand	16,344	74%	74%	1,626	14,457	261
2	Philippines	2,863	13%	87%	-	2,863	-
3	Indonesia	1,696	8%	95%	261	1,426	9
4	Japan	842	4%	99%	570	144	128
5	Spain	120	1%	100%	-	120	-
6	Mauritius	77	0%	100%	-	77	-
7	Malaysia	24	0%	100%	-	24	-
8	South Korea	2	0%	100%	1	-	0
<b>Total</b>		<b>21,967</b>			<b>2,458</b>	<b>19,111</b>	<b>399</b>

<sup>378</sup> WCPFC. 2022e. Op. cit., pg. 10. The total number of vessels may be up to 11, but the number of vessels allocated to each of these companies is not known.

<sup>379</sup> In 2019, under HS code 1604.14, Italy is identified as the main importer of processed tuna from the Solomon Islands. Of the total exports of 9,571 mt, Italy imported 8,619 mt or 90 percent of the Solomon Islands exports under this category. This export could be associated with imports of pre-cooked yellowfin loins caught by Taiwanese longliners, given the close relationship between Tri-Marine and the Italian tuna processing sector always eager for yellowfin.

Source: BACI

Note: Raw frozen tropical tuna includes HS Codes 0303.42, 0303.43, and 0303.44

*Solomon Islands Processed Tuna Exports*

As previously mentioned, Italy imported 8,619 mt of tuna under HS code 1604.14, which represented 90 percent of such processed tuna. Given that purse seine catches in the WCPFC are mainly for skipjack tuna (not typically used by Italy for canning), it is reasonable to believe that the exports of the Solomon Islands under this category would have involved yellowfin tuna caught by longline vessels, delivering tuna in that country. Table 112 shows the 2019 Solomon Islands exports of processed tuna products.

Table 112. Solomon Islands: Exports of Processed Tuna Products. 2019 (mt of product weight)

PROCESSED				
Rank	Importer	Total	Percent	Cum. Percent
1	Italy	8,619	90%	90%
2	USA	481	5%	95%
3	Fiji	244	3%	98%
4	Spain	128	1%	99%
5	France	51	1%	99%
6	United Kingdom	26	0%	100%
7	Greece	22	0%	100%
Total		9,571		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

## CHAPTER 8 | Analysis of the Pacific Albacore Fishery

This chapter describes the harvesting, processing, distribution, and marketing of Pacific albacore, highlighting those countries and actors that hold the greatest influence over supply chains and trade flows for these products. As discussed in greater detail below, albacore is targeted in the Pacific by longline, troll, and pole-and-line vessels, with catch primarily destined for both major brand and specialty canned markets. By volume and value, the longline fishery accounts for most of the catch. Thus, the longline fishery is the primary focus of this analysis. The supply chains and markets of the pole-and-line and troll-caught albacore fisheries are only briefly discussed.

Only a few countries serve as processing hubs for the Pacific albacore fishery. Except for Fiji, these countries play little to no role in the harvest sector. For this reason, we describe the two sectors separately, with activities in Fiji noted in the discussion of both the harvest sector and the processing sector.

### Summary of Trade Flows and Key Actors in the Pacific Albacore Fishery

#### Albacore Longline Tuna Fishery

The longline albacore fishery conducted by DWFNs focuses on exporting frozen albacore to processing centers where low labor costs are leveraged to produce pre-cooked tuna loins.<sup>380</sup> These loins are sent mainly to processing plants in Thailand, American Samoa, and the U.S. mainland, where the canning process is completed. Most of the canned albacore is then shipped to the U.S. under the HS codes for “processed tuna” (i.e., those beginning with 1604.14), where it is sold under a major brand label (i.e., Bumble Bee Seafood, Chicken of the Sea, or Starkist), a private label, or to the institutional market. The companies that own the major U.S. brands, Dongwon, FCF Fishery, and Thai Union, are key actors that wield significant power in the trade flows for these products.

Currently, whole frozen albacore is imported into Fiji or the Solomon Islands, where it is processed into pre-cooked loins. In addition, partial processing (pre-cooked loins) or full processing of albacore is performed at the Starkist plant in American Samoa. Vietnam is an emerging processor, also importing albacore to be processed into pre-cooked loins. Vietnam’s emerging competitiveness in this segment of the market may eventually affect the flow of trade currently directed to Fiji and the Solomon Islands.

#### Albacore Troll and Pole-and-Line Fishery

Vessels that use troll or pole-and-line gear to harvest albacore in the Pacific are primarily from the U.S., Canada, New Zealand, or Japan; all of these fisheries are MSC-certified. In the Pacific, the troll and pole-and-line albacore fishery is about one-fifth the size of the albacore longline fishery (around 22,000 mt compared to 102,000 mt), less than one-tenth the size of the tropical tuna longline fishery (around 221,000 mt), and tiny compared to the 2.7 million mt tropical tuna purse seine fishery.

About half of the U.S./Canadian catch of troll and pole-and-line albacore is exported to Spain for canning; about a quarter is consumed domestically in the U.S. and Canada as fresh/previously frozen albacore loins that have been processed domestically or abroad; and the remaining quarter is processed as a high-quality canned product

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<sup>380</sup> A relatively small portion of the longline caught albacore goes to the Japanese market and is used for sashimi.



in Vietnam, Costa Rica, or a few very small boutique canneries on the Pacific Northwest coast. Depending on market conditions, some U.S.-caught albacore may be exported whole frozen to Thailand for canning.

New Zealand's troll/pole-and-line albacore catches are either exported to Thailand for processing and then sent to the U.S. market or, more recently, to Spain. Japan's troll/pole-and-line albacore catches are mainly consumed domestically as sashimi; any surplus is exported to Thailand for processing and eventual export to the U.S. market.

## Albacore Longline Fishery Dynamics

Most longline-caught albacore is destined for canned markets; about ten percent or less of the catch is consumed as sashimi, primarily in Japan.

The longline fishery for albacore has two components corresponding to two distinct seasons, one in the North Pacific and one in the South Pacific. The South Pacific season runs from mid-March to late May, while the North Pacific season tends to run from mid-June to mid/end of October. The primary participants in these fisheries are the distant water fishing fleets of China, Taiwan, Japan, and South Korea, which provide the vast majority of longline caught albacore for the canned market. This catch is supplemented by the catch of other countries that fish primarily in local waters.

Some longline vessels from China, Taiwan, and South Korea that target tropical tuna in the Pacific switch their fishing effort to target albacore during these seasons. The distant water longline fleets generally target deeper swimming, mature albacore with low fat content; on average, these fish weigh 20 to 25 kilograms. The longline fleets freeze the albacore on board by means of forced cold air, also known as "blast freezing."

The catch of albacore by longline tuna fleets from DWFNs (China, Taiwan, Japan, and Korea) to supply producers of canned products is supplemented by the albacore catch by local fleets off their own coasts. Countries including French Polynesia, Fiji, and Vanuatu, as well as the U.S. (American Samoa), among others, have longline vessels that catch tuna locally. The catch by these vessels is either kept on ice and sold fresh to local markets or frozen on board to be sold for processing.

### Canned Albacore Markets

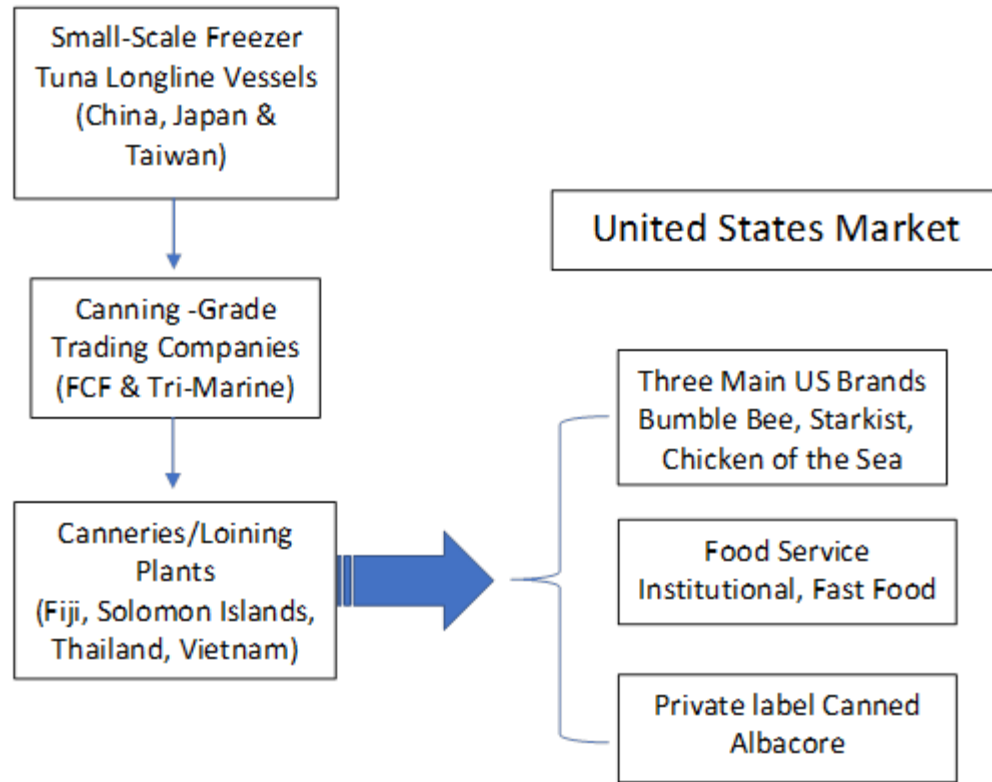
Longline albacore caught by offshore and distant water fleets from China, Japan, and Taiwan capable of freezing the fish on board are destined almost exclusively for the North American (primarily U.S.) canned albacore market<sup>381</sup> and follow a basic trade flow pattern. Once the fish is caught, tuna trading companies purchase the fish and deliver it to canneries where the fish is processed into pre-cooked tuna loins.<sup>382</sup> The pre-cooked tuna loins are then exported to Thailand and/or the U.S. where the albacore is canned/pouched and sold in the U.S. market under the main national brands (Bumble Bee, Chicken of the Sea, or Starkist), packed for the

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<sup>381</sup> Although albacore is also consumed in Japan as a canned product, the size of this market is not significant.

<sup>382</sup> Frozen, longline-caught albacore delivered to Thailand or Vietnam may go through the entire canning process there.

institutional market, or packed under private labels. Figure 51 shows how the frozen, longline-caught albacore from the Pacific flows into the canned albacore market in the U.S.



**Figure 51. Frozen Longline-Caught Pacific Albacore Flows into the U.S. Canned Albacore Market**

Source: IEc/GHA elaborated using Campling et al. 2017. Op. cit.

### Sashimi-Grade Albacore Markets

About ten percent or less of longline-caught albacore is consumed as sashimi in the Japanese market. Japanese longline vessels usually unload frozen and fresh albacore at the port of Yaizu in Japan, where there is extensive cold storage infrastructure. Some Taiwanese and Chinese vessels may also unload directly there, where they are authorized to do so by the Japanese government. An unknown amount of fresh albacore is also flown into Japan for consumption as sashimi; data are not available to quantify these deliveries.

The albacore is traded and auctioned either at a wholesale producer's market or a wholesale consumer's market<sup>383</sup>, where the “Big Four” sashimi-grade trading and processing companies play important roles.<sup>384</sup> The albacore is then distributed to supermarkets, foodservice and/or small-scale retail/restaurants.

Figure 52 depicts the basic pathways of sashimi-grade albacore flowing into the Japanese market.

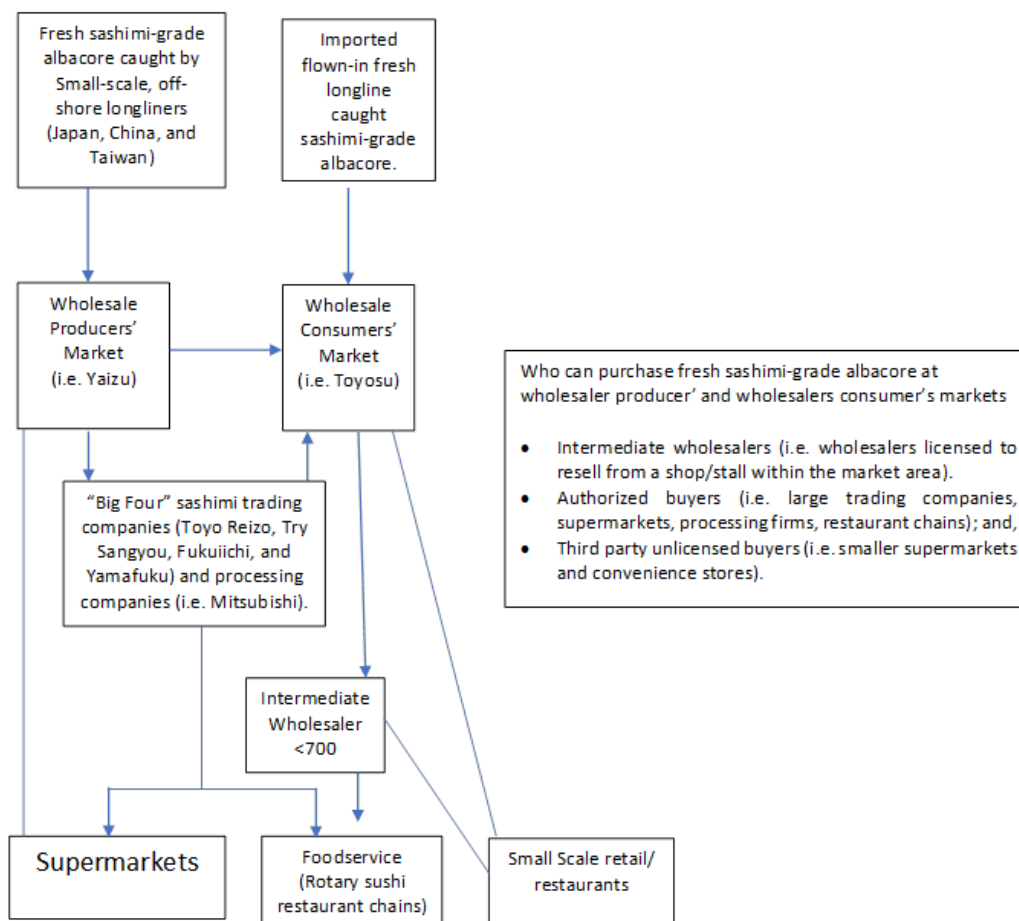


Figure 52. Fresh Sashimi-Grade Albacore in the Japanese Market

Source: IEc/GHA elaborated using Campling et al. 2017. Op. cit.

### Major Processing Hubs for Longline-Caught Albacore

As mentioned above, whole, frozen, longline-caught albacore in the Pacific may go through the entire canning process in one facility, but it is also often processed into pre-cooked albacore loins in one location and subsequently sent to final processing facilities owned by the main U.S. brands where the cooked loins are put

<sup>383</sup> Fresh caught longline sashimi-grade albacore can be landed at Japanese ports or flown into Japan; it is sold through the wholesale consumer's markets (not the wholesale producer's markets).

<sup>384</sup> According to Campling et al. (2017), pg. 87, four major trading companies account for 70 percent of the sashimi supply in the Japanese market (inclusive of albacore). These are: Toyo Reizo (Mitsubishi subsidiary) Try Sangyou, Fukuichi and Yamafuku.

into the can. U.S. imports of tuna loins (including albacore loins) avoid the tariffs associated with the importation of canned products, so it is often economically beneficial to do the final processing in the U.S. This issue does not apply to trade of canned/pouched tuna supplying markets in countries other than the U.S.

In the Pacific, there are five main locations where albacore longline catches are processed: Fiji, the Solomon Islands, American Samoa, Vietnam, and Thailand. Occasionally, some other countries such as Ecuador (which has the infrastructure to produce pouches) and the Philippines (which does an institutional pack) also receive refrigerated containers with albacore that are processed into canned/or pouched products. In addition, China may also process some albacore, but no clear data are available to verify this. The five albacore processing hubs are discussed below.

### Fiji

Fiji's albacore catches and albacore landed in Fiji by vessels of other countries, which are mainly destined for canned markets, are processed into pre-cooked loins to send to the U.S. or exported whole frozen to Thailand, American Samoa (U.S.), Taiwan, and Vietnam. Smaller amounts of albacore are also exported to the E.U. market. Sashimi-grade albacore is exported to Japan.

In Fiji, Bumble Bee Seafood (owned now by FCF Fishery Co. Ltd.) has an exclusive contract with Pacific Fishing Company Limited,<sup>385</sup> where longline-caught albacore is processed into pre-cooked tuna loins that are exported to the U.S. tuna processing facilities of Bumble Bee in Santa Fe Springs, California, and occasionally, to the Chicken of the Sea plant in Lyons, Georgia.

As a processing hub, Fiji is also a destination for imports of frozen albacore for processing. In 2019, Fiji imported 1,533 mt of albacore from Taiwan; no other albacore imports appear in the BACI data.

In 2019, Fiji exported 7,152 mt of albacore; 462 mt corresponded to fresh/chilled albacore, while 6,690 mt represented exports of whole frozen albacore, presumably for canning. Three countries, American Samoa, Thailand, and Vietnam accounted for 78 percent of Fiji's exports of albacore. Table 113 presents Fiji's albacore exports in 2019.

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<sup>385</sup> Viewed at <https://www.youtube.com/watch?v=vJcztmsf11o>, March 21, 2023.

Table 113. Fiji: Exports of Fresh/Chilled and Raw Frozen Albacore by Importing Country, 2019 (mt of product weight)

ALBACORE					0302.31	0303.41
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	American Samoa	2,429	34%	34%	116	2,313
2	Thailand	1,759	25%	59%	-	1,759
3	Vietnam	1,389	19%	78%	-	1,389
4	Spain	580	8%	86%	-	580
5	USA	397	6%	92%	339	57
6	Netherlands	286	4%	96%	-	286
7	China	157	2%	98%	-	157
8	Japan	103	1%	99%	3	100
9	France	33	0%	100%	-	33
10	Niue	7	0%	100%	-	7
>10	Others	12	0%	100%	4	8
Total		7,152			462	6,690

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

In addition to exports of whole frozen albacore, Fiji exports processed tuna products, which include, among others, pre-cooked albacore loins. In 2019, Fiji exported 9,822 mt of processed tuna (including tropical tuna and albacore) as pre-cooked loins. The U.S. was the recipient of 9,581mt (97 percent) of all Fiji's exports of these commodities. Table 114 shows Fiji's 2019 exports of processed tuna products.

Table 114. Fiji: Exports of Processed Tuna Products by Importing Country, 2019 (mt of product weight)

PROCESSED				
Rank	Importer	Total	Percent	Cum. Percent
1	USA	9,581	97%	97%
2	Vanuatu	73	1%	98%
3	New Zealand	47	0%	99%
4	Other Asia, nes (Taiwan)	39	0%	99%
5	Tonga	21	0%	99%
6	Marshall Islands	18	0%	100%
7	Samoa	17	0%	100%
8	Tuvalu	11	0%	100%
9	Timor-Leste	9	0%	100%
10	Australia	6	0%	100%
>10	Others	6	0%	100%
Total		9,827		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

According to NMFS, in 2019 the U.S. imported 9,579 mt of tuna loins, presumably corresponding to albacore tuna loins (although this is not specified in the data). No data are available to confirm who buys of the balance of those imports, but the Bumble Bee plant in Fiji produces very little canned tuna, so the remaining quantity, 5,170 mt, was most likely pre-cooked albacore loins, which could have been imported by Chicken of the Sea to be processed in its Lyon, Georgia, facility.<sup>386</sup>

### Solomon Islands

Longline fleets also directly deliver their albacore catches to the Tri-Marine plant (Soltai Tuna or Soltuna) in Noro, Solomon Islands, where the fish is processed into pre-cooked loins that are then exported to the U.S. or to Thailand to be packed into a canned albacore product for a national brand or for a private label in the U.S. or Canadian market.

<sup>386</sup> Potentially, some of Fiji's exported loins could also have gone to Starkist plant in American Samoa. However, we do not have any supporting data to definitively confirm the destination of these loins.

In 2019, the Solomon Islands imported 1,800 mt of frozen albacore from Taiwan, probably by direct delivery of Taiwanese longline vessels (which may be operating under the Solomon Islands flag or Taiwanese flag) into the port of Noro. In 2019, the Solomon Islands exported 9,571 mt of processed tuna under HS Code 1604.14, primarily to Italy. However, this is probably pre-cooked yellowfin tuna loins caught by purse seiners, rather than albacore. The U.S. imported 481 mt of processed tuna from the Solomon Islands under HS Code 1604.14, which were likely pre-cooked albacore loins based on industry knowledge.

### Vietnam

Vietnam registers no albacore catch or RFMO-registered tuna longline fleet. It has many small artisanal vessels that catch tropical tuna but not albacore. Nevertheless, it does serve as a processing hub for Pacific albacore.

Vietnam is a relative newcomer to the tuna industry and is engaged in the processing of tropical tunas and albacore. It has about 15 tuna processors, handling both tropical tuna and albacore. Among the more important processors are Dragon Waves (owned by Hi Vuong Group), Bidfisco, and Havico. Please see Chapter 6 for additional detail on the activities of these processors.

Vietnam imported 12,015 mt of mainly frozen albacore in 2019. These imports came primarily from Japan, Taiwan, Fiji, and China, which combined comprised 78 percent of all of Vietnam's imports of albacore (see Table 115).

**Table 115. Vietnam: Imports of Fresh Chilled and Raw Frozen Albacore by Exporting Country, 2019 (mt of product weight)**

ALBACORE					30231	30341
Rank	Exporter	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Japan	4,246	35%	35%	-	4,246
2	Other Asia, nes (Taiwan)	2,524	21%	56%	-	2,524
3	Fiji	1,389	12%	68%	-	1,389
4	China	1,222	10%	78%		1,222
5	USA	927	8%	86%	295	633
6	Senegal	663	6%	91%	-	663
7	New Zealand	351	3%	94%	-	351
8	Malaysia	164	1%	96%	-	164
9	Indonesia	162	1%	97%	-	162
10	Canada	139	1%	98%	-	139
>10	Others	227	2%	100%	11	216
<b>Total</b>		<b>12,015</b>			<b>306</b>	<b>11,709</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

In 2019, Vietnam exported 45 mt of whole frozen albacore, 30 mt of which went to the U.S. It is not clear if such exports went to the continental U.S. or to American Samoa. Small amounts also went to the Philippines (8 mt), Canada (5 mt), and Turkey (2 mt).

As an emerging processor of pre-cooked loins and canned products, Vietnam exported 59,545 mt of processed tuna products under HS Code 160414 (which includes both tropical tunas and albacore) (Table 116). The U.S. absorbed 21,523 mt or 36 percent of Vietnam's total processed tuna products. Of these, about 6,500 mt were pre-cooked tuna loins of both tropical tuna and albacore. The balance, approximately 15,000 mt corresponded to canned and pouched products.<sup>387</sup>

Spain, Thailand, and Israel accounted for approximately 25 percent of Vietnam's total exports of processed tuna products. Vietnam's exports to Spain and Thailand may have been pre-cooked tuna loins. Available data do not allow species identification of processed tuna imports and exports, so we do not know how much of these products were albacore as opposed to tropical tuna.

**Table 116. Vietnam: Exports of Processed Tuna by Importing Country, 2019 (mt of product weight)**

PROCESSED				
Rank	Importer	Total	Percent	Cum. Percent
1	USA	21,523	36%	36%
2	Spain	5,455	9%	45%
3	Thailand	5,089	9%	54%
4	Israel	4,385	7%	61%
5	Germany	2,939	5%	66%
6	Canada	2,087	4%	70%
7	Japan	1,922	3%	73%
8	Jordan	1,252	2%	75%
9	Other Asia, nes (Taiwan)	1,225	2%	77%
10	Egypt	1,206	2%	79%
>10	Others	12,462	21%	100%
<b>Total</b>		<b>59,545</b>		

Source: BACI

<sup>387</sup> NMFS Trade data.



Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Finally, in 2019 Vietnam also exported 35,586 mt of “Other” tunas under HS Codes 0304.87 and 0303.49 (Table 117). It is not possible to determine how many of these exports may have involved albacore tuna products. The main beneficiaries of Vietnam’s exports of “Other” tuna were South Korea, Thailand, Japan, and the U.S.

**Table 117. Vietnam: Exports of "Other" Tuna Products by Importing Country, 2019 (mt of product weight)**

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	USA	14,145	40%	40%	14,124	21
2	Russian Federation	1,813	5%	45%	1,813	-
3	Israel	1,768	5%	50%	1,768	-
4	Japan	1,675	5%	55%	906	769
5	Mexico	1,581	4%	59%	1,581	-
6	Thailand	1,510	4%	63%	40	1,470
7	Netherlands	1,395	4%	67%	1,383	13
8	China	1,183	3%	70%	1,180	3
9	Germany	1,099	3%	74%	1,094	5
10	Spain	1,010	3%	76%	1,010	-
>10	Others	8,407	24%	100%	6,948	1,460
	<b>Total</b>	<b>35,586</b>			<b>31,845</b>	<b>3,740</b>

Source: BACI

Note: “Other” tuna includes HS Codes 0304.87 and 0303.49.

### Thailand

Thailand is not only a major processor of tropical tunas but also of albacore. Longline fleets transship albacore via reefer carriers and/or refrigerated sea containers to Thailand, where the fish is processed partially into pre-cooked loins or fully into a canned/pouched product. Thai Union, Thailand’s largest tuna processing company, owns the U.S. brand Chicken of the Sea, which includes albacore as well as tropical tuna products. Thai Union receives longline albacore and processes it into pre-cooked albacore loins later exported to the Chicken of the Sea plant in Lyons, Georgia, where the albacore is canned. Thailand also processes longline albacore under private labels that are exported to the U.S.

## Major Pacific Albacore Distant Water Longline Fishing Nations

The primary albacore longline fishing countries in the Pacific are China, Taiwan, and Japan, described below. In 2019, the combined catches of these and other smaller longline fleets amounted to 102,847 mt.

### China

China is a major participant in the longline fishery for albacore in the Pacific at the fishing level.<sup>388</sup>

#### *China's Longline Albacore Catch in the Pacific*

In 2019, China reported a longline albacore catch of 42,722 mt. This catch represented 41.5 percent of the Pacific-wide longline albacore catch of 102,847 mt, identifying China as a leader in the longline albacore fishery. China's longline albacore catches are predominantly focused on the Western Pacific, with catch in the WCPFC convention area of 32,814 mt, compared to 9,908 mt within the IATTC convention area.

#### *Chinese Longline Albacore Fleet*

The Chinese longline fleet registered to fish in the Pacific consisted of 296 longline vessels. However, this figure includes vessels that target tropical tunas for the sashimi grade market in addition to those vessels that target mainly albacore tuna. Therefore, it is difficult to establish how many longline vessels were associated with China's catch of the 42,722 mt of albacore in 2019.

In addition, there are many Chinese deep frozen tuna longline vessels operating in the EEZs of PICs under the flags of other countries. In 2016, Chinese longline vessels fished in the Solomon Islands (35), Kiribati (34), and Fiji (9) under diverse charter arrangements.<sup>389</sup> The vessels operating in both the Solomon Islands and Fiji deliver their albacore catches in those locations where the fish is typically processed into pre-cooked tuna loins that eventually are shipped to the U.S. for canning. No company name information is available from Datamyne.

According to Campling et al. (2017), 50 vessels were registered under the Fiji flag by 15 Fijian companies that were believed to be under direct or indirect control by Chinese interests. Many of these Fijian flag vessels are not authorized to fish within Fiji's EEZ but can conduct fishing operations in the adjacent areas of the High Seas.<sup>390</sup>

There are two types of Chinese tuna longline vessels that target albacore. The first category are ice fresh longline vessels which catch albacore and keep them in ice; the second category is deep frozen tuna longline vessels, which are vessels capable of freezing albacore at -60 degrees Celsius.<sup>391</sup> Within the first category there are presently 29 vessels that are based in the Marshall Islands that target not only albacore but more importantly, yellowfin and bigeye tuna. The vessels fish within the Marshall Islands EEZ, making trips that last from 10 to

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<sup>388</sup> China is emerging as a processing country for pre-cooked and frozen tuna loins. No available information indicates that albacore is processed into pre-cooked loins in China, but frozen albacore may be cut into sashimi-grade loins for the Japanese market.

<sup>389</sup> According to Campling et al. (2017), there are three Chinese beneficially owned companies in the Solomon Islands that manage the longline vessels: Global Fishery Ltd. (2), Solong Seafood Development Ltd. (31), and Southern Seas Investment Ltd. (2). Two Chinese-controlled companies, Kiribati Fish Ltd (33) and Ministry of Fisheries and Marine Resources Development (1) manage 34 vessels in Kiribati, and four Chinese-controlled companies operate nine deep frozen tuna longline vessels in Fiji: Win Full Fisheries Co. Ltd (2), Gonedau Enterprises (4), Kiwaitui Co. Ltd (2), and Yavusa Tonga Holdings (1).

<sup>390</sup> Campling et.al. 2017. Op. cit., pg. 173.

<sup>391</sup> Campling et.al. 2017. Op. cit.

15 days.<sup>392</sup> The vessels belong to two subsidiaries of the company Luen Thai Fishing Venture, one of the important Chinese fishing companies.<sup>393</sup> Once the fish are landed, they are air-shipped to sashimi-grade markets in Japan and the U.S.,<sup>394</sup> however, no detailed information as to quantities and values was available at the time of this report. The albacore caught by these vessels seldom goes into the canned market.

Under the second category, there are 91 longline vessels that target albacore, bigeye, and yellowfin. The deep-frozen albacore that these vessels catch go to canneries for processing.<sup>395</sup>

Table 118 provides a list of the companies that own more than six tuna longline vessels.

**Table 118. China: Chinese Companies Owning More than Six Tuna Longline Vessels, 2021**

Company	Number of Vessels
CNFC Overseas Fisheries Co., Ltd.	46
China Southern Fishery (Shenzhen) Company, Ltd.	20
Dalian Ocean Fishing Company, Ltd.	19
Shan Dong Lidao Oceanic Technology Company Limited	15
Ping Tai Rong Ocean Fishery Group Co., Ltd.	15
Rongcheng Ocean Fisheries Company, Ltd.	12
Liancheng Overseas Fishery (FSM) Co., Ltd.	12
Shenzhen Shengang Overseas Industrial Company, Ltd	11
Fujian Zhongji Farsea Fishery Company, Ltd.	10
Weihai Changhe Fishery Company, Ltd.	10
Shanghai Deep Sea Fisheries Company, Ltd.	8
Shenzhen Shuiwan Pelagic Fisheries Company, Ltd.	7
Zhejiang Ocean Family Company, Ltd.	7
Fujian Changfeng fishery Co., Ltd	6
Rongcheng Deep-Sea Fisheries Company, Ltd.	6
Dalian Jinguang Fishery Company, Ltd.	6
Dalian Changhai Ocean Fisheries Company, Ltd.	6

<sup>392</sup> GHA personal communication with Maurice Brownjohn, former commercial manager for the PNA, March 23, 2023.

<sup>393</sup> Campling et.al. 2017. Op. cit., pg. 171.

<sup>394</sup> GHA personal communication with Maurice Brownjohn, former commercial manager for the PNA, March 23, 2023.

<sup>395</sup> Campling et al. 2017. Op. cit., pg. 171.

Company	Number of Vessels
Zhong Yu Global Seafood Corporation	6

Source: IEc/GHA Vessel Compilation analysis

Data are not available in most cases to distinguish whether these vessels fish albacore and/or tropical tuna, but most are likely involved in catching bigeye, yellowfin, and albacore tunas. Of the companies identified in Table 118 as being heavily involved in Chinese longline fishing, two are worth noting due to their particular involvement in the albacore fishery.<sup>396</sup>

The first company is Ping Tai Rong Ocean Fishery Group Co. Ltd. It is a privately held company that focuses on distant water tuna longlining. Although more recent data identify the company as having 15 longline vessels, as of 2017, the company had (in all oceans) "...a fleet of 22 relatively new distant water longline vessels with -55°C freezers built between 2010 and 2015, and two older vessels built in 2006 with -35°C capability. The six newest vessels were built in 2015, and all vessels in the fleet are said to target albacore in the eastern portion of the WCPO as well as in the High Seas of the Eastern Pacific Ocean and the overlap area".<sup>397</sup> Four of these vessels are chartered to Kiribati Fish Ltd and have access to the Kiribati zone. Four have purchased access to the Cook Islands EEZ. The remaining vessels fish exclusively in the High Seas. The vessels come back to port every four years.<sup>398</sup> In the past, the company's albacore catches all went to canneries for processing. However, it appears that some of the fish has been sent for processing to their factory in Zhoushan (Zhejiang Rongzhou Marine Industry Co. Ltd.) and sent as loins for the Japanese sashimi market.<sup>399</sup>

The other company is Shanghai Deep Sea Fisheries Co. Ltd. The company operates three large ULT longline vessels and five albacore freezer longline vessels in association with Kiribati Fish Ltd. In 2014, Kiribati Fish Ltd. started operations in Tarawa, Kiribati for the purpose of processing fish at low temperatures. The company is owned by the government of Kiribati (40 percent), Golden Ocean Fish Ltd of Fiji (40 percent), and Shanghai Deep Sea Fisheries Co. (20 percent). It is not clear if the company is currently processing loins in Kiribati.<sup>400</sup>

### *China's Exports of Albacore*

In 2019, China exported 20,050 mt of fresh and frozen albacore, with Thailand being the main recipient, importing 12,828 mt or 64 percent of China's total exports of albacore for that year. As China's fleet operates in all three main ocean areas, it is not possible to identify how much of this fish may have originated in the Pacific Ocean. Spain, Vietnam, and the Philippines, accounted for a combined 23 percent of the total exports. Table 119 shows China's 2019 exports of raw fresh and frozen albacore tuna.

It is worth noting that both Japan and Samoa registered some imports of frozen albacore from China. In the first case, based on professional industry knowledge of Guillermo Gomez, GHA, it is likely that the Japanese imports

<sup>396</sup> Per professional industry knowledge of Guillermo Gomez, GHA.

<sup>397</sup> Campling et.al. 2017. Op. cit., pg. 184.

<sup>398</sup> Campling et.al. 2017. Op. cit., pg. 184. It is not known if this trend has continued since publication of this source.

<sup>399</sup> Campling et.al. 2017. Op. cit., pg. 184.

<sup>400</sup> GHA personal communication with Maurice Brownjohn, former commercial manager for the PNA, March 23, 2023.

represented sashimi-grade quality albacore, whereas the imports into Samoa likely represented product that was destined for the canned market.

China also registered exports of 98,195 mt of all processed tuna under HS Code 1604014 (half of which went to Spain, Thailand, and Algeria) and 100,217 mt of “Other” processed tuna (all species) under HS Codes 030487, 030499, and 030349 (primarily to Japan and Korea). It is possible that some of these Chinese exports may include processed albacore under one or several of these codes, but the data do not allow us to make this distinction, nor is it possible to tell whether the Chinese exports of processed tuna under HS Code 160414 are in canned/pouched or cooked loin form.

Table 120 and Table 121 show 2019 China’s exports of processed tuna products (HS Code 1604.14) and 2019 China’s exports of “Other” tunas.

**Table 119. China: Exports of Fresh/Chilled and Raw Frozen Albacore Tuna by Importing Country, 2019 (mt of product weight)**

Albacore					30231	30341
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Thailand	12,828	64%	64%	-	12,828
2	Spain	2,312	12%	76%	-	2,312
3	Vietnam	1,222	6%	82%	-	1,222
4	Philippines	1,077	5%	87%	-	1,077
5	Japan	995	5%	92%	-	995
6	Samoa	962	5%	97%	-	962
7	Ecuador	526	3%	99%	-	526
8	Canada	50	0%	100%	13	37
9	Other Asia, nes (Taiwan)	49	0%	100%	-	49
10	USA	29	0%	100%	-	29
>10	Others	0	0%	100%	-	0
<b>Total</b>		<b>20,050</b>			<b>13</b>	<b>20,037</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

Table 120. China: Exports of Processed Tuna Products by Importing Country, 2019 (mt of product weight)

PROCESSED				
Rank	Importer	Total	Percent	Cum. Percent
1	Spain	25,059	26%	26%
2	Thailand	12,812	13%	39%
3	Algeria	10,902	11%	50%
4	Mexico	6,345	6%	56%
5	Israel	4,832	5%	61%
6	Oman	3,434	3%	65%
7	Venezuela	3,328	3%	68%
8	Peru	2,808	3%	71%
9	USA	2,677	3%	74%
10	Vietnam	2,244	2%	76%
>10	Others	23,754	24%	100%
Total		98,195		

Source: BACI

Note: Includes prepared and preserved fish preparations (HS Code 1604.14), including Tropical Tunas, Albacore, and Tuna-Like Species.

Table 121. China: Exports of “Other” Processed Tuna by Importing Country, 2019 (mt of product weight)

OTHER					0304.87	0303.49
Rank	Importer	Total	Percent	Cum. Percent	Tuna, Non-Specific, Fillets, Frozen	Tuna, Other, Frozen
1	Japan	11,273	50%	50%	11,267	6
2	Russian Federation	3,686	16%	66%	3,686	-
3	Thailand	2,029	9%	75%	316	1,713
4	Vietnam	784	3%	78%	70	714
5	South Korea	643	3%	81%	618	24
6	Turkey	583	3%	84%	583	-
7	USA	527	2%	86%	527	-
8	Costa Rica	500	2%	88%	-	500
9	Côte d'Ivoire	468	2%	90%	-	468
10	Fiji	463	2%	92%	27	436
>10	Others	1,783	8%	100%	1,363	420
Total		22,738			18,458	4,280

Source: BACI

Note: “Other” tuna includes HS Codes 0304.87 and 0303.49

## Taiwan

Taiwan is a major participant in the longline fishery for albacore in the Pacific at the harvest level.

### Taiwan's Pacific Albacore Catch

In 2019, Taiwan's longline catch of albacore tuna in the Pacific was 18,603 mt.

### Taiwan's Pacific Longline Fleet

According to the vessel registers of both the WCPFC and the IATTC, Taiwan has a total of 573 longline vessels authorized to fish in the Pacific in 2021. These longline vessels fish for bigeye, yellowfin, and albacore tunas so it is difficult to determine how many of them are engaged exclusively or primarily in albacore fishing.

The Taiwan Tuna Fishing Association, a longline association that represents distant water fishing longline vessels larger than 100 gross tons (GT), claims that in 2017, there were between 60 and 80 longline vessels

active in the Pacific Ocean, of which 50 were targeting sashimi-grade tuna (yellowfin and bigeye) and 20 to 30 vessels were targeting albacore for the canning industry.<sup>401</sup>

The Taiwan Fishery Agency separates longline vessels into two classifications: the STLL fleet, which include vessels between 20 and 99 GT, and LTLL fleet vessels greater than 100 GT. According to this Agency, in 2015, the total number of vessels over 100 GT was 76, and the number of vessels under 100 GT was 1,306.<sup>402</sup> This number differs from the RFMO data for 2021, likely reflecting adjustments in the size of the fleet, possibly related to reflagging. Most of the Taiwanese fleet is registered in Taiwan, however, there are vessels that operate under flags of convenience, such as Vanuatu, or under charter arrangements with PICs.

The STLL vessels have been upgrading their refrigeration systems to improve quality and handle ULT to minus 60 degrees Celsius. This fleet now can be divided into two groups: (1) vessels that target tropical tunas between 15 degrees North and 15 degrees South, which conduct fishing operations on a yearly basis and rely on transshipping to off-load their catches, refuel, and re-provision on the High Seas, and (2) vessels that target albacore and usually come into port in PICs to land their catches, refuel and provision.

In 2015, the STLL fleet albacore catch within the WCPFC area was 4,813 mt; the LTLL albacore catch for that same year was 5,226 mt in the WCPFC convention area,<sup>403</sup> for a total combined catch of 10,039 mt. As indicated, the total Taiwanese albacore catch in 2019 was significantly larger (18,603 mt).

#### *Taiwan's Exports of Albacore*

Because Taiwan has no albacore processing facilities, all of its exports are in raw, frozen form. In 2019, Taiwan reported exports of raw, frozen albacore of 50,585 mt. Thailand was the main recipient of these fish, importing 17,106 mt or 33 percent of Taiwan's total albacore exports. Table 122 shows Taiwan's 2019 exports of albacore tuna.

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<sup>401</sup> Campling et.al. 2017. Op. cit., pg. 139.

<sup>402</sup> Campling et.al. 2017. Op. cit., pg. 140.

<sup>403</sup> Campling et.al. 2017. Op. cit., pg. 140.



Table 122. Taiwan: Exports of Fresh/Chilled and Raw Frozen Albacore Tuna by Importing Country, 2019 (mt of product weight)

ALBACORE					30231	30341
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Thailand	17,106	33%	33%	-	17,106
2	Japan	6,541	13%	46%	-	6,541
3	South Africa	5,332	10%	56%	-	5,332
4	American Samoa	4,390	9%	65%	-	4,390
5	Mauritius	4,371	8%	73%	-	4,371
6	Uruguay	3,866	7%	81%	-	3,866
7	Vietnam	2,524	5%	86%	-	2,524
8	Solomon Islands	1,800	3%	89%	-	1,800
9	Fiji	1,533	3%	92%	-	1,533
10	Trinidad and Tobago	892	2%	94%	-	892
>10	Others	3,228	6%	100%	-	3,228
Total		51,585			-	51,585

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

It should be noted that BACI data do not identify the ocean region source of the albacore, and Taiwan's longline fleet operates and delivers their catch in the Pacific, Atlantic, and Indian Oceans. The exports from Taiwan of albacore into South Africa and Mauritius shown in Table 122 are consistent with the operations of Taiwanese longline vessels fishing in the Indian Ocean. Taiwanese exports to Japan shown in the table are likely associated with sashimi-grade albacore.<sup>404</sup> Taiwanese raw, frozen albacore exports to American Samoa (Starkist plant owned by Dongwon), the Solomon Islands, and Fiji shown in Table 122 are consistent with operations of longline Taiwanese vessels operating in the Pacific, with the involvement of FCF Fishery Co. Ltd., as indicated earlier.

#### *Key Taiwanese Companies Involved in the Albacore Fishery*

FCF Fishery Co. Ltd. is a major player in Taiwan's tuna longline fleet, whether the fleet is catching tropical tunas or temperate tunas (albacore). On average, FCF handles approximately 600,000 mt of tuna per year, of which 80,000 mt are sashimi-grade tuna caught by longline vessels. Of this, about 50,000 mt are albacore, and

<sup>404</sup> Per professional industry knowledge of Guillermo Gomez, GHA.

the remaining 30,000 mt are tropical tunas. Most of the purchases of albacore by FCF Fishery Co. Ltd., are done under supply contracts, but some of the fish is also purchased on the spot market.<sup>405</sup>

FCF Fishery Company's most important involvement in the Pacific longline albacore fishery is in organizing carrier vessels, fuel, bait, and other supplies delivered at sea or at a port. The company is also the major buyer of the Chinese longline-caught albacore that goes to the Bumble Bee-associated Pacific Fishing Company processing plant in Suva, Fiji, as well as for the albacore that gets delivered to Bangkok and to Starkist plant in American Samoa.<sup>406</sup> Four other Taiwanese companies are important participants in longline-caught albacore and tropical tunas in the Pacific: Ming Dar Fishery (Vanuatu) Co. Ltd;<sup>407</sup> Yuh Yow Fishery Co Ltd., and Lung Soon Fishery Co Ltd (LS).<sup>408</sup>

## Japan

Japan is a significant participant in the Pacific longline fishery for albacore at the harvest level.

### *Japan's Pacific Albacore Longline Catch*

In 2019, Japan recorded a Pacific longline albacore catch of 3,271 mt. However, other sources indicate that the 2019 albacore longline catch (including the coastal, and offshore, and distant longliner categories described in the next section) amounted to 10,144 mt.<sup>409</sup>

### *Japan's Pacific Albacore Longline Fleet*

As described in Chapter 7, the Japanese longline fleet can be classified into three categories- coastal, offshore, and distant water, based on the areas in which the vessel fish and the vessel size. In 2019, the Japanese fleet was made up of 393 vessels. Approximately 62 percent of the fleet corresponded to the smaller offshore vessels category.<sup>410</sup> In 2017, this fleet caught about 73 percent of the total Japanese longline catch of tropical tuna and albacore.<sup>411</sup> Unlike tropical tuna, albacore is targeted at subtropical and temperate latitudes both north and south of the equator between 15 degrees and 40 degrees north and south.<sup>412</sup>

Information on the companies owning Japanese longline vessels was provided in Chapter 7.

### *Japan's Imports of Albacore*

In 2019, Japan imported 11,518 mt of albacore, of which 41 mt corresponded to fresh/chilled albacore, and the balance, 11,477 mt, was frozen whole albacore. Taiwan was the main supplier of frozen albacore to Japan with

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<sup>405</sup> Campling et.al. 2017. Op. cit., pg. 149.

<sup>406</sup> Campling et.al. 2017. Op. cit., pg. 140

<sup>407</sup> OPRT. 2023b. Ming Dar Fishery (Vanuatu) Co., Ltd. Viewed at <http://oprt.or.jp/eng/members/ming-dar-fishery-vanuatu-co-ltd/>, March 22, 2023.

<sup>408</sup> Lung Soon Ocean Group. 2023. Company website. Viewed at <http://www.lungsoon.com/>, March 22, 2023.

<sup>409</sup> WCPFC. 2022f. Op. cit.

<sup>410</sup> WCPFC. 2022f. Op. cit.

<sup>411</sup> MRAG Asia-Pacific. 2019. Op. cit., pg. 55.

<sup>412</sup> MRAG Asia-Pacific. 2019. Op. cit., pg. 55.

6,541 mt or 57 percent of Japan's total albacore imports. Vanuatu, Korea, and China together contributed 4,296 mt or 37 percent. Table 123 shows Japan's 2019 imports of albacore.

**Table 123. Japan's Imports of Fresh/Chilled and Raw Frozen Albacore by Exporting Country, 2019 (mt of product weight)**

ALBACORE					30231	30341
Rank	Exporter	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Other Asia, nes (Taiwan)	6,541	57%	57%	-	6,541
2	Vanuatu	2,305	20%	77%	-	2,305
3	South Korea	996	9%	85%	-	996
4	China	995	9%	94%	-	995
5	Seychelles	424	4%	98%	-	424
6	Fiji	103	1%	99%	3	100
7	Tuvalu	56	0%	99%	-	56
8	Singapore	45	0%	100%	-	45
9	New Caledonia	38	0%	100%	38	-
10	Senegal	9	0%	100%	-	9
>10	Others	7	0%	100%	0	7
<b>Total</b>		<b>11,518</b>			<b>41</b>	<b>11,477</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

### *Japan's Exports of Albacore*

Historically, Japan's albacore catches were destined for the canned export market; however, increasingly, longline albacore catches that are suitable for sashimi remain in the Japanese market and/or are exported as such to other countries.

Japan exported 8,418 mt of frozen albacore to Vietnam and Thailand. Their combined imported quantity represented 97 percent of Japan's total albacore exports. Table 124 shows Japan's 2019 exports of frozen albacore.

Table 124. Japan: Exports of Fresh/Chilled and Raw Frozen Albacore by Importing Country, 2019 (mt of product weight)

ALBACORE					30231	30341
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Vietnam	4,246	50%	50%	-	4,246
2	Thailand	3,899	46%	97%	0	3,899
3	Mexico	119	1%	98%	-	119
4	China, Hong Kong SAR	46	1%	99%	-	46
5	USA	37	0%	99%	-	37
6	Spain	27	0%	99%	-	27
7	Philippines	24	0%	100%	-	24
8	South Africa	6	0%	100%	-	6
9	Colombia	5	0%	100%	-	5
10	Guam	3	0%	100%	3	-
>10	Others	7	0%	100%	2	5
Total		8,418			4	8,413

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

## Korea

At one time, Korea caught significant quantities of albacore by longline gear. Although Korea still catches some albacore, its participation has dropped, as its longline fleet focuses more heavily on tropical tuna.

### Korea's Pacific Longline Albacore Catch

Korea's longline vessels registered at the WCPFC target primarily tropical tuna and registered a catch of 35,936 mt. Korea's longline albacore catch in 2019 was only 2,634 mt or about seven percent of the country's total longline catches of 35,936 mt for all tuna. Part of the Korean catches of frozen albacore went to the Japanese frozen sashimi market and part was destined for the U.S. canned albacore market.

### Korea's Pacific Longline Albacore Fleet

In 2019, Korea had 102 longline vessels registered with the WCPFC. Most of the vessels in the Korean longline fleet are relatively large, ranging between 353 and 488 gross tons, with an average holding capacity of approximately 400 mt. The vessels are equipped with freezing equipment that can bring temperatures down to -60 degrees Celsius. Information is not available as to how many vessels currently focus on catching albacore. In the past, Korean longline vessels targeted albacore; however, with the introduction of ultra-low temperatures at

minus 60 degrees Celsius, the Korean fleet has now focused on targeting mainly tropical tuna, with albacore catches in the recent past accounting for as little as 5 percent or less of the catch.

#### *Korean Exports of Albacore*

The Korean longline fishery exported 2,047 mt of albacore in 2019, which represented approximately 78 percent of its longline albacore catch. Japan was the primary beneficiary of these exports, absorbing 996 mt or almost 50 percent of all Korean exports of albacore. Western Samoa received 415 mt of albacore. It is not clear why Korea may have exported this volume of albacore to Western Samoa since there is no processing facility there.<sup>413</sup>

American Samoa received 314 mt, which probably consisted of direct deliveries of albacore to the Starkist plant owned by the Korean company Dongwon. Table 125 shows Korean exports of albacore in 2019.

**Table 125. Korea: Exports of Raw Frozen Albacore by Importing Country, 2019 (mt of product weight)**

ALBACORE					30231	30341
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Japan	996	49%	49%	-	996
2	Samoa	415	20%	69%	-	415
3	American Samoa	314	15%	84%	-	314
4	USA	76	4%	88%	-	76
5	Thailand	53	3%	91%	-	53
6	Ecuador	50	2%	93%	-	50
7	Canada	46	2%	95%	-	46
8	Philippines	27	1%	97%	-	27
9	Portugal	26	1%	98%	-	26
10	Vietnam	25	1%	99%	-	25
>10	Others	20	1%	100%	-	20
<b>Total</b>		<b>2,047</b>			-	<b>2,047</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

<sup>413</sup> One possible explanation for this activity is that Korea may have landed the fish in Western Samoa and exported it again without any processing occurring.

## Pacific Albacore Local Fishing Nations

Several PICs, including French Polynesia, Vanuatu, and Fiji, as well as the U.S. (American Samoa), among others, have longline fleets that fish for albacore in surrounding waters. The most important of these nations in terms of albacore catch are discussed below.

### Fiji

As previously discussed, Fiji is a major albacore processing hub that imports and exports albacore; in addition, it is a significant participant in the albacore longline fishery at the harvest level.

#### *Fiji's Albacore Longline Catch and Fleet*

Among the PICs, Fiji is one of the countries with the largest longline albacore catches in the region. In 2019, Fiji caught 9,072 mt of albacore. Compiled data for 2021 indicate that Fiji had a longline fleet of 47 vessels. However, more recent data submitted to the WCPFC by the Fiji Offshore Fisheries Division of the Ministry of Fisheries in June of 2022 indicated the catch was 8,588 mt and the fleet comprised 93 vessels.<sup>414</sup>

The Ministry's report indicates that Fiji's longline fleet operates within its EEZ, the High Seas, and in the EEZ of neighboring States in which the fleet is licensed and allowed to fish. According to the report, 2020 and 2021 were unprecedented years for the longline fleet, since COVID had an impact on the community that resulted in diminished catches. Fiji's longline fleet declined from a high of 96 vessels in 2018 to 67 vessels in 2021.<sup>415</sup> Also, the lack of flights in and out of Fiji due to COVID limited the exports of fresh tuna to the U.S. and other markets.

Unlike other tuna longline fleets, albacore is a major part of the Fiji's longline catch. Fiji's albacore catches over the period 2017 to 2021 averaged 8,107 mt; on average, albacore represented 57 percent of the total annual catches of 14,298 mt by Fiji's longline fleet during this period. Table 126 shows Fiji's annual longline catches of albacore, bigeye, yellowfin, and other tuna-like species for the 2017 to 2021 period.

**Table 126. Fiji: Annual Longline Catches of Albacore, Bigeye, Yellowfin, and other Tuna-Like Species, 2017 - 2021 (mt)**

TOTAL ANNUAL CATCH [MT] FOR FIJI NATIONAL LONGLINE FISHING FLEET 2017 - 2021					
Species	2017	2018	2019	2020	2021
Albacore	9,837	9,327	8,588	6,320	6,463
Bigeye	1,083	879	1,144	692	477
Yellowfin	4,638	2,695	3,664	4,279	2,477
Tuna-Like Species	2,375	2,159	1,940	1,512	943
Total [MT]	17,933	15,060	15,336	12,803	10,360

<sup>414</sup> WCPFC, 2022j. Scientific Committee Eighteenth Regular Session. Annual Scientific Report to the Western and Central Commission, Part 1. Information on Fisheries, Research, and Statistics for 2021 (Fiji). WCPFC-SC18-AR/CCM-07. Downloaded from <https://meetings.wcpfc.int/node/15322>, April 25, 2023.

<sup>415</sup> WCPFC. 2022j. Op. cit.

Source: WCPFC, 2022. Scientific Committee Eighteenth Regular Session. Annual Scientific Report to the Western and Central Commission, Part 1. Information on Fisheries, Research, and Statistics for 2021. WCPFC-SC18-AR/CCM-07

Ownership of Fiji's fishing vessels was distributed among 16 companies in 2021, as shown in Table 127.

**Table 127. Fiji: Longline Fleet Ownership**

Company	Number of Tuna Longliners
Solander Pacific Limited	11
Sunshine Fisheries Pte Ltd	7
Rising Fisheries Pte Ltd	5
Hangton Pacific Co Pte Ltd	3
Yong Xing Fisheries (Fiji) Ltd	3
Hsinlong Fisheries Ltd	3
Wistar Fiji Ltd	3
Winfull Fishing Co Ltd	2
Ocean Harvest (Fiji) Ltd	2
Zhong Da Company Limited	2
Fengyuh Fisheries Ltd	1
He Shun Fishing Company Pte Ltd	1
Fiore Marine PTE Limited	1
Green Tuna Fisheries Company Limited.	1
Sea Quest Vessel Leasing Ltd	1
Services Marine Ltd	1
<b>Total</b>	<b>47</b>

Source : IEc/GHA Vessel Compilation analysis

## French Polynesia

French Polynesia is a significant participant in the longline fishery for albacore in the Pacific at the harvest level.

### *French Polynesia Albacore Longline Catch and Fleet*

In 2019, the Pacific longline albacore catch of French Polynesia was 5,822 mt (including both the WCPFC and IATTC convention areas). In 2021, the French Polynesian fleet included three longliners with freezing capacity that are registered with the WCPFC and operate inside French Polynesia's EEZ.

According to the French Polynesian government, in 2021, the French Polynesia tuna fleet comprised 73 tuna longline vessels. These vessels range in length from 13 to 24 meters and they operate within the country's EEZ. In addition, there are 354 smaller artisanal boats of five to eleven meters in length; these vessels use different gears, such as pole-and-line, handlines, troll, etc. The artisanal vessels fish in the territorial sea.<sup>416</sup>

The commercial catch of all tuna species by the 73 vessels in 2021 was 8,923 mt; albacore accounted for 2,945 mt or 33 percent of the catch.<sup>417</sup>

#### *French Polynesia Exports of Pacific Albacore*

In 2019, French Polynesia exported 262 mt of fresh and 12 mt of frozen albacore, mostly to the U.S. (including American Samoa). These volumes are insignificant compared to the exports of the DWFN discussed in previous sections. Table 128 shows the 2019 French Polynesian exports of albacore. The destination of the albacore catches that were not reported here as exports is unknown.

**Table 128. French Polynesia: Exports of Fresh/Chilled and Raw Frozen Albacore by Importing Country, 2019 (mt of product weight)**

ALBACORE					30231	30341
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	USA	262	92%	92%	262	-
2	American Samoa	12	4%	96%	-	12
3	France	9	3%	99%	-	9
4	Canada	1	0%	100%	1	-
5	Chile	1	0%	100%	1	-
6	Singapore	0	0%	100%	-	0
<b>Total</b>		<b>285</b>			<b>264</b>	<b>21</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

<sup>416</sup> WCPFC. 2022g. Scientific Committee, Eighteenth Regular Session (August 2022), Part1: Information on Fisheries, Research and Statistics. WCPFC-SC18-AR/CCM-08 FRENCH POLYNESIA. Downloaded from <https://meetings.wcpfc.int/node/15323>, April 24, 2023.

<sup>417</sup> WCPFC. 2022g. Op. cit., pg. 1. Albacore catches of 2,945 mt in 2021 were down substantially from the 5,822 mt reported in 2019. This was because of both the impact of the COVID pandemic and the fact that the 2019 data did not include catches in the IATTC convention area.



## Vanuatu

Like other PICs, Vanuatu is a significant participant in the longline fishery for albacore in the Pacific at the harvest level.

### *Vanuatu's Albacore Catch and Fleet*

In 2019, Vanuatu registered an albacore catch of 5,063 mt. In 2021, Vanuatu had a longline fleet of 68 vessels, according to the WCPFC vessel register. A recent report by the government of Vanuatu to the WCPFC indicates that in 2021, Vanuatu caught 6,090 mt of albacore and had 78 longliners of which 56 were active with licenses to fish in the WCPFC convention area.<sup>418</sup>

Vanuatu's albacore catch is taken by a longline fleet controlled mainly by Taiwanese interests, which take advantage of Vanuatu's International Shipping Registry to re-flag their vessels under this "flag of convenience".<sup>419</sup>

Albacore is the main species caught by Vanuatu's fleet. In 2021, the fleet registered an albacore catch of 6,090 mt, which is the highest ever recorded under Vanuatu's flag (the lowest, which was in 2014, was 4,741 mt).<sup>420</sup>

Vanuatu does not have land-based processing facilities where its albacore catch could be processed. Therefore, Vanuatu's catch is normally sold/transshipped to reefer carrier vessels arranged for export by FCF Fishery Co., Ltd.<sup>421</sup>

### *Vanuatu's Exports of Albacore*

In 2019, Vanuatu's albacore export amounted to 4,271 mt, all of which was whole frozen fish. Japan absorbed 2,305 mt or 54 percent of Vanuatu's total albacore exports, with Thailand taking 1,911 mt or 45 percent of the exports. Table 129 shows Vanuatu's 2019 exports of albacore.

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<sup>418</sup> WCPFC. 2022h. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission. Part 1: Information on Fisheries, Research, and Statistics. WCPFC-SC18-Ar/CCM-28. The Republic of Vanuatu Fisheries Department. Downloaded from <https://meetings.wcpfc.int/node/15343>, April 24, 2023.

<sup>419</sup> WCPFC. 2022h. Op. cit.

<sup>420</sup> WCPFC. 2022h, Op. cit., pg. 4.

<sup>421</sup> Campling et.al. 2017. Op. cit., pg. 149.

Table 129. Vanuatu: Exports of Raw Frozen Albacore by Importing Country, 2019 (mt of product weight)

ALBACORE					30231	30341
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Japan	2,305	54%	54%	-	2,305
2	Thailand	1,911	45%	99%	-	1,911
3	Other Asia, nes (Taiwan)	49	1%	100%	-	49
4	South Korea	6	0%	100%	-	6
Total		4,271			-	4,271

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

### United States

The U.S. has both longline and troll/pole-and-line fisheries that catch albacore in the Pacific. Some of the catches occur within the WCPFC convention area, some take place within the IATTC convention area, and some occur in the North Pacific outside of the jurisdiction of either of the two tuna RFMOs. Catches taking place in the North Pacific are monitored by the International Scientific Committee for Tuna and Tuna Like Species in the North Pacific Ocean, which coordinates their activities with both tuna RFMOs. This section focuses on the U.S. albacore longline fishery; the activities of the U.S. troll/pole-and-line fisheries are discussed later in this chapter.

#### *U.S. Albacore Longline Catch and Fleet*

In 2019, the total U.S. longline catches of albacore amounted to 2,035 mt. Five percent (112 mt) of the catch occurred in the North Pacific, while 1,923 mt were caught in the South Pacific. The longline catch has fluctuated over the past few years, with the catch in 2020 reaching 2,526 mt and the catch in 2021 declining to 1,480 mt.<sup>422</sup>

In 2019, the U.S. and Participating Territories' tuna longline fleet comprised 156 vessels. In 2021, the number of vessels in the fleet had dropped to 149, as shown in Table 130 below. The U.S. tuna longline fleet is diverse and is homeported in Hawaii and its Participating Territories (American Samoa, Guam, and the Commonwealth of the Northern Marianas Islands) in the Pacific. The vessels in this fleet (especially those in Hawaii) catch tropical tunas and occasionally target albacore.

The vessels that are homeported in American Samoa and in some of the territories focus their fishing effort more on albacore, which is delivered to the Starkist plant in Pago Pago, American Samoa, although they also target

<sup>422</sup> WCPFC. 2022i. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission. Part 1: Information on Fisheries, Research, and Statistics. WCPFC-SC18-Ar/CCM-27 (Rev.02), submitted by the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), pp. 3-6.

tropical tuna. The longline fleet catches albacore in both in the North and South Pacific (north or south of the equator), but most of their catches take place in the South Pacific.<sup>423</sup>

Table 130 provides estimates of the U.S. and Participating Territories' longline fleet operating in the WCPFC convention area.

**Table 130. United States: Estimated Number of United States and Participating Territories Longline Vessels Operating in the WCPFC Statistical Area**

Vessel Homeported	2017	2018	2019	2020	2021
North Pacific-Based (a)	136	136	138	135	137
American Samoa-Based (b)	118	113	127	122	24
Total U.S. Tuna Longline Vessels	150	151	156	146	149

Source: Table prepared by IEc/GHA using data from the NWCPFC, 2022. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission. Part 1: Information on Fisheries, Research, and Statistics. WCPFC-SC18-Ar/CCm-27 (Rev.02), submitted by the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS).

Notes:

1. Includes Hawaii and California-based vessels that fish west of 150 W.
2. Some longline vessels fished in both Hawaii and American Samoa and are counted only once in the U.S. longline totals.

### *U.S. Imports of Albacore*

As the primary end market for longline-caught albacore, the U.S. did not export significant quantities of albacore,<sup>424</sup> but it did import fresh/chilled and frozen whole albacore. Landings in American Samoa by non-U.S. fleets do not appear to register as U.S. imports, nor does product arriving in mainland U.S. from American Samoa or other U.S. territories.

In 2019, the U.S. imported 2,270 mt of albacore. Of this, 1,508 mt were fresh/chilled albacore and 762 mt corresponded to whole frozen albacore that is eventually canned (Vanuatu does not process albacore into precooked loins). The top countries supplying the U.S. with albacore were Ecuador, Canada, Fiji, and French Polynesia. Together these countries accounted for 87 percent of the total U.S. imports of albacore in 2019. The data do not distinguish whether the albacore imported was caught by longline or troll/pole-and-line, but based on professional industry knowledge of Guillermo Gomez, GHA, the only countries exporting to the U.S. that fish using troll/pole-and-line are Canada and New Zealand, so all other U.S. albacore imports were longline caught. Table 131 shows the 2019 U.S. imports of fresh/chilled and frozen whole albacore.

<sup>423</sup> WCPFC. 2022i. Op. cit.

<sup>424</sup> This is not true of troll/pole-and-line-caught albacore, much of which is currently exported (primarily to Spain), as discussed later in this chapter.

Table 131. United States: Imports of Fresh/Chilled and Raw Frozen Albacore by Exporting Country, 2019 (mt of product weight)

ALBACORE					30231	30341
Rank	Exporter	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Ecuador	839	37%	37%	839	-
2	Canada	486	21%	58%	35	451
3	Fiji	397	17%	76%	339	57
4	French Polynesia	262	12%	87%	262	-
5	South Korea	76	3%	91%	-	76
6	Japan	37	2%	92%	-	37
7	Vietnam	30	1%	94%	-	30
8	China	29	1%	95%	-	29
9	New Zealand	25	1%	96%	1	25
10	South Africa	24	1%	97%	0	24
>10	Others	64	3%	100%	33	32
	<b>Total</b>	<b>2,270</b>			<b>1,508</b>	<b>762</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

### US Exports of Albacore

Because the U.S. albacore market generally prefers the white meat of longline-caught albacore, and U.S. albacore consumption far exceeds its own catches, virtually no longline-caught albacore is exported from the U.S.

### Pacific Albacore Troll/Pole-and-Line Fishery

Although most Pacific albacore catches are by longline vessels, fleets from the U.S., Canada, New Zealand, and Japan catch albacore using pole-and-line or troll fishing gear. Unlike longline vessels, the troll and pole-and-line vessels have very few incidental catches of other species besides albacore; the main reason is that each fish is individually caught, and the fishermen can release any unwanted species that are incidentally caught.

These fleets tend to target smaller, younger albacore that swim near the surface of the ocean. These fish have higher fat content in their bodies and tend to weigh between eight and 15 pounds. Once cooked, the color of the flesh of these albacore is “pinkish” and is preferred in markets such as Spain and other E.U. markets. The combined estimated albacore catches of these four countries by troll and pole-and-line vessels in the Pacific in 2019 was 21,670 mt, compared to 102,847 mt caught by longline in the Pacific. The countries and their 2019

reported catches were: the U.S. (7,766 mt);<sup>425</sup> Canada (2,402 mt);<sup>426</sup> New Zealand (2,751 mt);<sup>427</sup> and Japan (8,751 mt).<sup>428</sup>

## Processing and Markets for Troll/Pole-and-Line Caught Albacore

The troll/pole-and-line fleets of the U.S., Canada, and New Zealand have obtained MSC certification, which has allowed them to expand their domestic and export markets. The albacore caught by the U.S. and Canadian troll/pole-and-line albacore fleets has traditionally been destined primarily for the U.S./Canadian canned markets; in recent years, a significant portion is exported to Spain, as explained in more detail below. New Zealand's albacore catches are either exported to Thailand for processing and then sent to the U.S. market or more recently, to Spain, where New Zealand fish enjoys a very good reputation. Japan's albacore catches are mainly consumed domestically as sashimi; any surplus is exported to Thailand for processing and eventual export to the U.S. market.

Traditionally, the catches of the U.S. and Canadian vessels that fish for albacore off the Pacific Northwest coast of North America were sold to the main tuna brands: Bumble Bee, Chicken of the Sea, and Starkist. These three brands used to have tuna processing plants in the continental U.S., where they canned the albacore from this fleet and sold it together with any other albacore they imported from around the world.

With the closure of all U.S. tuna processing plants in the early 1980s,<sup>429</sup> the major brands contracted with local companies known as buying stations spread along the Pacific coast to purchase the albacore on their behalf and ship it to American Samoa or other locations where the three major brands then processed albacore.

The cost of shipping the fish was deducted from the final price paid to the fishermen and the buying station charged a fee for its service. In the early 2000s, the troll/pole-and-line fleet struggled to work under this system, since the prices they received were barely enough to cover their fishing costs. In response to this situation, the tuna trading company Tri-Marine and a few other entrepreneurs started to explore export markets in the E.U. for troll/pole-and-line albacore.

The albacore caught off the Pacific coast by the U.S. and Canadian fleets was the same species that the Spanish and French fishermen were catching in the Cantabrian Sea, known there as "Bonito del Norte." The Spanish albacore season coincided with that of the U.S. in the Pacific. When the demand for fresh-caught Spanish albacore by the consumers in Spain was too high, tuna processors that canned Bonito del Norte started to experience shortages of fish. The U.S. and Canadian troll/pole-and-line caught albacore became an alternative raw material source for these Spanish processors. From 2005 onward, the U.S. troll/pole-and-line fleet started to

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<sup>425</sup> International Scientific Committee for Tuna and Tuna Like Species in the North Pacific Ocean. 2022, Kona, Hawaii, July 12-18, 2022. Plenary 09. National Report of USA (USA Fisheries and Research on Tuna and Tuna Like Fisheries in the North Pacific Ocean). NOAA, NMFS, USA. Page 26 and Table 2, Page 29.

<sup>426</sup> 20th Meeting of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean, Plenary 4, ISC/20/Plenary /4. National Report on Canadian Tuna and Tuna-like Fisheries in the North Pacific in 2019. Table 1, Page 3.

<sup>427</sup> WCPFC. 2022l. Scientific Committee, Eighteenth Regular Session, Annual Report to the Commission Part 1: Information on Fisheries, Research and Statistics. WCPFC-SC-18-AR/CMM-16, Ministry for Primary Industries, New Zealand. Table 6, Page 9.

<sup>428</sup> WCPFC. 2022f. Op. cit., Table 6, pg. 13.

<sup>429</sup> Bumble Bee opened a partial processing plant in Santa Fe Springs, CA and Chicken of the Sea opened a similar operation in Lyons, GA decades later.

export increasing volumes of albacore to the Spanish market. Buying stations served as a liaison between Spanish buyers (canned tuna processors) and the U.S. and Canadian albacore fishermen.

The U.S. albacore troll/pole-and-line vessels belong to one of two major fishermen's associations, the Western Fishboat Owners Association (WFOA)<sup>430</sup> or the American Albacore Fishing Association (AAFA).<sup>431</sup> WFOA does not get involved in direct marketing the catches of its members, whereas AAFA does, deducting a fee from the final fish prices to cover its operational costs. AAFA members are also involved in selling their own canned albacore products under the brand American Tuna. This is a "raw" tuna pack that is cooked only once (in the can), unlike the traditional tuna canning process that involves cooking the fish once in the production of loins and again in the sealed can. AAFA has contracted with U.S. boutique canneries and canners in Costa Rica that custom pack their albacore to be sold under the American Tuna brand.<sup>432</sup> This product can be found in supermarkets like Whole Food Markets, for example.

Today, about half of the U.S./Canadian catch of troll/pole-and-line albacore is exported to Spain, where it is canned and sold under major albacore brands such as Ortiz, Albo, Serrats, Arroyabe, Campos, Isabel, and others.<sup>433</sup> About one quarter of the U.S./Canadian troll/pole-and-line albacore catch is consumed domestically in the U.S. and Canada as fresh/previously frozen albacore loins that have been processed domestically or abroad. The remaining approximately one quarter of the catch is processed as a high-quality canned product in Vietnam, Costa Rica, or a few very small boutique canneries on the Pacific Northwest coast. From time to time, depending on market conditions, some U.S.-caught albacore is exported whole frozen to Thailand for canning.

As mentioned above, whole, frozen, longline-caught albacore in the Pacific may go through the entire canning process in one facility, but it is often processed into pre-cooked albacore loins in one location and subsequently sent to final processing facilities owned by the main U.S. brands where the cooked loins are put into the can or pouch. U.S. imports of tuna loins (including albacore loins) avoid the tariffs associated with the importation of canned products, so it is often economically beneficial to do the final processing within the U.S. This issue does not apply to trade of canned/pouched tuna supplying markets in other countries. In the Pacific, there are five main locations where albacore longline catches are processed: Fiji, the Solomon Islands, American Samoa, Vietnam, and Thailand.

## Major Pacific Albacore Troll and Pole-and-Line Fishing Nations

The primary albacore fishing countries in the Pacific using troll and pole-and-line gear are the U.S., Canada, New Zealand, and Japan, described below.

### United States

As the main world market for canned and pouched albacore, the U.S. absorbs large volumes of Pacific albacore; in addition, it has an active troll/pole-and-line albacore fleet.

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<sup>430</sup> Western Fishboat Owners' Association. 2023. Organization website. Viewed at <http://www.wfoa-tuna.org/>, March 26, 2023.

<sup>431</sup> American Albacore Fishing Association, Inc. 2023. Viewed at <https://americanalbacore.com/aafa-newsletters>, March 26, 2023

<sup>432</sup> Viewed at <https://americantuna.com/>. Accessed April 1<sup>st</sup>, 2023.

<sup>433</sup> Professional industry knowledge of Guillermo Gomez, GHA.

*U.S. Troll/Pole-and-Line Albacore Catch and Fleet*

The catches of albacore by the U.S. troll/pole-and-line fleet reached a record in 1996 with 16,962 mt. During the period 2000 to 2015, catches remained relatively stable at around 11,000 to 12,000 mt.<sup>434</sup> However, since 2016, the catches have dropped substantially, reaching 4,209 mt in 2021, as shown in Table 132, below.

The U.S. troll/pole-and-line fleet that catches albacore is composed of relatively small vessels that are based along the U.S. west coast, from San Diego, California, in the south to Bellingham, Washington to the north. In 2019, this fleet was made up of 311 vessels; as previously mentioned, they belonged to either the WFOA<sup>435</sup> or AAFA.<sup>436</sup> AAFA membership includes the San Diego-based pole-and-line vessels that tend to catch almost two-thirds of the total yearly catch of albacore off the west coast. WFOA includes many small fishing vessels that alternate fishing for albacore and salmon every year.<sup>437</sup>

Table 132 presents the number of troll/pole-and-line vessels and the U.S. albacore catches by this fleet for the period 2015 to 2021, showing the significant decline in both fleet sizes and annual albacore catches since the peak in 2015/2016, especially from 2020 to 2021.

**Table 132. United States: Number of Troll/ Pole-and-line Vessels and Albacore Catches by this Fleet, 2015 - 2021 (mt)**

Year	Number of Troll & Pole-and-line Vessels	Albacore Catch (mt)
2015	574	11,597
2016	568	10,777
2017	517	7,431
2018	452	7,728
2019	556	7,766
2020	404	7,516
2021	311	4,209

Source: Table prepared by IEC/GHA using data from the International Scientific Committee for Tuna and Tuna Like Species in the North Pacific Ocean. 2022, Kona, Hawaii, July 12-18, 2022. Plenary 09. National Report of USA (USA Fisheries and Research on Tuna and Tuna Like Fisheries in the North Pacific Ocean). NOAA, NMFS, USA. Pages 26 and 29.

<sup>434</sup> International Scientific Committee for Tuna and Tuna Like Species in the North Pacific Ocean. 2022, Kona, Hawaii, July 12-18, 2022. Plenary 09. National Report of USA (USA Fisheries and Research on Tuna and Tuna Like Fisheries in the North Pacific Ocean). NOAA, NMFS, USA. Pp 26 and 29.

<sup>435</sup> Western Fishboat Owners' Association, 2023. Op. cit.

<sup>436</sup> American Albacore Fishing Association, Inc., 2023. Op. cit.

<sup>437</sup> GHA personal communication with Bob Pringle, Pringle Enterprises, April 2, 2023.

The troll/pole-and-line fleet operates mostly in the North Pacific during the albacore summer season in this hemisphere; however, a handful of U.S. vessels are engaged in catching albacore in the southern hemisphere. These vessels leave the U.S. in late February/early March and head towards French Polynesia, where they fish for several months. Some of these vessels unload their catches in Papeete, Tahiti, French Polynesia, and/or Auckland, New Zealand. Some vessels bring their catches back to the U.S. or deliver their catches to Canadian buyers. Fishing for this fleet has been poor lately. In 2022, the highline (most successful) vessel caught only 40 mt during the entire season, whereas in the past, this catch was close to 220 mt.<sup>438</sup>

### *U.S. Imports of Albacore*

Most imports of albacore into the U.S. were of longline-caught fish, as discussed in the albacore longline section above. In 2019, the U.S. imported 2,270 mt of albacore. Of this, 1,508 mt were fresh/chilled albacore and 762 mt corresponded to whole frozen albacore that is eventually canned. The top countries supplying the U.S. with albacore were Ecuador, Canada, Fiji, and French Polynesia. Together these countries accounted for 87 percent of the total U.S. imports of albacore in 2019. Table 133 shows the 2019 U.S. imports of fresh/chilled and frozen whole albacore.

**Table 133. United States: Imports of Fresh/Chilled and Raw Frozen Albacore by Importing Country, 2019 (mt of product weight)**

ALBACORE					0302.31	0303.41
Rank	Exporter	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Ecuador	839	37%	37%	839	-
2	Canada	486	21%	58%	35	451
3	Fiji	397	17%	76%	339	57
4	French Polynesia	262	12%	87%	262	-
5	South Korea	76	3%	91%	-	76
6	Japan	37	2%	92%	-	37
7	Vietnam	30	1%	94%	-	30
8	China	29	1%	95%	-	29
9	New Zealand	25	1%	96%	1	25
10	South Africa	24	1%	97%	0	24
>10	Others	64	3%	100%	33	32
<b>Total</b>		<b>2,270</b>			<b>1,508</b>	<b>762</b>

Source: BACI

<sup>438</sup> GHA personal communication with Bob Pringle, Pringle Enterprises, April 2, 2023



Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

### U.S. Exports of Albacore

The U.S. also exports some troll/pole-and-line-caught albacore. In 2019, the U.S. exported 5,962 mt of albacore; 405 mt consisted of fresh/chilled albacore that was exported mainly to Canada and Vietnam, and 5,557 mt of whole frozen albacore, with 92 percent of the exports sent to four main countries: Canada, Spain, Vietnam, and Thailand. Table 134 shows the 2019 U.S. exports of albacore. Most of the exports of whole frozen albacore are destined for canning, except for the exports to Canada, which are likely processed for sale as fresh/previously frozen steaks or loins for grilling.<sup>439</sup>

**Table 134. United States: Exports of Fresh/Chilled and Raw Frozen Albacore by Importing Country, 2019 (mt of product weight)**

ALBACORE					0302.31	0303.41
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Canada	2,632	44%	44%	100	2,532
2	Spain	1,121	19%	63%	-	1,121
3	Vietnam	927	16%	79%	295	633
4	Thailand	780	13%	92%	-	780
5	France	218	4%	95%	-	218
6	Costa Rica	156	3%	98%	-	156
7	Peru	46	1%	99%	-	46
8	South Africa	23	0%	99%	-	23
9	Ecuador	23	0%	99%	-	23
10	China	10	0%	100%	-	10
>10	Others	26	0%	100%	10	16
<b>Total</b>		<b>5,962</b>			<b>405</b>	<b>5,557</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

Most U.S. longline albacore catches occur near American Samoa and are directly unloaded at the main port there, Pago Pago, to be processed for the U.S. canned albacore market. As a U.S. territory, product entering the

<sup>439</sup> Based on professional industry knowledge of Guillermo Gomez, GHA.

U.S. is not registered as an import or export. Therefore, it is reasonable to assume that the quantities of frozen albacore exported by the U.S. originated from the troll/pole-and-line fleet.

### Canada

Like the U.S., Canada is a major market for canned albacore and absorbs significant volumes of Pacific albacore imports; in addition, it has an active troll albacore fleet.

#### *Canadian Troll Albacore Catch and Fleet*

In 2019, Canada reported a Pacific albacore catch of 2,402 mt. This catch was taken entirely by troll vessels that operated exclusively in the Eastern Pacific Ocean.<sup>440</sup> Only a small portion of the catch occurred outside of the Canadian EEZ (including within the U.S. EEZ).

Canada and the U.S. have a bilateral agreement whereby troll albacore vessels are entitled to operate in the corresponding EEZ and deliver their catches in ports of both countries. In the recent past, however, the fleets of each country have kept their fishing activities within their own jurisdictional waters.<sup>441</sup>

The Canadian fleet that targets albacore is comprised of 122 troll vessels. These vessels belong to the British Columbia Tuna Fishing Association (BCTFA).<sup>442</sup> Most of the Canadian troll vessels freeze their catch using forced air (blast freezing). Table 135 shows the Canadian catches of albacore and the total number of vessels during the 2015 - 2019 period.

**Table 135. Canada: Albacore Troll Fleet Size and Catches (mt), 2015 - 2019**

Year	Number of Vessels	Total Catch (mt)
2015	160	4,391
2016	152	2,842
2017	121	1,830
2018	121	2,717
2019	122	2,402

Source: Table produced by IEC/GHA using data from Fisheries and Oceans Canada. 2020. 20<sup>th</sup> Meeting of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean, Plenary 4, ISC/20/Plenary /4. National Report on Canadian Tuna and Tuna-like Fisheries in the North Pacific in 2019. Page 5. Downloaded from [https://isc.fra.go.jp/pdf/ISC20/ISC20\\_PLENARY04\\_National\\_Report\\_of\\_Canada.pdf](https://isc.fra.go.jp/pdf/ISC20/ISC20_PLENARY04_National_Report_of_Canada.pdf), June 7, 2023.

<sup>440</sup> 20<sup>th</sup> Meeting of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean, Plenary 4, ISC/20/Plenary /4. National Report on Canadian Tuna and Tuna-like Fisheries in the North Pacific in 2019.

<sup>441</sup> Professional industry knowledge of Guillermo Gomez, GHA.

<sup>442</sup> B.C. Tuna Fishermen's Association. 2023. Organization website. Viewed at <https://www.bctfa.com/>, April 1<sup>st</sup>, 2023.

*Canadian Albacore Imports*

The Canadian market for frozen albacore appears to be limited, with the total supply consisting of the domestic landings plus imported product. Canadian albacore consumers have a marked preference for albacore that is sold as sashimi-grade for local restaurants, or sold as loins that, once defrosted, are used for grilling.<sup>443</sup>

In 2019, Canada imported 3,398 mt of albacore; 120 mt represented imports of chilled/fresh albacore, with the remaining 3,278 mt corresponding to whole frozen albacore. The U.S. was the main supplier of both fresh/chilled and whole frozen tuna, with 77 percent (2,632 mt) of the total Canadian imports of fresh and frozen albacore. Taiwan supplied an additional 13 percent (438 mt) of the total albacore imports, and New Zealand, China, and Korea supplied most of the remainder. Table 136 shows Canada's 2019 imports of fresh/chilled and frozen albacore.

**Table 136. Canada: Imports of Fresh/Chilled and Frozen Albacore by Exporting Country, 2019 (mt of product weight)**

ALBACORE					0302.31	0303.41
Rank	Exporter	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	USA	2,632	77%	77%	100	2,532
2	Other Asia, nes (Taiwan)	438	13%	90%	-	438
3	New Zealand	208	6%	96%	0	208
4	China	50	1%	98%	13	37
5	South Korea	46	1%	99%	-	46
6	Vietnam	5	0%	99%	0	5
7	Indonesia	5	0%	100%	-	5
8	Philippines	4	0%	100%	0	4
9	Japan	2	0%	100%	-	2
10	Fiji	2	0%	100%	0	2
>10	Others	6	0%	100%	6	-
<b>Total</b>		<b>3,398</b>			<b>120</b>	<b>3,278</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

<sup>443</sup> Professional industry knowledge of Guillermo Gomez, GHA.

*Canadian Albacore Exports*

In 2019, Canada exported 744 mt of albacore, of which only 37 mt corresponded to fresh/chilled albacore versus 707 mt of whole frozen albacore. The U.S. was the main recipient of Canada's fresh chilled and whole frozen albacore with a total of 486 mt. (35 mt fresh/chilled and 452 whole frozen albacore). Table 137 shows Canada's 2019 exports of fresh/chilled and frozen albacore.

**Table 137. Canada: Exports of Fresh/Chilled and Frozen Albacore by Importing Country, 2019 (mt of product weight)**

ALBACORE					0302.31	0303.41
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	USA	486	65%	65%	35	451
2	Vietnam	139	19%	84%	-	139
3	Thailand	63	8%	92%	-	63
4	Philippines	49	7%	99%	-	49
5	China, Hong Kong SAR	5	1%	100%	-	5
6	France	2	0%	100%	2	-
7	United Arab Emirates	1	0%	100%	-	1
8	Australia	0	0%	100%	0	-
9	Slovenia	0	0%	100%	0	-
10	Singapore	0	0%	100%	-	0
>10	Others	-	0%	100%	-	-
<b>Total</b>		<b>744</b>			<b>37</b>	<b>707</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

No information is readily available as to the main fishing and buying companies involved with Canadian albacore.<sup>444</sup>

<sup>444</sup> Although the IEC/GHA Vessel Compilation analysis does identify the names of companies that own troll vessels, none rise as being particularly dominant as nearly all own a single vessel.

## New Zealand

New Zealand troll-caught albacore is important for the processing activities and market supply for Thailand and Spain, respectively, as discussed below.

### *New Zealand Albacore Troll Catch and Fleet*

In 2019, the New Zealand catch of albacore was 2,751 mt, caught entirely by the country's troll fleet. Most albacore is landed whole in New Zealand, not transshipped or delivered to other locations.

Albacore catches in New Zealand have fluctuated over the years, with a record catch in 1995 of 6,820 mt, and a low catch in 2017 of only 2,084 mt. Table 138 shows the New Zealand albacore troll catch in the 2015 – 2020 period.

**Table 138. New Zealand: Albacore Troll Catch 2015 - 2020 (mt)**

Year	Total Landed Catch (mt)
2015	2,536
2016	2,218
2017	2,084
2018	2,641
2019	2,751
2020	3,083

Source: IEC/GHA Table using data from Brouwer, S., M Tornquist, K. Large, D. Middleton, P. Neubauer, and L. Tremblay-Boyer. 2021. Characterization and CPUE analysis of the New Zealand Albacore Fishery. WCPFC-SC17-2021/SA-IP-19. Report to the Western and Central Pacific Fisheries Commission Scientific Committee. Seventeenth Regular Session, 11–19 August 2021. Electronic meeting. Downloaded from <https://meetings.wcpfc.int/node/12794>, June 7, 2023.

The New Zealand troll albacore fishery has been certified by the MSC; the certified fleet comprises 175 vessels.<sup>445</sup>

### *New Zealand Albacore Imports*

New Zealand does not import significant amounts of albacore tuna; in 2019, it only imported 4 mt of fresh/chilled albacore from Fiji.

<sup>445</sup> The list containing the names of all 175 troll vessels, authorized by the New Zealand Government to share the MSC certificate can be downloaded from MSC's website (MSC. 2023. New Zealand Albacore Troll Fishery. Viewed at <https://fisheries.msc.org/en/fisheries/new-zealand-albacore-tuna-troll/#:~:text=About%20this%20Fishery,-%C3%97&text=The%20fleet%20comprises%20175%20vessels>, April 1<sup>st</sup>, 2023. New Zealand vessels that have allocations in other fisheries participate “opportunistically” in catching albacore. While the number of vessels engaged in the troll fishery may exceed the 175 troll vessels that have been certified, the certified fleet is the one that has most consistently operated in the fishery.

*New Zealand Albacore Exports*

All albacore catches are landed at New Zealand ports, where several companies purchase the fish for export. One of the major buying companies involved in New Zealand's albacore fishery is Talley's. The company works with 80 of the New Zealand albacore trollers.<sup>446</sup> Three other companies are involved with New Zealand albacore, but their scope is much more limited than Talley's. These companies are Pendarves Limited, Marine Foods Limited, and Westfleet Seafoods Limited.

The catch is exported primarily to locations in Thailand and American Samoa where the fish is processed into canned products destined for the U.S. market. In the recent past, New Zealand has exported albacore to Spanish canneries.

In 2019, New Zealand exported 2,934 mt of albacore, of which all but 3 mt were whole frozen albacore.

Thailand imported 1,637 mt or 56 percent of the country's total albacore exports; Spain and Vietnam imported 355 and 351 mt respectively, representing approximately 12 percent each of New Zealand's albacore exports. Table 139 shows New Zealand's 2019 albacore exports. The exports to Thailand and Vietnam were likely for processing to send to the U.S. canned albacore market.

**Table 139. New Zealand: Exports of Fresh/Chilled and Raw Frozen Albacore by Importing Country, 2019 (mt of product weight)**

ALBACORE					0302.31	0303.41
Rank	Importer	Total	Percent	Cum. Percent	Fresh / Chilled Albacore	Frozen Albacore
1	Thailand	1,637	56%	56%	-	1,637
2	Spain	355	12%	68%	-	355
3	Vietnam	351	12%	80%	-	351
4	Portugal	282	10%	89%	-	282
5	Canada	208	7%	97%	0	208
6	France	68	2%	99%	-	68
7	USA	25	1%	100%	1	25
8	Australia	8	0%	100%	2	6
9	Vanuatu	0	0%	100%	0	-
<b>Total</b>		<b>2,934</b>			<b>3</b>	<b>2,931</b>

Source: BACI

Note: Fresh/chilled and raw frozen albacore includes HS Codes 0302.31 and 0303.41

<sup>446</sup> Talley's. 2023. Company website. Viewed at <https://www.talleys.co.nz/seafood/species/albacore-tuna>, April 2, 2023.

## Japan

The Japanese albacore longline fishery, including the disposition of catch and trade associated with those fish was discussed at length in the longline section of this chapter. This section provides a brief description of Japan's involvement in the catch of albacore by the pole-and-line fleet.

### *Japanese Albacore Pole-and-Line Catch and Fleet in the Pacific*

In addition to the longline albacore catch previously discussed, the Japanese pole-and-line fleet (offshore and distant water vessels) contributed 8,751 mt of albacore, for a total combined albacore catch by longline and pole-and-line vessels of 18,652 mt for that year.<sup>447</sup>

In 2019, the Japanese pole-and-line fleet fishing in the WCPFC area consisted of 67 vessels. The pole-and-line vessels operate during the summer season in the northern hemisphere, that is, they fish in waters above the equator in the north Pacific. Table 140 shows the Japanese coastal, off-shore, and distant water pole-and-line fleet fishing in the Pacific 2016 -- 2021.<sup>448</sup>

**Table 140. Japan: Pole-and-Line Coastal, Off-Shore, and Distant Water Fleet Fishing in the Pacific Ocean, 2016-2021**

Pole-and-Line	Pole-and-Line Coastal < 20 GT	Pole-and-Line Off-Shore and Distant Water > 20 GT		Total
	20-49 GRT	50-199 GRT	200- GRT	
2016	1	50	25	76
2017	1	48	31	80
2018	1	44	25	70
2019	1	42	24	67
2020	1	37	22	60
2021	1	35	22	58

Source: IEC/GHA using data from WCPFC, 2022f. Op. cit.

<sup>447</sup> WCPFC, 2022f. Op. cit. pg. 41.

<sup>448</sup> WCPFC, 2022. Op. cit. Page 41.

## CHAPTER 9 | Conclusions and Strategic Recommendations

This chapter presents key conclusions of the analysis and strategic recommendations for organizations interested in promoting sustainable, effective management of Pacific tuna fisheries. It identifies the actors and sectors of the trade flow that likely wield the greatest influence, the segments of the supply chain that are most difficult to decipher, and the applicability of the findings of the analysis to other fisheries managed by the target RFMOs, as well as fisheries managed by the IOTC and ICCAT. It also provides a series of additional observations related to trends in the target fisheries that have emerged from this analysis.

### Key Actors and Sectors of the Trade Flow Likely to Wield the Greatest Influence in Making Changes at the RFMO Level

This study has identified dozens of companies that are meaningfully engaged in one way or another in the global trade of tropical tuna and albacore caught in the Pacific. This report can serve as a detailed reference in identifying key actors and other relevant participants that interested organizations may wish to engage, differentiated by country and by position in the supply chain. The discussion that follows identifies several key actors who play particularly critical roles. These entities have the power to make or influence changes that could improve the sustainability and effective management of tuna fisheries at the RFMO level. Our characterization of the importance of these actors is based primarily on the quantity of Pacific tuna they catch, handle, process, buy and/or sell in their day-to-day operations.

#### Pacific Purse Seine Fishery for Tropical Tuna

The large number of purse seine vessels involved at the harvest level and the distribution of their ownership makes it difficult to single out just a few important companies that have the capacity to promote changes at the RFMO level. Even companies like Pesca Azteca (based in Mexico with a fleet of 20 large purse seine vessels) or Frabelle Fishing (based in the Philippines with 23 purse seine vessels) are unlikely to have sufficient power to successfully exert influence under individual initiatives with a tuna RFMO. Based on our analysis of tuna trade flows in the Pacific, working with actors in the processing sector offers better opportunities to effect management change.

Thailand's major role in the tuna trade flows of the Pacific and the specific participation of Thai Union Group makes Thailand's processing sector an important target in seeking support to create positive change at the RFMO level. The Thai tuna processing sector imports approximately 800,000 mt of whole frozen tuna, mainly caught by an international fleet of purse seiners in the Pacific Ocean. The sheer buying power of the Thai tuna processing sector is so great that the global reference price for skipjack tuna of 1.8 kilograms and greater is set in Bangkok almost daily.

Major Thai processing companies such as Thai Union Group, Sea Value, and Chottiwat do not have tuna purse seine fleets of their own and have chosen to rely entirely on tuna trading companies like FCF Fishery, Tri-Marine, and Itochu to source all their yearly raw material requirements of whole frozen tuna. The trading companies enter into long-term supply agreements with major tuna processors that can only be honored by the trading companies because of their long-term commercial and personal relationships with many tuna purse seine owners. The combination of these three elements – Thai Union's dominance, the company's reliance on the trading companies, and, in turn, the trading companies' network of relationships with purse seine owners -- suggests that interested entities should pursue close relationships with Thai Union and with at least two trading companies, FCF Fishery and Tri-Marine.



The Bolton Group, owners of Tri-Marine, is a second potential target for outreach and advocacy efforts. The Bolton Group's presence is particularly relevant in the European market, since the group owns major national brands in the Spanish, Italian, French, and other European canned tuna markets. The Bolton Group is of even greater importance to work with because Tri-Marine is very tightly linked with the main industry players in Ecuador (especially those associated with Spanish tuna companies) and with other major Latin American industry participants.

Interested organizations may also want to engage with key industry and government entities in PNG, which, for various reasons, is currently experiencing shortages of raw materials.<sup>449</sup> The key actors here are, at the industry level, RD Tuna Cannery and Frabelle Fishing, and, at the governmental level, PNG's NFA and the PNA. The tuna industries of PNG and the Philippines at the harvest and processing levels are very much intertwined. Jointly, these two countries process about 500,000 mt of whole frozen tropical tuna, most of which is exported to supply Germany's and the Netherlands' canned tuna markets, as well as pre-cooked tuna loins for final canning for other E.U. markets.

The tropical tuna purse seine and albacore longline catches in the Pacific are the main sources of supply for the three major U.S. tuna brands: Starkist, Bumble Bee, and Chicken of the Sea. The companies that own these brands were once American, but now are Korean, Taiwanese, and Thai, respectively. This change in ownership diminishes the leverage NGOs focused on the U.S. market hold to effect positive change in the management of the Pacific tuna fisheries. Nonetheless, they should attempt to engage the new owners – Dongwon, FCF Fishery, and Thai Union (owners of Starkist, Bumble Bee, and Chicken of the Sea, respectively) – to explore ways to move these companies into supporting improvements in the way the WCPFC and the IATTC operate.

In the U.S. market at the retail level, the three national brands are sold by Walmart, Costco, Kroger, and other major retail chains. These retailers could be encouraged to push their suppliers and the RFMOs for higher degrees of traceability and transparency in their supply chains so that these retailers can legitimately offer consumers tuna products that originate from sustainable and well-managed Pacific tuna fisheries. Similarly, by working with the Bolton Group and the retailers that sell that group's brands in various national markets (e.g., Mercadona, Alcampo and Eroski in Spain, Carrefour in France, etc.), the same sustainability goals could be pursued.

## Pacific Longline Fishery for Tropical Tuna

The longline fleets of Japan, Taiwan, Korea, and China appear to be adjusting their harvesting, transshipping, and marketing strategies to accommodate the contraction of the Japanese sashimi-grade tuna market and the emergence of new markets around the world, where the number of Japanese-style restaurants is growing. At the same time, both in the U.S. and E.U. markets, consumers' demand for fresh/frozen tuna steaks is increasing. In terms of harvesting, these longline fleets are expanding fishing activities on the High Seas and reducing fishing operations in EEZs, where the costs of licenses are increasing. Some major longline fleets are relying more on transshipping their catches on the High Seas, but the Korean and Chinese fleets are increasingly sending their catches to processors in their own countries, where they produce value-added sashimi-grade products that are exported to Japan. In contrast, Taiwan continues to supply Japan with whole frozen or gilled and gutted sashimi-grade tuna. Similarly, the Japanese tuna fleet now transships less than it once did, landing more of its catch directly in Japan. Interested organizations should be aware of these developments and adapt their strategies

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<sup>449</sup> The processing segments in PNG are confronting serious problems in procuring raw materials because many vessels once flagged under PNG are reflagging to other PICs, which is also creating instability in the PNA VDS. Should conditions deteriorate further, tuna trade flows from the Pacific could significantly change, further destabilizing the already fragile WCPFC management system.

accordingly. In particular, they should consider working directly with the Japanese government and OPRT to promote a reduction in High Seas tuna transshipments and closer monitoring and observation of operations on both longline vessels and reefer carrier vessels. This could result in WCPFC improvements in traceability and transparency in the operations of longline vessels and reefer carriers.

Large trading companies that exert control over much of the frozen sashimi-grade tuna supply and therefore deserve attention include the Mitsubishi subsidiary Toyo Reiz, as well as Try Sangyou, Fukuichi Fishery Co. Ltd., and Yamafuku Suisan Co. Ltd.<sup>450</sup> In addition, the wholesale producers and wholesale consumer markets where sashimi-grade tuna markets were traditionally auctioned appear to be changing. Shanghai Kaichuang Marine International Co. Ltd. have become more directly involved with tuna producers. Interested entities may consider approaching Aeon to learn more about its sustainability sourcing requirements and ways to engage this major supermarket chain in the tuna management discussion.

Korean and Chinese suppliers are engaging in the production of ultra-low temperature, sashimi-grade tuna products for the Japanese market. This is a relatively new trend in the Japanese sashimi-grade tuna trade flow, where in the past, the major exporters of tuna to Japan supplied whole gilled and gutted frozen bigeye and yellowfin tuna or fresh-chilled gilled and gutted tuna. In Korea, two companies to consider contacting are Dongwon Fisheries (which maintains a considerable longline fleet and a facility where sashimi-grade products are processed for export) and Sajo Group. In China, key actors include two private companies, Luen Thai Fishing Venture, which is part of an industrial conglomerate, and Pingtairong Ocean Fishery Group, which is a family-owned operation; both are involved in tuna fishing and processing. The Shanghai Kaichuang Marine International Co. Ltd. is another key company.<sup>451</sup>

The Taiwanese tropical tuna longline industry continues to be dominated by FCF Fishery Co., a key actor on multiple levels. FCF is likely to remain an important point of focus for NGOs interested in encouraging more sustainable management of the tropical tuna longline fishery.

### Pacific Longline Fishery for Albacore

Most of the Pacific longline catch of albacore, whether as the main target species or in combination with tropical tuna catches, is destined for the U.S. market. The catch of the longline fleets of Japan, Taiwan, and China is processed into pre-cooked tuna loins at a few locations in the Pacific (Fiji, the Solomon Islands, Vietnam, and China) or processed into finished canned albacore tuna products at Dongwon's Starkist plant in American Samoa. Thailand imports some of these fleets' albacore catches and produces both pre-cooked loins and finished canned products that are exported to the U.S. Cooked loins are sent to the processing plants of Chicken of the Sea and Bumble Bee in Lyons, Georgia, and Santa Fe Springs, respectively. As in the case of tropical tuna that is packed under the Starkist, Bumble Bee, and Chicken of the Sea labels, interested entities should encourage the three foreign companies that now own these brands to more actively engage in WCPFC and IATTC activities.

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<sup>450</sup> Havice et al. 2022. Op. cit., pg. 37.

<sup>451</sup> Campling et al. 2017. Op. cit., pg. 180.

## Segments of the Supply Chain Most Challenging to Determine Trade Flows, Including Identifying Particularly Opaque Exchanges of Product

As noted throughout this report, our analysis was limited by the inherent lack of transparency associated with the movement and trade of tuna products globally. This section identifies some of the key areas of limited, incomplete, or inconsistent information that prevent a detailed and complete mapping of Pacific tuna trade flows.

### Harvest Segment of the Supply Chain

#### Attribution of Catch to Individual Vessels

Clearly one of the greatest challenges in mapping Pacific-wide tuna trade flows is the inability to identify the catch of each individual vessel duly authorized by the WCPFC and IATTC. Confidentiality agreements prevent the RFMOs from publicly releasing information on the catch of individual vessels, so it is impossible to identify in detail the origin of the catch. The situation is further compounded by a lack of RFMO catch documentation requirements that would at least validate the amount and species composition of the catches reported by the harvesting countries.

In the absence of publicly available data on the catch of individual vessels, IEC/GHA sought the use of private trade data with the expectation that the commercial transactions between companies owning fishing vessels, trading companies, and tuna processors (shipper/consignee) could reflect the volumes of tuna sold from companies engaged in tuna harvest (e.g., a Dularra, Pesca Azteca, Frabelle Fishing, etc.) to traders such as Tri-Marine, FCF Fishery, etc., and from these trading companies to tuna processors in Thailand, Ecuador, Mexico, etc. (e.g., Thai Union, Negocios Industriales S.A (NIRSA), Pescados Industrializados de Mazatlan).

Unfortunately, the instances in which this type of data were available proved to be limited. IEC/GHA also expected to cross reference the Datamyne shipper/consignee data with Global Fishing Watch (GFW) data, with the intention of confirming that the initial transaction between shipper and consignees had taken place at the expected time and geographical location, particularly when such transactions took the form of transshipments. It was our expectation that the shipper/consignee data would provide sufficient information on the name of the shipper (company or, ideally, vessel name), the quantities sold, and a shipment date to support matching the GFW data with a date and location where the fishing vessel would have met a reefer carrier (owned or chartered by the trading company) to complete the transaction with the consignee. As it turned out, the shipper/consignee data were insufficient to identify the fishing vessel name, which in turn prevented IEC/GHA from attempting to analyze GFW data to identify encounters between a particular fishing vessel and a reefer carrier. Unless the names of the fishing vessel could be clearly identified in the Datamyne data, subsequent efforts were not warranted.

#### Transshipment

Tuna transshipments represent the second major challenge in assessing tuna trade flows. For fisheries managed by the IATTC, where most fish tend to be directly landed at processing plants by the fishing vessels, the traceability of the trade flows is less complex to assess than when the fish is transshipped at sea. There is an inherent problem in accurately determining the total volumes and species composition of the catch in the transshipping operations, and catches may be misreported. When a purse seine vessel transships its catch to the reefer carrier of a third party (e.g., a trading company), the fish is considered sold, and ownership is transferred to the trading company. When the trading company unloads the fish from the reefer carrier to the processing plant's cold storage, the title again changes from the trading company to the processing company. Although documentation of these transactions is in theory required by global trade statistics standards, there exist many

reporting gaps and complexities in transactions that limit accurate documentation of these transactions and make it difficult to accurately assess the trade flows at these levels.

In contrast to the case of the purse seine fishery, when the operation involves transshipping sashimi-grade tuna from a longliner to a reefer carrier, the fish is transferred “on consignment” and ownership of the fish does not change. The reefer company charges a fee for moving the fish to the final market, where the fish is unloaded and taken to the market to be auctioned. Until the fish is auctioned off, the owner of the catching vessel remains the owner of the fish. Once the fish is sold, all expenses associated with transporting the fish, unloading the fish, and related operations are deducted from the prices at which the fish is sold. The remainder represents the income the fishermen receive for the fish caught. Despite differences in the details of ownership and movement of product, there still exists an inherent lack of transparency and publicly available information documenting these transactions and movements.

### Attribution of Catch and Trade to Individual Countries

Another important limitation in assessing tuna trade flows stems from failure to assign a vessel’s catch to the flag of the State the vessel is flying. This may occur in the case of vessels chartered or operating under other arrangements, where it may be difficult to trace the true “nationality” of the catch. For example, the 2019 purse seine catch for Kiribati was 227,777 mt, while Kiribati’s exports of frozen tuna for that year were 48,176 mt. Based on the available information, we cannot determine the fate of 179,601 mt of tuna caught by Kiribati flagged vessels. It is highly unlikely that this large volume of tuna was consumed in Kiribati. We know that some vessels flying a Kiribati flag are managed by a Korean company that has established a Kiribati company to charter the vessels. We suspect the 179,601 mt were transshipped to Korea and processed there or were sold to a trading company. We cannot confirm this, however, and the BACI data indicate no such transaction. This kind of data anomaly highlights how opaque the data may be, whether intentionally or not.

Another example of this type of problem is the definition of a vessel’s flag in the case of PNG and its relationship to the Philippines fishing industry. Since 2019, when many PNG vessels switched their registration to countries elsewhere in the western Pacific, it is especially difficult to interpret fleet, catch, import, and export data, which is already complex because of conflicting data sources. In general, “PNG catch” is considered here to include catches by PNG-flagged vessels throughout the WCPFC convention area, and by LBFVs in PNG waters. However, it is possible that the catches of LBFVs in non-PNG Pacific waters are also being included in the PNG catch statistics.

### Catch Documentation Schemes

The accuracy of documenting tuna trade flows could be greatly improved by RFMO implementation of a Catch Documentation Scheme (CDS). Under a CDS, tuna caught by individual vessels could be officially validated by a Catch Document. This document could subsequently be required by other parties along the supply chain, respectively, until the fish reaches the final consumer. Hence, we strongly recommended that parties interested in promoting tuna sustainability advocate for the RFMOs to put CDS into place. However, we recognize that implementing a catch documentation scheme is challenging and requires the political willingness of all parties to the RFMO to be transparent in their operations (i.e., disclosing the actual catch volumes, species caught, areas in which the fish was caught) which not all vessel owners are willing to do disclose. It would also technically require the development and adoption of a digital system to produce, in real time, the catch documentation document. The most significant challenge would likely be developing a mechanism to properly enforce the accuracy of the information contained in the document, via the presence of observers or through other means.

## Processing and Trade Segment of the Supply Chain

### Domestic Use and Consumption

Publicly available and for-purchase trade data offer the most detailed and readily available information regarding the movement of tuna between sectors of the supply chains and identification of the individual companies involved in those transactions. However, trade data are only relevant when the product is moving across international borders. Once product is received and remains in a domestic market, little to no information exists that allow tracing of that fish as it moves through the supply chain.

### Fishery Origin of Fresh, Frozen, and Processed Products

Several factors make it particularly difficult to identify the specific fishery from which any tuna product, whether processed or not, originated. First and foremost is that location and gear type information is lost from the public data perspective beyond catch reporting by the RFMOs. By the time the fish enter the next point at which they can be traced, i.e., in trade data as imported or exported products, they are no longer associated with an ocean of origin or gear type. Although product codes for fresh/chilled and raw frozen tuna do identify the product by species, the lack of identification of an ocean of origin or gear type prevents attribution to a specific fishery. Further complicating matters is the fact that primary sources of trade data at the scale necessary to complete this type of analysis generally report product types at the six-digit HS code level. For processed products, the relevant code (HS code 1604.14) is defined generically as “prepared or preserved tunas, skipjack, and Atlantic bonito, whole or in pieces.” Critically, this level of code does not identify the species associated with the processed product, making any attribution to a specific fishery impossible. Further, the code includes both finished processed products such as canned or pouched tuna, as well as interim products that include cooked tuna loins for later canning. Because these two products follow different paths within a supply chain, and because the live weight conversion factors between different products can differ substantially from one another, this lack of detail further inhibits our understanding of trade flows and actors involved.

It is important to note that although data are not *publicly available* that allow for tracing of the fishery of origin for a given product, these data do generally exist and are maintained by processors, tuna trading companies, buyers, and others because of market requirements for traceability. Once a processing company processes a fish it purchased from either a fishing vessel or a tuna trading company, the documentation associated with the sale is maintained but not made publicly available. Even though the tuna processor and other stakeholders are well aware and can clearly identify which vessel’s fish went into the canned product, such documentation is, again, not available to the public.

## Applicability of the Supply Chain Insights to Other RFMO-Managed Fisheries

This analysis was intended as an initial application of a methodology designed for eventual broader use. This section thus considers the applicability of our methodology, results, and the insights our analysis can offer to other fisheries and RFMO regions.

### Applicability of Results and Insights to Other RFMO-Managed Fisheries

The trade flows and actors involved in them can be unique to specific fisheries, particularly in the case of tuna fisheries. Our analysis specifically describes the trade flows and key actors of the Pacific purse seine and longline fisheries for tropical tuna and albacore. These documented trade flows and the key actors that we have identified likely have only limited applicability to other tuna fisheries and provide little or no insight into these questions as they relate to non-tuna RFMO-managed fisheries.



Within the IOTC and ICCAT-managed tuna fisheries, it is likely that some of the same major companies documented in our analysis (e.g., Tri-Marine) would emerge as involved in the trade for Indian Ocean and Atlantic-caught tuna. However, there are substantial differences in the countries and actors that participate in these trade flows, and in the orientation of the supply chains. For example, where Pacific tuna fisheries are oriented to supplying the identified processing hubs, with a particular focus on Thailand, Atlantic and Indian Ocean tuna fisheries are focused on supplying Europe more directly. The countries and companies engaged in fishing in the Atlantic and Indian Oceans are also substantially different (e.g., the Seychelles emerges as an important source of Indian Ocean catch, but it does not participate in Pacific fisheries).

The WCPFC and IATTC manage other non-tuna species, including billfishes, mahi-mahi, sharks, and others. The vessels targeting sharks are often the same as those targeting tuna. However, similarities between these fisheries and the associated supply chains largely end there, and the key actors and supply chains identified in our analysis are probably not relevant to the trade flows or important companies engaged with other RFMO-managed fisheries.

Other insights offered by this analysis include the key data gaps and points in the supply chain where following tuna trade flows was particularly difficult or impossible. These challenges are very likely to be held in common with tuna fisheries managed by the IOTC and ICCAT. The sources upon which our analysis relied are global data sources. As such, an analysis of the tuna fisheries managed by the other RFMOs could be done relying on the same data sources and would thus be confronted by the same challenges.

### Applicability of the Methodology to Other RFMO-Managed Fisheries

We believe the analytical approach used to map the supply chains and trade flows associated with the Pacific tuna purse seine and longline fisheries for tropical tuna and albacore would generally be applicable to other tuna fisheries under the WCPFC and IATTC, or applicable to the tuna fisheries managed by RFMOs in the Atlantic and/or Indian Oceans.

In the case of the purse seine and longline fisheries for Atlantic and Indian Ocean tuna, the methodology should be quite applicable and in fact would require little additional data collection in terms of catch and trade data. The primary data sources upon which our analysis is based are global in coverage and could be directly applied to a similar mapping analysis of the trade flows emanating from these fisheries. In addition, for both the WCPFC and the IATTC, it might also be possible to undertake a similar analysis for Pacific bluefin tuna. However, some adjustments would need to be taken into consideration because of the practice of bluefin “farming”, as described below.

Because Pacific bluefin tunas are caught and transferred to grow-out corrals until they reach a certain weight and size, adjustments would be necessary to account for the increased weight of the fish when it is harvested and sold. Similarly, some mortality occurs during the grow-out period, which also would need to be considered.<sup>452</sup> In addition, because both longline and troll fleets catch bluefin tunas in the Pacific, further methodological adjustments would be needed to account for the contributions of these segments of the industry.

The two RFMOs deal with many other species, such as billfishes, mahi-mahi, sharks, and others. Overall, the methodological approach used for the present analysis could be applicable. However, the information available

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<sup>452</sup> Borrowing from approaches used in the livestock industry or other forms of aquaculture, it may be feasible to rely on a standard conversion factor to translate feed use per head to an estimate of weight gain or mean finished weight. Similarly, an estimate of the mortality rate per capita could be employed to adjust for losses during the grow-out period.

would likely be even more limited. For example, because of IUU issues associated with shark finning, shark catches and shark trade are generally underreported, and data are obscure. The data available on mahi-mahi is better, but not all of the countries that catch mahi-mahi in the areas of interest report their catches. Moreover, much of the catch is consumed in domestic markets where, as described previously, little to no information on intermediate transactions is available. In addition, the quantities that enter trade (for export) are often not known or are poorly characterized. Mahi-mahi is also processed in fillets which are easily identified using the existing HS code definitions.

## Observations on Pacific Tuna Fishery Trends

Tuna fisheries and markets are intrinsically dynamic. Consequently, many aspects of the Pacific-wide tuna fisheries are changing, particularly as they relate to tuna trade flows and tuna supply chains. Below are some observations on trends occurring in these networks.

- **Stability of supply chains.** The Pacific supply chains and tuna trade flows associated with canned tuna markets today are effectively sourcing from four major tuna processing hubs: Thailand, Ecuador, the Philippines, and PNG. It is from these four processing hubs that processed tuna products are being exported to the two major markets, i.e., the U.S. and the E.U. The supply chains that serve these tuna processing hubs vary and the interactions of tuna purse seine vessel owners, tuna traders, and processing companies to maintain and increase their market shares are affected by many drivers. As long as the tuna resources are sustainably managed, these interactions will be relatively stable. However, changes in resource availability, financial considerations, government policies, and other issues can quickly result in changes in tuna trade flows.
- **Free Trade Agreements.** Presently, Thailand is in the process of negotiating a Free Trade Agreement with the E.U., which could result in not having to pay the 24 percent duty on imported canned tuna products to which Thailand is currently subject. Should this happen, tuna trade flows from Thailand to the E.U. could significantly change. This could result in increased demand for tuna by the Thai processing industry as it seeks to capitalize on the opportunity to expand its share of the European market. The resulting redistribution in trade flows could come at the expense of other processing companies and countries in other parts of the Pacific.
- **Demand for Sustainable Seafood.** Consumers and retailers are increasingly demanding that the tuna they eat come from MSC-certified tuna fisheries. Tuna trading companies are positioning themselves strategically by adding MSC-certified tuna fisheries into their line of business, whether purse seine-caught tropical tuna or longline-caught albacore for canning. This is an additional way to strengthen the major tuna traders' hold on tuna supply chains, since processors, pushed by retailers and consumers, increasingly demand MSC-certified canned tuna products in the major U.S. and European markets. This trend is likely to continue.
- **Effects of Driving Factors.** Changes in preferential trade conditions through multi-lateral agreements (e.g., GSP), bilateral trade agreements, rules of origin for processed tuna products, labor-associated issues such as slave labor on vessels, and regulations put in place by the U.S. and E.U. to IUU fishing will continue to affect tuna trade flows.
- **Challenges to the PNA Vessel Day Scheme.** The permanence and success of the PNA countries' VDS in producing additional income streams for socio-economic development appears to be at risk, because the system is causing negative side effects in the form of re-flagging of DWFN vessels to Nauru, Kiribati, and others. This causes the VDS to be less effective in its implementation across the PNA

countries. Unless PICs find ways to address these issues, the VDS will experience some degree of instability.

- **Tuna Distribution.** The abundance, distribution, and migration patterns of tuna appear to be shifting from the west to the east, in part because of global climate change. This is causing fishing fleets to move to new fishing grounds. These changes could also have significant impacts on tuna trade flows and tuna supply chains.
- **Evolution of the Market for Sashimi-Grade Tuna.** The Japanese sashimi-grade market continues to be supplied by the catches of the Japanese, Korean, Taiwanese, and Chinese distant water fishing fleets. The strategies followed by each of these fleets with regards to fishing and transshipping of tuna is evolving, in turn shaping the trade flows that support the effective and efficient movement of sashimi-grade tuna into the Japanese market. These include operating in the High Seas areas where no fishing fees are required, relying heavily on transshipping operations, entering into charter arrangements, reflagging when circumstances are favorable, investing in land-based processing facilities in exchange for resource access, or other strategies. In addition, the emergence of Japanese-style restaurants in the U.S., the E.U., and other regions is creating new market outlets for the catches of these fleets. As the countries and actors involved in these supply chains adapt to changing market conditions, we may see substantial changes in trade flows and the relative importance of individual countries and companies.
- **Balance of Troll and Pole-Based Supply Chains.** The albacore catches of troll and pole-and-line vessels from the U.S., Canada, and New Zealand will continue to contribute to the expansion of their domestic fresh/frozen markets. A portion of their catches will also continue to be exported to Spain, where the characteristics of troll and pole-and-line caught albacore (e.g., higher fat content than longline caught albacore) are desired by canners and consumers. The albacore that these fleets catch represent a supplement to the catch of Spanish albacore fleets in the Atlantic. When those catches are poor, the Spanish canners seek additional supplies from the Pacific; when local catches are good, they purchase less albacore from the Pacific. Hence, depending on the supply of local albacore in Spain, the flow of trade from the Pacific to the E.U. is likely to vary from year to year. Despite this variation, trade between these fisheries and markets is likely to be a long-term factor in the global demand for troll and pole-and-line caught albacore.
- **Locating Processing Capacity.** Finally, in a highly competitive and dynamic environment, tuna trade flows in the Pacific will continue to be influenced by the economic and financial advantages offered by locating processing operations in Pacific Island and Latin American countries, where labor costs are low and tax incentives and/or tariff advantages favor tuna processing investors. All else being equal, tuna processors will continue to base their operations where social, political, and economic conditions allow them to maximize their long-term profits.



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## Appendix A. Individuals Consulted

Table A-1. List of Individuals Consulted by Guillermo Gomez, GHA

Name	Affiliation
Anonymous Interviewee	PINSA
Anonymous Interviewee	Grupo Mar
Anonymous Interviewee	Procesa Chiapas
Cynthia Asaf	Pacificall
Kate Barclay	University of Technology Sydney
Ricardo Belmontes	Inter-American Tropical Tuna Commission
Francisco Blaha	Consultant
Maurice Brownjohn	Parties to the Nauru Agreement (former)
John Burton	World Wise Foods
Liam Campling	Queen Mary University of London
Alejandro Chaljub	Procesa Chiapas/Walmart
Juan Corrales	Tri-Marine
Renato Curto	Inter Oceanic
Armando Diaz	Cicese
Cary Gann	Pacific Island Tuna Imports
Jessica Gephart	American University
Elizabeth Havice	University of North Carolina
Kimoyishi Hiwatari	Japan Fisheries Agency
Bill Holden	Marine Stewardship Council
Glenn Hurry	MRAG Asia Pacific

Name	Affiliation
Susan Jackson	International Seafood Sustainability Foundation
Florie Loth	Tuna Protection Alliance
Lara Manarangi-Trott	Western and Central Pacific Fisheries Commission
Sean Martin	Hawaiian Longline Association
Guillermo Moran	TunaCons
Sian Morgan	Consultant
Kathryn Novak	Sustainable Fisheries Partnership
Clarissa Ortiz	EU Market Observatory for Fisheries and Aquaculture (EUMOFA)
Eleanor Partridge	TM-Tracking
Tom Pickerell	Global Tuna Alliance
Bob Pringle	Pringle Enterprises
Tatiana Recalde	Empresa de Manifiestos
Benito Sarmiento	Baja Aqua Farms
Sari Tolvanen	Marine Change
Rafael Trujillo	Cámara Nacional de Pesquerías of Ecuador
Peter Trutanich	Tri-Marine
Evaristo Villa	Pesca Azteca
Nick Vogel	Inter-American Tropical Tuna Commission