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The Tuna Longline Industry in the Western and Central Pacific Ocean and its Market Dynamics

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LIST OF ACRONYMS

| | | | |
|-----------------|--|--------------|---|
| ALB | albacore | EC | European Commission |
| ANZ | Australia and New Zealand | EEZ | exclusive economic zone |
| APA | Asia Pacific Airlines | EII | Earth Island Institute's Dolphin Safe Scheme |
| APR | Responsible Tuna Fisheries Standard | EPA | Economic Partnership Agreement |
| AR | annual report | EPO | Eastern Pacific Ocean |
| ASAP | as soon as possible | ES | Spain |
| ASCM | Agreement on Subsidies and Countervailing Measures | EU | European Union |
| AO | Atlantic Ocean | FAD | fish aggregation device |
| BE | bigeye | FAJ | Fisheries Agency Japan |
| BET | bigeye tuna | FAO | UN-Food and Agriculture Organisation |
| BF | Atlantic bluefin | FCF | Fong Cherng Fishery Company Ltd. |
| CA | WCPFC Convention area | FFA | Pacific Islands Forum Fisheries Agency |
| CAD | Canadian dollar | FIMS | Fisheries Information Management System |
| CAN | Canada | FMA | Fishery Management Areas |
| CCSBT | Commission for the Conservation of Southern Bluefin Tuna | FOC | flag of convenience |
| CDS | catch documentation scheme | FOS | Friend of the Sea |
| CN | China | FRP | fibreglass reinforced plastic |
| CMA | Catch Management Agreement | FSM | Federated States of Micronesia |
| CMM | conservation and management measure | FTA | free trade agreement |
| CNFC | China National Fisheries Corporation | FY | financial year |
| COFC | CNFC Overseas Fisheries Co Ltd | GRT | gross registered tonnage |
| CNM | cooperating non-member | GSP | Generalised System of Preferences |
| CNY | Chinese Yuan Renminbi | GSP+ | EU Generalised System of Preferences Plus |
| CO | carbon monoxide | GT | gross tonnage |
| COFA | China Overseas Fisheries Association | HACCP | Hazard analysis and critical control points |
| COSI | Chicken of the Sea International | HQ | headquarters |
| CPUE | catch per unit effort | HS | Harmonized System of tariff nomenclature |
| CSFC | China Southern Fishery Shenzhen | HS | High Seas |
| DFZ | declared fishing zone | HSP | High Seas Pocket |
| DHA | Docosahexaenoic acid | IATTC | Inter-American Tropical Tuna Commission |
| DG SANTE | Directorate General for Health and Food Safety | ICCAT | International Commission for the Conservation of Atlantic Tunas |
| DW | distant water | ID | Indonesia |
| DWF | distant water fleet | | |
| DWFN | distant water fishing nation | | |

| | | | |
|---------------|---|-----------------|--|
| ILO | International Labour Organization | NOAA | National Oceanic and Atmospheric Administration (US) |
| IMO | International Maritime Organization | O2 | oxygen |
| IO | Indian Ocean | ODA | overseas development assistance |
| IOTC | Indian Ocean Tuna Commission | OPRT | Organisation for the Promotion of Responsible Tuna Fishing |
| IPO | initial public offering | OFCF | Overseas Fishery Cooperation Foundation (Japan) |
| IPOA | International Plan of Action | OFDC | Overseas Fisheries Development Council (Taiwan) |
| ISSF | International Seafood Sustainability Foundation | OPAGAC | Organización de Productores Asociados de Grandes Atuneros Congeladores |
| IUCN | International Union for Conservation of Nature | P&L | pole and line |
| IUU | illegal, unreported, unregulated fishing | PAE | party allowable effort |
| JFA | Japan Fisheries Association | PAFCO | Pacific Fishing Company (Fiji) |
| JP | Japan | PH | Philippines |
| JV | joint venture | PICs | Pacific Island countries |
| KFL | Kiribati Fish Ltd | PIPs | Pacific Island Parties |
| KOFA | Korea Overseas Fisheries Association | PNA | Parties to the Nauru Agreement |
| KR | Korea | PNG | Papua New Guinea |
| LDC | least-developed country | POC | Pacific Operating Committee |
| LL | longline | PS | purse seine |
| LL VDS | Longline Vessel Day Scheme | PS1 | purse seine special grade (skipjack) |
| LOA | length overall | PTR | Pingtairong Ocean Fishery Group Co. |
| LTFV | Luen Thai Fishing Ventures | RFMO | Regional Fisheries Management Organisation |
| LTLL | large scale tuna longline fleet | RFV | Record of Fishing Vessels of the WCPFC |
| MAFF | Ministry of Agriculture, Fisheries and Forestry (Japan) | RMI | Republic of Marshall Islands |
| MCS | monitoring, control and surveillance | RoO | Rules of Origin |
| MDO | marine diesel oil | RSW | refrigerated sea water |
| MEI | Ministry of Economics and Industries (Japan) | S&DT | special and differential treatment |
| MFN | most favoured nation tariff rate | SBF | Southern bluefin tuna |
| MIFCO | Marshall Islands Fishing Company | SCODI | Société des Conserves de Côte d'Ivoire |
| MSC | Marine Stewardship Council | SDSF | Shanghai Deep Sea Fisheries Co Ltd |
| MSG | Melanesian Spearhead Group | SFGCG | Shanghai Fisheries General Corporation (Group) |
| MSY | maximum sustainable yield | SIDS | small island developing states |
| mt | metric tonne | SIMP | Seafood Import Monitoring Program |
| NAFTA | North American Free Trade Agreement | SK | skipjack |
| NAMA | Non-Agricultural Market Access | SKJ | skipjack |
| NFD | National Fisheries Development | | |
| NGO | non-government organisation | | |
| NMFS | National Marine Fisheries Service (US) | | |

| | | | |
|--------------|---|--------------|--|
| SOE | state-owned enterprise | UAE | United Arab Emirates |
| SOLAS | International Convention of Safety of Life at Sea | UK | United Kingdom of Great Britain and Northern Ireland |
| SP | South Pacific | ULT | ultra-low temperature |
| SPC | Secretariat of the Pacific Community | USA | United States of America |
| SPS | sanitary and phytosanitary standards | USD | United States dollar |
| STLL | small scale tuna longline fleet | USITC | United States International Trade Commission |
| TAC | total allowable catch | VDS | Vessel Day Scheme |
| TAFCO | Taiyo A & F Co | VMS | Vessel Monitoring Scheme |
| TAE | total allowable effort | VU | Vanuatu |
| TFA | Taiwan Fisheries Agency | WCPFC | Western and Central Pacific Fisheries Commission |
| TH | Thailand | WCPO | Western and Central Pacific Ocean |
| TKA | Tokelau Arrangement | WIO | Western Indian Ocean |
| TOREI | Toyo Reizo Co. Ltd. | WR | whole round |
| TRY | Try Sangyou | WTO | World Trade Organisation |
| TTA | Taiwan Tuna Association | WWF | World Wildlife Fund |
| TTVP | Tuna Tracking and Verification Program | YF | yellowfin |
| TUF | Thai Union Frozen Foods | YFT | yellowfin tuna |
| TVMA | Te Vaka Moana Arrangement | ZDS | Zhejiang Daling Seafood |
| TW | Taiwan | ZOF | Zhejiang Ocean Family |

EXECUTIVE SUMMARY

This report provides industry and market intelligence regarding the current status of the tuna longline industry in terms of distant water fleets (DWF) and other companies involved in the global value chains that these fleets supply. The study examines the DWFs of China, Japan, South Korea and Taiwan. The primary focus is on industry dynamics, that is, key companies and organisations, industry organisation and corporate strategies; and the secondary focus is on markets and marketing strategies.

GLOBAL OVERVIEW

Tuna longline fleets operate in all four oceans – the Western and Central Pacific Ocean (WCPO), Eastern Pacific Ocean (EPO), Atlantic Ocean (AO) and Indian Ocean (IO). The total number of longliners (all sizes) currently registered on the four RFMO's record of fishing vessels is 17,494. While the International Commission for the Conservation of Atlantic Tunas (ICCAT) has the highest number of longliners registered at 11,481, over 90% are small-scale vessels less than 100GT. The Western and Central Pacific Fisheries Commission (WCPFC) has 3,156 vessels, Indian Ocean Tuna Commission (IOTC) 1,553, and Inter-American Tropical Tuna Commission (IATTC) 1,304.

In 2015, the total global longline tuna catch was around 450,000 mt. WCPO accounted for around 56%, EPO 16%, AO 15% and IO 13%. Bigeye accounted for 38% of total global catch by species, yellowfin 30% and albacore 32%. With the exception of 2012 when global longline catch exceeded 500,000 mt, annual catches were fairly stable at around 450,000-460,000 mt during 2011-2015.

The most significant distant water longline fleets operating in WCPO (and EPO) are China, Taiwan, Korea and Japan in terms of fleet size, catch volumes and bigeye catch quota allocation (hence, these four countries were selected as case studies for this study). Collectively, China, Taiwan, Korea and Japan's longline vessels have accounted for 75-83% of the total number of longliners active in the WCPO from 2011-2015.

In the WCPO, there are two longline fisheries – the southern and tropical longline fisheries. The tropical longline fishery typically consists of large-scale distant water vessels fishing between 20°N-20°S, which target bigeye and yellowfin for sashimi markets, with smaller volumes of incidentally-caught albacore. Vessels operating in the southern longline fishery are typically smaller (<100GT) and target albacore for canning markets in sub-tropical waters below 10°S and have small volumes of incidental bigeye and yellowfin by-catch. With advancements in freezer technology, particularly for the smaller vessels, the distinction between the tropical and southern longline fleets has become less obvious, with some vessels now having the ability to switch targets depending on seasonality, fishing location, stock abundance etc., moving between both fisheries. The southern longline fishery has developed significantly over the last 10-15 years, largely in association with growth in the number of Pacific Islands' domestic-flagged and chartered longline vessels.

The WCPO tropical longline fishery has had a long-term trend of below average economic conditions which has resulted in a declining number of vessels, particularly distant water vessels from Taiwan, Korea and Japan. It is projected that the fishery will continue to follow a declining trend from 2017 to 2026, resulting from a forecasted increase in fuel cost and a decline in catch rates, primarily bigeye, which will more than offset projected above-average fish prices. Economic conditions for the WCPO southern longline fishery have also declined.

Persistent low catches continue to impact negatively and if prolonged, will result in below average economic conditions for the fishery in the coming years.

High seas transshipment of catch is the norm for authorised vessels in the large-scale tropical longline fishery that spans both the eastern portions of the WCPO and EPO. The large Japanese, Korean, Chinese, and Taiwanese vessels in this fishery spend up to a year or more at sea, obtaining fuel from tankers at sea, as well as bait and various supplies from refrigerated carriers. These practices are integral to the economic viability of the fishery, where fishing activities take place over a wide range of the WCPO and EPO, often in areas that are far removed from ports that might otherwise be used for transshipment. However, there are concerns that given challenges relating to monitoring, control and surveillance, high seas transshipment increases opportunities for illegal activities, such as IUU fishing, human trafficking and smuggling.

Regulatory mechanisms shaping industry operations are layered. They work at multiple scales – regional, sub-regional and national – and at multiple points in the global value chains for longline products. The Western and Central Pacific Fisheries Commission (WCPFC) has a number of conservation and management measures (CMMs) in force which apply to the WCPO tropical and southern longline fisheries. *The Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna (CMM 2016-01)* is the primary management measure for tropical tuna stocks in the WCPO, establishing flag-based longline bigeye catch limits and requiring WCPFC commission and cooperating non-members (CCMs) to take measures to not increase longline yellowfin catches. CMMs (other than small-island developing states and Indonesia) are also required to not increase the number of longline vessels targeting bigeye above 2010-2012 levels. *The Conservation and Management Measure for South Pacific Albacore (CMM 2015-02)* requires CCMs to not increase the number of their vessels actively fishing for South Pacific albacore south of 20°S above 2005 levels or average 2000-2004 levels.

At the sub-regional level, in 2014 eleven Pacific Island countries agreed on text to establish the Tokelau Arrangement (TKA). The TKA is a voluntary in-zone-based management arrangement for the South Pacific Albacore Fishery comprised of a Catch Management Agreement (CMA) for longline vessels fishing within their Exclusive Economic Zones (EEZs) for South Pacific albacore, as either a target species or as by-catch. The CMA has been actively negotiated since 2014 and is nearing the stage where each member will need to make critical decisions whether to bring it into force or not. It provides for the setting of an overall Total Allowable Catch (TAC) and allocation of that TAC amongst parties. In 2014, the Parties to the Nauru Agreement's (PNA) Longline Vessel Day Scheme (LL VDS) also came into effect under the Palau Arrangement. As PNA waters largely fall within the WCPO's tropical zone (20°N-20°S), the LL VDS is a management scheme covering the tropical longline fishery, targeting bigeye and yellowfin. The LL VDS establishes a total allowable effort level (TAE) for fishing in all parties' waters, which is then allocated amongst the parties as party allowable effort (PAE). Following a trial period for several years, the LL VDS was formally implemented on 1 January 2017. At this time, seven out of eight PNA members had signed on as participants, plus Tokelau.

In recent years, labour standards in the fishing and fish processing sectors have gained increasing attention, particularly with the uncovering of serious human trafficking and labour rights abuses in Thailand's seafood fishing and processing sectors. This has prompted major players in the industry, including US and EU retailers, brand owners, processors and traders, as well as governments to respond. Labour issues will be particularly challenging to address for large-scale distant water longline fishing vessels which are away at sea for long periods (up to

18 months at a time), employing foreign crew who work very long hours under difficult conditions.

Numerous fisheries-related private standards and certification schemes have emerged over the past 20 years or so, largely due to concerns that public regulatory frameworks are not achieving the desired outcomes, in terms of responsible fisheries management, environmental sustainability, food safety, quality, ethical employment etc. While private standards are typically established by industry or non-government bodies and are voluntary, some may in practice become de facto mandatory, where compliance is a pre-requisite for market entry. Some examples of private standards and certification schemes applied to global tuna fisheries include Marine Stewardship Council (MSC), Earth Island Institute's Dolphin Safe Scheme (EII), International Seafood Sustainability Foundation (ISSF), Fair Trade, Friend of the Sea (FOS) and Seafood Watch.

TUNA LONGLINE INDUSTRY SUPPLY CHAINS AND MARKET DYNAMICS

The report focusses largely on two value chains for WCPO longline fisheries' tuna product; it highlights the main product linkages of large-scale and small-scale longliners with the principal markets – the Japan sashimi market and the US canned albacore market. A number of secondary markets exist for sashimi and other value-added fresh/frozen products such as the USA, EU, China and South Korea, but these are not discussed in detail.

Freezer longliners can be sub-divided between those that have ultra-low temperature freezing (ULT) capability at -60° and those that have -35 to -40° freezing capacity, with the former commanding a price premium. Fresh small-scale longliners principally supply the Japan sashimi market. There is an important intersection between some freezer longliners (large and small-scale) and both the sashimi and canning-grade chains. A longline vessel's albacore may be sold for canning, while bigeye and yellowfin is sold for sashimi/value-added products.

Japan's Sashimi Tuna Market

Japan is the major global market for sashimi quality tuna, accounting for around 80% of global sashimi consumption in 2010. This may be slightly lower in 2017 with the growth of Japanese restaurants elsewhere and declining consumption in Japan, but this market continues to drive the global longline industry. Of the estimated 750,000 mt tuna consumed in Japan in 2014, an estimated 62% was consumed as sashimi, around 23% as *katsuobushi* and canned tuna 15%. It has been estimated that sashimi consumption, not including skipjack, in 2014 was 449,000 mt round fish equivalent. This demand is met by a combination of domestic landings by Japanese vessels and imports from fleets of various other nations. In 2014, bigeye accounted for 38% of the total supply volume (imports and landings) of sashimi grade tuna, followed by skipjack (20%), bluefin (14%), yellowfin (15%), and albacore (13%). Notably, albacore is becoming increasingly attractive as lower-value sashimi. Overall, Japan has experienced a decline in household consumption and expenditure on tuna in the past two decades. While there is little price linkage or competition with other fish species such as salmon, competition exists from other protein sources, particularly chicken and beef.

Around 80% of the sashimi market in Japan is frozen tuna (232,700 mt in 2015) and 20% fresh (66,200 mt), with imports comprising 60% of total supply. While the majority of sashimi supply comes from longline vessels, catches from pole-and-line and purse seine vessels with ULT freezer capability are also utilized. The bulk of frozen catch (70-80%) is sold outside the auction system to trading companies and processors. Japan typically relies on about 10-15,000

mt per month of imported, mostly frozen, tuna. China and South Korea have considerable sashimi-grade processing capability, with much of their frozen processed product also exported to Japan.

In 2015, Japan's market sales for fresh tuna totaled 66,200 mt. The fresh tuna market is smaller than the frozen, with fresh catches generally marketed whole round through wholesaler auctions (e.g. Tsukiji). The domestic landings, mostly from the small offshore fleet, and all from the North Pacific, are dominated nowadays by albacore tuna, with declining catches of bigeye and yellowfin. Fresh tropical tuna (bigeye, yellowfin) imports are dominated by Indonesia, by Mexico in the case of air-freighted farmed Pacific bluefin, and the US and Canada in the case of Atlantic bluefin.

The Japanese sashimi market is characterized by multiple complex market arrangements and distribution systems, but these can largely be distinguished as two channels according to the fresh and frozen sashimi market segment. Fresh tuna (and to an increasingly less extent, frozen) sashimi-grade tuna is traded through government regulated wholesale market systems. Frozen sashimi-grade tuna is traded via 'unofficial' channels that either by-pass or only partly flow through the traditional wholesale market system.

With large advances in freezing technology and development of the cold chain over the past 20-30 years, coupled with the growing significance of trading companies in tuna sashimi trading, there has been a considerable shift in the volume of frozen sashimi-grade tuna sold through unofficial channels, rather than the traditional wholesale market channel. Unofficial channels dominate sales to supermarkets and large retailers.

Trading companies have become increasingly significant in Japan's sashimi distribution system. In 2016, the 'big four' sashimi trading companies were reported to be Toyo Reizo, Try Sangyou, Fukuichi and Yamafuku. Combined, they may account for over 70% of the traded volume. Toyo Reizo and Try Sangyou are subsidiaries of *sogo shosa* – a unique business group to Japan which can be thought of as giant conglomerates of companies involved in a very diverse range of businesses, with a core competence in, but not limited to, trading.

US Canning-Grade Albacore Market

The major market for longline-caught albacore is the USA, in canned or pouched form, with price and consumption driving the global market. Total global albacore catch was about 260,000 mt in the mid-2000s and an estimated 50-60% of the catch was consumed by the US market. East Asian-owned longliners active in the WCPO that target albacore sell the bulk of their catch to trading companies or directly to loining plants/canneries. Product is then largely imported into the USA as finished goods (i.e. pouch or canned form), or as for pre-cooked loins to be processed by Bumble Bee's cannery in Sante Fe Springs, California or Chicken of the Sea's in Lyons, Georgia.

Canned albacore is also sold in a variety of other secondary markets, such as Saudi Arabia and United Arab Emirates. Japan also consumes a small amount of canned albacore.

The USA 'shelf-stable' seafood market is dominated by canned and pouched tuna at 73% share of a USD 2.2 billion market, salmon follows at 10%. The US shelf-stable tuna market is divided into light (typically, skipjack, some yellowfin), white meat (albacore), and value-added products.

Albacore is packed as pouch or cans, in oil or water, imported or produced at the canneries in American Samoa or in the mainland US. Water packs are by far the greatest share of the US market, both pouched and in cans. The total supply of albacore to the US market in 2014 in whole round equivalent was 107,586 mt.

Light tuna is the largest segment of the US shelf stable tuna market with almost 60% of the tonnage, but it has only 44% of value market share. For canned albacore (white meat), this reverses, with a higher value (35%) than volume (29%) share of the market. This reflects higher retail prices paid for canned albacore. This tendency also applies to the pouched segment, which is typically a more profitable item compared to canned product.

Three brands dominate the US canned tuna market in volume and value, controlling 84% of the value market share in 2015. StarKist is owned by the South Korean giant Dongwon Industries – a large family-owned conglomerate (chaebol) with investments in many areas and which owns purse seiners and a small number of longliners. Bumble Bee is owned by private equity firm Lion Capital, which owns several other self-stable seafood brands, including the number one in Canada. It does not own boats but it does control supplies to and guarantees purchase of finished product from the PAFCO loining plant in Fiji, but is not the majority shareholder. Thai Union owns Chicken of the Sea, as well as many EU seafood brands and a growing number of other seafood businesses. Thai Union procures albacore globally.

US Market for High Value Tuna

In contrast to the USA market for canned albacore, the various fresh/frozen value chains for longline product feeding the US market are characterized by having both many suppliers and many buyers. These relations are moderated by the geographies of offloading and transshipment, the reliability of cold chains, historical business and marketing relationships, and linkages (or lack thereof) to market outlets.

The main species of fresh tuna consumed in the US is yellowfin. Suppliers include several countries in Latin America, Indonesia, Vietnam and even Senegal.

The USA fresh retail market for all fish species was valued at USD 4.6 billion market in 2015. Fresh tuna sales represent just 1.7% of this, with fresh salmon leading at 30.3% and shrimp following 18.1%. Nonetheless, according to IRI data, the value of the fresh tuna market grew by 40% between 2011 and 2015, reaching USD 76 million in 2015.

Tuna treated with tasteless smoke and carbon monoxide (CO) is a high volume non-canned product sold in US supermarkets and, in recent years, is increasingly being used in food service. This is a relatively low value segment and generally of less of a commercial focus of East Asian longline fleets, but there can be a significant amount of frozen yellowfin tuna (-35°C) sent to Vietnam from Taiwanese and Chinese owned longliners for CO processing for the US market. It is assumed that much of the Vietnam exports to the US is CO tuna and Philippine factories remain major suppliers too. Poke has grown in popularity in 2016 and 2017 in the USA and often uses CO tuna (most commonly yellowfin).

Higher value fresh tuna is mainly sold in specialty seafood retailers and higher-end mass retail. Supermarkets tend to procure non-canned tuna products from specialist distributors. Fresh tuna loins are packed in 'splint' boxes, which contribute to keeping colour and perceived freshness while reducing airfreight costs.

Total frozen seafood retail sales in the US were about USD 4.5 billion in 2015, with shrimp representing nearly half (49%), followed by tilapia (13%). Data compiled by the company IRI on retail of frozen tuna in the US market were USD 31.9 million; less than 1% of the total. Frozen tuna is seen as having potential to growth given that only 1.5% of US households are currently buying the product.

There is, however, a major market for frozen tuna products (e.g. steaks), worth around USD 323 million in 2016. Frozen loins are imported and processed in the US for retail or food service. The main species used here is yellowfin. The loin can be cut into steaks, medallion and kebab cuts, and half-size 'sandwich' steaks. Ground meat is used in sushi rolls.

Market channels for consumer purchase of frozen tuna are primarily supermarkets, warehouse club stores and food service sectors. A variety of products are offered, including individually frozen and wrapped single-servings in bulk packaging, both cooked and uncooked, with some of the latter cooked with faux grilling marks applied, and 'value added' items in sauce. The most commonly used raw material is yellowfin.

EU Market for High Value Tuna

Spain, Italy and France are the principal markets for fresh and frozen tuna for direct consumption in the EU, especially in these countries' urban centres. The main product type is steaks of yellowfin and albacore, believed to total around 40,000 mt. The main source of supply is the Western Indian Ocean, which is supplemented by some volume from the Atlantic and Pacific. There is a growing demand for ULT tuna products in some EU markets but the trade is limited by a lack of supporting infrastructure. However, where infrastructure it is available, such as in Belgium, the Netherlands, Spain and the UK, it is legally permitted to sell defrosted ULT fish as 'fresh'; although packaging must make clear that it was originally frozen. CO treated tuna is illegal in the EU.

Yellowfin tuna is the most important fresh-chilled species for all European countries, although there is demand for albacore in Spain, Italy and France. Steaks and sushi are the main product forms, and differences in prices with frozen tuna are considerable. EU consumption of fresh tuna is dominated by intra-EU trade (around 81% of supply), mainly by Spain and France. The leading extra-EU supplier is now the Maldives, given Sri Lanka lost its duty-free access under the EU GSP+ scheme and was delisted as a supplier of fish and fish products under the EU IUU regulation in 2015.

In general, Western Europe has seen a shift in fish and fish product consumption to more convenience products and sushi, especially among younger consumers. There has been growth in promotion and purchase of sushi kits in supermarkets and it is predicted that there will be growing demand for more premium sushi.

DISTANT WATER TUNA LONGLINE INDUSTRY

Japan

Japan's longline fleet is divided into distant water, offshore and coastal classes, but there are considerable interactions among them – especially the distant water and offshore classes. The small coastal longliners, mostly 1-20 GRT, only fish in Japan's coastal waters. The offshore longline vessels are divided into two sub-categories: (a) small offshore (10-20 GRT) which can range widely outside the Japan EEZ, within the WCPO and even to the EPO, and (b) (medium)

offshore longliners (20 -120 GRT, but mostly > 50 GRT) which fish in similarly extensive areas. Distant water longliners (120 GRT and up) can fish in all oceans (Atlantic, Indian and Pacific, Eastern and Western). In 2015, 338 longliners were active in the WCPO; 111 offshore/distant water and 227 small offshore vessels.

The distant water (DW) longline vessels utilize ultra-low temperature (ULT) freezers for catch storage, and mostly target bigeye (and to a lesser extent yellowfin and bluefin, seasonally). Vessels are constructed from steel, the average size is around 400 GRT, with hold capacities ranging from 300-400 mt. Annual average catch per vessel (all species) is around 250-300 mt for vessels targeting bigeye and yellowfin (around 1-1.5 mt/day), whereas catch volumes are lower (around 0.5 mt/day) for vessels seasonally targeting higher value southern bluefin which are also constrained by strict quota limits.

The total number of offshore longliners, excluding coastal longliners, has fallen steadily over the past five decades. The biggest decline has been seen in the medium offshore longliners, whose numbers have declined from 757 in 1980 to 28 in 2017 (96% decline), and small offshore vessels from 420 to 236 (44% decline). Distant water longliners (>120 GRT) declined over the period 1980-2012 from 943 to 270 (70% decline) and further to around 80 in 2017. The decline in vessel numbers has largely been in response to economic hardship. High fuel prices coupled with stagnant fish prices have impacted negatively on vessel profitability and driven a considerable number of operations into bankruptcy. Capacity reduction programs implemented to address global longline fishery overcapacity issues have also contributed to declining vessel numbers. Subsequently, Japan's longline fishing effort (millions of hooks) in all oceans (excluding small offshore) declined from around 560 million in 1981 to 130 million in 2014, with a corresponding decline in catches.

In 2015, the total catch of the main tuna species in WCPO waters was 14,727 mt; bigeye accounted for 39% of the tuna catch, yellowfin 27% and albacore 34%. Japan's total tuna longline catch has steadily declined over the past five years, continuing a long term trend, and in step with the comparable decline in vessel numbers. Catch composition has remained relatively stable, with bigeye dominating as the main target species, but with the yellowfin proportion declining and albacore increasing slightly.

The majority of the catch is taken in high seas areas (60% in 2015, and close to 60% on average 2011-2015) and the extensive Japan EEZ (15%), with additional catches in FSM, RMI, Palau and Solomon Islands EEZs. Effort shifts seasonally, but with aggregate effort mostly north of 10°N, in high seas areas and the Japan EEZ, with very little effort south of the equator nowadays. The offshore/DW longline fleet also fishes extensively in the EPO, with catches often split about 60/40. The proportion of EPO fishing has increased as Japan DW vessels have fished less frequently within the EEZs of PICs.

Japanese DW vessels operating in WCPO waters are authorized to undertake high seas transshipment, but typically return to Japanese ports at the end of a voyage and only occasionally tranship on the high seas. This can in part be explained by a long-term 'understanding' between the Japanese government and the distant water fleet owners that catch is landed directly in Japan, and also because of maintaining quality in the ULT cold chain, which the Japan longline fleet has mastered.

Japan's small offshore and medium sized offshore vessels are permitted to fish beyond Japan's EEZ in WCPO waters. Catch is stored using refrigerated sea water (RSW) and is usually landed fresh in Japan and is increasingly less often offloaded to selected offshore longline bases in the WCPO (e.g. Guam) to be air-freighted to Japan. Given that catch is sold into the

fresh sashimi market with an emphasis on high quality, trip lengths are for a maximum of 25-30 days, whereas the medium size vessels may undertake trips of 30-45 days.

The area fished by the small offshore longliners has contracted considerably in recent years, with the various prefectural fleets choosing differing strategies. The Miyazaki fleet (70 vessels) fishes south and then east of Japan in mostly high seas and EEZ waters, targeting bigeye hot spots seasonally. No more fishing by this fleet occurs in Palau or FSM waters. The fishing pattern adopted by the Kochi vessels (74 vessels) is similar. The smaller Kesennuma fleet (3 small vessels, plus 13 medium size vessels), now mostly targets striped marlin and shark east of Japan, with some seasonal bigeye. The Okinawan fleet (63 vessels) fishes mostly high seas areas, but it is the only fleet still to fish FSM waters and the adjacent high seas pocket (HSP), with some unloading in Guam. If the HSP were to be closed then unloading in Guam would no longer be viable for this fleet. There is now no fishing by any small offshore boats south of the Equator and very little in the EEZs of PICs. As a result, and with the offshore/DW vessels fishing less and less in EEZ waters, very few Japanese vessels overall have subscribed this year to the PNA longline VDS, as few fish any longer within EEZs.

In recent years, the catch composition of small offshore longline vessels has changed significantly. In the 1980s and 1990s, yellowfin and bigeye were the main target species, with yellowfin accounting for the largest proportion of catch (around 40%). However, in the last ten years, albacore has become the predominant species caught (40% of catch), despite fresh bigeye and yellowfin prices being higher than fresh albacore. This relates largely to declining catch rates of bigeye and yellowfin in tropical waters, which has resulted in offshore vessels fishing more in temperate waters targeting albacore.

Very different types of companies make up Japan's longline industry. At one end of the spectrum are owner-operators with one offshore boat, and at the other are *sogo shosha* holding companies such as Mitsubishi, which are typified by a diverse range of multinational companies that are financially interlocking, but operationally autonomous. In-between these poles are specialized longlining companies that own four to six vessels and seafood multinationals such as Nissui (Nippon Suisan Hyakunnen), for which sashimi products are one component of their activities.

In the case of the distant water fleet, industry sources indicated in 2010 that currently only 30% of distant water longline vessels were profitable, 30% were borderline and 30-40% were struggling and on the road to bankruptcy, with a prediction that less than 100 or so vessels will survive in the next few years. This substantially still applies 7 years on, with around 80 DW vessels still fishing. Those vessel owners (mostly the larger companies) with diversified business interests (i.e. vertically integrated tuna operations with complimentary processing and/or retail operations and/or other non-tuna related businesses) are likely to be in a stronger position, than small family-run businesses consisting exclusively of only one, at most, three vessels. Industry sources also felt that several of these factors may potentially result in some distant water vessels changing their traditional fishing grounds. The current key industry priorities identified by Japan Tuna Fisheries Cooperative Association (Nikkatsukyo) are: i) to secure fishing grounds; ii) to attract new, young crew members; iii) facilitate new vessel construction to replace ageing vessels; and, iv) sashimi market stimulation.

'Islandisation' projects (i.e. Pacific Islands-based joint venture fishing operations) were identified in 2010 as a potential means of addressing several of these issues, if suitable local partners could be identified. It was believed that islandisation could assist in securing access to fishing grounds, with potentially cheaper licence fees. In addition, basing operations outside of Japan would enable vessels to avoid Japanese government regulations concerning crewing,

vessel construction, maintenance and safety. Being in closer proximity to fishing grounds would also reduce fuel costs. This has however not been taken up to any extent, with decreasing unloading in Guam, minimal effort by offshore vessels in PIC EEZs, and distant water vessels fishing mostly in high seas areas in the WCPO and EPO.

Apprehension was expressed in Japan concerning the introduction of a PNA longline vessel day scheme (VDS), as well as the banning of at-sea transshipment under WCPFC. The PNA longline VDS was introduced this year but with very little fishing in PIC EEZs; only limited participation has been evident so far, as costs are regarded by industry as excessive.

High fuel prices, as well as the ageing of experienced officers and problems with recruiting young Japanese crew members were identified as the two most serious factors which will continue to impact the Japanese longline (and likely pole and line fleet) in the future.

The devastation associated with the tsunami of 2011, which seriously damaged some key ports in the Sendai area (e.g. Kesunnuma) has been largely overcome in the intervening six years, although complete recovery will never be achieved and fleet size and supply levels are yet to recover to previous levels.

Taiwan

Taiwan's fishing industry is heavily reliant on distant water (DW) activities, which constitute over 50% of the industry's marine capture production. Tuna longlining is the largest value segment of Taiwan's fisheries outside of its EEZ at 31%. The Pacific Ocean was the initial fishing ground for Taiwanese tuna fisheries, but the longline fleet is now a global operator and is active in all the major tuna fisheries.

The distant water Taiwan longline fleet is organized into two industry associations: the Taiwan Tuna Association and the Taiwan Tuna Longline Association. The Taiwan Tuna Association (TTA) represents large-scale longliners of >100GT (all steel hull boats). The Taiwan Tuna Longline Association is for vessels of 20-99GT. Most of these boats are made with fibre reinforced plastic (FRP). There are three types of vessels in the 20-99GT category: (a) the majority, of between 200-300 which have -35°C freezers; (b) between 100 and 150 that have ULT (-60°C) freezers; and (c) fresh boats (ice or RSW), which are the minority.

In 2015, a total of 1,382 longliners under Taiwan flag were active in the WCPO; 76 of which were large scale (100 GT+) and 1,306 that were small-scale (20-99 GT). Vessel numbers in both categories have declined over time. The Taiwan government has implemented a limited entry policy in tuna fisheries to ensure fleet size is commensurate with available fishing possibilities. Between 2005 and 2007 the government supported a vessel reduction scheme resulting in the scrapping of 183 large-scale tuna longline vessels.

The vast majority of the Taiwanese fleet is registered in Taiwan, however there are owners that use open registries ('flags of convenience') such as Vanuatu. Currently, around 200 Taiwanese beneficially-owned vessels are operating under foreign flags worldwide. Some Taiwan longline companies have re-flagged or operate their vessels under charter arrangements in Pacific Island Countries. Part of the motivation for doing so is to appear to support PICs domestic development aspirations and in doing so, gain concessional fishery access. However, more importantly in recent years, re-flagging or chartering has enabled Taiwan (and other distant water fishing nations) to obtain PIC bigeye catch quota in the WCPO. In addition, PIC governments can issue ICCAT certificates for bigeye exports to Japan

from re-flagged and chartered vessels, which addresses the issue of there not being enough bigeye quota allocated to Taiwan to cover the entire Taiwanese fleet. Without an ICCAT certificate, bigeye will not be accepted in Japan.

The fishing effort of the Taiwan longline fleet dropped over the five-year period, 2011-2015. Total days fished by the large scale tuna longline fleet (LTLL) declined by 28%, while the small scale tuna longline fleet (STLL) declined by 42%. However, 2011 was a 'peak' year because of the threat of piracy in the Western Indian Ocean; LTLL effort in the WCPO is now more stable, despite less boats.

The LTLL fleet can be divided into two groups based on target species – one group targets bigeye and operates mainly in tropical waters (15°N-15°S) conducting round-the-year trips, and relying on transshipment for offloading catches and refuelling/provisioning. The other group targets albacore in subtropical/temperate waters and enter PIC ports twice a year for landing catches, refuelling and re-supplying. The total tuna catch of the LTLL fleet declined by 18% from 2011 to 2015 (from 16,685 mt to 13,795 mt). The average tuna species breakdown in the period 2011-2015, was bigeye at 41% of total tuna catch; yellowfin at 16%, and albacore at 42%. This indicates that the switching of target species between tropical bigeye/yellowfin and sub-tropical albacore is common place for the LTLL fleet. The majority of the LTLL fleet's catch was in high seas areas. The average high seas catch as a proportion of total WCPFC-CA catch in 2011-2015 was 74%. The most important EEZs in this period were the Kiribati Line and Phoenix Groups, and the Solomon Islands between 2011 and 2013, but this dropped off in 2014 and 2015. It is assumed that the Solomon Islands remains important, but that catch was by vessels chartered by Solomon Islands with catches attributed to Solomon Islands flag during these years. Albacore fishing by the Taiwan flag fleet has mostly been in the high seas between 20°S-40°S, and to a lesser extent high seas around the Line Islands, with catches in Cook Islands and Solomon Islands EEZs. The 70-80 vessels of the LTLL fleet are controlled by around 30 companies, who are members of the Taiwan Tuna Association. Some of the firms involved are quite large and there is evidence of concentration of ownership.

The STLL fleet changes fishing grounds and target species based on fishing season and market price; ice vessels target yellowfin/bigeye for fresh sashimi markets; and freezer vessels target albacore/billfish. Beginning in the 2000s, a significant portion of the STLL fleet enhanced their freezing and fish hold capacity. These improvements enable higher quality bigeye and yellowfin to be held at -55°C rather than -35°C or -40°C. The result is an increase in autonomy at sea (i.e. lengthening trips) and expanded markets to include those for sashimi. The consequences of this shift include greater ability to shift targets (albacore vs. bigeye), and a greater reliance on at-sea transshipment for those vessels operating on the high seas.

There was an overall decrease in tuna catch of 32% between 2011 and 2015 (from 24,072 mt to 16,296 mt) for the STLL fleet. The average tuna species breakdown in the period 2011-2015, was yellowfin at 47% of total tuna catch; bigeye at 20%, and albacore at 37%. Tropical bigeye and yellowfin were the main target, but there was some opportunist switching to albacore. Like the LTLL fleet, the majority of the STLL fleet's catch was in high seas areas. The average high seas catch as a proportion of total WCPFC-CA catch in 2011-2015 was 66%. The most important EEZ in 2011 to 2013 was the Solomon Islands, but this dropped off in 2014 and 2015. The Solomon Islands remained an important EEZ, however Taiwan vessels fishing there were chartered by Solomon Islands, with catches attributed to Solomon Islands flag during these years. The next two most important PIC EEZs were Palau and FSM. STLL are operated by their owners who generally have only one or a few boats (i.e. not big fleets). These are members of the Taiwan Tuna Longline Association (vessels of 20-99GT).

Taiwan's longline fleet relies heavily on high seas transshipment. In 2015, 155 high seas transshipments of catches from the WCPFC CA were made, totalling 12,542 mt. In the same year, Taiwan also reported that the fleet made 406 transshipments in-port of catches.

Generally, the same issues are facing the Taiwan longline fleet as for Japan (and South Korea), i.e. while fuel costs are now stable, bait is usually available but sometimes hard to get in desired sizes, and good crews are hard to find and retain.

Korea

The Korean longline fishery is entirely comprised of large distant water vessels with ULT capacity for storing sashimi-quality fish at temperatures around -60°C. Typically 350-500 GRT in size, refuelling, bait replenishment and transshipment are done at sea. With this distant water mode of operation and the ULT freezing of catch, trips are typically 18-24 months, before return to Busan, the home port of all vessels. Vessels are bunkered and provisioned at sea or in port. There are no smaller fresh or frozen tuna longline vessels operating in the Korean EEZ or adjacent waters in the North Pacific. In 2015, the global Korean tuna longline fleet consisted of 148 vessels, steadily decreasing from 202 in 1999, and 276 in 1990. No new vessels have been built since 1991 and there are reportedly no plans to build new vessels due to the high construction cost not being justified by current or future economic returns.

The global catch of the Korea longline fleet vessels was 38,439 mt in 2014 and may have declined slightly since that time. The great majority of Korean longline activity now occurs in the Pacific Ocean, where more than 80% of longline vessels fish, with around 20 vessels in the Indian Ocean, and less than 5 vessels in the Atlantic. Although there is no Korean government regulation in place that restricts vessel movement between oceans, seasonal shifts between ocean areas no longer occur, largely because of the increased operational costs in doing so. Some vessels recently relocated from the Indian Ocean to the Atlantic, and WCPO vessels have fished more frequently in the EPO since 2016, and more so in 2017.

The number of vessels actively fishing in WCPO has been recently stable in recent years, following a steep decline during the 1990s and 2000s from a peak of 220 in 1991. During 2011-13, vessel numbers were between 124-126, and 97 in 2016.

The WCPO vessels originally targeted albacore and operated from overseas bases, but since 1999, with enhanced freezer capacity and increasing vessel size, have operated from home base (Busan) in distant water mode, transshipping catch in selected ports, within EEZs and on the high seas. There is considerable processing of high quality ULT product prior to export which occurs mostly in Busan, and some landings are for domestic consumption. Korea longline catch in the WCPO has declined since the 2000s, in line with the fall in vessel numbers. Total annual WCPFC-CA catches have been in the range of 19,000 mt to 28,000 mt in the last five years, 2011-15, which is well below the historical high of 54,599 mt in 2002. The record of total effort over the last five years in WCPO indicates a 40% decline in days fished.

The catch is dominated by bigeye and yellowfin, the target species (95% on average of the total tuna caught in 2011-15), with only minor catches of albacore. The 2015 catch of albacore has however been the highest for several years. The target species (bigeye and yellowfin) are transhipped gilled and gutted, whereas albacore are traded whole round.

Prior to 2014, most of the catch was taken in the high seas (> 70%) with significant but smaller amounts in Solomon Islands and Kiribati EEZs, reflecting access agreements in place. In 2014, this situation reversed with 60-70% of catches originating from the three Kiribati

EEZs. This appears to be related to improved access arrangements between Kiribati and Korea, during which time a number of Korean purse seiners switched to Kiribati flag. In 2016, however, due to a combination of deteriorating access conditions and spatial shifts in favourable fishing conditions, the situation may have reversed again, with the majority of the WCPO catch being taken once again in high seas areas, accompanied by some movement into the EPO. The situation is likely to change again in 2017, with the introduction of the PNA VDS scheme so far being unsubscribed by distant water fleets who continue to fish outside EEZs for the time being, and the situation in Kiribati, which has opted to stay out of the VDS and establish its own Catch Management Scheme (CMS). It remains to be seen how this situation will play out, but some voices in the Korean industry feel that a viable fishery could be maintained without EEZ access, provided the EPO remains open and bigeye longline quotas in the WCPO and EPO are not further reduced.

Korean longline catch is regularly transhipped to carrier vessels, either in port, at sea within EEZs, or on the high seas. All Korean vessels are authorized to tranship on the high seas. During 2015 total transshipment of Korean longline catches from WCPFC area was 13,658 mt (all species). For yellowfin, bigeye and albacore caught in the WCPFC-CA the volume transhipped in 2015 was 11,729 mt, which is around 70% of total tuna catch – the remainder was likely returned to the home port (Busan) onboard the vessel.

Fuel and labour costs together make up 60% of total operating costs, and there is an increase in bait costs, currently around 11%. However, fish prices have remained relatively flat in the main market, Japan. The Korean fleet has struggled to maintain profitability in recent years, in the face of declining catches and increasing costs.

Four companies/groups dominate the ownership of Korean longline vessels – Sajo group (51 longline vessels), Dongwon Industries (15), Dongwon Fisheries (12) and Silla (11) make up 75% of the fleet numbers.

Japan remains the main market for Korean sashimi tuna, accounting for approximately 70% of Korean frozen (sashimi quality) exports, with most of the balance to the US, the EU and China. Virtually all high quality tuna intended for export is processed and packed at ULT cold storage plants in Busan port, following grading, skinning and slicing. About 10% of the total catch is landed direct in Japan ports, rather than in Korea. South Korean product is acknowledged as high quality and as such attracts strong demand, second only to Japan ULT longline fish, and commands corresponding higher prices than competing Taiwan and Chinese product. The remaining 30% of landed (tuna) product is directed to domestic sashimi consumption.

China

Between 2009 and 2015 the number of China longline vessels active in the WCPO increased from 219 to 429. Many of these vessels target albacore for canning, but a significant number of around 90 vessels are deep freezer vessels targeting higher value sashimi markets for both albacore and bigeye.

Modernization of China's longline fleet over time has been the result of technology transfer from some additions to the fleet from primarily Japan, later followed by vessels built in China. In the early 2000s, 90% of China's larger high seas fishing vessels were secondhand and its tuna fleet was very small. As China developed its fleet, Japan initially allowed export of refrigeration equipment and technology only. In the mid-2000s changes in Japanese policies

allowed China to obtain used fishing vessels, primarily larger longliners with ultra-low temperature freezing capabilities.

Of the 503 China longline vessels that record a date of construction on the WCPFC Registry of Fishing Vessels, 74% were built in 2000 onwards, and 46% were built in 2010 onwards. Like other national fleets in the WCPO longline fishery, many of the newer Chinese vessels are built with advanced features, including improved refrigeration, navigation, and communication systems. Lower freezing and holding temperatures in the later generations of some vessels built for the WCPO fishery can lessen high-grading of that portion of the catch formerly held as fresh, as well as diversify markets for the frozen catch. For example, vessels built with deep freezer refrigeration systems but targeting albacore can take advantage of an emerging Japan market for low-temperature sashimi-grade albacore.

China has two types of tuna longline vessels, ice fresh tuna longline (IFLL) including those targeting albacore (albacore vessels) and deep frozen tuna longline (DFLL). There are two components to the ice fresh tuna longline category. The first consists of 27 Marshall Islands-based vessels that utilize ice only and target bigeye and yellowfin. These vessels belong to two subsidiaries of Luen Thai Fishing Venture (LTFV) and typically fish in the Marshall Islands EEZ and surrounding area, making trips lasting from 10 days to two weeks. The second, much larger component is comprised of 338 vessels, some with reportedly both freezer and ice capability that target primarily albacore for cannery use. Those with ice capacity are said to have the capability to deliver fresh albacore, yellowfin and bigeye for non-cannery uses from the final few sets. A subset of this component includes vessels with deep freezing (-55°C) or ULT (-60°C) capabilities. Fishing activities take place primarily in the high seas for these vessels as well as in the EEZs of Solomon Islands and Vanuatu for some vessels. The distinction between deep freezing at -55°C and ULT is not always clear in terms of which market segment the product is distributed into – it is feasible that -55°C product enters the ULT cold chain, especially given the latter's price premium.

The deep frozen tuna longline component consists of vessels that wholly freeze their catch, whether targeting albacore or bigeye/yellowfin. China reports 91 vessels in this segment of their fleet, some of which may operate in the Eastern Pacific Ocean as well as parts of the WCPO, including the overlap area. It appears that much, if not all of the catch of these vessels is transhipped at sea.

In 2012 the government of China capped the total number of distant water longline vessels at 580. The WCPFC Record of Fishing Vessels (RFV) lists 516 Chinese vessels as authorized to fish in the WCPFC Convention Area – high seas and EEZs. Of those 516, 429 actively fished in 2015. Of the total 516 vessels on the RFV, 133 are listed as chartered and flagged to other CCMs, although the cessation of chartering as a means of granting access by Solomon Islands in 2016 may lower the chartered number. The government considers that for all distant water fisheries there has been sufficient uptake in knowledge and development of skills so that the government will no longer promote more expansion of the fleets concerned.

In 2016, 50 vessels were registered to Fiji flag by 15 Fiji companies that are believed to have some direct or indirect connection to China.

Total tuna catch in WCPO by the China longline fleet saw some fluctuation within the five-year period 2011-2015, peaking in 2012 at 42,54 mt, declined in 2013 and 2014, but then stabilized in 2014 and 2015 at around 30,000 mt. The average tuna species breakdown in the period 2011-2015 was 52% albacore, 31% bigeye and 46% yellowfin. Catch trends by species between 2011 and 2015 saw a 26% increase in albacore, 26% decline in bigeye and a 47% increase in yellowfin. The most important PIC EEZs in 2011-2015 were Kiribati – Line Group,

the Cook Islands, Vanuatu, and Marshall Islands. The average high seas catch as a proportion of total WCPO catch in the period 2011-2015 was 44%. However, high seas catch as a proportion of total catch has decreased: it was 58% in 2011, dropping to 27% in 2015. Total days fished by the China longline fleet in WCPO fluctuated during the period 2011-2015. It peaked in 2013 at 53,818 and declined considerably in 2014 and 2015, which represents a 41% drop from 2013 to 2015.

In 2015, a total of 18,451 mt (tuna and non-tuna species) was transhipped 'at sea' during 234 transhipment events to WCPFC registered carriers by the Chinese large-scale longline fleet.

The three major distant water longline operating expenses usually cited irrespective of vessel nationality are crew, bait, and fuel. China's distant water longline fleet is not immune to many of the problems confronting fleets from other nations, but extensive programs of subsidies at central and provincial government levels are believed to have been available to China's fleet.

The structure of companies in China's tuna longline industry echo much of the transformation within China's business sector during the past 30 years. Companies can be generally categorized as those wholly or substantially owned by large state owned enterprises (SOEs) engaged in fisheries and those companies that are funded by and operate fully in the private sector. Large SOEs have tended in recent years to create listed stock companies engaging in specific fisheries from subdivisions within their operations while retaining a controlling interest in those listed companies. Private sector companies can be privately-held or listed stock companies. In general, the smaller private firms are those that have had experience in other fisheries and have expanded or switched their activities to tuna. The larger wholly private companies are mostly those with extensive experience in tuna and other fisheries. A unique company is Luen Thai Fishing Venture (LTFV), part of a growing industrial conglomerate that had limited experience in fisheries but devised a unique business plan that draws support from other aspects of the parent company's business.

China's fishing companies active in the WCPO have invested in facilities in Fiji, Kiribati, Palau, FSM, Marshall Islands, and most recently in Samoa. The extent of such investment is variable, but primarily done to gain access (to both fishery access and quotas) and to the Pacific Island EEZs concerned, and secondarily to support or enhance operations in the region.

Japan has for several years been attempting to stimulate the marketing of high quality longline-caught tuna in China. The hope is to tap into China's growing elite and upper-middle class consumers. During the past decade several large cold stores were built in China (e.g. in Dalian and elsewhere), supported by technical assistance from Japanese companies and joint ventures between Japanese and Chinese firms. Investment from Japan in China's ULT processing sector has continued, but indications are that the Chinese sashimi market for high value tuna has not grown substantially (stable at around 12,000 mt/year).

A relatively recent increase in the use of albacore as sashimi in Japan has driven some processing and fleet expansion in China. Whether higher value bigeye or albacore, China's processing sector for ULT tuna will remain primarily focused on the Japanese market. In that regard, China's ULT export-oriented processing may be starting to challenge Korea's. It may be some time, though, before China product reaches the same quality of Korean and Taiwan whole round supply; instead China exports are likely to focus on 'fillet' (block) product.

INTRODUCTION

Rationale and Aims of the Research

The overarching aim of this report is to provide industry and market intelligence to FFA members regarding the current status of the tuna longline industry in terms of distant water fleets (DWF) and other companies involved in the global value chains that these fleets supply. The study examines the DWFs of China, Japan, South Korea and Taiwan. The primary focus is on industry dynamics, that is, key companies and organisations, industry organisation and corporate strategies; and the secondary focus is on markets and marketing strategies.

Good quality information exists on longline catch and effort trends and there is some research on bio-economic modelling in this marine capture sub-sector. Yet the industry and market dynamics of the global longline industry are little understood, especially compared to the global canned tuna industry. It is widely known that the vast majority of sashimi grade tuna go to the Japanese market and that the majority of canning-grade albacore is processed for sale in the USA. Two prior studies commissioned by FFA have looked in detail at these two markets, which, in combination with the updates in this report, provide a rich original empirical resource.¹

The more recent of these FFA commissioned studies included cutting-edge analysis of the longline industry, including case studies of the main fleets and, and it provides a base line for the current work.² Given the global nature of the prior study, which included original research in 12 countries on various sub-sectors in the global tuna industry, it was only able to scratch the surface of the East Asian longline sector. In addition, much is changing in the sector, including the rise of the China flagged fleet, new trends in sashimi product processing and international trade, shifts in traditional markets and the growth of nascent ones, and two new regulatory initiatives developed by the Pacific Islands countries (PICs).³ This study is thus an update, extension and deepening of the prior two FFA studies' coverage of the tuna longline industry and associated markets.

After the success of the Vessel Day Scheme in capturing considerable increases in rent from the WCPO distant water purse seine fishery, PICs turned to examine possibilities for improved regional management of the longline sector and the potential capture of enhanced local development gains. The two PIC initiatives are the Tokelau Arrangement which is focussed on the South Pacific albacore longline fishery which was initiated in 2014, and the Longline Vessel Day Scheme for the tropical longline fishery (bigeye and yellowfin), formally implemented on 1 January 2017. It is too early to say what the relative achievements of these new access arrangements will be, but there is a need to better understand the main players in the longline sector (boat owners, trading companies), what drives them (Japan, USA and other markets for longline products), and how these activities are regulated (public and private requirements at national and regional scales).

Research Methodology

Most of the original research for this study was done in the first four months of 2017 and as such is a snap-shot from this period of time. The industry and its regulation is dynamic and thus some elements of the analysis will have changed over the period of drafting this report.

¹ See for example, Campling, Havice and Ram-Bidesi. (2007) and Hamilton, McCoy, Lewis, Havice and Campling (2011).

² Hamilton, McCoy, Lewis, Havice and Campling (2011).

³ The term PIC(s) is used in the report to refer to the Pacific island countries that are members of the Pacific Islands Forum Fisheries Agency.

The research is a case study analysis of the four main East Asian tuna longline fleets and their principal markets (i.e. Japan and the USA). The method for the study combined desk research of grey literature (consultancy reports), industry press, market research and academic sources with interviews with representatives of industry and government from the four case studies. Semi-structured interview schedules were developed in advance and reviewed by the team. Separate interview schedules were developed for the four main categories of interviewee:

1. longline industry association representatives
2. longline tuna buyers
3. longline boat operators
4. government officials

Each schedule consisted of around 30 questions, grouped under 6 thematic areas: organisation overviews; fishery access arrangements; the buying and selling of raw material (tuna); competition among firms within an activity and along value chains; regulation and government supports; and interactions with PICs. We also asked interviewees their view on future prospects for the industry and whether there were other people we should talk to (i.e. 'snowballing').

The interview schedules deliberately incorporated the same questions on a number of issues so to provide for the possibility of soliciting different views and to allow for triangulation where interviewees held similar views. Interviews were transcribed which allowed for the whole team to review material and re-examine interview data as required.

Interviews typically lasted between 1 and 1.5 hours, but several were a lot longer and a small number were shorter. Tours of fish markets and factories were done and field notes were taken on these. All interview data is anonymous and interviewees are not named in relation to particular opinions. A full list of persons consulted is provided at the end of the report. Interviews were done by:

- Lewis in Seoul (with Campling) and Busan in South Korea during 27 to 31 March 2017
- Lewis in Tokyo, Yaizu and Shimizu in Japan, during 3 to 8 April 2017
- McCoy in Taipei, Kaohsiung and Donggang in Taiwan, during 6 to 10 March 2017
- McCoy in Beijing, Shanghai, Shenzhen, Ningbo and Zhoushan in China, during 24 to 28 April 2017

A small number of additional interviews and personal communications were done with other experts. Others interviewed or consulted included FFA staff and other international organisations, and representatives of industry from other countries than the case studies. Budget constraints meant that we were unable to undertake fuller research on industry dynamics and processes outside of the four case studies; for example, the team relied on secondary sources for the analysis of the EU and US markets.

Study structure

The report starts in Chapter 1 with a snap shot of crucial data points and global trends in longline tuna fisheries such as stock status, global fleet capacity and identifying the major players, differentiating between albacore and tropical longline fisheries in the WCPO and the economic conditions of this region, and noting important trends in by-catch and high seas transshipment. The rest of this chapter surveys the main regulatory contexts shaping the WCPO longline industry. It details the various layers of regulation, which works at multiple scales – regional, sub-regional and national – and at multiple points in the global value chains for longline products – i.e. at extraction (fishing), processing and principal market access.

Regulation is not only about the public sector (i.e. by RMFOs/governments), but also by the private sector and NGOs; these forms of ‘private ordering’ of the industry often interact with public ones.

In order to further situate the case study chapters, Chapter 2 of the report examines tuna longline product market trends, market structure and, where new information became available, processing for these markets (i.e. sashimi grade products). Due to the centrality of Japan for sashimi tuna and of the US for canned albacore, these two markets receive the largest analytical weight and relative coverage in the report compared to the various global value chains that the longline fleets supply. Additional coverage is provided of the US and EU markets for products using longline tuna because of their relative commercial significance and the availability of information. Very limited information is provided on the US-centred albacore tuna processing sector because this has been studied extensively elsewhere.⁴

The rest of the report is dedicated to the four national case study longline industries, with an emphasis on the WCPO. Each case study is addressed in a stand-alone chapter, in order of the historical development of national longline fleets: Japan (Chapter 3), Taiwan (4), South Korea (5) and China (6). The analysis is limited to vessels flagged by these four countries, although, given their commercial significance, some discussion of flag of convenience vessels in the Taiwan fleet is provided. The emphasis is on distant water fleets, with some supplementary coverage of offshore fleets – mainly of Japan and Taiwan. Each chapter provides a sketch of the historical development of the fleet, describes its current status and WCPO operations (e.g. catch, effort and transshipment), and, where available, indicators of operating costs are provided. Each chapter then identifies and profiles the major companies in the sector, including, where information was available, their major foreign buyers and information on the domestic market (i.e. the export-oriented sashimi-grade processing industry in China and South Korea, and local consumption of tuna sashimi).

Style Notes

Extensive interview data are used throughout. These are generally not referenced unless a specific factual piece of information is provided. Therefore, unless otherwise specified (i.e. in a footnote) the reader can assume that information is from interviews. Currency amounts in the report are expressed in US dollars unless otherwise specified, and fish quantities expressed in tons are metric tons. All references to temperature are Celsius.

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⁴ For example, Campling et al. (2007), Hamilton et al. (2011), Campling (2015), McCoy et al. (2015) and references therein; and a wide range of academic publications across disciplines.

1 A GLOBAL OVERVIEW OF TUNA LONGLINE FISHERIES AND THEIR REGULATION

1.1 GLOBAL OVERVIEW

1.1.1 Biology: Stock Status

Tuna longline fleets operate in all four oceans – the Western and Central Pacific Ocean (WCPO), Eastern Pacific Ocean (EPO), Atlantic Ocean (AO) and Indian Ocean (IO). The current health (status) of bigeye, yellowfin and albacore stocks targeted by longliners varies between oceans (Table 1.1).

Table 1.1: Status of longline-targeted tuna stocks

| Ocean | Species | | |
|-------------|---|--|---|
| | Bigeye | Yellowfin | Albacore |
| WCPO | Not overfished Overfishing not occurring | Not overfished Overfishing not occurring; full exploitation in tropical regions | Not overfished Overfishing not occurring (For northern/southern stocks) |
| EPO | Slightly overfished Overfishing not occurring in recent years | Slightly overfished Overfishing not occurring | Not overfished Overfishing not occurring (For Northern/Southern stocks) |
| IO | Not overfished Overfishing not occurring | Overfished Overfishing occurring | Not overfished Overfishing not occurring (some uncertainty) |
| AO | Overfished Overfishing occurring | Slightly overfished Overfishing occurring (some uncertainty) | Unknown stock status; overfishing likely not occurring (insufficient data) |

Sources: ISSF 2017 for all data except WCPO BET status which uses McKeachie, Pilling and Hampton 2017

Bigeye stocks are considered healthy in the Indian Ocean and borderline in the Eastern Pacific Ocean, with a reduction in fishing pressure in recent years. However, in the Atlantic Ocean, bigeye is in a precarious state. While previous stock assessments indicated that bigeye in the Western and Central Pacific was overfished, with overfishing occurring, at the time of writing a new stock assessment was adopted by WCPFC's 13th Scientific Committee which indicates a more positive outlook in terms of stock status; results indicate that the bigeye stock is not experiencing overfishing (with 77% probability) and is not in an overfished state (with 84% probability).⁵

⁵ Refer to McKeachie, Pilling and Hampton 2017 for further details.

Indian Ocean yellowfin stocks are currently deemed to be in an overfished state, with overfishing occurring; the Atlantic Ocean yellowfin stock are slightly overfished, but there is some uncertainty underpinning the stock assessment. In the Eastern Pacific Ocean, there is some recovery with overfishing no longer occurring, however, stocks remain in a slightly overfished state. WCPO boasts the only healthy yellowfin stock, however, stocks are fully exploited in some parts, particularly within the western tropical region.

Albacore remains biologically healthy in all four oceans; however, sufficient data is lacking for the Atlantic Ocean to perform a conclusive stock assessment.



Pacific bluefin sold at Tsukiji market. Photograph: Antony Lewis

There are longstanding concerns that overcapacity in global longline fisheries (from high vessel numbers and operational/technological developments) has placed excessive fishing pressure on vulnerable tuna stocks, particularly bluefin, bigeye and yellowfin. In addition, high levels of incidental by-catch of juvenile bigeye and yellowfin by purse seiners fishing on fish aggregation devices (FADs) has negatively affected the adult biomass of these species (and in turn, potentially longline catch rates of these species).

1.1.2 Global Longline Fleet

The total number of longliners (all sizes) currently registered on the four RFMO's record of fishing vessels is 17,494 (Table 1.2). While ICCAT has the highest number of longliners registered, over 90% (10,715) are small-scale vessels less than 100GT/GRT.

Table 1.2: Total global number of tuna longliners and flags (2017)

| RFMO | No. of LL Vessels | Flags |
|--------------|-------------------|---|
| WCPFC | 3,156 | Australia (38), China (514), Cook Islands (10), FSM (18), Fiji (75), French Polynesia (75), Japan (472), Kiribati (1), Korea (118), New Caledonia (16), New Zealand (1), PNG (8), Portugal (9), Solomon Islands (1), Spain (23), Taiwan (1,536), Tonga (1), Tuvalu (2), USA (163), Vanuatu (75) |
| IOTC | 1,553 | Australia (41), China (105), EU-France (18), India (4), Indonesia (194), Iran (5), Japan (207), Kenya (1), Korea (87), Madagascar (8), Malaysia (16), Maldives (48), Mauritius (5), Mozambique (12), Oman (7), Philippines (7), EU-Portugal (19), Seychelles (60), South Africa (22), EU-Spain (148), Sri Lanka (537), EU-UK (2) |
| IATTC | 1,304 | Belize (4), China (378), Costa Rica (12), Ecuador (16), EU-Portugal (10), EU-Spain (125), EU-France (14), Japan (233), Kiribati (3), Korea (191), Mexico (15), Nicaragua (1), Panama (65), Peru (1), Taiwan (152), USA (38), Vanuatu (46) |
| ICCAT | 11,481 | Algeria (442), Angola (2), Belize (12), Brazil (17), Canada (2), China (41), Egypt (4), EU-Croatia (6), EU-Cyprus (42), EU-Spain (224), EU-France (250), EU-Italy (925), EU-Malta (597), EU-Portugal (44), EU-UK (3), Fr St Pierre & Miquelon (1), Iceland (1), Ivory Coast (2), Japan (204), Korea (74), Libya (6), Morocco (563), Mexico (31), Namibia (2), Panama (33), Senegal (2), South Africa (1) St. Vincent & Grenadines (32), Taiwan (85), Trinidad & Tobago (20), Tunisia (831), Turkey (6,911), Venezuela (31), US (40) |
| Total | 17,494 | |

Source: Vessel registers - WCPFC, IOTC, IATTC, ICCAT August 2017

In 2015, the total global longline tuna catch was around 450,000 mt. WCPO accounted for around 56%, EPO 16%, AO 15% and IO 13%. Bigeye accounted for 38% of total global catch by species, yellowfin 30% and albacore 32% (Table 1.3). With the exception of 2012 when global longline catch exceeded 500,000 mt, annual catches were fairly stable at around 450,000-460,000 mt during 2011-2015 (Table 1.4).

Table 1.3: Total longline tuna catch by ocean by species (2015)

| Ocean | Catch (mt) | | | |
|--------------|----------------|----------------|----------------|----------------|
| | Bigeye | Yellowfin | Albacore | Total |
| WCPO | 64,682 | 101,326 | 86,857 | 252,865 |
| EPO* | 35,096 | 8,522 | 28,874 | 72,492 |
| IO | 32,164 | 16,410 | 10,993 | 59,567 |
| AO | 40,073 | 11,694 | 17,150 | 68,917 |
| Total | 172,015 | 137,952 | 143,874 | 453,841 |

*2014 estimates used for YF/ALB catches as 2015 data are not available

Source: WCPFC 2016, IATTC 2016, IOTC 2017, ICCAT 2016

Table 1.4: Total longline tuna catch by ocean (2011-2015)

| Ocean | 2011 | 2012 | 2013 | 2014 | 2015 |
|--------------|----------------|----------------|----------------|----------------|----------------|
| WCPO | 258,977 | 270,190 | 237,731 | 259,190 | 252,865 |
| EPO | 56,566 | 73,319 | 72,988 | 72,192 | 72,492 |
| IO | 63,180 | 91,271 | 66,814 | 61,824 | 59,567 |
| AO | 77,915 | 76,666 | 71,875 | 65,191 | 68,917 |
| Total | 456,638 | 511,446 | 449,408 | 458,397 | 453,841 |

Source: WCPFC 2016, IATTC 2016, IOTC 2017, ICCAT 2016

1.1.3 Major Fleets

The most significant distant water longline fleets operating in WCPO (and EPO) are China, Taiwan, Korea and Japan in terms of fleet size, catch volumes and bigeye catch quota allocation (see Section 1.3.1). Hence, these four countries were selected as case studies for this study.

Collectively, China, Taiwan, Korea and Japan's longline vessels have accounted for 75-83% of the total number of longliners active in the WCPO from 2011-2015 (Table 1.5). In terms of catch volume, these fleets have accounted for 39-48% of total longline catch under flag-based allocation, with additional catches attributed to chartering states (Table 1.6).

Table 1.5: Number of China, Taiwan, Korea and Japan longline vessels active in WCPO (2011-2015)

| Year | Taiwan | Japan | Korea | China | Total | Total WCPO | % WCPO |
|------|--------|-------|-------|-------|-------|------------|--------|
| 2011 | 1,471 | 432 | 124 | 275 | 2,302 | 2,864 | 80% |
| 2012 | 1,413 | 402 | 126 | 286 | 2,230 | 2,726 | 81% |
| 2013 | 1,378 | 409 | 125 | 379 | 2,291 | 2,747 | 83% |
| 2014 | 1,348 | 369 | 110 | 353 | 2,180 | 2,796 | 78% |
| 2015 | 1,382 | 338 | 84 | 429 | 2,233 | 2,983 | 75% |

Source: WCPFC 2017; various WCPFC AR-1 2016.

Table 1.6: Total WCPO catch^a by China, Taiwan, Korea and Japan longline fleets (mt) (2011-2015)

| Year | Taiwan | Japan | Korea | China | Total | Total WCPO | % WCPO |
|------|--------|--------|--------|--------|---------|------------|--------|
| 2011 | 40,757 | 22,639 | 23,833 | 27,733 | 114,962 | 258,977 | 44% |
| 2012 | 34,159 | 23,025 | 27,919 | 42,154 | 127,257 | 270,190 | 47% |
| 2013 | 37,731 | 17,809 | 19,689 | 39,471 | 114,700 | 238,731 | 48% |
| 2014 | 29,901 | 16,621 | 22,187 | 29,962 | 98,671 | 259,190 | 38% |
| 2015 | 30,001 | 14,727 | 22,895 | 30,088 | 97,711 | 252,865 | 39% |

Source: WCPFC 2017

^a Bigeye, yellowfin, albacore

1.1.4 WCPO Southern vs. Tropical Longline Fisheries

In the WCPO, there are two longline fisheries – the Southern and Tropical longline fisheries. Vessels operating within the Tropical longline fishery are typically large-scale distant water vessels fishing between 20°N-20°S, which target bigeye and yellowfin for sashimi markets, with smaller volumes of incidentally-caught albacore. Vessels operating in the Southern longline fishery are typically smaller (<100GT) and target albacore for canning markets in sub-tropical waters below 10°S and have small volumes of incidental bigeye and yellowfin by-catch. With advancements in freezer technology, particularly for the smaller vessels, the distinction between the tropical and southern longline fleets has become less obvious, with some vessels now having the ability to switch targets depending on seasonality, fishing location, stock abundance etc., moving between both fisheries.



Luenthai vessels after undergoing maintenance in Zhoushan, China. Photograph: Mike McCoy

The Southern longline fishery has developed significantly over the last 10-15 years, largely in association with growth in the number of Pacific Islands' domestic-flagged and chartered longline vessels. This is reflected in WCPO catch composition data for all longline vessels. In 1980, yellowfin was the main target species, comprising 54% of total catch, while bigeye was 27% and albacore only 18%. In 2015, yellowfin remained the dominant species but had declined to 40%, while albacore increased to 33% and bigeye remained about the same at 26%. From 2001-2015, total annual albacore catch in the WCPO almost doubled from around 33,000 mt to 57,000 mt.⁶

1.1.5 WCPO Economic Conditions⁷

The WCPO tropical longline fishery has been through two phases of below average economic conditions since 1997 (the beginning of the assessment period). During 1997-2008, economic conditions continuously and rapidly declined, given rising costs, particularly fuel, coupled with falling fish prices and catch rates. In 2009, the global fuel price fell significantly, while at the same time, catches increased, resulting in a two-year improvement in economic conditions. However, from 2011-2014, economic conditions were once again below average, due to declines in catch rates and fish prices. Despite a significant fall in fuel prices in 2014-2015 (e.g. ave. \$485/mt in 2014 vs. \$900-\$1,000 mt in 2011-2014) and recovering fish prices, economic conditions remained below average in 2015 and 2016. It is projected that the fishery will continue to follow a declining trend from 2017 to 2026, resulting from a forecasted increase in fuel cost and a decline in catch rates, primarily bigeye, which will more than offset projected above-average fish prices. This long-term trend of below average economic conditions has resulted in a declining number of vessels operating in the tropical longline fishery, particularly distant water vessels from Taiwan, Korea and Japan.

Economic conditions for the WCPO Southern longline fishery have declined since 1997, with particularly poor economic conditions from 2010-2014 due to low catches and high fuel prices, despite record high albacore prices in 2011-2012. The long term average real albacore price from 1997-2015 was US \$2,904/mt, while prices in 2011-2013 ranged from around US \$3,000-3,500/mt. In 2015 and 2016, economic conditions improved significantly as a result of declining fuel prices and stable favourable fish prices. However, persistent low catch rates continue to impact negatively on economic conditions and if prolonged, will result in continued below average economic conditions for the fishery in the coming years.

Despite challenging economic conditions, several fleets operating within the Southern longline fishery have continued to operate, but there has been some serious decline in some PIC fleets. Chinese-flagged and Chinese-beneficially owned vessels operating under Pacific-island flag or charter arrangements have been the most resilient, in light of government subsidies available to them which have bolstered profitability. Technological advances have also helped to combat constraints relating to fish price and catch rates for albacore. The development of ULT freezing capacity on smaller vessels has enabled better storage of yellowfin and bigeye portions of catch for sale to high-value sashimi markets, while increased vessel capacity has enabled longer trips. The number of hooks deployed per longline has also increased over time.

⁶ Pilling and Williams 2016

⁷ Skirtun and Reid 2017

1.1.6 By-catch Issues⁸

One of the main environmental concerns relating to tuna longline fisheries is by-catch – notably, sharks, sea turtles, sea birds and other finfish.

Longline fisheries typically have quite high catch rates of sharks, both incidental and in some cases, targeted. A wide range of shark species are caught – some species which are considered relatively resilient to fishing (i.e. blue shark) and others which are considered more vulnerable given their low reproductive rates (e.g. thresher and porbeagle sharks) or overfished states (e.g. oceanic whitetip, silky shark).

Sea turtles are also caught by longliners and are typically discarded alive or dead. Over half of sea turtles caught are alive, so mitigation measures are designed for live release (i.e. de-hookers, line-cutters, circle hooks).

Seabirds, particularly albatrosses and petrels are cause for concern, especially in higher latitudes. Over 90% of seabirds are dead when the longline is reeled in due to drowning, hence mitigation methods focus on avoiding the birds getting hooked in the first place (e.g. weighted branch lines, tori (bird scaring) lines), colour-dyed baits

Longline vessels also catch a number of finfish species, some of which are not of immediate concern given their high productivity (e.g. dolphin fish or “mahī mahī”), while others such as marlin are known to be vulnerable to fishing pressure. Mitigation methods include catch limits.

Each of the tuna RFMOs have a range of conservation and management measures in place relating to longline by-catch mitigation. Measures include enhanced monitoring and reporting, mitigation research and adoption of mitigation technologies.

1.1.7 High seas transshipment

High seas transshipment of catch is the norm in the large-scale tropical (bigeye/yellowfin) longline fishery that spans both the eastern portions of the WCPFC Convention Area and the Eastern Pacific Ocean managed by the Inter-American Tropical Tuna Commission (IATTC). While WCPFC prohibits high seas transshipment, exemptions can be granted by flag states to vessels who determine that it is impracticable to operate without being able to tranship in the high seas (see Section 1.3.1). IATTC permits transshipment at sea by large-scale tuna longline vessels (EEZs/high seas) subject to receiving prior flag state authorisation. The target catch is held at -35°C or -60°C and transhipped to specialized carriers with -35°C or -60°C refrigeration capacity. The large (typically ~ 40 to 50 metres in length) Japanese, Korean, Chinese, and Taiwanese (both Taiwan flagged and otherwise) vessels in this fishery spend up to a year or more at sea, obtaining fuel from tankers at sea, as well as bait and various supplies from the refrigerated carriers. These practices are integral to the economic viability of this type of vessel, where fishing activities take place over a wide range of the WCPO and EPO, often in areas that are far removed from ports that might otherwise be used for transshipment.

These fleets are also the primary source of albacore that is transhipped at sea. Industry sources indicate that while the primary target is bigeye and yellowfin, the albacore portion of the catch from vessels in this fishery fluctuates considerably, but can be up to 40 per cent or

⁸ ISSF 2017

more. The percentage of albacore can be influenced by price as well as good/poor fishing for the target species. Among all fleets, the Taiwanese are known to switch targets the most, fishing in the southern areas to target albacore, then returning closer to the Equator for bigeye.

Both tuna canneries in Pago Pago, American Samoa source some of their albacore supply from high seas transshipment in this fishery; but the amounts relative to direct unloading are not known. The entire catch of a vessel is purchased,⁹ with the bigeye/yellowfin portion either remaining on the carrier or placed in ULT containers to be eventually unloaded in Japan or other Asian markets.

For a number of years now, there have been calls for RFMOs to fully ban high seas transshipment for longliners, given difficulties relating to monitoring and control which increases opportunities for illegal activities, such as IUU fishing, human trafficking and smuggling. Distant water longline fleets are generally strongly against such a ban on the grounds that their fishing operations will no longer be viable if they are forced to return to port to unload/tranship, due to higher fuel costs and lost fishing time. As long as RFMO decision-making is based on reaching consensus, it is unlikely that high seas transshipment will be fully banned. China, in particular, is likely to remain completely inflexible to proposals that impact its vessels. Vessels that are tied to onshore investments in PICS and/or fish mostly within EEZs, are likely to be less impacted by such a ban compared to vessels mainly fishing and transshipping in high seas.

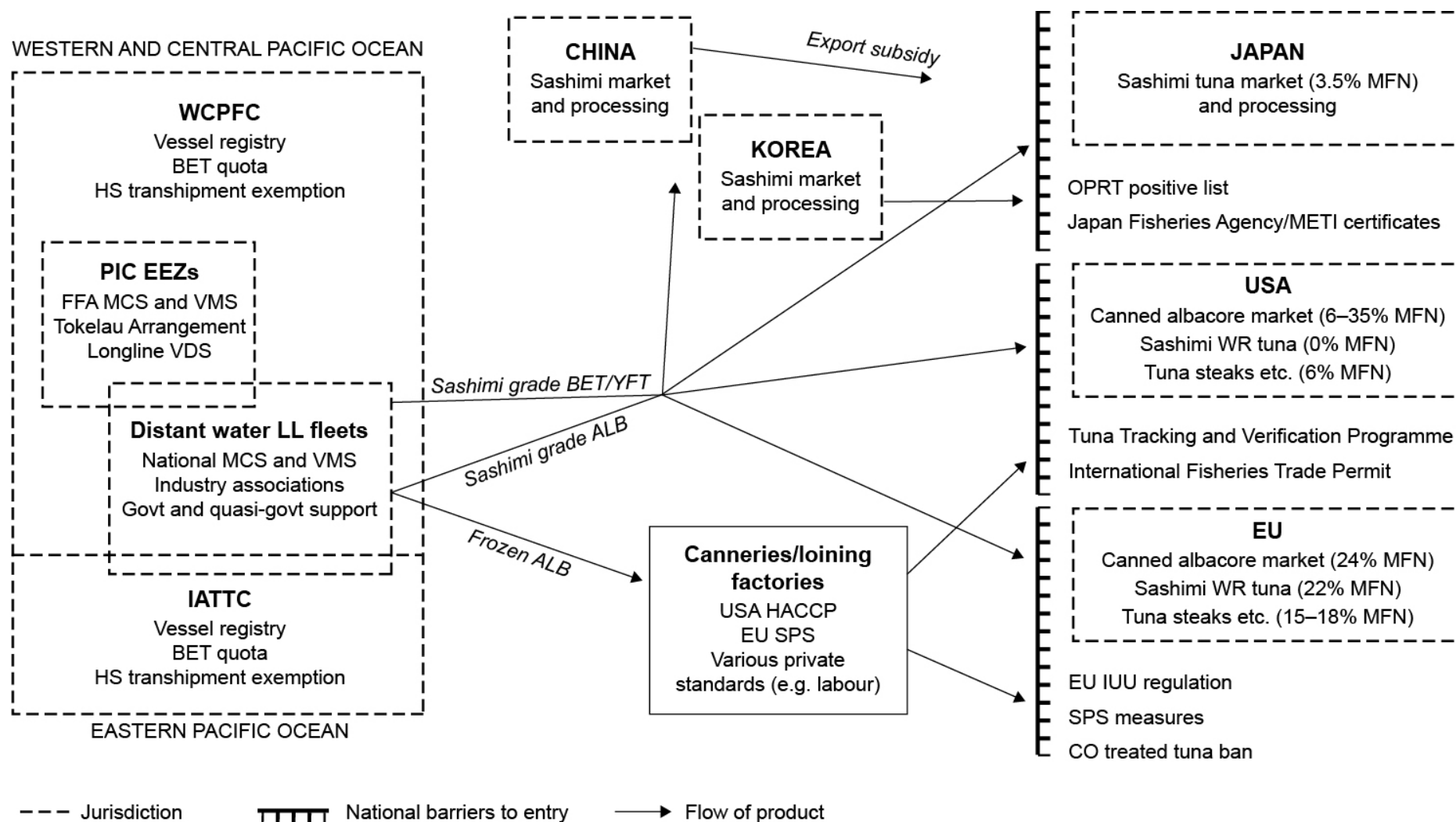
1.2 Longline Fisheries Regulation

This section describes the main regulatory context for the longline industry, with a focus on the Western and Central Pacific Ocean and, to a lesser extent, the Eastern Pacific Ocean, given some fleets move between the two jurisdictions. An ICCAT statistical documentation requirement for bigeye affecting longline vessels operating globally is also discussed. Regulatory mechanisms shaping the industry operations are layered. They work at multiple scales – regional, sub-regional and national– and at multiple points in the global value chains for longline products – i.e. at extraction (fishing), processing and principal market access. Regulation is not only public (i.e. by RFMOs/governments), but also by the private sector and NGOs; these forms of ‘private ordering’ of the industry interact with public ones. A snap-shot of these various forms of regulation is provided in Figure 1.1. These layered ‘rules of doing business’ are only described here, although, where relevant, their analytical implications are drawn out through the rest of the report in terms of interactions with longline industry dynamics.

There are also multiple forms of international or global governance of the industry, which shape the conditions of its operation existence both directly (e.g. the International Maritime Organization on maritime pollution and the International Labour Organization on working conditions) and indirectly (e.g. World Trade Organization rules on non-discrimination in national trade policy). These are beyond the scope of the report and are thus not addressed here.

⁹ The most valuable non-tuna species being swordfish and shortfin mako shark.

Figure 1.1: Schematic of the main forms of public and private regulation of the WCPO longline industry



ALB: albacore tuna; BET = bigeye tuna; LL = longline; MFN = most-favoured nation import duty; VDS = vessel day scheme; WR = whole round fish; YFT = yellowfin tuna

1.2.1 Regional Fisheries Management Organizations

Western and Central Pacific Fisheries Commission (WCPFC)

The Western and Central Pacific Fisheries Commission has a number of conservation and management measures (CMMs) in force which apply to the WCPO tropical and southern longline fisheries. A selection of these CMMs are listed in Table 1.9, with several major ones briefly described below.

The Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna (CMM 2016-01) is the primary management measure for tropical tuna stocks in the WCPO, setting out management measures for the purse seine, longline and other commercial fisheries. This measure was first introduced in 2005 (CMM 2005-01) and has since undergone seven revisions. For the tropical longline fishery, bigeye catch limits were first established in 2005 and have continued through various iterations of the CMM. For 2006-2008, Commission Members and Cooperating Non-Members (CCMs) were required to not increase longline bigeye catches above average 2001-2004 or 2004 catch levels (CMM 2005-01). Phased annual bigeye catch reductions were introduced in 2009 (CMM 2008-01) and continue to date, in line with previous scientific recommendations that bigeye fishing mortality needed to reduce by a minimum of 30% to remove overfishing. The most recent catch limits established in CMM 2015-01 and rolled over into CMM 2016-01 are presented in Table 1.7. Pacific Island countries are not subject to bigeye catch limits given their Small Island Developing State (SIDS) status. Developed countries that are not specifically listed have a catch limit of 2,000 mt.

Table 1.7: WCPO bigeye longline catch limits by flag (2014-2017)

| CCMs | Annual BE catch limit (mt) | | | | Average BE Catch (2013-2015) |
|-----------|----------------------------|--------|--------|--------|------------------------------|
| | 2014 | 2015 | 2016 | 2017 | |
| China | 9,398 | 8,224 | 8,225 | 7,049 | 9,417 |
| Indonesia | 5,889 | 5,889 | 5,889 | 5,889 | n.a. |
| Japan | 19,670 | 18,265 | 18,265 | 16,860 | 12,947 |
| Korea | 15,014 | 13,942 | 13,942 | 12,869 | 11,114 |
| Taiwan | 11,288 | 10,481 | 10,481 | 9,675 | 10,017 |
| USA | 3,763 | 3,554 | 3,554 | 3,345 | 3,620 |

Source: WCPFC (CMM 2016-01); WCPFC 2016

A comparison of average bigeye catches to annual catch limits set under CMM 2016-01 from 2013-2015, indicates that China has exceeded its limits, as has the USA. Japan and Korea's average catches are safely below their limits. In 2017, Taiwan's bigeye catches will need to reduce from the 2013-2015 average to not exceed its catch limit. There have been substantial disagreements amongst Commission members about the use of chartering arrangements to have catch attributed to other members, particularly between the US and its Territories.

For the past few years, there has been an impasse between the purse seine and longline sectors in the WCPO regarding further measures to reduce bigeye fishing mortality. The longline sector holds the position that it has already sustained at least a 30% reduction in bigeye catches and that the deterioration of the bigeye (and yellowfin) stock largely relates

to the incidental by-catch of juveniles from purse seine vessels fishing on FADs. As such, the longline sector maintains that further limits placed on longline vessels would be both unfair and could end up completely crippling the industry. Conversely, the purse seine sector (driven by PNA) maintains that any additional FAD management measures will result in a disproportionate conservation burden, given conservation gains will mostly benefit the longline sector targeting bigeye. Unless the longline sector is willing to accept further management measures or compensate the purse seine sector for the disproportionate burden, no further management measures for bigeye will be agreed for purse seiners.

For yellowfin, CCMs are required to take measures not to increase longline yellowfin catches. CMM 2016-01 indicated that the Commission would formulate and adopt appropriate longline (and purse seine) limits based on recommendations from the Scientific Committee at WCPFC13 in 2016. However, no limits were adopted, on the assumption that yellowfin limits will be handled in the new bridging measure for tropical tunas to come into effect post-2017, when CMM 2016-01 expires (discussed further below).

In order to reduce overcapacity in the longline fishery, CMM 2016-01 also requires CMMs (other than SIDS and Indonesia) to not increase the number of longline vessels with freezing capacity targeting bigeye tuna above the current level (i.e. 2010-2012) and similarly, to not increase the number of ice-chilled longliners exclusively landing fresh fish above the current level or above the current number of licences under established national limited-entry programs.

The current tropical tunas measure is due to expire on 31 December 2017. Negotiations are underway for a bridging measure, while the Commission develops harvest strategies for key stocks and fisheries over the next few years. Negotiation of this measure has been somewhat complicated by the release of the new bigeye stock assessment, which greatly shifts focus from what was a need to achieve further reductions, to now needing to consolidate current measures and maintain fishing mortality at recent levels. Bigeye management options for the longline fishery currently under consideration for the bridging measure include retaining flag-based bigeye catch limits and a cap of vessel numbers and the introduction of limits on fishing effort under PNA's Longline Vessel Day Scheme (see Section 1.2.8), complemented by high seas limits.

The Conservation and Management Measure for South Pacific Albacore (CMM 2015-02) requires CCMs to not increase the number of their vessels actively fishing for South Pacific albacore south of 20°S above 2005 levels or recent historical levels (average 2000-2004). All fleets operating in the southern longline fishery must also provide vessel-level data by species for 2006-2014, which will enhance future stock assessments and assist in assessing the effectiveness of the CMM. Since 2011, FFA members have unsuccessfully tabled proposals to establish a total catch limit for South Pacific Albacore to more effectively manage the fishery, given vessel numbers have continued to increase, despite the existing measure in place. The proposals have received strong opposition from distant water fishing nations, particularly China and Taiwan, on the grounds that since the stock remains above MSY levels, there is no biological or scientific need to adopt strengthened measures. At WCPFC13 in 2016, CCMs agreed to progress a bridging measure inter-sessionally for South Pacific albacore during 2017 while a harvest strategy is being progressed. An interim total catch limit is proposed south of the equator which is allocated between the high seas and EEZs, until a target reference point is set for South Pacific albacore and harvest control rules for the fishery are developed. It has been impossible for the Commission to adequately assess implementation of this measure due to the ambiguity of the limit on vessels "actively fishing" for albacore and different interpretations of what that means.

The Conservation and Management Measure for Regulation of Transshipment (CMM 2009-06) prohibits transshipment on the high seas for longline vessels, except where a CCM has determined, subject to guidelines, that it is impracticable for certain vessels to be able to operate without being able to tranship on the high seas. Under CMM 2009-06's interim guidelines, the prohibition of transshipment in the high seas would need to cause significant economic hardship (assessed in terms of the cost incurred to tranship/land in alternative locations vs. high seas) and require a vessel to make significant and substantial changes to its historical mode of operation. CCMs are supposed to advise the Commission of its procedures for monitoring and verification of high seas transshipments, indicate the vessels to which the determinations apply, as well as submit a plan detailing what steps the CCM is taking to encourage transshipment to occur in port in future. Vessels are required to notify the Commission at least 36 hours prior to each transshipment and submit a transshipment declaration within 15 days of completion. In reality, CMM 2009-06 has not been properly implemented to date. While vessels generally comply with the notification requirements prior/after high seas transshipment takes place, several CCMs that have notified their entire fleets qualify for the exemption, rather than specific vessels, without providing any assessment of the costs incurred to land/tranship fish in locations other than the high seas. Also, CCMs have failed to submit plans to encourage transshipment in port. In 2013, the Executive Director presented draft guidelines for the determination of circumstances where transshipment in port or national waters is impracticable. No agreement was reached on these guidelines, so the interim guidelines under CMM 2009-06 remained in place. In 2016, the Secretariat presented a revised paper on draft guidelines to the Technical and Compliance Committee (TCC12). Despite reasonable discussion, once again, there was no agreement from CCMs. Hence, there is still no basis established on which to assess the economic consequences of vessels being prohibited from transshipping in the high seas.

The Conservation and Management Measure for [the] Charter Notification Scheme (CMM 2016-05) applies to CCMs that charter, lease or enter into other mechanisms with vessels flagged to another state or fishing entity to form an integral part of a chartering members' or participating territories' domestic fleet. Chartering states must notify the Commission within 15 days prior to commencement of fishing of the chartering arrangement; only vessels listed on the WCPFC Record of Fishing Vessels and not on the WCPFC or any other RFMOs IUU list are eligible for charter. Catch and effort of chartered vessels are to be attributed to the chartering state. CMM 2016-05 replaced CMM 2015-05, which was text rolled over from CMM 2012-05. The previous versions did not stipulate how catch should be attributed for charter vessels (i.e. to the flag or chartering state), which resulted in inconsistencies in annual catch reporting by CCMs for longliners operating under charter arrangements, which is potentially problematic for management measures allocating fishing rights based on historical catch/effort as well as resulting in "double counting" in instances where both the flag State and charter State are providing data on the same vessel.

Inter-American Tropical Tuna Commission (IATTC)

Some large-scale freezer longliners and newer smaller-scale vessels operating in the WCPO, also fish within the EPO. Interviews with industry in Korea, China, Taiwan and Japan confirmed this is the case, particularly in recent years. Hence, a brief overview is provided on IATTC's longline management measure for bigeye. In 2003, IATTC introduced a flag-based bigeye catch limit for large-scale longliners greater than 24 metres. Each Member and Cooperating Non-Member (CPC) was required to ensure its total longline bigeye catch in 2004 did not exceed the 2001 level (Resolution C-17-01). In 2004, a textual revision to the measure specified annual bigeye catch limits for China, Japan, Korea and Japan, which remain in place

today. All other CPCs are required to ensure their annual bigeye catches do not exceed 500 mt or 2001 levels (if less than 500 mt). From 2010 until 2020, the same annual catch levels have been adopted for these four CPCs (Table 1.8). From 2018, the US will also have a limit established.

Table 1.8: EPO bigeye longline catch limits by flag

| Flag | Annual Bigeye Catch Limit (mt) | | | Average BE Catch (2013-2015) |
|--------|--------------------------------|---------------|-----------|------------------------------|
| | 2009 | 2010-2017 | 2018-2020 | |
| China | 2,533 | 2,507 | 2,507 | 7,050 |
| Japan | 32,743 | 32,372 | 32,372 | 13,999 |
| Korea | 12,073 | 11,947 | 11,947 | 8,671 |
| Taiwan | 7,645 | 7,555 | 7,555 | 4,929 |
| US | Not specified | Not specified | 750 | 551 |

Source: IATTC various resolutions (2009-2017); IATTC 2017

China's average bigeye catch from 2013-2015, greatly exceeds its bigeye catch limits set from 2009. Japan's average catch is more than 50% below its catch limits. Korea, Taiwan and the US are also below theirs.

International Commission for the Conservation of Atlantic Tunas (ICCAT)

In 2002, the ICCAT Bigeye Tuna Statistical Document Program was established to collect trade data to help address uncertainty on Atlantic bigeye tuna catches. All bigeye tuna imported by ICCAT Contracting Parties and Cooperators (CPCs) must be accompanied by an ICCAT Bigeye Tuna Statistical Document ('ICCAT certificate') or an ICCAT Bigeye Tuna Re-Export Certificate. This requirement applies to bigeye catches from any fishing gear type, including longline, but excludes purse seine or pole-and-line-caught bigeye destined for canning. The ICCAT Certificate requires validation by a vessel's flag state authority, or if under charter, the chartering state authority. Re-export certificates are validated by the state re-exporting the tuna. The ICCAT certificates contain data fields including vessel name, registration number and flag, ocean area of catch, gear type, product type (i.e. fresh/frozen; round, gilled and gutted etc.) and net weight, as well as an exporter certification, in addition to the government validation. When bigeye has been caught in either the Pacific or Indian Oceans, information on product type and net weight is not required, nor the exporter certification, although vessels operating outside of the Atlantic Ocean, generally still report this information.

ICCAT CPCs that are notable importers of bigeye (and besides Japan, re-exporters) include Japan, Korea, China, Taiwan and the United States. According to industry sources, Japan and Korea apply ICCAT requirements very strictly to frozen bigeye imports from longliners. They even undertake DNA testing to validate species. Korea, China and Taiwan request ICCAT certificates for bigeye imports that are destined for re-export to Japan or any other ICCAT CPCs. However, these countries are typically less strict on requiring ICCAT certificates if imported bigeye will be consumed in their own (small) domestic markets (see Sections 4.7, 5.7 and 6.7). The United States, while an ICCAT CPC, does not require ICCAT certificates.

Japan's strict implementation of the requirement for ICCAT certificates for bigeye imports is creating difficulties for longline vessels that have inadequate bigeye catch quota allocations, notably Taiwan and China in the WCPO. Once vessels have exhausted their allocated quota, their respective flag state authorities will no longer issue ICCAT certificates. Hence, any bigeye caught outside of the vessel's quota can no longer be exported to Japan. Japan is also particularly strict with net weights recorded in the ICCAT certificates versus actual weights to be imported. This situation has profitability implications for vessels, as they are forced to sell high quality bigeye to less valuable markets. It also potentially fosters bigeye species misreporting (i.e. classified as another species, typically yellowfin) or catch under-reporting. In recent years, the inability to obtain ICCAT certificates from flag states once quota levels have been reached, has also incentivised Taiwan and Chinese vessels to seek out chartering arrangements with Pacific Island countries, since they do not have bigeye catch limits in place, which may place additional fishing pressure on bigeye stocks. Also, it transfers the compliance burden to the chartering state which is supposed to have full control over its own flagged and chartered vessels. This was problematic for both Solomon Islands and Vanuatu who received 'yellow card' warnings from the EU under its IUU Fishing Regulation, as both countries were deemed to have inadequate controls in place over longliners operating under charters, particularly when fishing in other EEZs or the high seas (see above).

Table 1.9: Selected WCPFC conservation and management measures with application to WCPO tropical and southern longline fisheries

| Reference | Title of CMM | Key Elements |
|------------------------------------|---|--|
| MANAGEMENT OF TARGET STOCKS | | |
| CMM 2016-01 | CMM for Bigeye, Yellowfin & Skipjack Tuna in the WCPO | <ul style="list-style-type: none"> ▪ Flag state BE catch limits; monthly reports of BE catch to Secretariat ▪ CCMs LL catching < 2,000 mt BE in 2004 to not exceed this level for 2014-2017 ▪ CCMs (except SIDS/Indonesia) to not increase the number of freezer/ice-chilled LL targeting BE above current levels (2010-2012) |
| CMM 2015-02 | CMM for South Pacific Albacore | <ul style="list-style-type: none"> ▪ CMMs to limit no. of LL actively fishing for SP ALB south of 20°S to 2005 or 2000-2004 levels ▪ CMMs to report annual LL catch levels of SP ALB & no. of active vessels targeting SP ALB south of 20°S, initially for 2006-2014, then updated annually |
| CMM 2014-06 | CMM to develop and implement a harvest strategy approach for key fisheries and stocks in the WCPO | <ul style="list-style-type: none"> ▪ Workplan and indicative timeframes to adopt or refine harvest strategies by end Dec 2015; subject to review 2017. ▪ Harvest strategies for key fisheries/stocks to include management objectives, target & limit reference points, acceptable levels of risk, monitoring strategy, harvest control rules and management strategy evaluation. |
| BY-CATCH MITIGATION | | |
| CMM 2015-03 | CMM for Mitigating Impacts of Fishing on Seabirds | <ul style="list-style-type: none"> ▪ CCMs to implement IPOA-Seabirds ▪ South of 30°S – LL to use at least two mitigation measures - weighted branch lines, night setting & tori lines ▪ North of 23°N – Large-scale LL ≥ 24m to use at least two measures from Table 1, one of which from Column A (Table 1 presents 8 measures in two columns); small-scale LL < 24m to use at least one measure from Table 1, Column A ▪ Within 30°S-23°N – LL encouraged to employ at least one measure in Table 1 |
| CMM 2014-05 | CMM for Sharks | <ul style="list-style-type: none"> ▪ LL fisheries targeting tuna & billfish to not use/carry wire traces as branch lines or leader; and/or to not use shark lines |
| CMM 2013-08 | CMM for Silky Sharks | <ul style="list-style-type: none"> ▪ Prohibition of retention on board, transshipping, storing on the vessel or landing silky shark, in whole or in part ▪ Release of any silky shark ASAP after it is brought alongside the vessel with minimal harm ▪ CCMs to estimate the number of silky shark releases and status (alive/dead) |
| CMM 2011-04 | CMM for Oceanic Whitetip Sharks | <ul style="list-style-type: none"> ▪ Prohibition of retention on board, transshipping, storing on the vessel or landing oceanic whitetip shark, in whole or in part ▪ Release of any oceanic whitetip shark ASAP after it is brought alongside the vessel with minimal harm |

| Reference | Title of CMM | Key Elements |
|---|--|---|
| | | <ul style="list-style-type: none"> ▪ CCMs to estimate the number of oceanic whitetip shark releases and status (alive/dead) |
| CMM 2010-07 | CMM for Sharks | <ul style="list-style-type: none"> ▪ CCMs to implement IPOA-Sharks ▪ Full utilisation of any retained catches of sharks (i.e. all parts) to first point of landing/transshipment ▪ Fins onboard to total no more than 5% of the weight of carcasses on board up to the first point of landing |
| CMM 2008-03 | CMM of Sea Turtles | <ul style="list-style-type: none"> ▪ CCMs will implement FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations ▪ Shallow set longline fisheries targeting Swordfish to use large circle hooks or finish bait ▪ All LL to carry and use line cutters and de-hookers to handle and properly release caught or entangled sea turtles; also carry and use dip-nets |
| MONITORING, CONTROL & SURVEILLANCE | | |
| CMM 2016-02 | CMM for Eastern High Seas Pocket Special Management Area | <ul style="list-style-type: none"> ▪ Vessels in E-HSP to report sightings of any other fishing vessels to Secretariat within 6 hours ▪ Adjacent coastal states/territory to receive continuous near real-time VMS data; flag states to monitor vessels using WCPFC VMS (at a minimum) ▪ Secretariat to maintain a 'live list' of vessels present in E-HSP ▪ All transshipment activities prohibited in E-HSP from 1 Jan 2019 |
| TRANSHIPMENT | | |
| CMM 2009-06 | CMM on Regulation of Transshipment | <ul style="list-style-type: none"> ▪ No LL transshipment in high seas, except when a CCM has determined impracticability for a vessel to operate otherwise (i.e. no HS transshipment will cause significant economic hardship or result in a vessel having to make significant changes to its historical mode of operation). ▪ For permitted HS transshipments, CCM notifies WCPFC 36 hours prior and submits a transshipment declaration within 15 days of completion ▪ 100% observer coverage on receiving vessels |
| CHARTERS | | |
| CMM 2016-05 | CMM on Charter Notification Scheme | <ul style="list-style-type: none"> ▪ Notification of charters to WCPFC 15 days prior to fishing ▪ Catch/effort attributed to chartering member/participating territory |

Source: WCPFC website 2017

1.2.2 Sub-Regional I – Tokelau Arrangement

In October 2014, eleven Pacific Island countries agreed on text to establish the Tokelau Arrangement (TKA) – a voluntary in-zone-based management arrangement for the South Pacific Albacore Fishery. TKA signatories – Tokelau, Vanuatu, Australia, Cook Islands, New Zealand, Niue, Samoa, Tonga, Tuvalu, Fiji and Solomon Islands have agreed to implement a Catch Management Agreement (CMA) for longline vessels fishing within their EEZs for South Pacific albacore, as either a target species or as by-catch. The CMA has been actively negotiated since that time and is nearing the stage where each member will need to make critical decisions whether to bring it into force or not. It provides for the setting of an overall Total Allowable Catch and allocation of that TAC amongst parties. Each party has the obligation not to exceed their individual catch limit but flexibility as to how they meet that obligation. If implemented, the CMA would include a five-year introductory period during which time critical supporting mechanisms, such as electronic reporting and CDS would be implemented. Catch limits would not be binding during that period. Additional mechanisms such as trading, pooling and cooperative licensing are catered for in the CMA, but to be developed in the future.

As mentioned, FFA members have unsuccessfully tabled multiple proposals to WCPFC for the replacement of the existing limit on the number of vessels actively fishing for South Pacific albacore south of 20°S, with a total catch limit applicable from south of the equator. In 2015 and 2016, FFA members also proposed the establishment of an interim target reference point for South Pacific albacore which has not been adopted. While stocks are considered biologically healthy, FFA members have called for strengthened best management practice, which will not only maintain the biological health of the fishery, but economic viability, as well. Given an increasing number of vessels have entered the Southern longline fishery in recent years, particularly subsidized vessels from China, the Catch Per Unit Effort (CPUE) has declined to uneconomic levels for many fleets, despite stocks being classified as healthy. Given the failure of WCPFC to adopt strengthened measures for South Pacific albacore, FFA members have opted to establish The Tokelau Arrangement in the interim, with the intention of influencing WCPFC to adopt compatible measures for the entire Southern longline fishery, including the high seas, through an albacore bridging measure and harvest strategies.

In 2014, TKA signatories were assigned interim albacore catch limits for their zones, while the CMA is being developed and agreed. The collective interim total allowable catch (TAC) reflects the sum of individual EEZ allocations (63,918 mt) (Table 1.10). All participants are entitled to a baseline limit of 2,500 mt/year, with those exceeding 2,500 mt/year in 2001-2012 entitled to use their highest historical annual catch as their in-zone limit. Participants are also able to voluntarily propose lower limits.¹⁰

¹⁰ *ibid.*

Table 1.10: Interim catch limits by zone under the Tokelau Arrangement - 2014

| TKA Signatory | Total Allowable Catch (mt) |
|-----------------|----------------------------|
| Tokelau | 2,500 |
| Vanuatu | 8,376 |
| Australia | 2,526 |
| Cook Islands | 9,698 |
| New Zealand | 6,700 |
| Niue | 2,500 |
| Samoa | 4,825 |
| Tonga | 2,500 |
| Tuvalu | 2,500 |
| Fiji | 7,294 |
| Solomon Islands | 14,500 |
| Total | 63,918 |

Since 2014, TKA signatories have been working towards the development of a Catch Management Agreement (CMA). However, Fisheries Ministers expressed concern in early 2017 that the agreement seems to be stalling and tasked FFA and fisheries officials to move this instrument forward. In recent months, TKA participants have met twice to resolve a number of strategic and technical issues and have neared finalization of the text of the Agreement. On discussions concerning limit setting and allocation, participants have agreed that the sum of the TKA interim catch limits are too high and that the starting TAC should be lower. It is anticipated that the CMA will be integrated into upcoming discussions in October 2017 on WCPFC's bridging measure for albacore.¹¹

1.2.3 Sub-Regional II – Longline Vessel Day Scheme

In November 2014, the Parties to the Nauru Agreement's (PNA) Longline Vessel Day Scheme (LL VDS) came into effect under the Palau Arrangement, with five parties becoming signatories – Federated States of Micronesia, Marshall Islands, Nauru, Solomon Islands and Palau.¹² As PNA waters largely fall within the WCPO's tropical zone (20°N-20°S), the LL VDS is a management scheme covering the tropical longline fishery, targeting bigeye and yellowfin. The LL VDS is intended to help PNA parties gain greater control of the tropical longline fishery by securing rights to the fishery in their waters and maximizing the value of fisheries access, as well as ensuring sustainable management of longline tuna resources. In addition, PNA members are able to call on WCPFC to apply compatible management measures in the remainder of the WCPFC Convention Area, particularly the high seas, where most of the tropical longline fishery's effort currently occurs.

Like PNA's Purse Seine Vessel Day Scheme (which came into effect in 2007), the LL VDS establishes a total allowable effort level (TAE) for fishing in all parties' waters, which is then allocated amongst the parties as party allowable effort (PAE). The original TAE adopted in 2014 was 130,000 fishing days. However, this increased in 2015 to 146,592 and once again in 2016, when the parties agreed to a five-year TAE of 165,132 days (covering PNA members +

¹¹ FFA 2017

¹² Palau Arrangement for the Management of the Western Pacific Tuna Fishery – Management Scheme (Longline Vessel Day Scheme), adopted March 2015

Tokelau).¹³ This TAE is not science-based; rather, it reflects the sum of participants' PAEs based on their individual development and aspirations and willingness to limit effort to enhance conservation. For example, Papua New Guinea's TAE of 20,000 days is well above historical longline fishing effort in its zone, while Solomon Islands' PAE 29,342 is below its highest level of fishing effort.

An allocation key was used as the basis for originally calculating PAE, where a number of different models were developed based on historical catch/effort and EEZ area. This model selected the best PAE option for each Party.¹⁴ However, some members have gone on to negotiate aspirational limits outside of this basis. Based on a TAE of 165,132 days, the PAEs are as follows (Table 1.11).

Table 1.11: PNA + Tokelau Party Allowable Efforts under the Longline Vessel Day Scheme (2017-2021)

| EEZ | PAE (Fishing Days) |
|--------------------------------|-----------------------|
| FSM | 30,928 |
| <i>Kiribati</i> | <i>41,597</i> |
| Marshall Islands | 13,730 |
| Nauru | 5,000 |
| Papua New Guinea | 20,000 |
| Palau | 12,035 |
| Solomon Islands | 29,342 |
| Tokelau | 5,000 |
| Tuvalu | 7,500 |
| Total TAE | 165,132 |
| Total TAE less Kiribati | 123,535 |

Source: PNA 2017 Note: Kiribati has not signed onto the LL VDS

Following a trial period for several years, the LL VDS was formally implemented on 1 January 2017. At this time, seven out of eight PNA members had signed on as participants, plus Tokelau. To date, Kiribati has not signed onto the LL VDS, but has opted to implement a compatible catch management system which establishes a limit on catch, rather than fishing days. Economic modelling conducted by PNAO suggests access fees should be priced in the order of US \$100-\$150/day, but further work needs to be completed to refine the model.¹⁵ Industry representatives indicate that if days are priced higher than US \$100/day, that vessels will likely opt to shift to EEZs where access is cheaper or to the high seas, where no access fees are charged and there is anecdotal evidence in 2017 that this has already occurred.

At this stage, LL VDS participants are at different phases of implementation. Like any new fisheries management system, it will take some time to fully develop and implement and in turn, for industry to adjust. For example, unlike the PS VDS, the LL VDS does not cater for non-fishing days; every day a longliner is in a PNA zone is currently counted against a participant's PAE, even if the vessel is unlicensed in the zone and transiting through. Also, there are no options developed yet for pooling of fishing days and/or multi-zone access.¹⁶

¹³ Parties to the Palau Arrangement 2017

¹⁴ FFA pers. comm. 2017.

¹⁵ Parties to the Palau Arrangement 2017b

¹⁶ op.cit. Parties to the Palau Arrangement 2017

As of April 2017, 227 longline vessels were registered on PNA's LL VDS Register under the following flags: Cook Islands (1), China (77), Fiji (1), FSM (16), Japan (53), Kiribati (1), Palau (1), Taiwan (61) and Vanuatu (16).¹⁷ This reflects only a very small proportion of longline vessels authorized to fish within the WCPFC Convention Area (around 7%).¹⁸ In 2016 (the final trial year), the actual number of days fished in PNA EEZs by vessels reporting on PNA's Fisheries Information Management System (FIMS) was 42,057, accounting for only 25% of TAE. With the exception of Kiribati and Solomon Islands where effort exceeded their PAEs, all other participant's PAEs were underutilized. These numbers should only be treated as indicative, given not all longline vessels were reporting on FIMS at the time. This underutilization indicates potential issues with TAE being set too high, vessels opting to fish mostly or exclusively in high seas and not all parties' EEZs being covered under the scheme (i.e. Kiribati, which historically, together with Solomon Islands, is where the majority of in-zone longline fishing effort occurs amongst PNA members).¹⁹

The basic premise underlying the PNA's purse seine vessel day scheme is that by creating scarcity of access to the fishery, the value of access will increase. This model has been successful for the purse seine fishery, resulting in significant increases in fishing access revenue for PNA members since its 2007 implementation from around US \$60 million to over US \$450 million in 2016.²⁰ However, the success of this model is largely linked to the fact that the majority of purse seine fishing effort (~90%) occurs in PNA waters. In the case of the tropical longline fishery the majority of effort (~60-70%) occurs in the high seas, not in PNA EEZs. In the southern longline fishery about 30 to 40% of effort has been in the high seas in recent years. This means that PNA has much less leverage in the longline fishery, which is cause of concern for some, who feel a VDS scheme is not the most appropriate fisheries management model for the tropical longline fishery. For example, an industry representative has indicated that in the case of Solomon Islands, with the implementation of the LL VDS in 2017, currently only around 60 of the 100 fishing licences available have been taken up, with vessels opting instead to fish in the high seas.

Solomon Islands, Tuvalu and Tokelau are signatories to both the LL VDS and the Tokelau Arrangement. While the Tokelau Arrangement establishes an output control (catch limit) for albacore, the LL VDS establishes an input control (fishing effort) that is intended to manage fishing for bigeye and yellowfin, but also covers catches of albacore in Parties' EEZs. These countries need to determine how best to implement a management system in their zone that meets their commitments under both schemes. This is particularly important for Solomon Islands, which is the PNA member with the most significant in-zone longline fishing effort in both the tropical and southern longline fisheries. It is understood that Solomon Islands has committed to implement the LL VDS as the primary management tool for its longline fishery, but has taken into account albacore fishing effort, when determining its PAE.

1.2.4 National regulation

A variety of different national regulations apply to the longline fishery in each of the four countries considered, relating to *inter alia* vessel registration, operational aspects (manning, labour standards, areas fished, safety), flag state measures, etc. Where these are deemed to be of particular importance they are noted in the individual chapters on industry by country.

Organization for the Promotion of Responsible Tuna Fisheries

¹⁷ *ibid.*

¹⁸ Based on 3,156 longline vessels currently authorized to fish within the WCPFC Convention Area.

¹⁹ *op.cit.* Parties to the Palau Arrangement 2017

²⁰ Havice, McCoy and Campling 2017a

Of paramount importance to all longlining companies seeking to export to Japan is the Organization for the Promotion of Responsible Tuna Fisheries (OPRT). Founded in 2000, OPRT plays a role in adjusting the inflow of sashimi-grade tuna into Japan. A prime mover in its inception was Japan Tuna Fisheries Cooperative Association and the Japanese large-scale longline industry that saw major problems in global overcapacity and lack of control exerted on the activities of flag of convenience (FOC) vessels. OPRT was successful in promoting capacity reduction of Japanese vessels and assisted in efforts to get Taiwan to eliminate FOC fishing vessels, bringing them under greater Taiwan government control.

Of OPRT's 24 members, 17 are tuna fishing associations, including Japan Tuna Fisheries Cooperative Association and the other DWFN associations representing Taiwan, Korea, China, Philippines and Vanuatu vessels, amongst others. Other members include three Japanese trade and distributor organizations, one Japanese consumer organization and three Japanese semi-governmental organizations, including Overseas Fishery Cooperation Foundation (OFCF) and Japan Fisheries Association (JFA). Having the latter three categories of Japanese organizations is important because of the leverage they bring in (1) market access and (2) the potential for the provision of aid that is not considered or counted as official development aid. An example of the latter was the effort to assist China in developing its domestic tuna sashimi industry through the provision of cold storage facilities and experts to boost consumer acceptance of sashimi (see Section 1.4.6).

In order for longline-caught tuna to be granted customs import clearance into Japan, vessels must be registered with OPRT and must be duly authorised to fish by the respective RFMOs and in turn, listed on the RFMO vessel register (termed by OPRT as the 'positive list'). When applicable, the consignment must be accompanied with a relevant statistical document from the flag state (e.g. ICCAT certificate for bigeye). The Japanese importer will then apply to Fisheries Agency Japan (FAJ) who verifies the fish has been caught by vessels authorised by RFMOs and then issues a certificate ('FAJ certificate') The importer also applies to the Ministry of Economics and Industries (MEI) to obtain an MEI certificate. Once these two certificates have been obtained, Japan's Customs Department will provide import clearance.²¹

As of March 2017, a total of 899 longline vessels were registered with OPRT. This number has gradually decreased since 2003, when the number of vessels registered peaked at 1,454.²²

OPRT continues its efforts to limit capacity in the industry and has undertaken studies that monitor the importation of tuna into Japan and lessen IUU and FOC activities. One of the subjects to which it has given major attention in recent years is the catch of bigeye by purse seiners and the use of FADs in the purse seine fishery. Staffing at the organization's headquarters in Tokyo is drawn mainly from former Japan Tuna executives and senior staff.

EU IUU Fishing Regulation

In 2008, the European Union adopted a Regulation (EC Regulation No. 1005/2008) establishing a system to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing (referred to as the 'IUU Fishing Regulation'), which entered into force on 1 January 2010.

The IUU Regulation establishes a catch certification scheme to enhance the traceability of fisheries products through the various stages of the supply chain, from fishing vessels

²¹ Katsuyama 2006

²² OPRT 2017

onwards. Fisheries products from ‘third countries’ (i.e. non-EU members) into the EU must be accompanied by a catch certificate issued by the competent authority of the flag state of the fishing vessel, which verifies that fish have been caught in accordance with applicable national, regional and international laws, regulations and conservation and management measures. Any imports that are not accompanied by a validated catch certificate will be refused entry into the EU. The IUU Regulation covers all catches of marine fishery products originating from third country fishing vessels and exported to the EU, irrespective of where the fish were caught (i.e. EU waters, other countries’ EEZs or high seas).²³

Since the implementation of the IUU Fishing Regulation, the EU has conducted audits of many third countries in their capacity as flag, port, coastal or markets states, to evaluate their systems to determine if they are cooperating in the fight against IUU fishing (including some third countries not yet approved to export fish to the EU). Those countries identified as potentially non-cooperating for not having adequate systems in place in terms of fisheries management, effective control over its flagged/charters vessels, implementation of the catch certificate system, legislation etc. are issued a ‘yellow card’ warning and are given a certain period to rectify the perceived shortcomings or risk being issued a ‘red card’ and losing access to the EU market for fish and fisheries products.

Multiple third countries who are major players in the global tuna industry have been issued ‘yellow cards’ since the IUU Regulation was first implemented, a number of whom are PICs – Thailand, Taiwan, Korea, Vanuatu, Sri Lanka, Philippines, Panama, Papua New Guinea, Solomon Islands, Fiji, Kiribati and Tuvalu. To date, of this list of countries, only Sri Lanka received a ‘red card’ and was officially added to the EU’s list of non-cooperating third countries in the fights against IUU fishing, with all imports prohibited (the red card was lifted in April 2016). Korea, Vanuatu, Philippines, Panama, PNG, Solomon Islands and Fiji were successful in having their yellow card lifted after considerable efforts were channelled into addressing the shortcomings.

One of the EU’s concerns, which is relevant to the longline sector, is that countries do not have effective control of vessels carrying their flag or operating under charters, particularly when they are fishing outside of national waters in other EEZs or the high seas (this was one of the longline sector-related concerns highlighted for Solomon Islands and Vanuatu). While the ‘yellow card’ warnings are forcing third countries to make necessary improvements to their systems that might not otherwise have happened within such a short time frame, this is not without significant cost to the third countries who are required to channel considerable resources into addressing shortcomings as viewed by the EU, noting that these do not always match with national priorities for fisheries improvement. It is particularly challenging for developing countries, who face constraints in terms of funding, human resourcing etc.

US Seafood Import Monitoring Program²⁴

On 1 January 2018, a new regulatory program designed to deter IUU fishing and seafood fraud from entering the US market will go into effect. The program, known as the Seafood Import Monitoring Program (SIMP) is a traceability program that establishes permitting, data reporting and record keeping requirements for target species, including albacore, bigeye, yellowfin, bluefin and skipjack tuna.²⁵ Under SIMP, the ‘importer of record’ holds central

²³ Hamilton et. al. 2011

²⁴ Havice, McCoy and Campling 2017b; Havice 2017

²⁵ Complete text of the final rule is available at: <https://www.federalregister.gov/documents/2016/12/09/2016-29324/magnuson-stevens-fishery-conservation-and-management-act-seafood-import-monitoring-program>

responsibility for collecting, submitting and retaining all required data, and thus is the central actor responsible for ensuring that product is eligible for entering the US market. For product to enter into the US market after 1 January 2018, the importer of record must provide all data required by SIMP, even if the product was caught before 1 January 2018. This dimension of the rule could be significant for importers and suppliers working with frozen product and product destined for shelf stable markets.

Importers, processors and fishing firms supplying tuna to the US market are already subject to data reporting requirements under the US' Tuna Tracking and Verification Program (TTVP) associated with the 'dolphin safe' label. There is significant overlap between the requirements of the TTVP and those of the SIMP, though the SIMP requires around 25 per cent more data, including enhanced reporting on all entities involved at the point of harvest, on the fish itself, and on the vessel and product at the time of harvest.²⁶ As such, actors across the tuna sector will be familiar with the kinds of requirements that the SIMP reporting system requires for compliance, though there will be significant work and coordination associated with collecting and providing the full set of requirements for compliance. The SIMP is not a labelling program and it does not require any form of government attestation associated with the data reporting process.

A current legal challenge to the rule is under review in US District Court. The new US administration has indicated that it will defend the SIMP in court. In the meantime, the National Oceanic and Atmospheric Administration (NOAA), the agency responsible for its implementation, is preparing for full implementation by the start date of the program (1 January 2018), though several details of requirements and implementation have yet to be finalized. NOAA officials are working with importers and customs brokers to pilot and test data entry interfaces.

1.2.5 Labour standards

In recent years, labour standards in the fishing and fish processing sectors have gained increasing attention, particularly with the uncovering of serious human trafficking and labour rights abuses in Thailand's seafood fishing and processing sectors in 2014. While these abuses related mostly to the shrimp industry, Thailand's domestic tuna industry has come under scrutiny also. This has prompted major players in the industry, including US and EU retailers, brand owners, processors and traders, as well as governments to respond. For example, the Seafood Task Force (formerly the Shrimp Sustainable Supply Chain Task Force) is an industry-led coalition established in 2014 to tackle Thailand's forced labour and human trafficking issues.

While the Seafood Task Force's primary focus is on Thailand's shrimp and tuna sectors, models are being developed that are scalable and will allow expansion to other countries and species. The Seafood Task Force has developed a comprehensive Code of Conduct and is in the process of finalising associated auditable social standards, which will be implemented by members of the Seafood Task Force. In addition to employment practices/social standards, the Task Force is also focussing on IUU fishing, supply chain transparency and environmental sustainability.²⁷ The Thai Government has also taken considerable steps to address human rights and labour abuse issues including arrests of human trafficking gangs, amending the

²⁶ NOAA Fisheries, undated

²⁷ Seafood Task Force 2017

anti-trafficking legislation to include harsher sentences and fines, a new Fisheries Act and labour regulation to enhance labour monitoring and surveillance.²⁸



Indonesian crew loading bait onto a longline in China. Photograph: Mike McCoy

Several fishing fleets have also recently come under scrutiny for labour abuses which has required action on the part of their flag states. For example, more than 20,000 foreign crew members are employed on Taiwanese fishing vessels. In response to several international labour and human rights organisations being highly critical of labour practices onboard these vessels, Taiwan's new law, the Distant Water Fisheries Act 2017, contains a specific section addressing hiring of foreign crew (Article 26) (note that the new Act was developed largely in response to the EU's 'yellow card' warning concerning Taiwan's implementation of the EU IUU Fishing Regulation). The new law requires registered agents to be used to hire foreign crew and contracts must be in place which specify workers' rights in accordance with Taiwan's new Regulations on the Authorization and Management of Overseas Employment of Foreign Crew Members. Violators who do not follow the requirements will face large fines and vessel owners who abuse their workers may lose their fishing licences for a year. In September 2016, an investigative report focused on alleged labour abuses onboard US-flagged longliners based in Hawaii, that collectively employ about 700 foreign crewmen from countries such as Philippines, Vietnam, Indonesia and Kiribati. The issues raised included the inability of foreign crew to legally go ashore in the US, except in exceptional circumstances and poor living and working conditions on some vessels. In response, Hawaii's local fishing industry formed a task force comprised of vessel owners, fish suppliers, the Honolulu fish auction and the Seafood

²⁸ Campling and Havice 2016

Council to address the problem. A standardized crew employment contract has been developed, which the Honolulu fish auction now requires to be in place as a prerequisite for the vessels wishing to sell fish there.²⁹

In June 2017, at the United Nations Ocean Conference, a voluntary commitment was made by over 60 of the world's largest retailers, tuna processors, markets, traders and harvesters, together with 20 civil society organisations and six governments to traceable, social and environmentally responsible tuna supply chains. Signatories are committed to eliminating any form of slavery and suppliers will at least meet minimum internationally recognised social standards.³⁰ Other recent notable developments relating to fisheries social standards include the Marine Stewardship Council (MSC) introducing a requirement that MSC certified fisheries and supply chains are free of forced and child labour; Pacifica launching social accountability guidelines for purse seine tuna vessels participating in PNAs MSC program; OPAGAC (the fishing association representing the Spanish purse seine tuna fleet) launching the Responsible Tuna Fisheries Standard (APR); and, Anova Food obtaining SA8000 social accountability certification for its Vietnam-based yellowfin processing facility.

Industry representatives indicated that several major retailers are now requesting that social audits be conducted of fishing vessels supplying their tuna brands to ensure their supply chain is free of slavery and labour abuse; this is likely to become the norm for socially responsible retailers. The onus is largely on processors and traders to work with vessel operators to address any labour-related issues to ensure compliance with international standards.

In terms of longline vessels, those catching albacore for the US canning market are becoming aware of the increasing pressure being placed on buyers to source fish from vessels with sound labour practices, with some vessel operators already required to cooperate in social audits. Currently, there is less pressure from the Japanese and other Asian sashimi markets regarding longline social standards.

Labour issues will be particularly challenging to address for large-scale distant water longline fishing vessels which are away at sea for long periods (up to 18 months at a time), employing foreign crew who are required to work very long hours under difficult conditions. Various International Labour Organisation (ILO) standards form the basis of minimum requirements developed to date by various entities, including the ILO Work in Fishing Convention No. 188 (2007) which will come into force on 17 November 2017. Robust labour standards for fishing fleets should include: minimum requirements (i.e. minimum age, medically fit to perform duties); conditions of service (i.e. adequate manning and rest periods, employment contracts, repatriation, recruitment and placement); accommodation and food; and, medical care, health protection and social security.

1.2.6 Private Standards

Numerous fisheries-related private standards and certification schemes have emerged over the past 20 years or so, largely due to concerns that public regulatory frameworks are not achieving the desired outcomes, in terms of responsible fisheries management, environmental sustainability, food safety, quality, ethical employment etc. While private standards are typically established by industry or non-government bodies and are voluntary, some may in practice become *de facto* mandatory, where compliance is a pre-requisite for market entry.

²⁹ Havice, McCoy and Campling 2016

³⁰ Havice, McCoy and Campling 2017c

Some examples of private standards and certification schemes applied to global tuna fisheries include Marine Stewardship Council (MSC), Earth Island Institute's Dolphin Safe Scheme (EII), International Seafood Sustainability Foundation (ISSF), Fair Trade, Friend of the Sea (FOS) and Seafood Watch. Of these examples, ISSF and MSC are briefly discussed below.

International Seafood Sustainability Foundation³¹

Leading industry players in the canned tuna industry collaborated with marine scientists and environmental NGOs to establish the International Seafood Sustainability Foundation (ISSF) in 2009. The ISSF is comprised primarily of tuna processing firms and trading companies representing roughly 60% of global tuna processing capacity and its mission is undertaking 'science based initiatives for the long-term conservation and sustainable use of the tuna stocks, reducing by-catch and promoting ecosystem health'. The nine founding members of ISSF are Bolton Alimentari, Bumble Bee Foods, LLC/Clover Leaf Seafoods, MW Brands, Princes Ltd., Sea Value Co. Ltd., StarKist Co., Thai Union Manufacturing Co. Ltd./Chicken of the Sea International, Tri Marine International and WWF. In addition to the founding members, there are currently fourteen full and six associated members.

ISSF is emerging as a major player in tuna management since the organisation represents some of the sector's most powerful players, although players that have historically not had a voice in tuna management bodies. The ISSF serves to lobby RFMOs to adopt conservation measures based on scientific grounds. Members are also committed to adopting practices that can promote conservation and complement the efforts of RFMOs. Given its broad membership, ISSF holds the power to use members' collective control over tuna processing to shape tuna management and production.

ISSF's entrance into the tuna sustainability debate has come with speculation on the organisation's motives. While ISSF members have an interest in the long-term sustainability of fisheries, critics question the conflict between ISSF's commitments to environmental sustainability and its membership's imperative to secure and expand access to fish resources, suggesting that ISSF is a mechanism for industry to position itself to influence policy in favour of its members.

Since its founding, ISSF has been a regular participant in RFMO and tuna conservation meetings and regularly advocates for stronger conservation measures. ISSF has also adopted numerous conservation measures and commitments which must be complied with by ISSF Participating Companies (i.e. processors, traders, importers, transporters, marketers and others involved in the seafood industry). Transactions cannot be undertaken with fishing vessels not meeting these requirements. Participating Companies are audited annually by third-party auditors engaged by ISSF for compliance against these measures and audit reports are published. Conservation measures to date relate to RFMO support; traceability and data collection; by-catch mitigation; monitoring, control and surveillance; IUU fishing, purse seine capacity and vessel registration.

While ISSF's membership and focus is largely orientated towards the purse seine sector for canning, a number of conservation measures relate to all gear types, including longline. In 2018, two longline-specific measures will also come into effect (Table 1.12). ISSF has also prepared a guidebook for skippers on sustainable longline fishing practices.

³¹ Hamilton et. al. 2011

Table 1.12: ISSF conservation measures applicable to tuna longliners

| ISSF Measure | | Effective Date |
|--------------|---|------------------|
| 1.1 | Vessel must be included on RFMO record of authorised vessels | 3 May 2011 |
| 1.2 | The vessel's flag state must be an RFMO member or cooperating non-member | 31 December 2012 |
| 3.1(b) | Vessels are not permitted to carry out shark finning | 1 September 2012 |
| 3.1(c) | Fishing companies should have a public policy in place prohibiting shark finning | 1 September 2012 |
| 3.6 | Large-scale longliners (>20 m LOA) are covered by a policy requiring best practices for sharks and marine turtles (i.e. use of circle hooks and monofilament lines, no shark lines, implementation of crew best practice handling techniques as per ISSF's Guidebook) | 1 July 2018 |
| 4.1 | Vessels have an IMO number | 31 May 2011 |
| 4.4(c) | 100% observer coverage for at sea-transhipments by large-scale longline vessels (i.e. human observer present on either fishing vessel or carrier) | 1 January 2018 |
| 5.1 | Vessel must not be listed on any RFMO IUU fishing lists | 21 October 2014 |

Source: ISSF 2017

Marine Stewardship Council³²

The Marine Stewardship Council (MSC) is an independent not-for profit organisation that was founded in 1997 through a joint effort from WWF and Unilever (a multinational corporation with large interests in fish retail products). The MSC certification is based on a set of principles and criteria for sustainable fisheries and chain-of-custody certification (to ensure that MSC certified fish are distinct from non-certified fish throughout the entire supply chain from catch through to retailing). The MSC adopts the United Nations' definition of 'well managed fisheries', the main principles of the FAO's Code of Conduct for Responsible Fisheries and is in full compliance with FAO guidelines for voluntary eco-labelling schemes for fish and fishery products. Fisheries interested in MSC certification undergo a third-party assessment to determine if they qualify as a 'sustainable' fishery and what modifications (conditions) are necessary for compliance. The fishery is assessed against performance criteria relating to three principles: 1) health of the target stock; 2) ecosystem impacts and, 3) fisheries management systems.

Across the board, MSC certification has gained market relevance as major retailers globally have committed to selling MSC-certified products. Suppliers of both canning and fresh-chilled/frozen tuna products have engaged in MSC certification processes for three main reasons. Firstly, fisheries want to be prepared to deliver product to supply the growing 'sustainable' category; a category that has the potential to grow rapidly and perhaps become an industry standard. Second, MSC certification carries with it opportunity to tap into niche markets and their potential (but not guaranteed) price premiums that environmentally conscious, high-end consumers might be willing to pay to help make sustainable fishing profitable. Last, but not least, complying with certification guidelines for fisheries management has the potential to improve the sustainability of the fishery for the long term, a factor of increasing importance given that many tuna populations are fully- or over-exploited.

³² Hamilton et. al. 2011

To access these potential benefits, however, fisheries must undergo what is often a time consuming and costly certification process.

At the end of 2016, there were 286 MSC-certified fisheries in 36 countries, with an additional 92 fisheries in assessment. A total of 37,721 sites were covered by MSC Chain of Custody certificates in 82 countries. Over 20,000 MSC-labelled products were available for sale and 660,000 mt of seafood was traded bearing the MSC eco-label valued at US \$4.6 billion. Currently, there are fourteen MSC-certified tuna fisheries, two of which are longline fisheries - The Fiji albacore tuna longline fishery and the Liancheng Overseas Fishery (Shenzhen) Co. Ltd (SZLC), China Southern Fishery Shenzhen Co. Ltd (CSFC) and Liancheng Overseas Fishery (FSM) Co. Ltd. albacore and yellowfin longline fishery in the Cook Islands' EEZ. French Polynesia and American Samoa's albacore and yellowfin longline fisheries are currently in assessment.³³

1.3 Implications for Pacific Island Countries

- Compared to purse seining, a far greater proportion of longline fishing in the WCPFC Convention Area takes place in the high seas, with some effort in selected EEZs and some movement into the EPO. Given the introduction of in-zone management measures for PIC EEZs (i.e. PNA Longline Vessel Days Scheme for the tropical longline fishery and the Tokelau Arrangement for the southern longline fishery), as well as spatial shifts in favourable fishing conditions, it is expected that vessels will continue to fish mostly in high seas in the coming years, with perhaps even less effort in-zone.
- The LL VDS scheme is so far unsubscribed by most DWFNs, who continue to fish outside EEZs for the time being. Similarly, Kiribati's Catch Management Scheme (CMS; Kiribati's alternative to implementing the LL VDS) has not gained very much traction with distant water fleets, where a reported levy of USD 700 per mt is charged.
- Because less fishing takes place in PIC EEZs it appears that attempts to capture more revenue from this sector by mirroring the PNA's Purse Seine VDS strategy may be frustrated.
- It remains to be seen how this situation will play out, but some voices in the Korean industry feel that a viable fishery could be maintained without EEZ access, provided the EPO remains open and bigeye longline quotas in the WCPO and EPO are not further reduced.
- There is now no fishing by any Japan small offshore boats south of the Equator and very little in the EEZs of PICs. As a result, and with the offshore/DW vessels fishing less and less in EEZ waters, very few Japanese vessels overall have subscribed this year to the longline VDS as few fish any longer within EEZs.
- Taiwan longline owners were concerned that the Tokelau Arrangement and LL VDS would put an additional squeeze on a business that is already reportedly operating on low margins. In this context, a major argument advanced is that vessel owners prefer the certainty of a fixed cost for a licence and that the LL VDS system introduces uncertainty and increases risk.
- The China albacore fleet operates primarily on the high seas and in the EEZs of Vanuatu, Cook Islands, and Solomon Islands. In contrast to the other longline fleets, representatives of China's fleet suggested during interviews that they can work within the Tokelau Arrangement's quota system and the Longline Vessel Day Scheme.

³³ MSC 2017

2 TUNA LONGLINE INDUSTRY SUPPLY CHAINS AND MARKET DYNAMICS

2.1 Tuna Longline Product Markets: A Snap-shot

The market analysis commences with a sketch of the main product types and the principal value chains for longline-caught tuna. This is to emphasize from the outset crucial differences in longline products and markets.

Figure 2.1 is a schematic depiction of selected value chains for WCPO longline fisheries' tuna products. This is not a comprehensive mapping, but illustrates the main product linkages of large-scale and small-scale longliners with the principal markets – the Japan sashimi market and the US canned albacore market. Trading companies play an important strategic role in both of these chains. In general, the same companies do not straddle each chain but instead, tend to specialise in one or the other (with some exceptions).

The freezer longliners can also be sub-divided between those that have ultra-low temperature freezing (ULT) capability at -60° and those that have -35 to -40° freezing capacity, with the former commanding a price premium. Fresh small-scale longliners principally supply the Japan sashimi market.

Japan's market for tuna is complex. As an initial snap-shot, Japanese tuna sources and products include:³⁴

- Longline -35°C to -40°C : frozen whole round tuna (albacore, bigeye, yellowfin), gilled/gutted, sashimi product to the Japanese domestic market, especially for shorter trips with catch delivered directly to Japan.
- Longline -60°C ULT: frozen whole round tuna (bigeye, bluefin, yellowfin), gilled/gutted, higher grade sashimi to the Japanese domestic market, especially for longer trips or higher value bluefin.
- Pole and Line B1 Grade: -50°C frozen whole round skipjack, no bleeding process onboard, sashimi product to Japanese domestic market, loins for *tataki* (i.e. lightly seared tuna blocks) and *katsuobushi* (i.e. dried shaved tuna flakes) production.
- Pole and Line S1 Grade: same as B1, but bleeding process applied onboard to live skipjack, good grade sashimi product to Japanese domestic market.
- Purse Seine (PS) Special: -40° to -50° ULT, whole round yellowfin above 10 kg, no bleeding process onboard, sashimi product to Japanese domestic market.
- Purse Seine 1 (PS1): -40° to -50° ULT frozen whole round skipjack, no bleeding process onboard, sold for *katsuobushi*, *tataki* and sashimi.

In addition to the above, the Japanese market segregates landings so that:

- Lower quality yellowfin goes to canneries in Japan.
- Lower quality skipjack goes to domestic or overseas canneries.

There is an important intersection between some freezer longliners (large and small-scale) and both the sashimi and canning-grade chains, as indicated in Figure 2.1. A longline vessel's

³⁴ Building on McCoy et al. (2015)

albacore may be sold for canning, while bigeye and yellowfin is sold for sashimi/value-added products. Importantly, and a more recent development, high quality albacore is increasingly consumed as sashimi in Japan. Japan traders mostly only take albacore from Japanese vessels and sometimes Taiwanese ones. The albacore needs to be handled properly on board (and differently to canning grade albacore), so a conscious decision is made by vessels to catch and handle albacore for the sashimi market.³⁵



Grading ULT sashimi grade tuna in Ningbo, China for processing and export to Japan.
Photograph: Mike McCoy

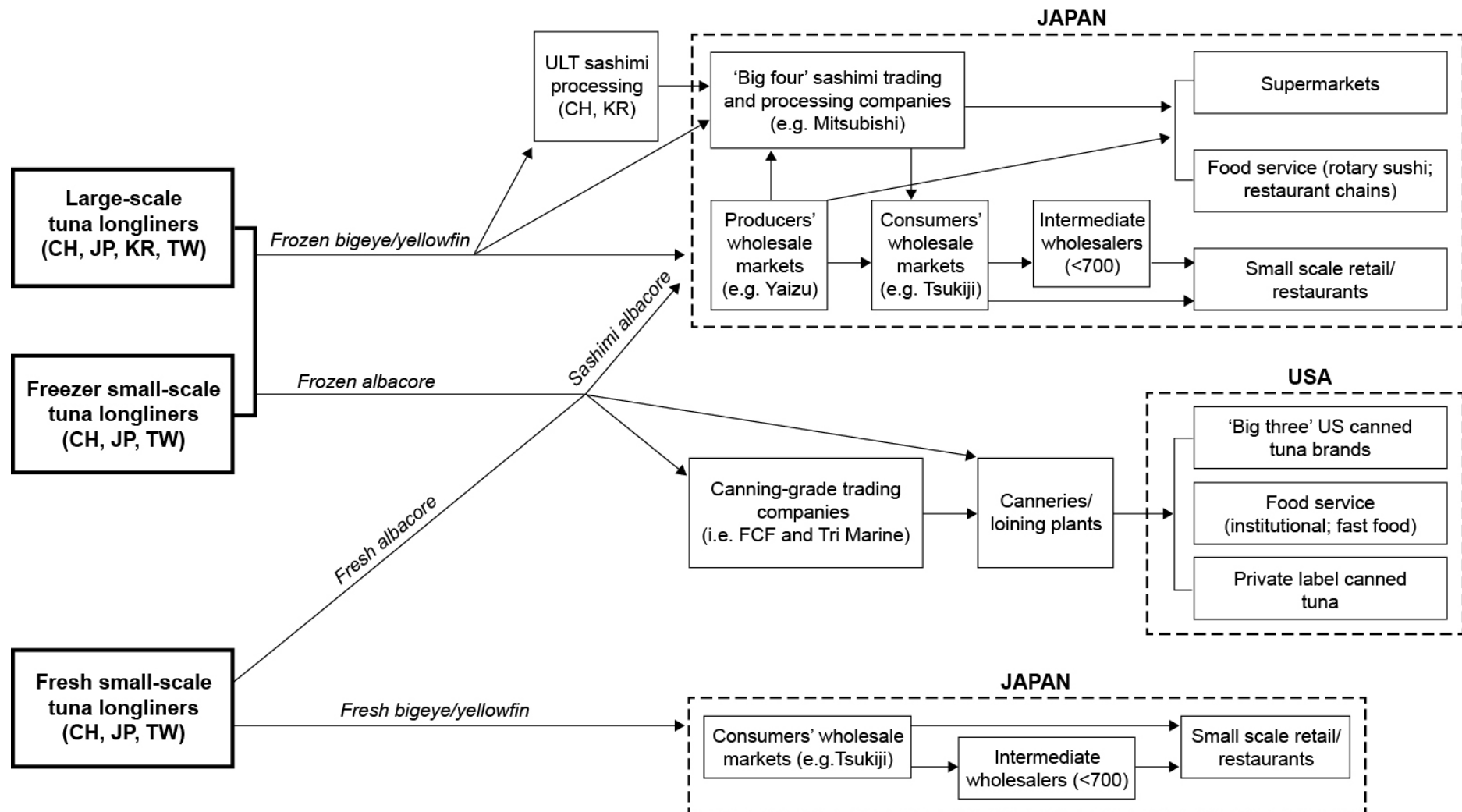
As shown in figure 2.1, frozen bigeye and yellowfin can go direct from vessels to Japan sashimi traders. It is normally gilled and gutted (G&G) for processing in Japan into *toro* and *akami* (lean meat/no fat), etc.³⁶ Other catch goes to export-oriented processors. Some Japan traders have strong relationships with processors in China and Korea: all China plants have ownership or other commercial links to Japan traders, while Korean processors are a mixture of having commercial links to traders and some independent but which then sell to traders. Since early 2016, ULT frozen loins are being auctioned at Tsukiji, sold by large-scale boats doing processing onboard.

A number of secondary markets are not depicted in the figure. First, various sashimi and other value-added fresh/frozen markets are excluded such as the USA, EU, China and South Korea, and canning-grade albacore processed in, for example, Thailand for the French market in *Thon au Naturel*. Second, figure 2.1 excludes mention of tuna treated with tasteless smoke and carbon monoxide, which can be based on -35°C raw material caught by China and Taiwan fleets (normally yellowfin); this is touched on in Section 2.4. Third, the figure does not indicate the input of alternative sources of supply, such as marine capture and ranched bluefin species, or purse seine special grade (see Box 2.1). These are important influences in shaping particular market segments (i.e. high value sashimi and loins for *tataki* respectively).

³⁵ Personal communication, industry representative, 24 August 2017

³⁶ We italicise Japanese names where they are not in common English usage (e.g. sashimi, sushi).

Figure 2.1: Schematic of value chains based on the WCPO tuna longline industry



2.2 Japan's Sashimi Tuna Market

2.2.1 Overview

Japan is the major global market for sashimi quality tuna, accounting for around 80% of global sashimi consumption in 2010.³⁷ This was a decline from an estimated 84-89% in the mid-2000s.³⁸ This may be slightly lower in 2017 with the growth of Japanese restaurants elsewhere and declining consumption in Japan,³⁹ but this market continues to drive the global longline industry.

In Japan, the term '*sashimi*' refers to fresh raw seafood which is sliced into thin bite-sized pieces and traditionally served with soy sauce, wasabi (horseradish paste) and condiments (e.g. fresh ginger, radish).⁴⁰ Tuna flesh (*maguro*) and the fatty belly portion of tuna (*toro*) are very popular sashimi dishes.⁴¹ '*Sushi*', a term which is often confused by non-Japanese consumers and used interchangeably with *sashimi* despite being distinctly different, refers to a Japanese dish comprised of cooked cold vinegar-flavoured rice (*shari*) which is moulded into various shapes and is garnished with other ingredients (*neta*), most commonly raw seafood (*sashimi*), egg or vegetables. Tuna sashimi is a popular sushi ingredient. Sashimi-grade tuna is also served in other forms including *tataki* (loins that are lightly seared on the outside, raw on the inside and then sliced), *saku* blocks (pre-cut loins that are later sliced into sashimi) and minced sashimi.



Sushi shopfront near Tsukiji market. Photograph: Antony Lewis

³⁷ Hamilton et al. 2011

³⁸ Shima and Kawamoto 2008

³⁹ Kawamoto 2017

⁴⁰ This paragraph draws on Hamilton et al. 2011

⁴¹ Unless otherwise stated, references to sashimi in this chapter apply specifically to tuna.

During the 1990s Japan's tuna sashimi market had kept relatively steady. However, in the 2000s the market began to shrink as a result of the country's lack of economic growth. OPRT estimates Japan's total consumption of sashimi tuna as 560,000 mt in 2004 (whole fish equivalent), 480,000 mt in 2006 and 420,000 mt in 2009.⁴² Figure 2.2 provides slightly different estimates, but the downward trend is similar.⁴³ In this context it is interesting to note that one market projection forecasts fish and fish products to experience the highest growth rates of all food and drink categories until 2021.⁴⁴

Of the estimated 750,000 mt tuna consumed in Japan in 2014, an estimated 62% was consumed as sashimi, around 23% as *katsuobushi* and canned tuna 15%. It has been estimated, that sashimi⁴⁵ consumption, not including skipjack, in 2014 was 449,000 mt round fish equivalent, which is approximately 246,950 mt of loins.⁴⁶

This demand is met by a combination of domestic landings by Japanese vessels and imports from fleets of various other nations. In 2014, bigeye accounted for 38% of the total supply volume (imports and landings) of sashimi grade tuna, followed by skipjack (20%), bluefin (14%), yellowfin (15%), and albacore (13%) (Figure 2.2).

Industry sources estimate that Japan's total annual *import* market for ULT frozen tuna (sashimi grade) is around 160,000 mt, which includes longline caught and farmed fish. Roughly 65% is delivered by reefer carrier, 15% by ULT containers, and 15% by longliner vessels offloading directly (e.g. the Korean fleet). Fisheries Agency of Japan (FAJ) data provided during the research visit give more detail. In 2015, total bigeye imports were 75,900 mt, of which 71,100 mt was frozen; yellowfin 52,600 mt, of which 45,600 mt frozen; Atlantic bluefin 22,800 mt imports, of which 18,000 mt frozen; and southern bluefin 11,300 mt, of which 9,600 mt frozen. Total imports (longline-caught and farmed bluefin) in 2015 were 162,600 mt and the total import of frozen tuna was 140,000 mt. Finally, *Japan's total import market for frozen bigeye and yellowfin in 2015 was 116,700 mt.*



Intermediate wholesaler stall in Tsukiji.
Photograph: Liam Campling

While Japan remains the leading market for sashimi tuna, total sashimi consumption in Japan as estimated in whole-round fish declined by 25% during the period 2005-2009. It levelled out somewhat in the years 2010-2014, declining only a further 10%, as shown in Figure 2.2.

⁴² See: <http://oprt.or.jp/eng/data/global-tuna-supply-sashimi-tuna/>

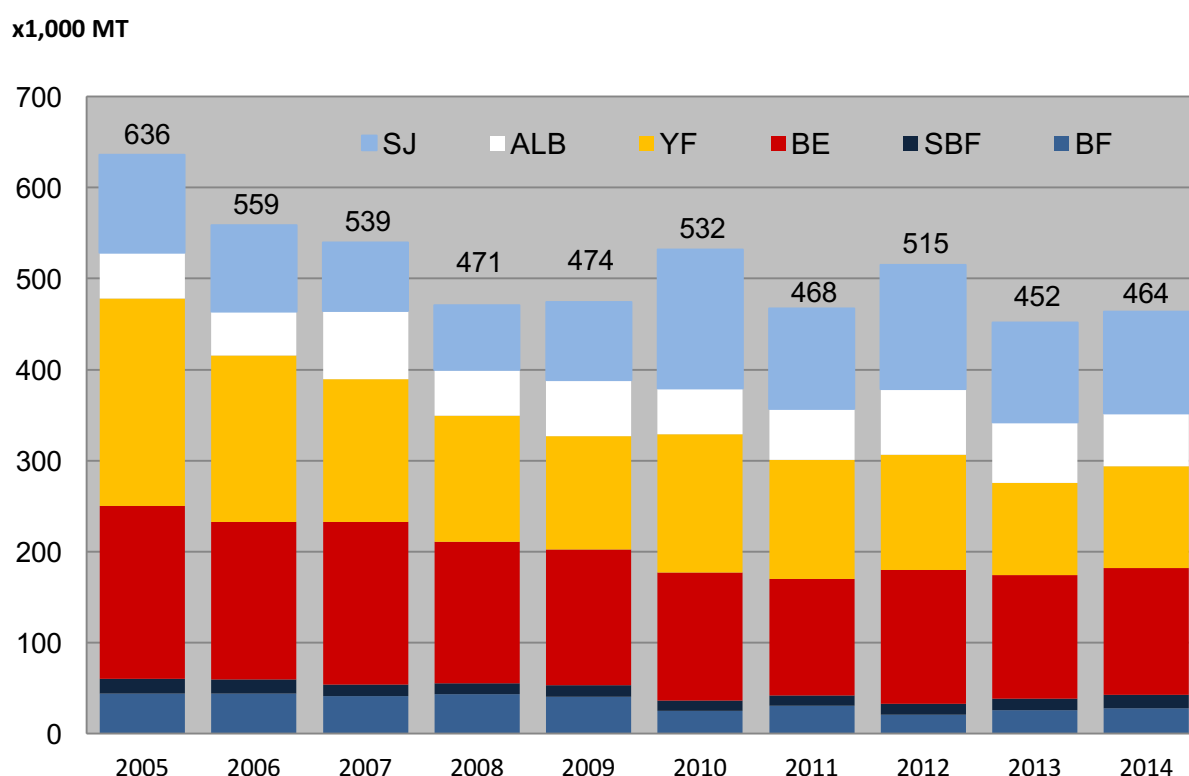
⁴³ Precise data are not available because a considerable volume is imported in processed form, which introduces the need for rather arbitrary conversion ratios.

⁴⁴ BMI 2017c

⁴⁵ Including *negitoro* (minced tuna) frozen at -35°C.

⁴⁶ Kawamoto 2016

Figure 2.2: Estimated total sashimi (round fish equivalent) supply in Japan, 2005-2014



Note: Quantities converted to round fish equivalents: sashimi block yield 0.52; sashimi loin yield 0.55. As with any conversion ratios are subject to error.

Source: Taro Kawamoto (personal communication) and Kawamoto (2016)

Japanese consumers have developed a strong preference for fatty tuna, with the fatty belly portions (*chu-toro*, *o-toro*) being the most prized cuts. Hence, the most valuable and sought after tuna species for sashimi is bluefin (Atlantic, Pacific and Southern) followed by bigeye, as these species have the highest fat content and most attractive colour. After bluefin and bigeye, yellowfin is the next most popular species. Yellowfin consumption, especially frozen, has shown some decline, whereas skipjack and albacore consumption have increased. Figure 2.3 offers a schematic outline that ranks the range of species, but as the original author warns 'There are no definite standards in Japan by which sashimi tuna products can be categorised'.⁴⁷

Fat content alone is not the sole indicator of quality but also the *taste* of the *toro*. For example, sashimi grade tuna exported to Japan (species not specified) from Canada fetches an equivalent price to that exported from the USA despite the former having a higher average fat content. This is believed to be because of the seasonality of the fishery which means that the tuna feed on different prey and thus have a different taste; with the USA catch being preferred.⁴⁸

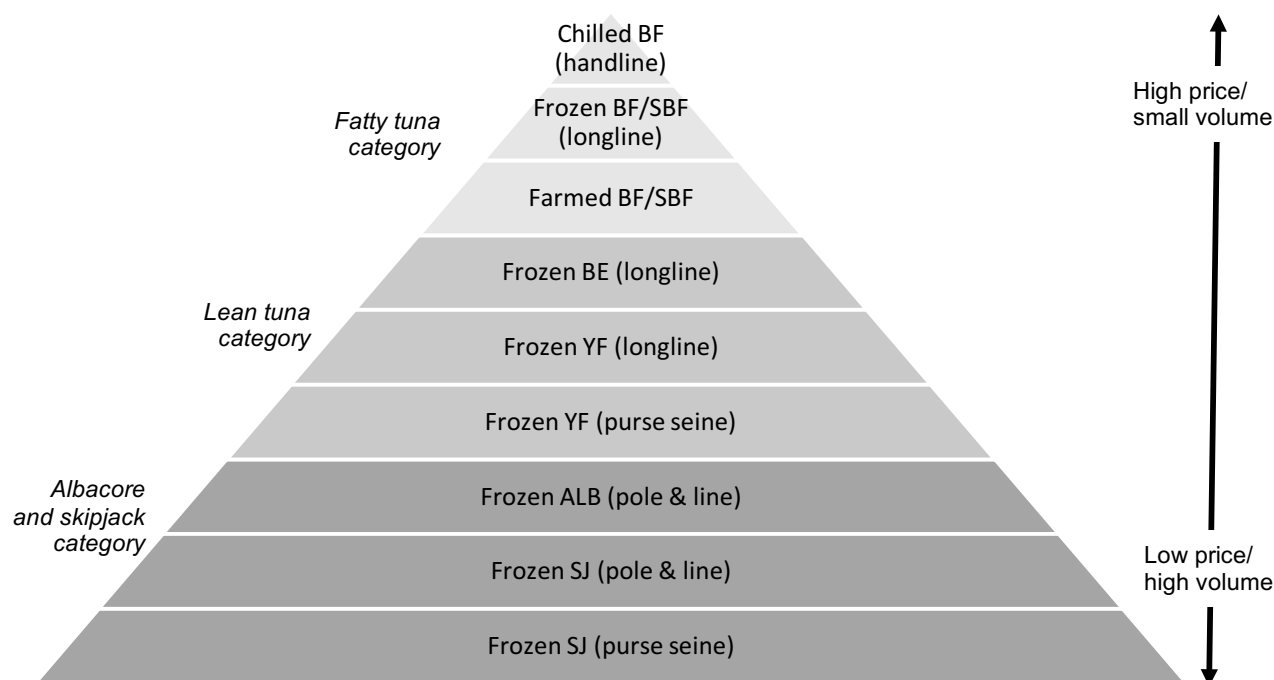
Albacore is becoming increasingly attractive as lower-value sashimi (particularly, 'poor man's' *toro*, or 'fatty white') and reportedly accounts for two-thirds of tuna sales through

⁴⁷ Kawamoto 2017

⁴⁸ Agriculture and Agri-Food Canada 2016a

supermarkets.⁴⁹ It is estimated that 59,000 metric tons of albacore was consumed as sashimi in 2014 (Figure 2.3). Japan's domestic albacore production in 2015 was 46,100 metric tons (75% fresh, 25% frozen) and was mostly consumed domestically, which was down from 53,400 metric tons (69% fresh, 39% frozen) in 2014.⁵⁰ The major external supplier of frozen albacore to Japan in 2014 was Taiwan with a value of approximately USD 25 million.⁵¹ The majority (~70%) of sashimi grade skipjack is consumed as *tataki* – seared tuna which is raw in the middle.⁵²

Figure 2.3: A schematic categorization of sashimi tuna products



Source: Kawamoto 2017

Figure 2.4 illustrates over 16 years of per capita tuna consumption of and household expenditure on tuna in Japan. In 2000, monthly consumption of tuna averaged through the year was 87gm per capita and average monthly household expenditure was ¥705. By 2010 this had plummeted to a monthly average of 66gms per person and ¥470 per household, and in 2016 it was 63gms and ¥477 respectively.⁵³ The annual peaks in consumption and expenditure every December are around *Shogatsu* – Japan's new year celebrations, which is the country's largest annual festival. The first auction at Tsukiji of the new year regularly sees record prices paid for fresh bluefin as restaurant owners bid to hit the national (and international) headlines for buying the most expensive fish.

⁴⁹ The Suisan Times 2010a.

⁵⁰ Globefish Highlights, Annual Issue for January-December, 2015, FAO, Rome.

⁵¹ Converted to USD as an average exchange rate for 2014 from CAD values stated in: *Inside Japan, The Fish and Seafood Trade*, Agriculture and Agri-Food Canada, April 2015.

⁵² Skipjack *tataki* was traditionally a handmade local food from Kochi, Japan, but began to be mass produced in the 1970s (Kawamoto 2016). In the late 1990s, Japanese consumers started consuming frozen skipjack sashimi in small volumes, following a strong promotional campaign launched by the Japanese tuna industry (Miyake et. al. 2010: 64).

⁵³ Importantly, 2016 saw a recovery in Japan of total sales of fish and seafood to almost 2010 levels (1.8 million tonnes). The period of decline between these years is explained by concerns around radioactive contamination caused by the Fukushima nuclear disaster in March 2011 (Passport 2017g).



Bluefin *toro* sushi (three kinds) with seared -40°C albacore. Photograph: Antony Lewis

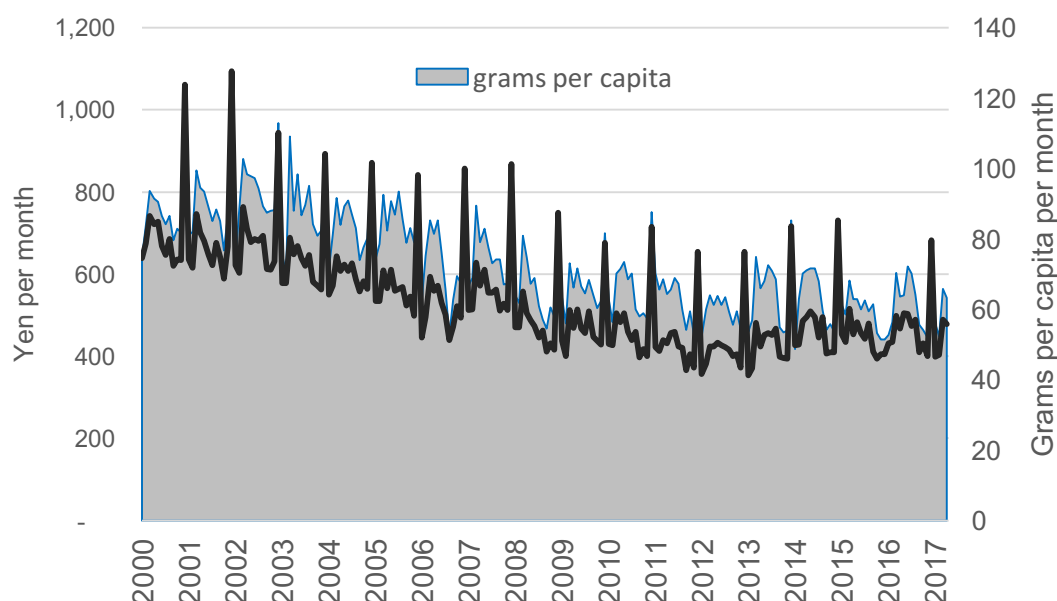
Another driver of consumption is tourism. A total of 24 million tourists visited Japan in 2016 (around 20% of Japan's population).⁵⁴ Often with an interest in Japanese culture, tourists are likely to eat out and pay a price premium for sushi and sashimi.

Importantly, nominal household expenditure does not take into account national inflation, which means that even the minor average increase of ¥7/household per month between 2010 and 2016 represented a real decline. A further dampening effect on the 'real' value of this household expenditure is introduced for firms exporting tuna to Japan given the depreciation of the Yen to the US dollar, which is illustrated below in Figure 2.7. But even Japanese firms are not insulated from currency depreciation because gasoil and other inputs are pegged to the US dollar, see Figure 2.5. In sum, these data indicate both a decline in consumption and a relative cheapening of product over time, which is reflected in the growing consumption of cheaper sashimi-grade albacore noted earlier, but also in the long-term trend in tuna consumption increasingly taking place at home.⁵⁵

⁵⁴ Passport 2017g

⁵⁵ Shima and Kawamoto 2006

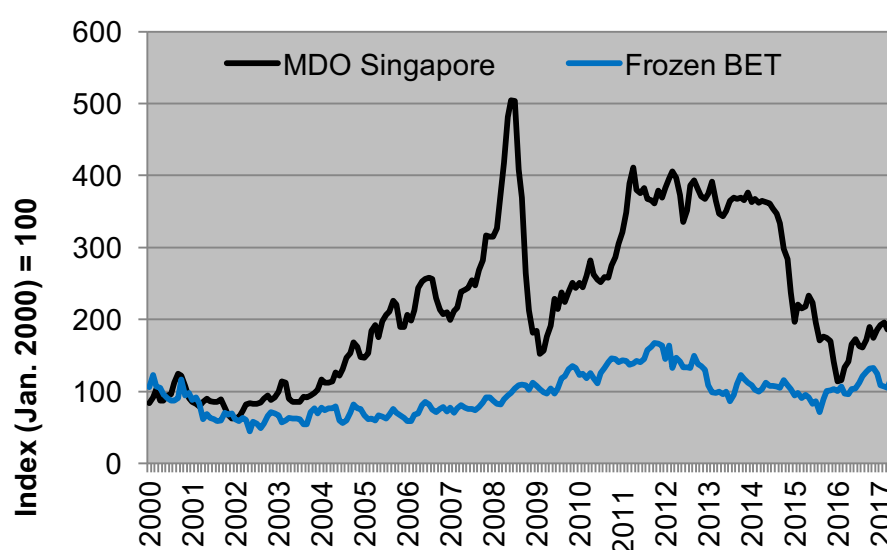
Figure 2.4: Japan per capita tuna consumption – grams per capita and Yen per household, 2000 to April 2017



Source: FFA Fisheries Development Division databases

Figure 2.5 provides an indication of the fluctuating cost-price squeeze on the longline industry. While frozen bigeye tuna prices remain relatively stable and have not reflected the cost of inflation through the 2010s, marine diesel oil prices grew rapidly in 2011 before dropping off in late 2014.

Figure 2.5: Index of frozen bigeye tuna (BET) and marine diesel oil (MDO) prices, 2000-April 2017



Source: FFA Fisheries Development Division using http://tonto.eia.doe.gov/dnav/pet/pet_pri_spt_s1_m.htm; Crude oil, average spot price of Brent, Dubai and West Texas Intermediate, equally weighed; MDO, <http://shipandbunker.com/prices/apac/sea/sg-sin-singapore#MDO>; all data prior Jan 2016 sourced Bunkerworld.

The Japanese sashimi market is complex and tuna prices are influenced by a number of factors. These include:⁵⁶

- species (i.e. bluefin, bigeye, yellowfin, albacore, skipjack in descending order of value);
- fresh-chilled vs. frozen product, with fresh product often, but not always, reaching a higher price (see Figure 2.6);
- quality (i.e. freshness, flesh colour, texture, fat content, size);
- size (see Figure 2.8 below);
- country (and fleet) of origin;
- species quotas may also have an impact (e.g. southern bluefin, bigeye) and vessels may even consider reflagging to avoid quotas imposed on the major fishing countries.
- market location in Japan (regional price variations exist given different taste/species preferences);
- time of the year, with most species attracting higher prices in Japan at the beginning and end of the year;⁵⁷ and,
- cold storage inventories and the role of the major trading companies (see Section 2.2.5)

The general industry view is that there is little price linkage or competition with other fish species such as salmon, but that competition from other protein sources (primarily chicken and beef) was an issue, especially amongst younger consumers. This was both price and preference driven, but price in the current economic climate is no doubt an important consideration. Prices paid by consumers for tuna in Japan are reportedly stagnant and according to a 2013 survey by Maruha Nichiro there is limited willingness to pay more in sushi restaurant chains.⁵⁸

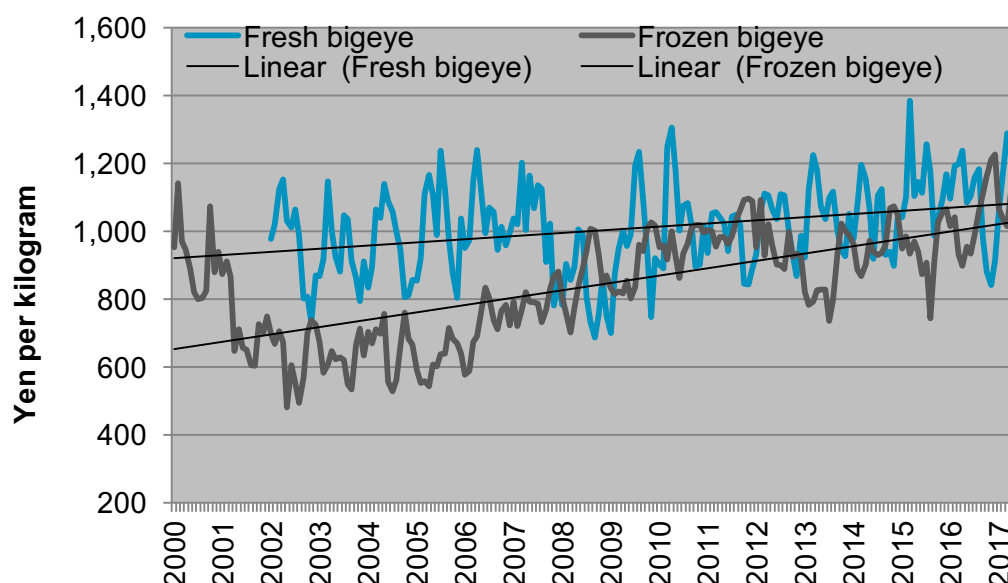
The 40kg+ bigeye prices, typically from the Indian Ocean, are often seen as an industry benchmark and do not vary much around 880-920 ¥/kg, although supply is currently poor. With bigeye stocks subject to overfishing in 3 of the 4 ocean areas in early 2017, supplies are unlikely to show any significant increase for some time. Figure 2.6 shows price trends over time for frozen bigeye landed in Japan and fresh bigeye imported from Oceania. It shows greater fluctuations (instability) in fresh price. Frozen bigeye price has increased more quickly than fresh prices – converging on the fresh bigeye price from around 2006 onwards, which presumably reflects the ULT premium.

⁵⁶ The following summarizes and builds upon Campling et. al. (2007: 243) and Miyake et. al. (2010: 72).

⁵⁷ See OPRT price data for fresh and frozen, in the main fishing ports in Japan, by month, 2016.

⁵⁸ Nagahata 2013

Figure 2.6: Japan bigeye tuna price – fresh imports from Oceania* versus frozen landed at major ports**, 2000 to April 2017



*All including Australia and New Zealand **Major Japan ports for bigeye

Source: FFA Fisheries Development Division databases

The current (2017) yellowfin price is high, with cuts in Indian Ocean production, whereas yellowfin inventories were very high in 2016 and prices were low. Price awareness has no doubt fuelled the now dominant place of albacore in supermarket sales, the increasing use of fatty white ULT albacore as quality sashimi, and the emergence of purse seine special, both yellowfin and skipjack, at the middle-lower end of the sashimi market, as *tataki* in the case of skipjack. At the high end, there is optimism that overall bluefin supply will continue to increase, with some recovery of wild stocks in the Atlantic and Southern Oceans, resulting in increased quotas, and increased farm production. Pacific bluefin stocks remain heavily overfished, and it is unclear what impact catch restrictions will have on supply of wild fish to Japanese farms.

OPRT estimates that there are around 12,000 consignments of tuna imported into Japan by its members per year. Each consignment must include a range of information, including: vessel IMO number and length overall (LOA), vessel characteristics, target species, ocean area in which it was caught, port of shipment and import port, weight by species, as well as international regulatory needs such as southern bluefin catch info for CCSBT quota and a frozen bigeye catch certificate for ICCAT.

Table 2.1 below shows the supply of domestic tuna landings and imports, including bluefin tunas (southern, Pacific and Atlantic), bigeye, yellowfin and albacore tunas, for the years 2009 and 2015. Imports have been more than 1.5 times the volume of domestic landings in the total supply of sashimi grade tuna to Japan during the present decade and the gap continues to widen, even as overall consumption declines. Around 80% of the sashimi market in Japan is now frozen tuna and 20% fresh: In 2015 total supply of fresh was 66,200 mt compared to total frozen of 232,700 mt. While total supply has only declined slightly since 2009, imports now comprise 60% of total supply, up from 50% in 2009.

Table 2.1: Japan total supply of fresh/ frozen sashimi-grade tuna by domestic landings/imports, 2009 vs. 2015

| | Domestic Landings | | | Imports | | | Total |
|-------------|-------------------|---------------|--------------|--------------|---------------|--------------|----------------|
| | <i>Fresh</i> | <i>Frozen</i> | <i>Total</i> | <i>Fresh</i> | <i>Frozen</i> | <i>Total</i> | |
| 2009 | 51,000 | 98,000 | 149,000 | 41,000 | 117,000 | 159,000 | 308,000 |
| 2015 | 47,600 | 71,200 | 118,800 | 18,600 | 161,500 | 180,100 | 298,900 |

Source: FAJ data supplied by M Nakada



-35°C purse seine caught yellowfin and bigeye being unloaded at Yaizu. Photograph: Antony Lewis

Although this report is focused on longline tuna and its primary utilization as sashimi, it should be noted in passing that both pole-and-line and some purse-seine fish are also utilized in the Japan sashimi market to a considerable and increasing degree. This aspect of supply is summarized in the Box 2.1 below and will not be further discussed in any detail in this report.

Box 2.1 Non-longline sources of sashimi-grade tuna in Japan

Around 80-90% of catch from the Japanese **pole-and-line fleet** (skipjack and albacore) is supplied to Japan's sashimi market. Industry sources indicated that around 60% of the skipjack catch is used for lower-end sashimi products (i.e. seared tuna (*tataki*)) and 20% for sashimi. The remaining skipjack catch is utilised for *katsuobushi* production. Albacore is used for sashimi and sushi products, and is said to dominate supermarket sales of packaged sashimi products.

All Japanese purse seine vessels are equipped to freeze a portion of catch at ULT temperatures below -35° to -40°C. Purse seine catch of -35° to -40°C fish (known as purse seine special) now comprises around 20-30 % of Japan's purse seine catch. *PS Special* whole round yellowfin is normally above 10 kg, no bleeding process is done onboard. When caught, the fish is put into the brine tank for quick freezing until around -18°C and then shifted to the air freezing room where it is held at below -45°C. *PS Special* is used for sashimi products in Japan (minced sashimi, *saku* blocks, *tataki*), primarily for sale to supermarkets and sushi-train style restaurants (*kaiten-zushiya*).

A separate product is *PS1*, which denotes high grade purse seine special catch of skipjack, which also has no bleeding process onboard and ULT is at under -40°C. *PS1* competes directly with pole-and-line catch supplying Japan's *katsuobushi* processors, *tataki*, and in the lower end sashimi markets. Despite the rapid growth in supply of *PS special* grade yellowfin and skipjack, longline industry representatives interviewed in China and Taiwan did not express any concern about potential competition from this *PS special* product.

Bluefin farming: Imports of ULT bluefin for the high end sashimi market were around 30,000 mt in 2015, about half of which is probably from farms in overseas countries (e.g. Australia, Croatia, Mexico, Spain etc). Currently, the majority of farmed bluefin tuna, both domestic and imported, is produced from fattening juvenile wild-caught tuna (*yokowa*, *meiji*) in offshore pens (often referred to as 'tuna ranching'). In anticipation of ongoing reduced supplies of wild-caught and ranched bluefin tuna, Japan's tuna farming industry has been carefully positioning itself to fill this gap with cultivated Pacific bluefin tuna (*honmaguro*), with considerable advances made in closing the breeding cycle and growing out to market size. In response to growth in overseas sashimi markets and the oversupply situation in the Japanese market, an increasing number of large trading or fishing firms (e.g. Tafco, Sojitz, Fukuichi, Toyota Tsusho, Toyo Reizo) have invested in tuna farms in the past decade. There were an estimated 92 farms in operation at the end of 2013, and reportedly 160 in 2017. Total production is unknown but if it was 14,700 mt in 2014, it may well be over 20,000 mt in 2017. Kinki University managed to close the life cycle of Pacific bluefin in 2002, and in 2010, the first commercial production from 'artificial seed' was achieved by Fukuichi. Costs of production are however still high with conversion ratios of between 1:15 and 1:17, according to industry sources, and the cost of feed is increasing.

Imports of farmed Atlantic (Mediterranean, North Africa), Pacific (Mexico) and Southern bluefin tuna (Australia) are even higher – the estimated volume of these imports in 2007 was around 34,000 mt and may be similar at present, as noted above. These imports are not always well reflected in the official statistics, as noted. According to industry opinion, this has impacted negatively to some extent on prices for wild-caught bluefin and bigeye. Farmed product has provided a lower-cost source of competition for high-value fatty tuna and is available year-round, which is a key market advantage.

2.2.2 Japan market for frozen longline tuna

2.2.2.1 Whole round fish market: with a focus on imports

In 2015, Japan's market sales for frozen tuna totalled 232,000 mt. The bulk of frozen catch (70-80%) is sold outside the auction system to trading companies and processors (see below). Frozen tuna imports, mostly super-frozen (ULT) come from a variety of countries, depending on the species. Frozen imports totalled 161,500 mt in 2015, and were dominated by bigeye (71,100 mt) and yellowfin (45,600 mt) – see Table 2.2, which also compares with 2014. Domestic landings of these two species, mostly by the distant water fleet, is around half the volume of imports. Imports of high value bluefin tunas total 27,600 mt, with imported albacore (17,200 mt) also gaining traction as a sashimi product (see below).

Table 2.2: Japan frozen tuna supply – imports versus domestic landings

| | Imports | | | | | | Domestic landings | | | | |
|-------------|---------|------|------|------|------|-------|-------------------|------|------|------|-------|
| | BFT | SBT | BET | YFT | ALB | Total | SBT | BET | YFT | ALB | Total |
| 2014 | 12.8 | 10.0 | 73.9 | 46.2 | 17.3 | 160.3 | 1.9 | 23.6 | 28.9 | 16.8 | 71.2 |
| 2015 | 18.0 | 9.6 | 71.1 | 45.6 | 17.2 | 161.5 | 2.4 | 25.4 | 31.5 | 11.7 | 71.2 |

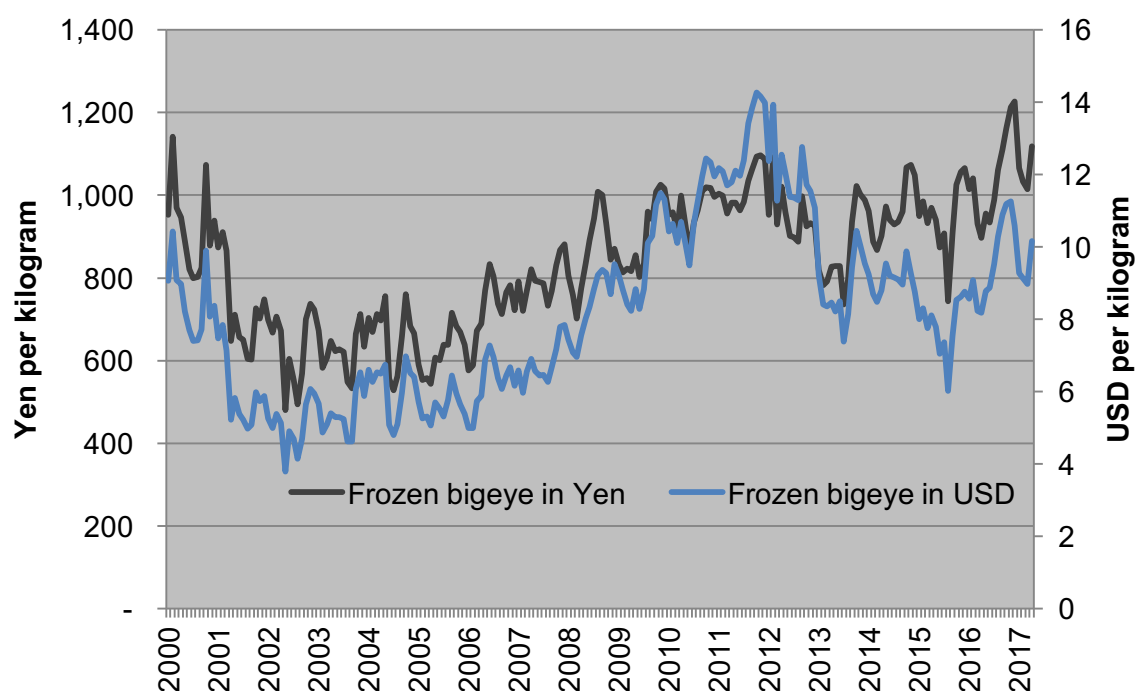
Source: FAJ data supplied by M Nakada



Buyers inspecting southern bluefin tuna prior to auction at Yaizu market. Photograph: Antony Lewis

An industry source advises that Japan normally relies on about 10-15,000 mt per month of imported mostly frozen tuna, but in the first 3 months of 2017 this figure has been much lower, at around 5,000 mt, significantly driving up prices. The principal issue here, especially since mid-2013 has been the devaluation of the Yen to the US dollar, which is a big issue when inputs are paid for in US dollars by Japanese longliners (e.g. international bunkering) and in relation to even more inputs for other fleets.

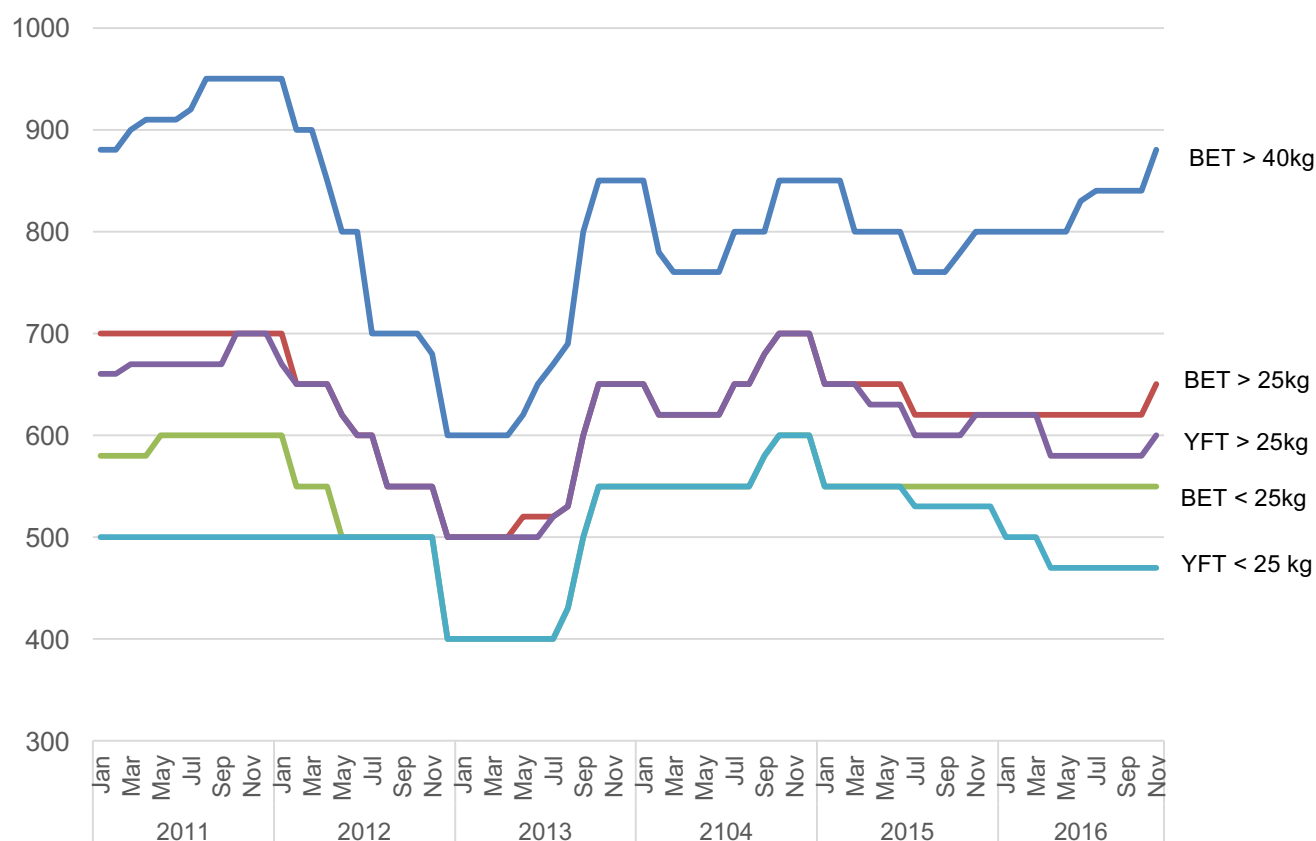
Figure 2.7: Japan frozen bigeye price in Yen and US dollar, 2000 to April 2017



**Major Japan ports for bigeye Source: FFA Fisheries Development Division databases

It is important to take account of fish size in the market for most high value species, and these may be masked by the use of average prices across the species. This is especially the case for ULT (frozen) fish. Figure 2.8 shows a time series (2011-2016) for bigeye and yellowfin, by size, and illustrates the importance of size in the price structure, with yellowfin >25kg often equal to or even above the price of bigeye >25kg, and almost always above the price for <25kg bigeye. The figure also shows the relative stability in price for frozen bigeye and yellowfin since 2014, after recovery from a price dip through 2013 for both species

Figure 2.8: Japanese landed price of frozen bigeye and yellowfin differentiated by size, January 2011 to November 2016



Source: Industry data for fish caught in the Indian Ocean by Taiwanese vessels

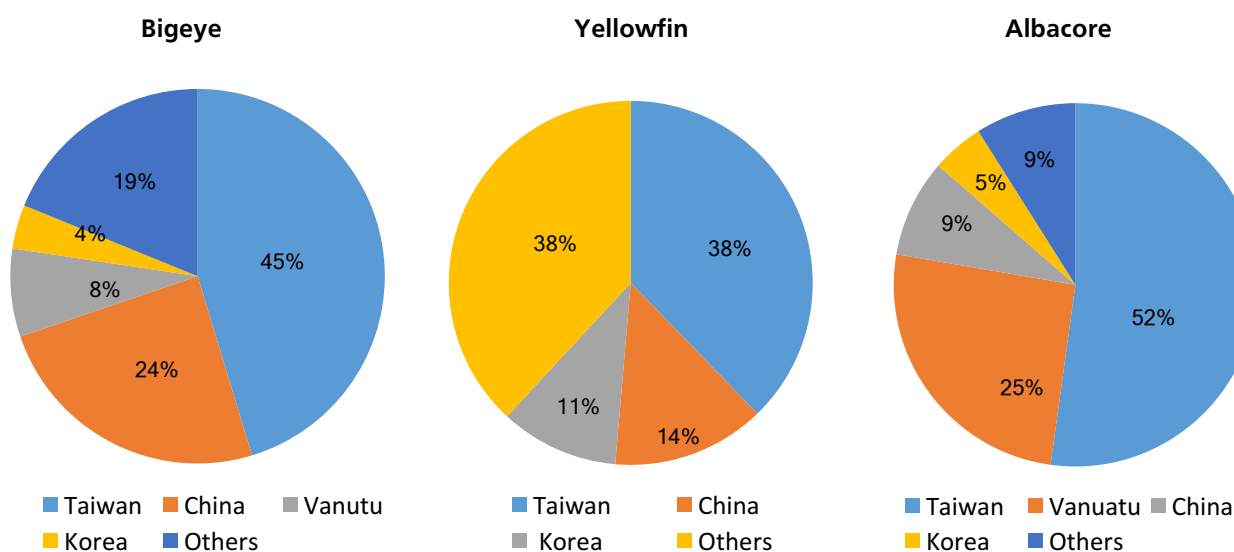
Table 2.3 shows the breakdown of imports by supplying country and species using the International Trade Centre 'Trade Map'. The results match very closely with the FAJ data cited earlier (they are presumably drawn from a common source). A major gap in these data are imported ULT tuna 'fillets', a segment within which South Korea is a market leader and which explains its relatively low percentage share of Japan's bigeye and yellowfin import market (Figure 2.9).

Table 2.3: Japan import of selected tuna frozen species by selected country, 2015 (mt)

| Species | Total (mt) | Supplying countries ('000 mt) |
|---------|------------|---|
| BET | 71,088 | Taiwan (36.2), China (17.4), Vanuatu (5.4), South Korea (2.7) |
| YFT | 45,558 | Taiwan (17.2), China (6.2), Korea (4.8) |
| ALB | 17,247 | Taiwan (9.0), Vanuatu (4.4), China (1.5), Korea (0.8) |

Source: ITC Trade Map: <http://www.trademap.org>

Figure 2.9: Share of Japan import market for whole frozen tuna by species, 2015



Source: ITC Trade Map: <http://www.trademap.org>

The ULT imports are reportedly 65% by carriers from distant water vessels, 15% by containers and 15% direct vessel unloading (e.g. Korean vessels). All fish are gilled and gutted with the exception of albacore which is whole round. One trading company reportedly handles up to 60% of these frozen imports (see below). Unloading occurs all over Japan, but Shimizu accounts for 80-90% with a number of other ports including Misaki and Kesennuma.

Frozen bigeye imports are drawn mostly from Taiwan and China, with lesser contributions from Vanuatu, South Korea, Fiji, Tuvalu, Kiribati, FSM and others. Frozen yellowfin imports are also dominated by Taiwan and China, with lesser amounts from Korea, Philippines, Kiribati and then USA, Vanuatu, Fiji, Marshall Islands, and PNG. The albacore may largely originate from the South Pacific, from Taiwan and Vanuatu vessels, with small amounts from China and Korea.



Maintaining the cold chain. Photograph: Antony Lewis

2.2.2.2 Frozen sashimi tuna product imports

Interviews in China and South Korea in 2017 identified considerable sashimi-grade processing in each country – mainly of bigeye and yellowfin. Much of this processing is export-oriented, although some is sold in domestic markets (see Sections 5.7 and 6.7 on South Korea and China respectively). The principal source of supply in both cases is the domestic longline fleet, although some fish may be landed in South Korea by Taiwanese boats. As elaborated further in Chapter 4, fish processing in China benefits from considerable government subsidies, which include incentives to export fish caught and landed by China-flagged boats.

The following provides Japan import data for processed frozen tuna products. HS codes were sourced directly from Japan's tariff schedule.⁵⁹ The focus here is on frozen tuna 'fillets', for which there are six separate HS codes.⁶⁰ This is a very high level of disaggregation by species which indicates the commercial importance of these product types, but it is assumed that some have only been applied since 2015 because of a lack of data before that year (see below). However, the HS code category of 'fillets' is problematic because it could include several product types on the Japan market (e.g. sashimi loins, saku blocks). *All* of these tariff headings are subject to a MFN (or 'WTO') import tariff of 3.5%; although developing countries qualifying under Japan's Generalized System of Preferences (GSP) access the market duty free.



Packing boxes with blocks-saku pieces for export to Japan in -60°C room, in Busan, South Korea. Photograph: Antony Lewis

⁵⁹ Japan Customs, Japan's Tariff Schedule as of May 16 2017. Available at: http://www.customs.go.jp/english/tariff/2017_5/index.htm

⁶⁰ These are: 0304.87.020 - Bluefin tunas (*Thunnus thynnus*, *Thunnus orientalis*); 0304.87.030 - Southern bluefin tunas (*Thunnus maccoyii*); 0304.87.040 - Yellowfin tunas (*Thunnus albacares*); 0304.87.050 - Bigeye tunas (*Thunnus obesus*); 0304.87.060 - Other; 0304.87.090 - Skipjack or stripe-bellied bonito (*Euthynnus (Katsuwonus) pelamis*).

It is not possible to identify different product types (e.g. by ULT or sashimi-blocks vs saku blocks), but the trade data do differentiate among several tuna species in relation to frozen 'fillets'. Unfortunately, Japan import data for bigeye and yellowfin tuna frozen 'fillets' only appears in the online database in 2015 and 2016 – there is no recording of data in 2011-2014 for these product types. It is not known if this is because these species-specific HS codes only began to be used from 2015 and imports used to be recorded under a different heading (although there was no significant trade under the heading of 'Other' frozen tuna 'fillet' in these years), but it is known that South Korea exported these types of products prior to 2015.⁶¹

Table 2.4 presents Japan import data for frozen bigeye 'fillets' in 2015 and 2016, ranked in descending order of supplier based on 2016 volume. This import market was worth a total of ¥16.8 billion in 2015 and ¥17.3 billion in 2016 (around USD 152 million). South Korea's share of the total value of imported frozen 'fillets' of bigeye tuna was 59% in 2015 and 58.5% in 2016. China's share of this import market grew in the same period from 30% to 33.1%. Between them, exports from these two countries dominate this market with a combined share of 89% in 2015 growing to 91.6% in 2016. It is assumed that not all imports are of the same quality or even specific product type, and are combined under the code 'fillets'. For example, in both years France imports record greater volume but less value than from Seychelles, which indicates a different product type and/or quality.

Table 2.4: Japan import of frozen 'fillets' of Bigeye tuna (*Thunnus obesus*) in 2015 and 2016 (in tonnes and 1,000 Yen)

| | 2015 | | 2016 | |
|---------------|----------------|----------------------|----------------|----------------------|
| | Volume (mt) | Value (in 1,000 Yen) | Volume (mt) | Value (in 1,000 Yen) |
| South Korea | 69,767 | 9,922,675 | 70,189 | 10,152,805 |
| China | 38,761 | 5,046,364 | 45,064 | 5,743,160 |
| Indonesia | 1,319 | 218,112 | 2,040 | 294,837 |
| Taiwan | 2,165 | 257,761 | 2,108 | 239,379 |
| Fiji | 7,036 | 19,218 | 2,387 | 220,765 |
| FS Micronesia | 1,152 | 118,313 | 1,699 | 163,875 |
| Kiribati | 1,784 | 150,604 | 1,600 | 160,786 |
| Vanuatu | 36 | 6,142 | 1,176 | 159,368 |
| Cook Is. | - | - | 527 | 75,094 |
| Ghana | 535 | 35,685 | 826 | 49,500 |
| Philippines | 83 | 18,474 | 122 | 29,571 |
| Vietnam | - | - | 460 | 22,917 |
| Mauritius | 103 | 6,413 | 157 | 8,995 |
| Tanzania | - | - | 53 | 8,382 |
| Seychelles | 230 | 30,734 | 70 | 8,129 |
| France | 353 | 22,213 | 145 | 6,887 |
| Maldives | 1,468 | 191,364 | - | - |
| Oman | 147 | 19,560 | - | - |
| Sri Lanka | 35 | 8,790 | - | - |
| Thailand | 309 | 42,320 | - | - |
| Total | 125,283 | 16,814,742 | 128,623 | 17,344,450 |

Note: data are ranked by 2016 volume Source: Imports from All Countries for 0304.87.050. Trade Statistics of Japan (2017)

⁶¹ A search was also done for Frozen 'other' tuna products (i.e. not 'fillets') using HS code 0304.99.991 (Bluefin tunas (*Thunnus thynnus*, *Thunnus orientalis*) and 0304.99.994 Southern bluefin tunas (*Thunnus maccoyii*). But no record of imports for the period 2011-2016 was present for China, South Korea or Taiwan.

Table 2.5 presents Japan import data for frozen yellowfin ‘fillets’ in 2015 and 2016, ranking suppliers in descending order of their 2016 trade volume. This import market was worth a total of ¥13.7 billion in 2015 and ¥12.2 billion in 2016 (around USD 108 million). South Korea’s share of the total value of imported frozen ‘fillets’ of yellowfin tuna was 29.6% in 2015 and 31% in 2016. Again, China’s share of this import market grew from 15.1% to 23.1%. In sum, between them, these two countries have a growing share of the market from 44.7% in 2015 to 54.1% in 2016. Nonetheless, unlike the market for frozen bigeye ‘fillets’ there is more competition for imported frozen yellowfin ‘fillets’, with a larger volume coming from other countries. Unfortunately, the trade data mask crucial quality and product type differentials, although some indication of these can be discerned from the unit cost, where, for example, a larger volume of product was imported from France in 2016 but sold at a lower price compared to the Philippines.

Table 2.5: Japan import of frozen ‘fillets’ of Yellowfin tuna (*Thunnus albacares*) in 2015 and 2016 (in tonnes and 1,000 Yen)

| | 2015 | | 2016 | |
|------------------|----------------|----------------------|----------------|----------------------|
| | Volume (mt) | Value (in 1,000 Yen) | Volume (mt) | Value (in 1,000 Yen) |
| South Korea | 39,281 | 4,054,240 | 37,709 | 3,796,864 |
| China | 20,755 | 2,072,341 | 29,877 | 2,828,745 |
| Indonesia | 11,013 | 1,184,201 | 10,201 | 1,204,959 |
| Fiji | 13,535 | 1,152,793 | 10,103 | 783,336 |
| Vietnam | 13,640 | 1,197,274 | 9,569 | 806,589 |
| France | 7,858 | 619,988 | 9,073 | 656,779 |
| Philippines | 9,533 | 2,047,913 | 5,092 | 1,071,757 |
| Papua New Guinea | 472 | 45,386 | 2,791 | 271,931 |
| Mauritius | 3,818 | 317,794 | 2,745 | 197,363 |
| Kiribati | 1,547 | 134,121 | 2,073 | 188,241 |
| Taiwan | 2,773 | 298,033 | 1,990 | 147,196 |
| Ghana | 4,376 | 313,849 | 1,926 | 133,674 |
| Sri Lanka | 360 | 42,094 | 795 | 37,604 |
| Vanuatu | 60 | 7,092 | 597 | 70,401 |
| Cook Is. | - | - | 275 | 32,116 |
| India | 919 | 64,043 | 233 | 16,101 |
| Seychelles | 61 | 7,283 | 78 | 4,771 |
| Maldives | 114 | 15,981 | - | - |
| FS Micronesia | 1,265 | 92,904 | - | - |
| Tanzania | 26 | 6,066 | - | - |
| Thailand | 316 | 18,644 | - | - |
| Total | 131,721 | 13,692,040 | 125,127 | 12,248,427 |

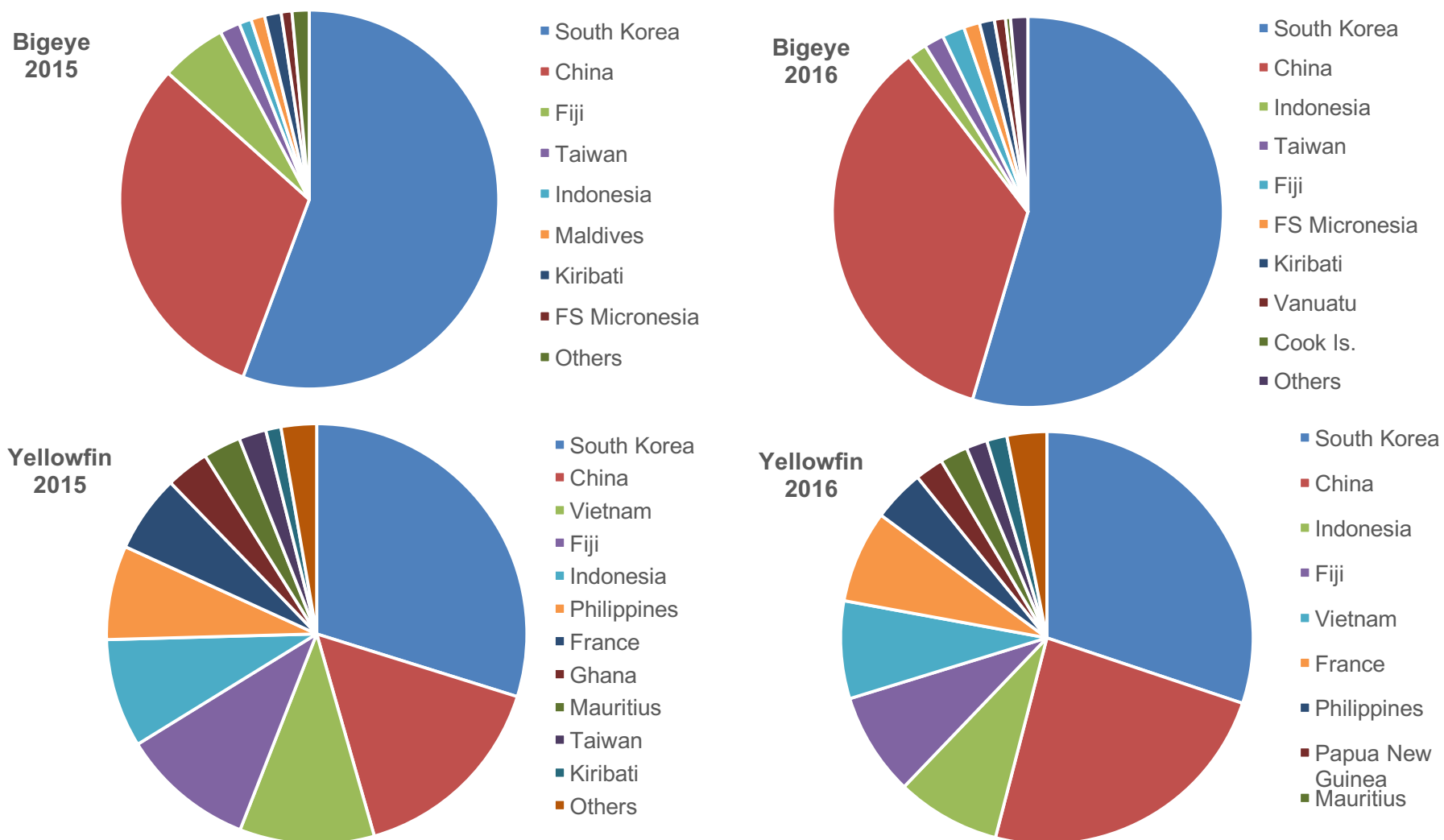
Note: data are ranked by 2016 volume Source: Imports from All Countries for 0304.87.040. Trade Statistics of Japan (2017).

There is another code for 'fillets' but which is not differentiated by species and is instead named 'Other'.⁶² It is assumed that these are frozen albacore fillets, and are likely to be ULT product. This import market was worth a total of ¥543.8 million for 6,616 mt in 2015 and doubled to ¥1.09 billion for 14,495 mt in 2016 (around USD 10 million). China had a volume share of 77.8% in 2015 and South Korea had 5%. In 2016, this shifted to 87.6% and 11.5% respectively, indicating greater concentration of supply to these leading processors and a potential sharpening of competition between them.

There are data going back for the five-year period 2012-2016 for 'fillets' of bluefin species, which is no doubt because of the very high value of this product type (imported bluefin fillets were worth around USD 320 million in 2016). While not the focus of this report, these data are provided here for information; not least because of market interactions among high quality grades of sashimi product. Given the locations of suppliers, it is also highly likely that products made with ranched bluefin are included in these import data, re-iterating the point made in Box 2.1 on the commercial interactions of farmed tuna.

⁶² There is also a code for Skipjack or stripe-bellied bonito (*Euthynnus (Katsuwonus) pelamis*) -- 0304.87-090 -- but the volumes and value are minor.

Figure 2.10: Share of Japan import volume market of frozen bigeye and yellow tuna ‘fillets’ by major supplier country



Source: Imports from All Countries for 0304.87.040 and 0304.87.050. Trade Statistics of Japan (2017)

Table 2.6: Japan import of frozen ‘fillets’ of bluefin tunas (*Thunnus thynnus/Thunnus orientalis*), 2012-2016 (in tonnes and 1,000 Yen)

| | 2016 | | 2015 | | 2014 | | 2013 | | 2012 | |
|--------------|----------------|-------------------|----------------|-------------------|---------------|-------------------|----------------|-------------------|---------------|-------------------|
| | Volume | Value | Volume | Value | Volume | Value | Volume | Value | Volume | Value |
| Malta | 49,624 | 12,744,868 | 46,720 | 14,281,293 | 20,676 | 6,393,221 | 40,857 | 12,771,151 | 17,077 | 5,810,131 |
| Spain | 26,439 | 6,503,072 | 25,530 | 7,525,823 | 14,341 | 4,510,197 | 19,615 | 6,195,098 | 15,165 | 5,073,875 |
| Croatia | 17,093 | 4,228,439 | 18,539 | 5,506,018 | 18,151 | 5,094,997 | 14,221 | 4,064,287 | 17,187 | 5,391,234 |
| Turkey | 16,706 | 4,153,795 | 19,065 | 6,147,788 | 13,353 | 4,338,518 | 15,086 | 4,548,560 | 13,804 | 4,788,108 |
| Mexico | 14,727 | 2,559,136 | 10,111 | 2,257,773 | - | - | 311 | 10,197 | - | - |
| Morocco | 9,488 | 2,325,451 | 12,071 | 3,456,205 | 5,158 | 1,479,750 | 6,497 | 1,780,247 | 7,186 | 2,037,394 |
| Tunisia | 5,707 | 1,450,621 | 9,862 | 2,981,348 | 11,881 | 3,658,617 | 12,629 | 3,849,936 | 5,812 | 2,015,217 |
| Libya | 4,929 | 1,234,650 | 1,821 | 502,966 | 1,109 | 383,647 | 203 | 56,944 | - | - |
| Algeria | 2,449 | 621,672 | 2 | 444 | - | - | - | - | - | - |
| Italy | 1,706 | 374,271 | 3,884 | 1,073,742 | 1,352 | 419,069 | 342 | 88,798 | 2,969 | 1,081,102 |
| Portugal | 806 | 201,673 | 1,951 | 502,986 | 976 | 270,003 | 863 | 249,640 | 326 | 117,290 |
| France | 282 | 31,323 | - | - | 366 | 110,951 | - | - | 195 | 59,572 |
| Greece | 0 | 0 | - | - | - | - | 1,082 | 325,379 | 805 | 291,453 |
| South Korea | 0 | 0 | 28 | 2,713 | - | - | - | - | - | - |
| Total | 149,956 | 36,428,971 | 149,582 | 44,239,099 | 87,364 | 26,658,970 | 111,705 | 33,940,237 | 80,527 | 26,665,376 |

Source: Imports from All Countries for 0304.87.020. Trade Statistics of Japan, Ministry of Finance

Table 2.7: Japan import of frozen ‘fillets’ of southern bluefin tunas (*Thunnus maccoyii*), 2012-2016 (in tonnes and 1,000 Yen)

| | 2016 | | 2015 | | 2014 | | 2013 | | 2012 | |
|--------------|------------|---------------|------------|---------------|------------|---------------|----------|----------|------------|---------------|
| | Volume | Value | Volume | Value | Volume | Value | Volume | Value | Volume | Value |
| Australia | 102 | 17,687 | 2 | 405 | 10 | 3,015 | - | - | 119 | 30,573 |
| Indonesia | 68 | 7,640 | 209 | 27,043 | 114 | 11,640 | - | - | - | - |
| South Korea | 14 | 3,477 | - | - | - | - | - | - | - | - |
| Total | 184 | 28,804 | 211 | 27,448 | 124 | 14,655 | - | - | 119 | 30,573 |

Source: Imports from All Countries for 0304.87.030. Trade Statistics of Japan (2017)

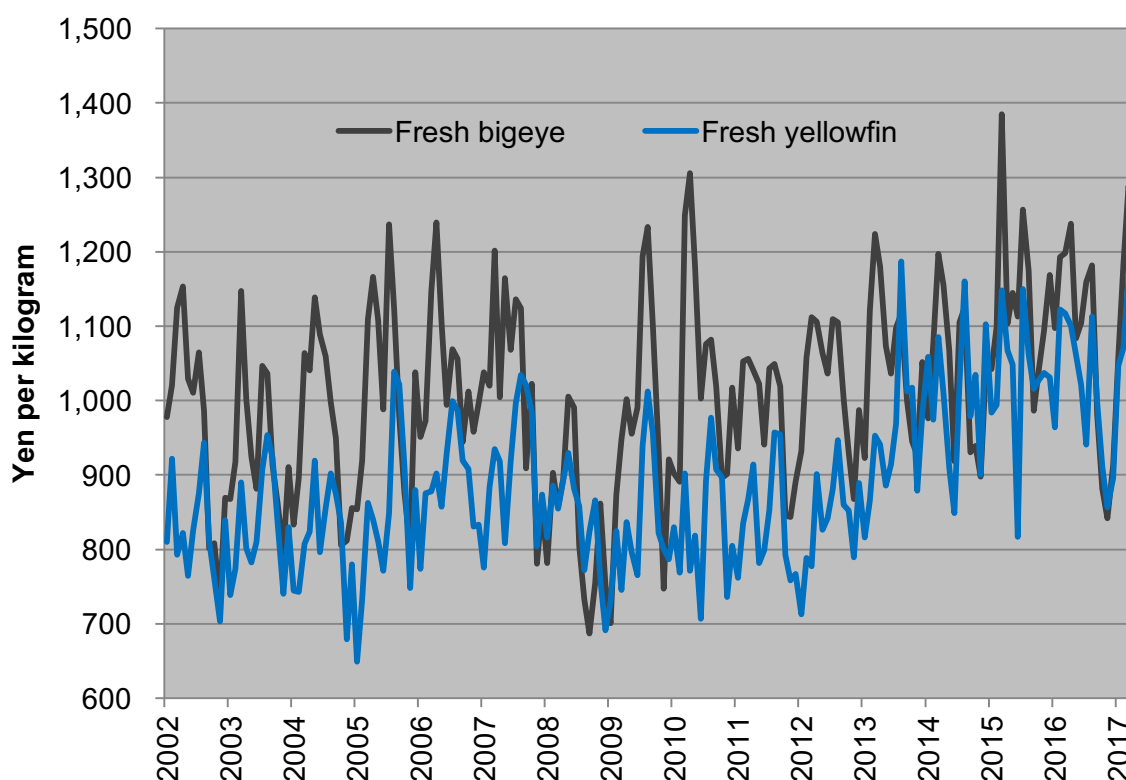
2.2.3 Japan market for fresh longline tuna

In broad terms, *fresh* fish purchased in Japan was around 14 kg per person in 1965, declining to just over 12 kg in 1982, and was just under 10 kg in 2010.⁶³ The composition of this consumption shifted from tuna being fifth most popular in 1965 to second place in 1982 (following only squid), but in 2010 it had dropped to third place behind salmon and squid.

Sales of fresh fish and seafood in Japan in 2015 were dominated by foodservice at 47.6%, followed by retail at 33.8%, and institutional catering at 18.6%.⁶⁴

In 2015, Japan's market sales for fresh tuna totaled 66,200 mt. The fresh tuna market is smaller than the frozen, with fresh catches generally marketed whole round through wholesaler auctions (e.g. Tsukiji). The domestic landings, mostly from the small offshore fleet, and all from the North Pacific, are dominated nowadays by albacore tuna, with declining catches of bigeye and yellowfin, as noted previously.

Figure 2.11: Japan fresh bigeye and yellowfin price in Yen, 2002 to April 2017*



*Import price from Oceania, including Australia and New Zealand databases

Source: FFA Fisheries Development Division

As a rough snapshot, it seems that average fresh tuna prices may have increased by around 10% for the two species (bigeye and yellowfin) whereas frozen prices have increased only slightly (0-5% - bigeye, albacore) or even decreased (-35%, yellowfin). This merits a more detailed analysis but the upward trend for fresh fish prices seems at odds with Hamilton et al.

⁶³ Ministry of Internal Affairs and Communications: Household Budget Survey, cited by Nagahata 2013.

⁶⁴ This proportion has stayed roughly the same since 2010 (Agriculture and Agri-Food Canada 2017).

(2011) where relatively stagnant prices were observed over a 15 year period (1995-2010) and were explained by discrepancies in the data collection system which did not gather all data on all sashimi sources, especially imported ULT fish and local fresh fish, and supply was underestimated.



Slicing bluefin in Tsukiji market. Photograph: Antony Lewis

Fresh domestic landings are nearly three times those of the fresh imports, and are landed at a variety of ports, but much going to home ports in Kagoshima, Miyagi and Shizuoka. Fresh tuna imports seem to be on a downward trend most recently. This might be explained by the weak Japanese Yen.

Table 2.8: Japan fresh tuna supply – imports versus domestic landings

| | Imports | | | | | | Domestic landings | | | | |
|-------------|---------|-----|-----|-----|-------|-------------|-------------------|-----|-----|------|-------------|
| | BFT | SBT | BET | YFT | ALB | Total | BFT | BET | YFT | ALB | Total |
| 2014 | 3.8 | 1.4 | 9.9 | 8.0 | < 0.1 | 23.2 | 2.4 | 4.4 | 4.5 | 36.6 | 47.8 |
| 2015 | 4.8 | 1.7 | 7.0 | 5.2 | 0.5 | 18.6 | 2.6 | 4.0 | 6.5 | 34.5 | 47.6 |

Source: FAJ supplied by M Nakada

Fresh tropical tuna (bigeye, yellowfin) imports are dominated by Indonesia, by Mexico in the case of air-freighted farmed Pacific bluefin, and the US and Canada in the case of Atlantic bluefin. As noted later, the Japan-based Hong Kong firm Luen Thai is the largest single importer of fresh tuna into Japan.

Table 2.9: Japan fresh imports by species and selected country, 2015 (mt)

| Species | Total (mt) | Top countries ('000 mt) |
|---------|------------|--|
| BET | 7,006 | Indonesia (4.3), Thailand (0.6), |
| YFT | 5,186 | Indonesia (1.5), Thailand (0.7), Taiwan (0.6), PNG (0.5) |
| BFT | 4,795 | Mex (3.3), South Korea (0.5), Canada, USA (0.3), Spain (0.2) |
| SBT | 1,664 | Australia (0.9), New Zealand (0.5), Indonesia (0.2) |

Source: ITC Trade Map: <http://www.trademap.org>

Imported processed fresh tuna products

The Japan import market for fresh processed tuna products is very small. As for frozen tuna product imports, HS codes were sourced directly from Japan's tariff schedule.⁶⁵ The focus here is on fresh or chilled tuna 'fillets' and 'other' products, for which there are six separate HS codes, all of which are subject to a MFN (or 'WTO') import tariff of 3.5%; although developing countries qualifying under Japan's Generalized System of Preferences (GSP) access the market duty free.

The only record of imports under the fresh or chilled 'fillets' category is for 'Other', which, it is assumed, includes non-bluefin tuna species (e.g. bigeye), but which may also include other unnamed fish species.⁶⁶ This product might include vacuum-packed fresh loins. This category is commercially irrelevant, with a maximum import value of only ¥20,695,000 (around USD 181,000) (from Taiwan in 2012).⁶⁷ For fresh or chilled 'other' product types (i.e. not 'fillets'), there is also only a record of imports of 'other' (non-bluefin tuna) species, which may include tuna species as well as other fish. South Korean is the main supplier of this unknown species and unknown product type, exporting an average annual import value of ¥554 million (around USD 5 million) between 2012 and 2016, peaking in 2012.⁶⁸

⁶⁵ Japan Customs, Japan's Tariff Schedule as of May 16 2017. Available at: http://www.customs.go.jp/english/tariff/2017_5/index.htm

⁶⁶ A search was done of Trade Statistics of Japan for imports from All Countries for the period 2012-2016 using the following HS codes for 'fresh or chilled fillets': 0304.49.210 - Bluefin tunas (*Thunnus thynnus*, *Thunnus orientalis*); 0304.49.220 - Southern bluefin tunas (*Thunnus maccoyii*); 0304.49.290 - Other.

⁶⁷ Trade Statistics of Japan (2017) HS 0304.49.290

⁶⁸ Trade Statistics of Japan (2017) HS 0304.59.299

2.2.4 The restructuring of the Japan sashimi market

The Japanese sashimi market is characterized by multiple complex market arrangements and distribution systems, but these can largely be distinguished as two channels according to the fresh and frozen sashimi market segments:⁶⁹

- 'Traditional' channels – trade of fresh (and to an increasingly lesser extent, frozen) sashimi-grade tuna through government regulated wholesale market systems.
- 'Unofficial' channels – trade of frozen sashimi-grade tuna that either by-passes or only partly flows through the traditional wholesale market system.

Under the traditional wholesale market system, whole round or G&G tuna is traded on a fish by fish basis by auction through markets based at either fishing/landing ports (producers' wholesale markets (e.g. Yaizu)) or in populous areas (consumers' wholesale markets (e.g. Tsukiji)). Tuna sold through wholesale markets is purchased by intermediate wholesalers (i.e. wholesalers licensed to resell from a shop/stall within the market area), authorized buyers (i.e. large trading companies, supermarkets, processing firms, restaurant chains) or third party unlicensed buyers (i.e. smaller supermarkets and convenience stores). Auctions are conducted by auction houses on a commission basis on behalf of fishing vessel owners, importers or marketing companies.



Tsukiji market viewed from above. Photograph: Antony Lewis

⁶⁹ For more detailed commentary on Japan's sashimi market and distribution system, see Campling et. al. (2007: 242-257).

The majority of tuna auctioned through producers' wholesale markets is catch which is offloaded by Japanese vessels, although technically, foreign-flagged vessels offloading in Japanese ports could also be marketed through this channel (e.g. Korean vessels – 10% of the ULT catch). Some product purchased by trading companies through producers' wholesale markets, may in turn be re-sold through consumer wholesale markets. Imported product (including imports from PICs) that is marketed through traditional channels is sold through consumer wholesale markets. Sales to small restaurants and bars are dominated by consumers' markets intermediate wholesalers.

However, with large advances in freezing technology and development of the cold chain over the past 20-30 years, coupled with the growing significance of trading companies in tuna sashimi trading, there has been a considerable shift in the volume of frozen sashimi-grade tuna sold through unofficial channels, rather than the traditional wholesale market channel. Unofficial channels dominate sales to supermarkets and large retailers (i.e. restaurants, sushi bar chains), including, as we have seen, of sashimi tuna products (loins, saku blocks, etc.).

Supermarkets and convenience stores dominate the retail of food in Japan. Household survey data provide some insight here (Table 2.10). While convenience stores such as 7-Eleven are ubiquitous in Japan, supermarkets are the main retail format for fresh food. This includes fish where supermarkets accounted for 67% of average household expenditure on fish and fish products and 70% for specifically fresh seafood; rising from 64% and 63% in 1999 respectively. The retail share of fishmongers dropped from 18% in 1999 for fresh seafood to 10% in 2014. The implication is that most Japanese consumers buy sashimi tuna for home consumption from supermarkets, who in turn buy product from trading companies.

Table 2.10: Japan average household monthly retail expenditure on fish, shellfish and packaged sushi by Place of Purchase

| | 2014 | | | 2009 | | | 2004 | | | 1999 | | |
|-------------------------------------|---------|---------------|------------------|---------|---------------|------------------|---------|---------------|------------------|---------|---------------|------------------|
| | Seafood | Fresh seafood | Sushi (packaged) | Seafood | Fresh seafood | Sushi (packaged) | Seafood | Fresh seafood | Sushi (packaged) | Seafood | Fresh seafood | Sushi (packaged) |
| Average expenditure (in Yen) | 5,348 | 3,226 | 803 | 5,586 | 3,421 | 782 | 6,388 | 4,167 | 782 | 9,932 | 6,315 | 855 |
| Supermarket | 67% | 70% | 66% | 65% | 67% | 64% | 63% | 65% | 62% | 64% | 63% | 58% |
| Retail store (fishmonger) | 10% | 10% | 14% | 12% | 13% | 17% | 15% | 16% | 20% | 17% | 18% | 25% |
| Cooperative store | 6% | 5% | 2% | 8% | 7% | 3% | 10% | 10% | 3% | 9% | 9% | 3% |
| Department store | 4% | 4% | 6% | 5% | 4% | 8% | 6% | 5% | 8% | 6% | 5% | 8% |
| Convenience store | 1% | 0% | 4% | 1% | 0% | 3% | 1% | 0% | 3% | 0% | 0% | 2% |
| Others* | 8% | 6% | 7% | 7% | 5% | 4% | 5% | 4% | 4% | 4% | 4% | 3% |

Note: 'seafood' is fish and shellfish

Source: Statistics Japan, National Survey of Family Income and Expenditure (various years)

The leading supermarkets and convenience stores in Japan are detailed in Table 2.11. An ageing population who prefer to shop close to home has put pressure on supermarkets. Also, with the feminization of the labour force and the growth of two-person households and of women living alone, there is a greater emphasis on smaller volume purchases and convenience (e.g. ready meals). Reflecting growing inequality in the country, the retail market is also increasingly polarised between discounted and private label items, on the one hand, and premium quality brands and convenience on the other.⁷⁰

Table 2.11: Leading firms in Japan's mass grocery retail sector

| Parent Company | Sales (JPYbn) | Brand | Format | Outlets in Japan |
|--------------------|---------------|------------|-------------------|------------------|
| Aeon Co Ltd | 8,210 | Aeon | Supermarket | 1,882 |
| | | Ministop | Convenience store | 2,186 |
| | | Aeon | Hypermarket | 590 |
| | | Aeon Big | Discount Store | 330 |
| Seven & I Holdings | 5,835 | 7-Eleven | Convenience store | 18,572 |
| | | Ito-Yokado | Supermarket | 186 |
| Daiel | 813.6 | Daiel | Supermarket | 270 |
| Maruetsu Inc | 326 | Maruetsu | Supermarket | 260 |
| Inageya co Ltd | 240 | Inageya | Supermarket | 139 |

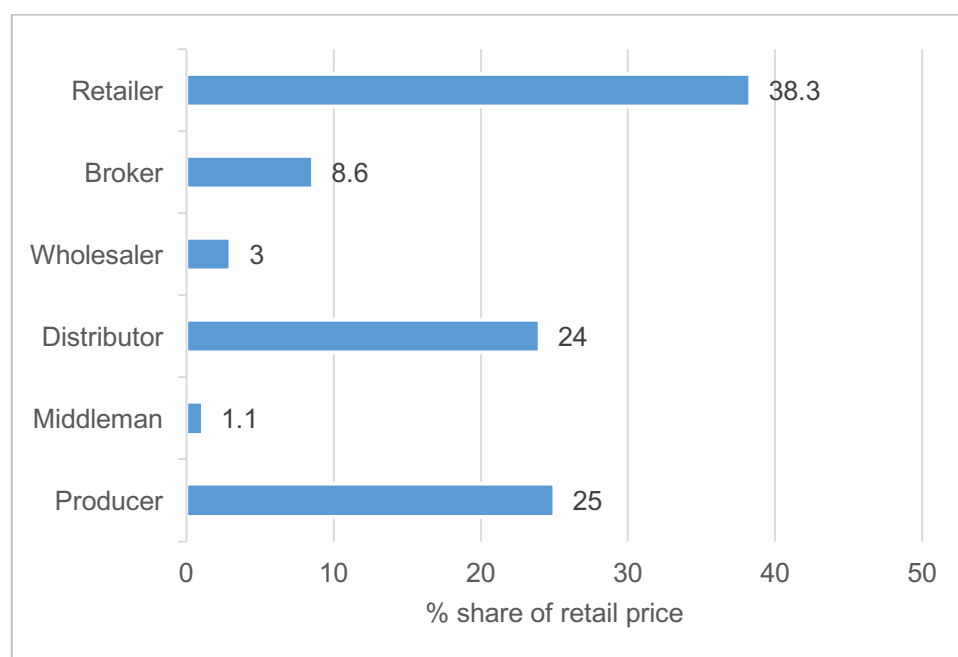
Note: Leading convenience stores such as FamilyMart and Lawson are excluded because this format is irrelevant to fish sales, but 7-Eleven and Ministop are included because they are part of a company that owns supermarkets.

Source: BMI 2017c

Figure 2.12 gives some indication of which players in the sashimi chain capture the final retail price. The data are based on a survey of multiple entities at each stage of the distribution chain for 10 fish species (bigeye tuna, skipjack tuna, sardine, horse mackerel, mackerel, Pacific saury, sea bream, flatfish, yellowtail, and common squid). The data suggest that the largest share (38%) was captured by retailers, which, as noted, is dominated by supermarket chains with ~70% market share. The segments 'middlemen' and 'distributors' take place at producers' wholesale markets such as Yaizu. While the 'wholesaler' and 'broker' segments are at consumers' markets such as Tsukiji.

⁷⁰ Agriculture and Agri-Food Canada 2016b

Figure 2.12: Capturing value in the Japan distribution channel for fish products



Source: Yagi (2011) citing Ministry of Agriculture, Forestry and Fisheries 2008 survey data

Large volumes of frozen tuna are now purchased directly by trading companies (and even some large retailers) from vessels, which is offloaded straight into cold storage facilities and then delivered direct to customers, typically after processing. A major benefit to vessel owners of such a marketing arrangement is that trading companies purchase the entire vessel's catch at one time (i.e. 200-300 mt consignments), often before the catch is even offloaded, and are able to pay straight away. By buying direct from boats and selling G&G or processing into sashimi products, the trading companies are able to cut out segments in the 'traditional' distribution channel (Figure 2.12), offer a lower price to supermarkets and sushi restaurant chains and, presumably, capture a higher rate of profit.

2.2.5 Sashimi trading companies

According to industry sources, 70-80% of trading companies' sales are through unofficial (direct) channels to larger retailers and supermarket chains. This is generally lower quality bigeye, as well as yellowfin and albacore, sold in both whole round and processed forms. The other 20-30% of sales consists of high quality frozen tuna (i.e. bluefin, bigeye) marketed by trading companies through traditional consumer wholesale auctions (80% through Tsukiji, 20% through other markets).⁷¹ As noted earlier, based on FAJ data, Japan's total import market for frozen bigeye and yellowfin in 2015 was 116,700 mt.

The Japan Fish Traders Association suggests that around half of total tuna sales in Japan are 'out-of-market distribution' (i.e. bypassing the wholesale system). It argues that this is of 'great merit' because reducing expenses required at the distribution stage, such as wholesalers' commissions, and speeding up product circulation, fish are both cheaper and fresher for end consumers.⁷² Toyo Reizo Co. Ltd., the world's leading tuna sashimi trader (see

⁷¹ Interviews, Japanese industry representatives, June 2010.

⁷² Translated from Japanese: <http://www.jfta-or.jp/wholesale.html>

below), claims that around half of the tuna for sashimi consumed in Japan are 'natural' (non-farmed) frozen tuna caught by distant water longliners.⁷³ This reinforces the centrality of trading companies in Japan's tuna consumption as domestic landings and farmed tuna are a long way from meeting demand.

The big trading companies are generally seen as price makers in the Japan sashimi market, controlling price variations, albeit within a quite narrow band; provided that supply is adequate and inventory levels are high. They are certainly *not* price takers ! This narrowness of the band of room for manoeuvre on price recognizes consumer resistance to major price hikes and the ability to switch to other protein sources (i.e. substitutability, see above). A barometer of price for non-bluefin sashimi tuna is the Indian Ocean, where bigeye tuna at 40kg+ acts as a baseline of sorts (price was ¥ 800-900/kg in early April 2017, and is generally in the range of ¥700-900 so is relatively stable over time). Price is also shaped to some extent by what is in the inventory (i.e. in ULT stores). For example, ULT yellowfin inventory levels in 2016 were very high which contributed to the price being lower. Despite substitutability in terms of consumption patterns (e.g. shifting from tuna to beef or chicken), there is no known price linkage.

Trading companies have become increasingly significant in Japan's sashimi distribution system. In 2006, four major trading companies accounted for an estimated 65% of sashimi supply in the Japanese market. These were reported to be: Toyo Reizo (a subsidiary of Mitsubishi) 35%; Try Sangyou (a subsidiary of Sojitz⁷⁴) 15%; Itochu Fresh 5-8%⁷⁵; and Maruco (Marubeni) 5-8%.⁷⁶

In 2016, the 'big four' sashimi trading companies were reported to be Toyo Reizo, Try Sangyou, Fukuichi and Yamafuku. Combined, they may account for over 70% of the traded volume,⁷⁷ with proportional turnover among them estimated as 10:4:3:3 units respectively. Other notable trading companies include Yashima and Nippon Access (see below). Whereas others that were important in the past no longer appear to be major players (i.e. Marubeni).

It is important to note that Toyo Reizo, Try Sangyou and Nippon Access are subsidiaries of *sogo shosa* – a unique business group to Japan which can be thought of as giant conglomerates of companies involved in a very diverse range of businesses, with a core competence in, but not limited to, trading. Typically, *sogo shosa* have over 500 subsidiaries (+50% ownership) and affiliated companies (with 20%-50% equity), and an average of around 50,000 employees in the group. The total sales of the seven *sogo shosa* (Table 2.12) constituted around 15% of Japan's GDP in 2011.⁷⁸ Because *sogo shosa* often trade in natural resource-based industries, they are exposed to primary commodity price fluctuations.

⁷³ <http://www.toyoreizo.com/activity/buy.php>

⁷⁴ Previously known as Nissho Iwai-Nichimen Holdings, it changed its name to Sojitz Corporation in 2004. See: <https://www.sojitz.com/history/en/company/sojitz/>

⁷⁵ The Itochu Corporation is a *sogo shosa*. Its subsidiary Itochu Fresh Corporation Inc. was acquired by Nippon Access, Inc, a wholesale food company, in October 2011. Itochu Fresh had changed its name from Yaizu Marine Products Co., Ltd. in October 1998. See: <http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapid=5489710>

⁷⁶ Campling et. al. 2007: 256.

⁷⁷ Industry source

⁷⁸ Ryan 2013

Table 2.12: A snapshot of the *sogo shosa*

| Name | Sales in 2012 (USD billion) | Net profit in FY ending 2016 |
|---------------------|-----------------------------|------------------------------|
| Mitsubishi Corp | 201.3 | ¥440.2 billion |
| Itochu Corp. | 119.8 | ¥352.2 billion |
| Marubeni Corp. | 105.8 | ¥155.3 billion |
| Mitsui & Co. | 104.8 | ¥306.1 billion |
| Sumitomo Corp. | 82.7 | ¥170.8 billion |
| Toyota Tsusho Corp. | 59.2 | ¥102.5 billion |
| Sojitz Corp. | 44.9 | ¥40.7 billion |

Source: Ryan 2013; *Japan Times* 2017

With the growing dominance of trading companies and large retailers in the trade of frozen sashimi-grade tuna, distribution systems have become increasingly complex and opaque. According to one industry representative, 'Distribution systems have now become very, very complicated – we cannot understand them. A large company can store product for 1-2 years and the quality won't change because of -60°C storage. They can stockpile and control price and only they know where their product goes.'⁷⁹



Value added sashimi packs in Yaizu fish outlet. Photograph: Antony Lewis

⁷⁹ Interview, Japanese industry representative, June 2010.

Sketches are provided below of the major sashimi trading companies where details are known, based on information provided during interviews and desk study. The 'big four' are listed first, followed by information on other traders where information was available. (All data are from interviews unless otherwise noted.)

Toyo Reizo Co. Ltd.

Toyo Reizo (or TOREI) is the leading sashimi trader in Japan, and thus the world (est. 1971). As a subsidiary of Mitsubishi, which is a *sogo shosa*, TOREI has excellent access to finance. It commands a ULT cold chain allowing it to distribute product throughout Japan. All of its tuna is sold in Japan (it does not export) and it has 14 offices dotted throughout the country.⁸⁰ In 2016 it had total sales (all species) of ¥1,674 billion (USD 1.5 billion).⁸¹

TOREI is divided into four trading groups: tuna, salmon, shrimp and octopus/squid. The tuna group is split into fresh, frozen and bluefin farming. Its annual traded volume of tuna is around 100,000 mt, of which 50-60% is bigeye, 20-30% yellowfin, and the balance a combination of albacore, striped marlin, swordfish and skipjack. Fish are normally purchased gilled and gutted (G&G), except for albacore which is whole round.

By gear type, this breaks down into longline 60%, farmed bluefin 20-30%, and skipjack 10%, which is assumed to be purse seine special and/or pole-and-line. The longline volume breakdown by fleet was given as Japan 30%, Taiwan 20-30%, China 20%, and others (South Korea, Solomon Islands, Vanuatu, etc) at 20-30%. TOREI has no particularly loyalty to the flag of vessels, but is instead focussed on quality. On these grounds, it tends to prefer Japan vessels first, then Korea and then Taiwan, with China reportedly the supplier of last resort.⁸² It also procures around 25,000 mt per annum of purse seine special, which it purchases solely from Japan and South Korean vessels.

TOREI has 3 large ULT reefer carriers which operate in the Atlantic/Mediterranean, Mexico and Australia, collecting fish from farms and possibly also some wild fish; they are also known to collect frozen bigeye and yellowfin tuna from vessels operating in the eastern WCPO. Basic processing is done very quickly onboard (e.g. into loins, gutted and gilled) and the freezing time from fresh is apparently the world's fastest at 12-14 hours (the norm is reportedly 20 hours or more).⁸³

Around 50% of available Pacific bluefin farmed in Japan is reportedly purchased by TOREI. It also has its own bluefin tuna farms based on artificial hatching cultivation, which means that they do not depend on wild caught fish. The process, developed in partnership with Kinki University, is marketed under the *Tuna Princess* brand.⁸⁴

TOREI has large -60°C cold storage capacity in Shimizu. It has a processing facility onsite where ULT fish is processed into loins (the main product type), blocks, *saku*, and some *negitoro* (i.e. minced) and steak, for sale to wholesalers and supermarkets. Some fish are sold as gilled and gutted. It was noted that demand for skipjack for *katsuobushi* is strong and the market here

⁸⁰ <http://www.toyoreizo.com/outline/office.php>

⁸¹ http://www.toyoreizo.com/outline/sales_volume.php

⁸² However, it is known that significant trade has existed. In leaked documents from a draft initial public offering (IPO), China Tuna Industry Group sold over 70% of \$62 million in annual sales in 2011-13 to Toyo Reizo (Havice et al. 2014).

⁸³ The reefers are Tuna Queen, Tuna Princess and Lady Tuna. See: <http://www.tunaqueen.com/tunaqueen/touketsusen/index.html>
<http://www.tunaqueen.com/tunaqueen/shinsen/index.html>

⁸⁴ See: <http://www.toyoreizo.com/tunaprincess/index.php>

is, again, entirely focussed on Japan. TOREI seeks to make full use of by-products, including collagen from tuna skin, fish meal and DHA fish oil.⁸⁵

An allied company Kouzai Bussan (est. 1984) processes seafood, including longline caught and farmed tuna, into sushi products.⁸⁶ It has six branches spread across Japan and had annual sales of ¥7.1 billion yen (as of March 2017). Mitsubishi also has a joint venture (25%) in China with Zhejiang Ocean Family Co., Ltd. (75%) in a ULT processing plant in Hangzhou, China. The new company, Zhejiang Daling Seafood Co., Ltd., processes seafood, including sashimi grade tuna products, for the Chinese market.⁸⁷ (See Section 6.6.2 for more information.)

TOREI's main rivals are those firms competing for supply of G&G ULT tuna by negotiating with boat owners before landing and those companies who buy G&G from TOREI and its competitors to process and sell to supermarkets, restaurants chains, etc.

Try Sangyou

Try Sangyou (or 'TRY') is a highly specialised sashimi grade tuna trader and processor (mainly ULT) headquartered in Shizuoka City, next to Shimizu port. It is the second largest trader of sashimi tuna in Japan and the main competitor to TOREI. In 2016 it had sales of ¥35,702 million (USD 322.9 million) and a profit of ¥437 million (USD 3.9 million), a 10% and 32% increase respectively over 2015.⁸⁸ TRY is believed to have ties to Sojitz Corporation, a *sogo shosa* created from the merger of Nissho-Iwai and Nichimen in 2003. The relationship is not made obvious on Sojitz's website (despite a thorough search)⁸⁹, but it is listed once as a Sojitz entity in the Food Resources Unit of the Consumer Lifestyle Business Division in a presentation by the Division's President.⁹⁰ There are also financial ties through one of TRY's group companies – Try-Tokyo (see below).

TRY regularly purchases the entire catch of ULT longliners, especially from boat owners that it considers to have reliable quality control (i.e. in post-harvest handling, freezer technology and onward ULT cold chain transportation). It also buys directly from tuna farms on the Mediterranean coast, Mexico and Australia, where an employee will be sent to supervise the production and freezing.⁹¹

TRY's subsidiary Try Tuna Products Inc. (est. 1994) has three ULT factories, all HACCP certified. The three facilities are located within one-hour drive of each other and have a combined ULT storage of over 15,000 mt and processing capacity of 60 mt per day. The factory in Shizuoka City in Shimizu (also TRY's HQ) has ULT storage of 6,486 mt and can process 30 mt per day, the second in Shimada has 8,383 mt ULT storage and processing capacity of 25 mt/ day, and the third, much smaller facility, in Makinohara City has 394 mt storage and 5 mt/ day capacity.⁹² The latter two are both certified to export to the USA and the company is trying to expand sales there and in Southeast Asia.⁹³

⁸⁵ http://www.toyoreizo.com/activity/sales_strategy.php

⁸⁶ See for example: <http://kouzai-bussan.jp/Maguro.html>

⁸⁷ See: <http://www.mitsubishicorp.com/jp/en/pr/archive/2013/html/0000023222.html>

⁸⁸ See: <http://www.try-sangyou.co.jp/about/#management>

⁸⁹ Searches of Sojitz's website were done using 'tuna' and 'Try Sangyou', only Kato (2013) was found. Google results were the same using: Sojitz "Try Sangyou").

⁹⁰ Kato 2013

⁹¹ See: <http://www.try-sangyou.co.jp/secure/buying/>

⁹² <http://www.try-sangyou.co.jp/about/group/>

⁹³ <http://www.try-sangyou.co.jp/secure/process/>

These three facilities process a wide variety of products, such as loins and saku blocks, to a wide variety of specifications (skin-on, skinless, more or less *toro*, small cuts for convenience food retail, etc). TRY sells processed and G&G tuna throughout Japan to a diversity of buyers such as markets, wholesalers, major supermarkets, mass merchandising stores, sushi chains and restaurants.⁹⁴

Try-Tokyo Corporation was founded in 2003 to deal exclusively in fresh sashimi grade tuna. It is a 15% subsidiary of Sojitz Corporation.⁹⁵ Based in Tsukiji, Try-Tokyo sells imported fish domestically and purchases and sells tuna in the Tsukiji market. It also procures from tuna farms and dispatches employees to farms dotted across world to manage production and shipping.

Sojitz operates a tuna farm under the 100% owned subsidiary Sojitz Tuna Farm Takashima (est. 2008). Sojitz also controls (51% share) Dalian Global Food Corporation which is a sashimi grade ULT tuna processing company in China. Set up in 2003 this was reportedly the first Japanese company to invest in this segment in China.⁹⁶ A second factory was being built in 2017 which will triple the processing and storage capacity of the joint-venture.⁹⁷

Fukuichi Gyo Gyo Co. Ltd

Fukuichi is reportedly Japan's joint third largest sashimi tuna trader. It sources widely, with longline tuna constituting around 80% of its total sales (bigeye and yellowfin, and bluefin, including farmed southern bluefin from Australia, and Atlantic bluefin from the Mediterranean), and 20% purse seine (some of which goes to *katsuobushi*).

Fukuichi has two large ULT cold storages – Fukuichi Nishijima Cold Storage at 6,000 mt and Fukuichi Ohigawa Cold Storage at 10,000 mt. It also has a processing plant in Yaizu. It also owns 5 purse seiners with wells at -45 to -50°C for PS special. NH³ refrigeration makes them more efficient. PS special grade is usually around 30% of catch, with yellowfin 20+kgs as the preferred catch, but the boats take yellowfin and skipjack of all sizes if good quality. The boats engage in mixed fishing, roughly 50:50 free school to FAD, and do 7 trips per year. Catch per boat is 5,000 mt and they are reportedly profitable at that level.

Fukuichi markets mostly in Japan, but is looking to diversify into the EU (where it sells loins and saku blocks) and the USA. In Japan it sells processed fish products to supermarkets, restaurants, and hotels. It owns three fresh fish retail outlets (2 in Yaizu, 1 in Shizuoka), where many buyers are restaurant owners and around 50% of sales are tuna products. It also owns fine dining sushi restaurants.

Yamafuku Suisan Co. Ltd.

Yamafuku Suisan (est. 1973) is reported to be the joint-third largest sashimi tuna traders.⁹⁸ It is a broker at Yaizu market – Yaizu being a leading industrial fisheries port in Japan. It has a network of ULT freezers (-50 to -60 °C) in Yaizu.

⁹⁴ <http://www.try-sangyou.co.jp/secure/sale/>

⁹⁵ See: https://www.sojitz.com/jp/ir/reports/annual/upload/ar2011e_053.pdf

⁹⁶ See: <http://www.sojitz.com/en/news/2003/01/20030109.php>

⁹⁷ <http://www.sojitz.com/en/special/letterzine/post-33.php>

⁹⁸ Not to be confused with Yamafuku Osaka Co. Ltd, which has a HQ in Osaka, a branch in Tohoku and a manufacturing plant in Miyazaki. It trades, manufactures and distributes tuna and a variety of Japanese cuisine to commercial food wholesale companies across Japan who in turn supply Japanese caterers and restaurants. It stocks 15,000 food products, which are both manufactured in its own factory under its brand *Ajinomaru*. See: <http://www.yamafuku-net.co.jp/>

Yamafuku Suisan has a ULT loining facility, which produces a basic range of sashimi products.⁹⁹ Interestingly, it also produces *tataki* (lightly seared externally, but raw in the middle). ULT loins are baked in charcoal kiln (at up to 1,000°C) but only the surface is cooked and then, after vacuum-packing, the *tataki* is rapidly frozen again to -35°C¹⁰⁰ The factory is HACCP certified and able to export to the USA.

Nippon Access, Inc

Nippon Access is specialised in the import and distribution of a wide variety of food products. Its majority shareholder is the *sogo shosa* Itochu (formerly called C. Itoh & Co).¹⁰¹ Nippon Access has a sophisticated logistics system and cold chain across Japan (including ULT), and supplies big retailers. Nippon Access took over the business of Itochu Fresh Corp. in 2011, which, as noted earlier, had around 5-8% share of Japan's sashimi-grade tuna market in the mid-2000s. The Fresh division of Nippon Access specializes in seafood, domestic and imported fruit and vegetables, and meats. Its seafood activities focus on tuna, where products include tuna sashimi and convenient bars for *negitoro* products and sushi rolls.¹⁰²

Marine Access Corporation (a wholly owned subsidiary, created in 2014) handles sashimi grade tuna trading, processing and distribution. Its tuna sashimi processing plant is in Shizuoka prefecture. The HACCP-compliant facility has a ULT freezer with capacity to store 3,500 mt of fish and it maintains -50°C conditions throughout processing into various cuts, depending upon customer demand.¹⁰³

Yashima Suisan KK

Yashima Suisan buys frozen tuna, processes and distributes to supermarkets. It has two large ULT cold stores (1,000 mt; 3,0000 mt) at Shimizu seaport and provides frozen-storage and transportation services, including a fleet of super-freezer trucks. Yashima Suisan procures bluefin, bigeye, yellowfin and albacore across the world, and sources solely from longlines, including from Japanese boats which it features on its website.¹⁰⁴ As such the company places considerable emphasis on 'natural' tuna (as opposed to farmed) and on the quality of its product (e.g. through meticulous three-stage sorting of fish). It processes a wide range of cuts of tuna to order, including high and medium *toro* belly and abdomen cuts, skinless loins, and saku blocks.¹⁰⁵

Luen Thai Fishing Venture Ltd (Japan branch)

This is the Japan trading office of the large Hong Kong trading giant involved in textiles, fast fashion, logistics, restaurants and fishing/trading (see Section 6.6). Luen Thai Fishing Venture has longline fleets operating from bases in the western Pacific (Palau, Pohnpei, FSM, Marshall Islands), with fresh fish transported by the company's own airfreight line.

It is the single largest importer of fresh tuna into Japan, supplying 16% of the yellowfin market, 21% of bigeye and 14% southern bluefin in 2016. Supply is from its own fleet of

⁹⁹ See: <http://www.yaizu-yamafuku.co.jp/catalog.html>

¹⁰⁰ See: <http://www.yaizu-yamafuku.co.jp/business.html>

¹⁰¹ See: <https://www.nippon-access.co.jp/en/corporate/history.html> As such, Itochu continues to feature this business in its corporate web. See: <https://www.itochu.co.jp/en/business/food/about/organization.html>

¹⁰² <https://www.nippon-access.co.jp/en/service/merchandising.html>

¹⁰³ <http://www.marine-access.co.jp/service/index.html>

¹⁰⁴ See: <https://www.yashima-suisan.co.jp/shipandboatman/>

¹⁰⁵ For more detail and images see: <https://www.yashima-suisan.co.jp/catalogue/> An interesting video of the cutting process on a band saw by a worker using his eye alone is available here: <https://www.yashima-suisan.co.jp/commitment/>

vessels (58 in total) and partner vessels (50 boats). By origin, Luen Thai's exports to Japan comes from Palau (53%), Marshall Islands (10%), other Oceania (29%), and others (8%).

Kiyomura Corporation

Kiyomura is a trading company and sushi restaurant chain with 52 outlets. It has four main sections: marine food trading, box lunch, sushi, and product development. Its 52 *Sushizanmai*¹⁰⁶ restaurants are high end, all over Japan but concentrated in the Tokyo region. It has 1,500 employees.¹⁰⁷

Kiyomura mainly buys whole fish and processes in company facilities. Some restaurants have a processing area, others do not and get fish from central processing and distributing facility as blocks, loins, saku, etc.

Tuna is around 30% of Kiyomura's total business volume, of which bluefin is 70% (it is a bluefin specialist), bigeye and yellowfin are 20% combined, and albacore ~10% along with some B1 grade skipjack and purse seine special. By area, it procures around 70% of supply from the Atlantic Ocean, and the Indian Ocean and WCPO 15% each. It has a specific approach for Atlantic bluefin which is to cull 100 kg+ fish from net, then grow out and fatten in pens; Kiyomura prefers larger fish so normal farmed/grow-out fish are too small.

It has several joint ventures overseas (e.g. in the Mediterranean), but also buys from overseas firms, Japan traders, and spot purchases in wholesale markets (mostly Tsukiji).

Kiyomura puts great emphasis on attention to detail and quality sourcing (e.g. even its pickled ginger is organic). Executive management is optimistic about the future, especially as sushi consumption overseas is growing rapidly. But sees a need to reduce domestic sashimi grade tuna prices to grow the market and to rebuild depleted stocks.

Taiyo A & F Co (TAFCO).

TAFCO is owned by Maruha Nichiro Corporation; a multinational corporation that specializes in marine products but also trades and distributes meat products among other things.¹⁰⁸

TAFCO has been trading sashimi grade tuna for 35 years. It previously operated 21 longliners but now just 1 in the Atlantic, targeting Atlantic bluefin tuna and bigeye. It also operates purse seiners based in Pohnpei and several other non-tuna gears in other regions. TAFCO's purse seiners produce 10,000 mt purse seiner special (-40° to -50°) for negiri sushi, and *katsuobushi*.

It also operates 5 tuna farms in Japan – the first started in 1985. It has a strong commitment to the future of tuna farming.¹⁰⁹ Among other items, TAFCO processes sashimi grade tuna products. Its parent Maruha Nichiro sells a wide diversity of tuna products, including mail order sashimi grade gift packages, which are kept at -50°C.¹¹⁰

¹⁰⁶ Not to be confused with *Sushi Zanmai*, which is a copy by competitors.

¹⁰⁷ See: <http://www.kiyomura.co.jp>

¹⁰⁸ See: <http://www.maruha-nichiro.co.jp/english/business/index.html>

¹⁰⁹ For detail, see: <http://www.tafco.jp/division/>

¹¹⁰ See: <http://www.direct.maruha-nichiro.co.jp/pickup/gift2017/gift03.htm>

Tohto Suisan Co., Ltd.

Tohto Suisan is a wholesale marine products, cold storage and distribution company (established in 1948 but with its origins in 1935 when Tsukiji Market first opened). It has several departments, including one dedicated to tuna, where it buys and sells Pacific bluefin, southern bluefin, bigeye and yellowfin.¹¹¹ One of its wholly-owned subsidiaries is Tohsui Foods Co., Ltd which specializes in procuring whole ULT tuna and processing it into a wide variety of product types and customer specifications.¹¹² As a whole, in financial year ending 31 March 2017 Tohto Suisan had sales of ¥119,232 million (around USD 1,077 million) and an operating profit of ¥1,345 million (USD 12 million)¹¹³

Toho Bussan Kaisha, Ltd.

Toho Bussan Kaisha is a trading company specializing in food (est. 1958). It is a 100% subsidiary of Mitsui, Japan's fourth largest *sogo shosa*. Toho Bussan Kaisha has a team dealing in tuna under its Second Marine Products Division. The team's stated procurement focus is the Mediterranean, both longline caught and farmed.¹¹⁴ It is not known how significant their role is in the sashimi tuna trade.



Mail order sashimi tuna in Japan. Photograph: Maruha Nichiro website

2.2.6 Recent Developments and Future Prospects

The increasing volume of frozen sashimi tuna traded through unofficial market channels is impacting some of the key players within the traditional wholesale auction system. The number of intermediate wholesalers is reducing annually due to a decrease in throughput of frozen fish through wholesale auction markets. This trend is likely to continue as intermediate wholesalers are suffering significantly from competition with large-scale buyers operating outside the traditional auction system. In conjunction with the decline in intermediate wholesalers, auction houses are being forced to adapt their business model to

¹¹¹ See: <http://www.tohsui.co.jp/products/>

¹¹² See: <http://www.tohsuifoods.com/product.html>

¹¹³ Available at: <http://www.tohsui.co.jp/en/wp-content/uploads/2016/12/6831500848508b4ef5d2c1c16e2077a9-1.pdf>

¹¹⁴ See: <https://www.tohob.co.jp/products/seisen2.php>

operate more like trading companies, in order to survive. A representative of one of Tsukiji's five auction houses handling sashimi tuna indicated that rather than focusing on supplying intermediate wholesalers, auction houses are also starting to 'join forces' with trading companies and sell to large retail chains.

In terms of market arrangements for high value fresh sashimi-grade tuna, Tsukiji Fish Market and other consumers' wholesale auction markets will continue to serve their purpose. However, the volume of fresh fish traded through wholesale markets is likely to continue to decline, due to strong consumer demand for lower-cost frozen sashimi (i.e. albacore and purse-seine special caught yellowfin). For frozen sashimi-grade tuna, the role of the traditional market channels will continue to decline, as the market becomes increasingly dominated by supermarkets. In this context, imported sashimi products (e.g. ULT loins) are expected to continue to grow in importance and China is expected to overtake Korea as the leading supplier.

The declining overall trend in sashimi consumption (both in restaurants and homes) is likely to continue given continued low population growth, declining household expenditure on food items generally, and changing consumer taste preferences of the younger generation away from seafood to non-seafood protein sources. Industry has made efforts to re-stimulate tuna consumption levels by promoting the health benefits of tuna compared with other non-tuna protein sources, but it is unclear if this had gained any traction.

Supplies of fresh tuna, both domestic and exports, are expected to continue to decline. On that basis, the dominant share of frozen tuna in the market is expected to increase further, with contribution of 'fatty white' albacore and purse seine special skipjack (and yellowfin) to lower end sashimi markets expected to continue.

At the high end of the market, there is optimism that overall bluefin supply will continue to increase, with some recovery of wild stocks on the Atlantic and Southern Oceans, resulting in increased quotas, and increased farm production. Pacific bluefin stocks remain heavily overfished and the impact on the supply of wild fish for ranching is not yet clear. With bigeye stocks subject to overfishing in 3 of the 4 ocean areas, supplies are unlikely to show any significant increase for some time

No major increases in sashimi tuna prices are anticipated in the near future, with traders continuing to maintain prices at around current levels in the face of consumer resistance to any price increases.

There is some interest in expanding markets to overseas destinations, notably the EU and the US, possibly involving purse seine special. But to capture Northern European markets, Japan's industry may require consideration of ecolabelling (especially MSC certification) which is currently not a priority issue in the domestic market.

The medium- to long-term impacts on Japan's sashimi market of the disastrous earthquake and tsunami (March 2011) have been limited, with recovery in most affected areas to a large extent. In the first few weeks following the disaster, fresh exports to the Japanese market declined significantly due to issues with Japan's cold storage capability stemming from electricity rationing. Due to concerns of radiation contamination of seafood caught in surrounding Japanese waters as a result of leakage from the Fukushima Daiichi nuclear plant, some overseas buyers opted to source tuna from alternative markets for the time being. Japanese consumption also shifted from fresh/frozen tuna (and other seafood products) to

shelf-stable products in the short-medium term due to radiation concerns,¹¹⁵ but these market reservations now seem to have been largely overcome and the situation has returned to normal, though probably at a lower level of domestic consumption.

Japan sashimi market: Key points

- sashimi tuna marketing is complex, and increasingly controlled by large trading companies.
- with bigeye stock now overfished in three of the four ocean areas, supplies are not expected to increase, and quotas imposed in the WCPO and EPO have not been limiting for the Japanese DW fleet
- domestic consumption of sashimi has levelled off in recent years after steady declines; prices have been stable in the face of consumer resistance to any increases.
- ULT albacore ('fatty white'), purse seine special skipjack and yellowfin (*negiri* sushi, *tataki*) have been making greater contributions to the overall sashimi market at the lower end.
- *katsuobushi* demand remains strong with increasing amounts of -35°C PS Special fish used; most traders handle this fish along with longline fish
- frozen fish (imports and domestic) comprise a greater share of the market, at 80% and this share can be expected to increase with the decline in fresh fish supply, both imports and domestic.
- supplies of bluefin are increasing from local and overseas farmed production, and hopes are held for increased hatchery-produced fish in Japan. Bluefin stocks in the Atlantic and the Southern Ocean are showing some recovery but Pacific bluefin stocks remain at very low levels.

2.3 Canning grade markets for longline tuna

2.3.1 Canning-grade albacore – an overview

Much is already known about North American markets for canned albacore – a product whose raw material is largely supplied by industrial longliners. The major market for albacore is the USA in canned or pouched form, so price and consumption there drives the market. (see below on the role of the Pacific Operating Committee in price negotiations.)

Total world albacore catch was about 260,000 mt in the mid-2000s and an estimated 50-60% of the catch is consumed on the US market.¹¹⁶ The estimated catch of albacore in the WCPO was 125,479 mt in 2009. Longline catches comprised close to 70% of this total (around 80,000 mt). Taiwan and Vanuatu (Taiwan owned) vessels accounted for the largest share of longline albacore catch, closely followed by China and Japan.¹¹⁷ In 2015, total global catch by *longline* was 143,874 mt, of which 86,857 mt was from the WCPO (see Table 1.3).

East Asian-owned longliners active in the WCPO that target albacore sell the bulk of their catch to trading companies or directly to loining plants/canneries. The finished product is then largely imported into the USA as finished product (i.e. canned or pouched form) or as for pre-cooked loins to be processed by Bumble Bee's cannery in Sante Fe Springs, California or Chicken of the Sea's in Lyons, Georgia.

¹¹⁵ Atuna 2011a; Atuna 2011b.

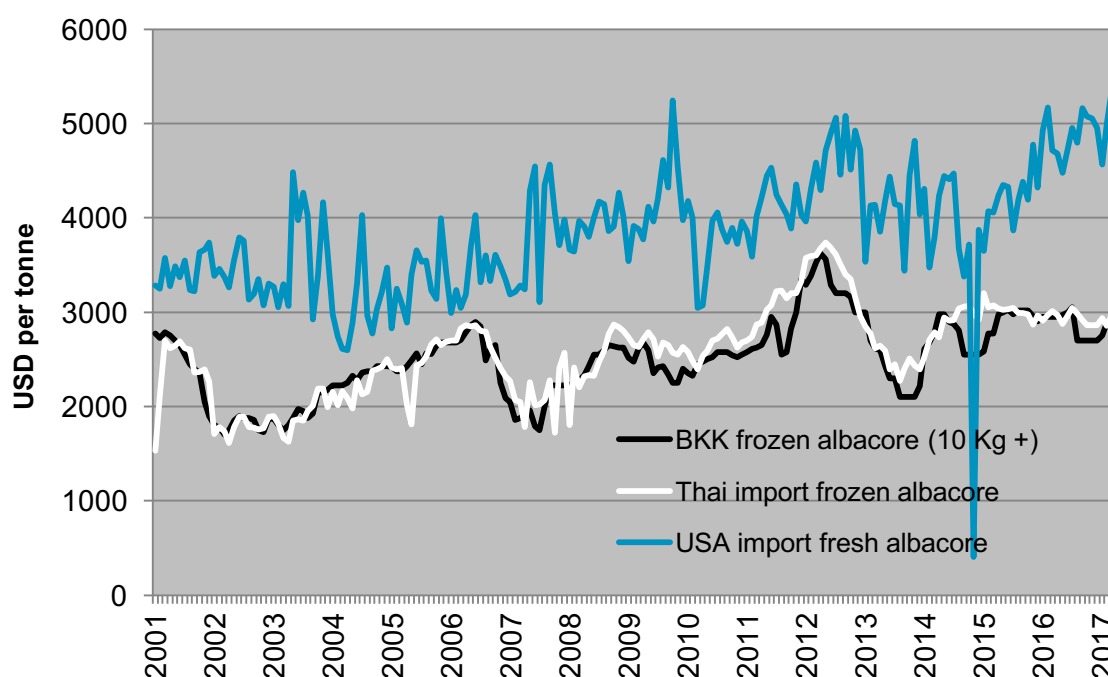
¹¹⁶ Campling et al. 2007

¹¹⁷ Hamilton et al. 2011

The Thai import price for canning grade frozen albacore was consistently higher than for frozen skipjack and yellowfin throughout the 60 months between 2012 and 2016; with an average monthly price of 2,970 per ton for albacore compared to 1,641mt for skipjack and 1,939 for yellowfin (Figure 2.13). Fresh chilled albacore fetches a further premium – the USA fresh albacore import price was an average 30% higher than the Thai frozen albacore import price in the period 2012-2016.

As well as a price premium on the US market, the higher price for canning-grade albacore is influenced by the size of the fish. As albacore tend to be two to three times bigger than light meat species (skipjack and small yellowfin), recovery rates are higher, which enhances labour productivity and in turn, profitability. In other words, it is more efficient to loin one large albacore than two to three small skipjack.¹¹⁸ Also, as a more expensive product, the US import tariff is more effective both in protecting domestic production (i.e. Bumble Bee and COSI's canneries) and making a trade preference more commercially viable where available (e.g. American Samoa). For example, in 2015 Starkist Samoa processed between 100,000-120,00 mt raw material; roughly 70% light meat and 30% albacore.¹¹⁹ The albacore is supplied almost entirely by the WCPO longline fleet and is the historical strength of this location of production.¹²⁰

Figure 2.13: Albacore prices – Thailand canning grade vs. USA fresh, 2001-2017



Note: USA import price from Oceania (excl. Australia and New Zealand)

Source: FFA Trade and Industry Advisor; Thai Customs; NMFS

The specific destination of albacore catch by longliners in the WCPO is mixed. Fish bought in Pago Pago, American Samoa is usually sold next door to StarKist Samoa, which is increasing its albacore throughput. Fish unloaded in Papeete, French Polynesia is containerized and sent to

¹¹⁸ Campling et al. 2007

¹¹⁹ Campling 2015

¹²⁰ Campling et. al. 2007; industry sources, pers. comm. 2015

Bangkok and Pago Pago. Bangkok is a major market, for example, taking approximately 50% of the albacore traded by Tri Marine, which also sells albacore to other canneries in Asia, the Indian Ocean and elsewhere, but it does not sell longline caught fish to Europe. In 2005, 95% of albacore imports into the EU went to Spain. In Spain it is sold as a premium product – Bonito del Norte or Atun Blanco.¹²¹

Canned albacore is sold in a variety of other secondary markets, such as Saudi Arabia, where canned albacore makes up 10% of the USD 247.3 million canned tuna market (in 2014) and United Arab Emirates where it is 30% of USD 40.3 million market. Both markets are dominated by supply from Thailand.¹²² Recent data are not available but in 2007 around 6% of Japan's canned tuna market used albacore.¹²³

2.3.2 USA market for shelf-stable albacore products

The USA 'shelf-stable' seafood market is dominated by canned and pouched tuna at 73% share of a USD 2.2 billion market, salmon follows at 10%.¹²⁴ The US shelf-stable tuna market is divided into light (typically, skipjack, some yellowfin), white meat (albacore), and value-added products.

Albacore is packed as pouch or cans, in oil or water, imported or produced at the canneries in American Samoa or in the mainland US. Water packs are by far the greatest share of the US market, both pouched and in cans. Table 2.13 below shows the quantities of the various products for the US market in 2014. The table breaks out American Samoa production from imports, even though the territory is outside the US Customs district and is also technically an import. According to the source for these figures,¹²⁵ the total market supply of albacore shown in the table represents 107,586 mt, whole round. The comparable whole round figure for light meat is 3.5 times larger at around 381,000 mt.

Table 2.13: US albacore market – products and main supplier locations in 2014

| Product | Source | Amount (mt) |
|-------------------|------------------------|---------------|
| Loins for canning | Fiji, Thailand, others | 26,001 |
| Pouch (water) | Imported | 4,239 |
| Pouch (water) | American Samoa | 2,415 |
| Canned (oil) | Imported | 748 |
| Canned (oil) | American Samoa | 956 |
| Canned (water) | Imported | 20,010 |
| Canned (water) | American Samoa | 19,816 |
| Total | | 74,185 |

Source: Trutanich 2015

¹²¹ Brus 2007

¹²² Sengupta 2014; Campling 2015

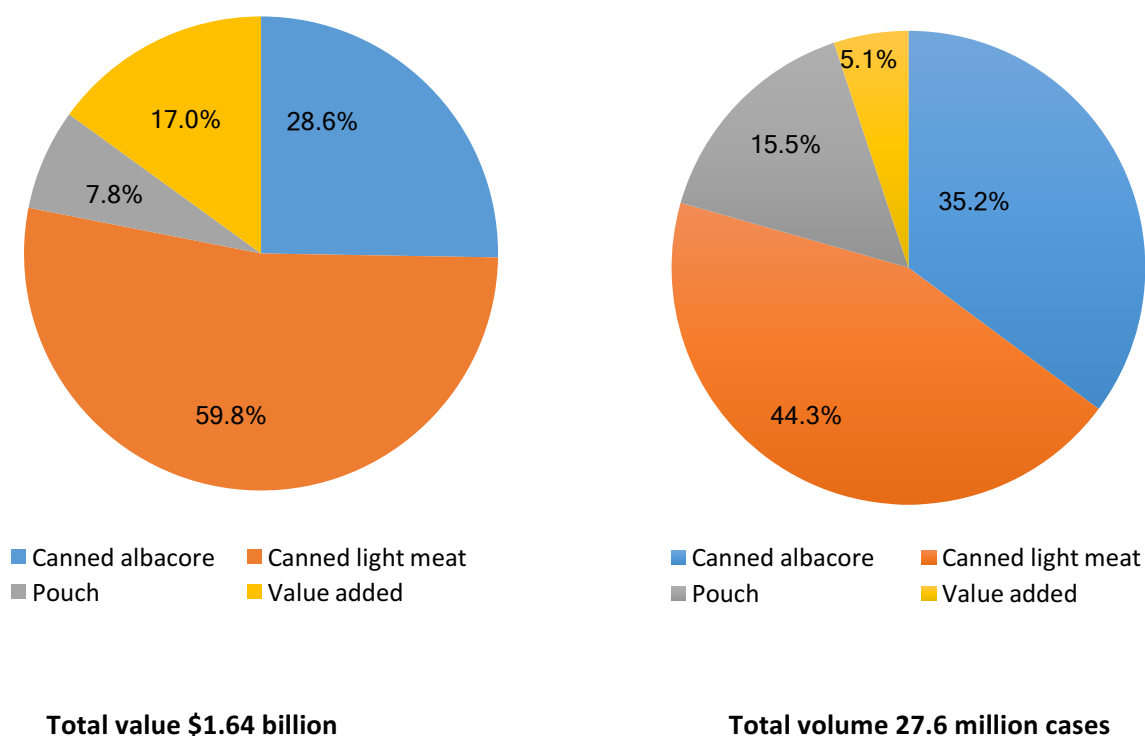
¹²³ Shima & Kawamoto 2010.

¹²⁴ Melbourne 2016

¹²⁵ P. Trutanich 2015, The tuna industry in the global market, VII World Tuna Conference, Vigo, Spain, 7-8 September.

Light tuna is the largest segment of the US shelf stable tuna market with almost 60% of the tonnage, but it has only 44% of value market share. For canned albacore (white meat), this reverses, with a higher value (35%) than volume (29%) share of the market. This reflects higher retail prices paid for canned albacore. This tendency also applies to the pouched segment, which is typically a more profitable item compared to canned product.¹²⁶ The species used in pouched tuna is not specified in Figure 2.14 (it can be either light or white meat), but more detail on this is provided below. It is worth noting that there is an increasing niche market presence of high-end albacore MSC-labeled products from the domestic North Pacific albacore pole & line and troll/jig fishery.

Figure 2.14: Share of US market by shelf stable tuna product in value and volume, 2015



Source: IRI cited by Melbourne 2016

To provide a finer grained understanding of the US import market for shelf-stable products using albacore tuna, a search of USITC trade data was done. The data extraction used all HS codes that specify albacore content (see Table 2.14), although data were not returned for all of these codes. All other product types that *may* contain albacore or other species are excluded as they are not directly relevant to the longline sector. Crucially, pre-cooked loins do not specify species and are not included here (for partial data see Table 2.14 above). This is important because it is known that Bumble Bee in particular packs large volumes of imported albacore loins in its Santa Fe Springs canning-only plant. As such, the data only provide a partial snapshot.

¹²⁶ Campling et al. 2007

Table 2.14: USA HS codes for shelf-stable albacore tuna products

| HS code/ Description | MFN |
|--|--------------------|
| 1604.14.10.91 Canned albacore tuna, in oil | 35% |
| 1604.14.22.51 Albacore, not in oil, in foil or other flexible airtight containers <6.8kg | 6% (within quota) |
| 1604.14.22.59 Canned albacore tuna, not in oil | 6% (within quota) |
| 1604.14.30.51 Albacore, not in oil, in foil or other flexible airtight containers <6.8kg | 12.5% (over quota) |
| 1604.14.30.59 Canned albacore, not in oil | 12.5% (over quota) |

Sources: USITC 2017a and 2017b; NMFS 2016

The USA *import* market for shelf-stable albacore products was worth USD 129.8 million in 2016. The main product type is canned albacore not in oil, with 85% share of the import market for these products in 2011, dropping to 77% in 2015 and 2016 (Table 2.15). Pouched tuna appears to have taken up this share but increasing its relative value position from 13% in 2012 to 19% in 2016. Canned albacore in oil has remained stable as a proportion of albacore product imports at 3-4% throughout the period. Interestingly, canned albacore in oil seems to not be prioritized in terms of pushing customs clearance to be within quota as only small volumes get into the market at 6%. It is assumed that because lower quality canned lightmeat is so price competitive, suppliers without a tariff preference (e.g. from Southeast Asia) put their energies in clearing this product within quota.

Table 2.15: USA value and volume import of albacore products under HS 1604, 2011-2016

| | | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|-----|-------------|-------------|-------------|-------------|-------------|
| Canned albacore tuna, in oil (1604.14.10.91) | USD | 3,957,000 | 3,290,000 | 5,203,000 | 3,753,000 | 4,567,000 |
| | Mt | 536 | 493 | 759 | 610 | 876 |
| <i>Canned albacore tuna, not in oil, within quota (1604.14.22.59)</i> | USD | 212,000 | 1,212,000 | 403,000 | 273,000 | 11,000 |
| | Mt | 40 | 228 | 112 | 32 | 10 |
| <i>Canned albacore, not in oil, over quota (1604.14.30.59)</i> | USD | 117,513,000 | 94,309,000 | 95,698,000 | 102,587,000 | 100,163,000 |
| | Mt | 19,428 | 17,321 | 18,265 | 19,565 | 22,947 |
| <i>Sub-total canned albacore, not in oil</i> | USD | 117,725,000 | 95,521,000 | 96,101,000 | 102,860,000 | 100,174,000 |
| | Mt | 19,468 | 17,549 | 18,377 | 19,597 | 22,957 |
| Pouched albacore, not in oil, over quota (1604.14.30.51)* | USD | 17,624,000 | 19,387,000 | 26,478,000 | 26,737,000 | 25,015,000 |
| | Mt | 2,496 | 2,886 | 4,345 | 4,373 | 4,246 |
| Total canned and pouched tuna imports | USD | 139,306,000 | 118,186,012 | 127,782,000 | 133,350,000 | 129,756,000 |
| | Mt | 22,500 | 20,928 | 23,481 | 24,580 | 28,079 |

*Pouched albacore, not in oil (1604.14.22.51) came in under quota only in 2013 at the tiny volume of 2 mt (USD 12,000) and is included in the 'over quota' pouched data. Source: USITC 2017b

Thailand is among the leading suppliers of canned albacore to the USA. As such, Thailand serves as an important market outlet for South Pacific albacore, particularly when raw material demand from the American Samoan and Fijian processing plants reduces or ceases (e.g. when cold storages are full or during; production shutdowns for routine maintenance/mechanical failures). As shown in Table 2.16, Fiji is a leading supplier to this market, following China and Indonesia.

Table 2.16: Total Thailand imports of canning-grade Albacore (whole round and frozen cooked loins, in whole round equivalent) (mt), 2011-2015

| COUNTRY | 2011 | 2012 | 2013 | 2014 | 2015 | Ave. 2011-2015 |
|--------------------------------|---------------|---------------|---------------|---------------|---------------|-------------------|
| American Samoa | 0 | 0 | 0 | 0 | 48 | 10 |
| Australia | 459 | 237 | 126 | 227 | 17 | 213 |
| Belize | 168 | 0 | 534 | 120 | 0 | 164 |
| Brazil | 0 | 403 | 0 | 0 | 0 | 81 |
| Canada | 2 | 0 | 0 | 0 | 0 | 0 |
| China* | 7,074 | 13,767 | 13,248 | 26,220 | 28,550 | 17,772 |
| Colombia | 0 | 15 | 0 | 0 | 0 | 3 |
| Fiji* | 5,109 | 2,545 | 14,201 | 2,642 | 1,433 | 5,186 |
| Federated States of Micronesia | 0 | 276 | 0 | 396 | 5 | 135 |
| France | 55 | 28 | 0 | 0 | 4 | 17 |
| Ghana | 197 | 0 | 130 | 0 | 0 | 65 |
| Guyana | 0 | 1,112 | 174 | 0 | 0 | 257 |
| Indonesia* | 5,468 | 6,281 | 5,046 | 13,529 | 10,240 | 8,113 |
| Japan | 0 | 0 | 0 | 12,944 | 0 | 2,589 |
| Spain | 0 | 0 | 491 | 0 | 746 | 247 |
| TOTAL | 18,533 | 24,664 | 33,951 | 56,079 | 41,042 | 34,854 |
| % WCPO^b | 68% | 68% | 81% | 76% | 73% | 73% |

Source: Thai Customs Database 2016

^a Based on 54% albacore loin recovery rate

^b Includes American Samoa, Australia, China, Fiji, FSM and Japan

* Exporter of both whole round fish and frozen cooked loins

Source: Havice and McCoy (2016)

2.3.3 Power dynamics in the US-centred canned albacore value chain

The 'supermarket revolution' of the 1980s shifted market power from branded-manufacturing firms to large retailers, initially in the UK and US and later in the 1990s to Western Europe and Japan, and increasingly in much of the developing world.¹²⁷ The top five supermarkets in the USA account for over 40% of sales, led by Wal Mart Stores, Inc, Kroger Co, Safeway Inc, Supervalu, and Publix Super Markets.

Supermarkets' increased market share and sales density generate enhanced economies of scale, buying power and reduced unit costs relative to competitors, resulting in an oligopolistic structure.¹²⁸ As a result, retailers' power over suppliers of primary commodities and basic manufactures has increased, allowing them to capture value and pass costs down

¹²⁷ Durand and Wrigley 2009; Reardon et al. 2012

¹²⁸ Burt and Sparks 2003

the chain. Growing market power enables supermarkets to sharpen competition among suppliers. In canned tuna chains, supermarkets play branded firms off of each other through the practice of 'slotting': a branded-firm rents premium shelf space for a period, and even then may be squeezed for additional revenue within that period so as to not lose their retail 'real estate'.¹²⁹

The canned albacore sector is a buyer-driven global value chain, in which retailers are lead firms that put downward price pressure on suppliers and contribute to generating a price sensitive market. Canned tuna is a 'core category' – a product with high turnover and customers that know and compare prices – for retailers in the US. Studies on the frequency and value of tuna sales in the US have shown that supermarket customers with tuna in their 'basket' spend 65 percent more on a shopping trip than customers without it.¹³⁰ Consequently, retailers often sell canned tuna on promotion in the US, competing to attract high-volume consumers. Big retail firms pass the cost of such promotions on to suppliers. To an extent, the albacore segment of the chain is buoyed from this overall canned tuna dynamic by the higher price point relative to the light meat segment of the market, though this gain is partly checked by the higher raw material price of albacore relative to lightmeat products.

Supermarkets also express market power over major brands through their own-brands or 'private label'. Private label canned tuna is taking an increasing percentage of market share in major EU markets such as France and the UK. Supermarkets' lower marketing and/or supply chain management costs enable them to sell private label more cheaply than the branded equivalent, exacerbating price pressures on branded-manufactures.¹³¹ In addition, they can switch shelf space to their private label canned tuna. However, the US canned tuna retail market remains dominated by big brands and private label has not eaten much into branded-value share over time.

Three brands dominate the US canned tuna market in volume and value, as shown in Figure 2.15 below. To an extent, the buyer driven model described above extends to the highly-concentrated branded section of the value chain in which three firms controlled 84% of the value market share in 2015. There is little movement in the concentration of their combined share over time: the 'big three' brands' value share was 86% in 2001 of a USD 1.11 billion market and 84% in 2005 of USD 1.04 billion.¹³² However, the value market has flattened (peaking in 2013 at USD 1.71 billion) and the volume market has declined by 10% between 2011 and 2015.¹³³

StarKist is owned by the South Korean giant Dongwon Industries – a chaebol with investments in many areas and which owns purse seiners and a small number of longliners (see Section 5.6). Bumble Bee is owned by private equity firm Lion Capital, which, owns several other self-stable seafood brands, including the number one in Canada (see below). It does not own boats but it does control supplies to and guarantees purchase of finished product from the PAFCO loining plant in Fiji, but is not the majority shareholder. Thai Union owns Chicken of the Sea, as well as many EU seafood brands and a growing number of other seafood businesses. Thai Union procures albacore globally.

Albacore plays a major part in the competitive positioning of the big three branded-firms. The lower dollar share of Chicken of the Sea in Figure 2.15 compared to its volume share reflects

¹²⁹ This analysis draws heavily on Havice and Campling 2017

¹³⁰ Lischewski 2006

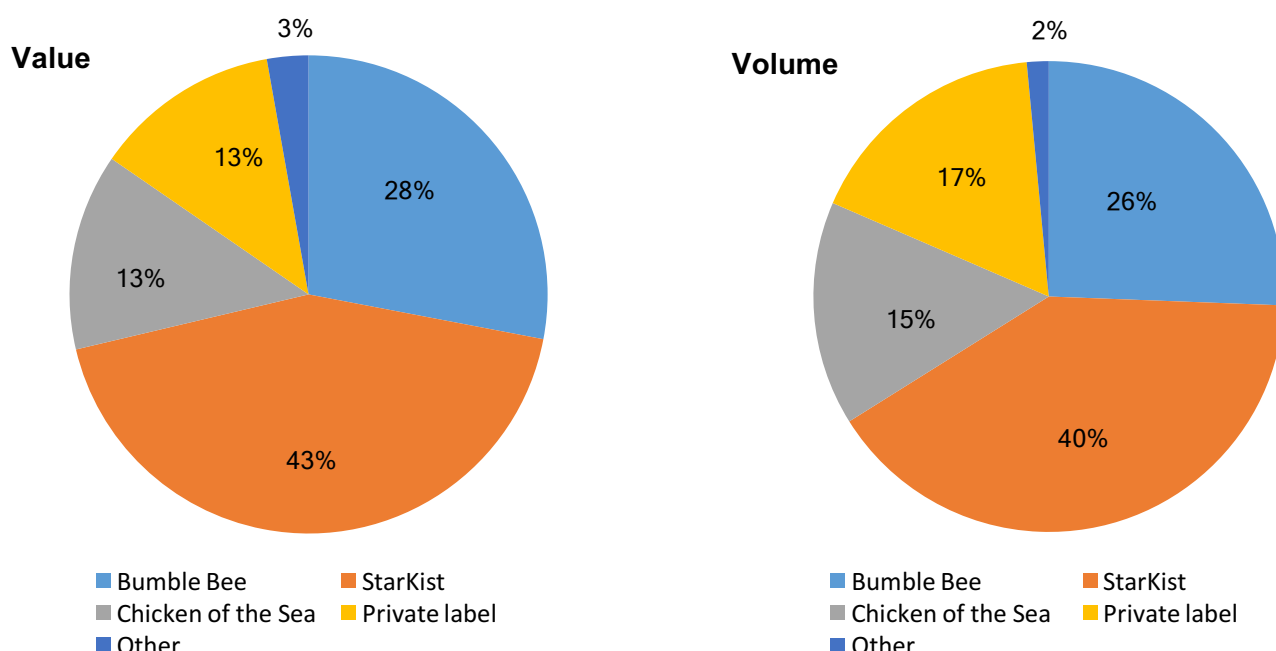
¹³¹ Interviews, EU and US industry representatives, March 2009 and February 2006.

¹³² Campling et al. 2007

¹³³ Melbourne 2016

its relatively weak presence in the canned albacore market, whereas the other two brands, Bumble Bee, followed by StarKist have traditionally been stronger in that segment. (StarKist is the leading brand of Light tuna.)

Figure 2.15: Share of US market by brand in value and volume in 2015



Source: Melbourne 2016

Source: IRI cited by Melbourne 2016

It is also worth noting that, in Canada the canned tuna market was worth \$178.5 million in 2015. Canned skipjack around two-thirds (65.7%) of 2015 volume sales of shelf-stable tuna, followed by albacore at 18.8%, and value added tuna at 13%; the latter market was worth \$50.9 million and may contain albacore.¹³⁴ The dominant brand is Clover Leaf which had a value share of 47.6% of Canada's shelf stable seafood market; and is owned by Bumble Bee/Lion Capital.

Each of the big three US branded firms has developed its own sourcing strategy, which intimately links branding and processing firms to the oceans supplying their raw material, and in some cases, to the other branded manufacturers. Global canned tuna processing capacity far outstrips the raw material supply that the oceans can deliver.¹³⁵ Throughout the 1990s there was a 30 percent gap between potential production and actual consumption.¹³⁶ This gap worsened in the 2000s with USD 500 million invested in new processing facilities between 2006 and 2008.¹³⁷ Meanwhile, consumption declined in the US and levelled off in the EU – the two most important markets for canned tuna.¹³⁸ This is a particular problem for processing firms which rely on high volumes to generate profit in a low-margin industry. In short, processors compete for the tuna raw material, which puts pressure on the extent and intensity of tuna extraction.

¹³⁴ Melbourne 2016

¹³⁵ McGowan and McClain 2010

¹³⁶ StarKist 2001

¹³⁷ Hamby 2009

¹³⁸ Hamilton et al. 2011

Supermarkets and branded firms rely on, and benefit from, geographically dispersed, export-oriented non-branded firms that ensure regular, diversified supply. The extent of supermarket and branded-firm power over non-branded manufacturers is reflected in their application of a 'cost plus' formula in supply arrangements: buyers pay costs along with a pre-determined profit margin.¹³⁹ This protects brands and supermarkets from regional fluctuations in raw material supply and price (e.g. declining catch rates, El Niño events, piracy in the Indian Ocean) and wider local political-economic dynamics (e.g. labour struggles, political crises, violent conflict). In short, branded-firms and supermarket buyers 'global ocean strategy' not only reduces risk it enables buyers to play non-branded manufacturers against each other in price negotiations. These conditions help explain why the price of lightmeat canned tuna in the US declined by 68 percent in real terms between 1980 and 2004.¹⁴⁰

Historically, a way in which the albacore longline fleet has tried to cope with this price squeeze is through a degree of cooperation in the form of the Pacific Operating Committee.¹⁴¹ Since the mid-1980s, the POC has grouped Taiwanese-owned longliners that fish in the Pacific Ocean. The POC would establish a (roughly) quarterly WCPO base price for albacore and 'the world price goes off on that; although monthly re-negotiations did also occur'.¹⁴² In practical terms, the POC and the Pago Pago canneries were able to stabilise the WCPO price for albacore because an estimated 50-60% of the catch is consumed on one market (the USA); whereas the sheer volume and diversity of sources of supply and of buyers of skipjack excludes price control. The logic behind POC was to established a degree of short-term albacore price stabilisation to smooth out the market. It is not suggested that the POC price did not necessarily follow market conditions, but more simply that it created a stable base for a given period, and that the price will change when renegotiated after a given period.

In 2017, StarKist reportedly remains the price-setting leader for albacore.¹⁴³ Certainly in the past, StarKist, as the larger of the US canneries in Pago Pago, generally (but not exclusively) led negotiations with the POC to establish a short-term stable price. However, because the POC is a disparate group it used FCF to coordinate and lead their negotiations.

The POC was reported to have ceased its activities in collective price negotiation by 2010, primarily because of the closure of the Chicken of the Sea plant in the Pago Pago and the downsizing of StarKist's plant.¹⁴⁴ The POC does still exist though, with the principal stated purpose of acting as a channel of communication with the Taiwan Fisheries Agency for the 'about 50 owners in the Pacific group' who 'may have a different focus on some subjects than other owners in the Taiwan Tuna Association'.¹⁴⁵ It was stated in one interview that albacore prices are set for one month periods.¹⁴⁶ Although sometimes the notification of a price change is only given one week in advance, the price has not fluctuated much on an annual basis. This is reflected in the relative stability of canning grade albacore prices since mid-2014, as detailed in Figure 2.13. At the same time, it was reported that the Suva price is effected by competition from American Samoa and that the PAFCO/Bumble Bee price is also dependent on Bumble Bee's supply from Mauritius.

¹³⁹ Multiple interviews, Thai industry representatives, April 2015.

¹⁴⁰ Lischewski 2006

¹⁴¹ The following draws partly from Campling et al. 2007

¹⁴² Interview, US industry representative 2006.

¹⁴³ Interview, Taiwan industry representative, 2017

¹⁴⁴ Hamilton et al. 2011

¹⁴⁵ Interview, Taiwan industry representative, 2017

¹⁴⁶ Interview, Taiwan industry representative, 2017

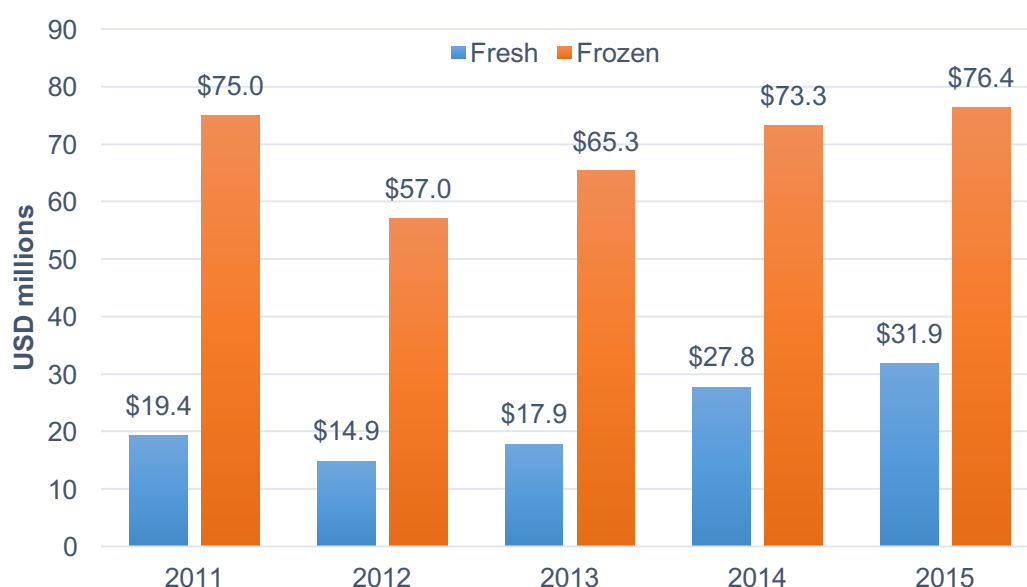
2.4 US Market for High-value Tuna

In contrast to the USA market for canned albacore, the various fresh/frozen value chains for longline product feeding the US market are characterized by having both many suppliers and many buyers. These relations are moderated by the geographies of offloading and transshipment, the reliability of cold chains, historical business and marketing relationships, and linkages (or lack thereof) to market outlets.

The USA **fresh** retail market for all fish species was valued at USD 4.6 billion market in 2015. Fresh tuna sales represent just 1.7% of this, with fresh salmon leading at 30.3% and shrimp following 18.1%.¹⁴⁷ Nonetheless, according to IRI data, the value of the fresh tuna market grew by 40% between 2011 and 2015, reaching USD 76 million in 2015 (Figure 2.16). These data contrast with USITC statistics which indicate USD 191.9 million of fresh yellowfin and bigeye tuna was imported in 2015 (see Table 2.18 below), which presumably incorporates supply for all other points of consumption (e.g. restaurants, sushi chains, institutional food service).

Tuna treated with tasteless smoke and carbon monoxide (CO) is a high volume non-canned product sold in US supermarkets and, in recent years, is increasingly being used in food service.¹⁴⁸ This is a relatively low value segment and generally of less of a commercial focus of East Asian longline fleets, but there can be a significant amount of frozen yellowfin tuna (-35°C) sent to Vietnam from Taiwanese and Chinese owned longliners for CO processing for US market. It is assumed that much of the Vietnam exports to the US is CO tuna and Philippine factories remain major supplier as well.¹⁴⁹ Poke (fresh fish salad) has grown in popularity in 2016 and 2017 in the USA and often uses thawed CO tuna (most commonly yellowfin).

Figure 2.16: USA market for fresh and frozen tuna, 2011-2015 (in US dollars)



Source: IRI data cited by Melbourne, 2016

¹⁴⁷ Melbourne 2016

¹⁴⁸ Kowalski 2007; personal communication, industry analyst, August 2017.

¹⁴⁹ Further analysis of these countries' trade is beyond the scope of this study.

Higher value fresh tuna is mainly sold in specialty seafood retailers and higher-end mass retail (e.g. Whole Earth). Supermarkets tend to procure non-canned tuna products from specialist distributors. Fresh tuna loins are packed in 'splint' boxes, which contribute to keeping colour and perceived freshness while reducing airfreight costs.

End-use of fresh tuna can be for home cooking, as sashimi, or as a sushi topping, and in a variety of other food service preparations. If intended for raw consumption, the FDA does not require prior freezing of species of large tuna. This is not the case for other fish species intended for raw consumption, which must be first frozen to kill potentially harmful parasites.¹⁵⁰ Nevertheless, quantities of 'fresh' tuna are imported frozen, then thawed and sold, particularly those treated with carbon monoxide and its various proprietary forms such as 'clear smoke' or 'tasteless smoke'.

Total frozen seafood retail sales in the US were about USD 4.5 billion in 2015, with shrimp representing nearly half (49%), followed by tilapia (13%). IRI data on retail of frozen tuna in the US market were USD 31.9 million; less than 1% of the total (see Figure 2.16). USITC data show that USA import of frozen albacore, bigeye and yellowfin tuna *combined* in 2015 was USD 21.7 million. Frozen tuna is seen as having potential to growth given that only 1.5% of US households are currently buying the product.¹⁵¹

There is, however, a major market for frozen tuna products (e.g. steaks), worth around USD 323 million in 2016 (see Table 2.23 and associated discussion below). Frozen loins are imported and processed in the US for retail or food service. The main species used here is yellowfin. The loin can be cut into steaks (normally in between 280gm and 110gm portions), medallion and kebab cuts, and half-size 'sandwich' steaks. Ground meat is used in sushi rolls.¹⁵²

Market channels for consumer purchase of frozen tuna are primarily supermarkets (e.g. in 10oz bags), warehouse club stores (e.g. in 2lb boxes of steaks in resealable bags) and foodservice sectors (e.g. individually wrapped steaks in 10lb boxes). A variety of products are offered, including individually frozen and wrapped single-servings in bulk packaging, both cooked and uncooked, with some of the latter cooked with faux grilling marks applied, and 'value added' items in sauce. The most commonly used raw material is yellowfin.

Some firms, such as Orca Bay of Seattle and Bumble Bee label products as 'ahi', trading on the recognized Hawaiian name for yellowfin. Bumble Bee has been aggressive in marketing a variety of different product forms in a new 'Ultra Fresh' line, including individual portions of cooked seared tuna. In spite of its relatively small share of the market, frozen tuna is identified as a growth opportunity, since only a very small percentage of US households currently purchase such products.¹⁵³ The fresh/frozen segment of the industry has lagged behind shelf-stable forms, with one reason perhaps being that products are not branded and thus consumer comparison shopping is difficult.

The sale of frozen tuna products is believed to have been fuelled by the extensive use of carbon monoxide (CO) treated tuna in the US market, though no data are available on trends. CO treatment, which is prohibited in Europe, enhances the red colour of the tuna flesh, which consumers associate with tuna quality. CO treatment has benefited firms dealing in frozen tuna by stabilising price and supply and offering consumers a lower-priced option in

¹⁵⁰ <http://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/ucm189211.htm>

¹⁵¹ Melbourne 2016

¹⁵² Walsh 2010 and 2012

¹⁵³ Melbourne 2016

comparison with fresh tuna; product is primarily used for 'supermarket sushi', steaks for restaurants and the catering sector, saku blocks and ground meat for use in sushi rolls.¹⁵⁴

CO-treated tuna is controversial because it misleads consumers on the quality and freshness of the product, although it is a legal requirement for products to specify if they have been CO-treated. Some wholesalers and distributors and some retailers that deal in fresh and frozen tuna have refused to carry CO treated fish over food safety and freshness concerns. Nevertheless, consumers often are unaware when they are purchasing treated tunas. When marketed as 'seared ahi', treated tuna has high consumer acceptance, arguably because consumers assume they're being served fresh fish.¹⁵⁵

To build upon the above data a detailed search was done of US import data in an attempt to explore market foci of the four longline fleets (or segments therein, i.e. fresh-chilled vs. frozen LL). As with the EU, the HS codes for some of these products are not uniform across the US Harmonized Tariff Schedule¹⁵⁶ and official USITC online search platform.¹⁵⁷ The full range of HS codes is featured in Table 2.17. Searches were undertaken for all of these codes.

¹⁵⁴ Walsh 2010 and 2012

¹⁵⁵ Hamilton et al. 2011

¹⁵⁶ HS codes were found in a line-by-line search of USITC (2017a), *Harmonized Tariff Schedule of the United States 2017*.

¹⁵⁷ USITC (2017a) HS codes were checked (and expanded) against the USITC (2017b) Interactive Tariff and Trade DataWeb https://dataweb.usitc.gov/scripts/user_set.asp

Table 2.17: USA HS codes for tuna and tuna products

| HS code/ Description | MFN |
|---|-----|
| <i>Fresh fish</i> | |
| 0302.31.00 00 Albacore or longfinned tunas (<i>Thunnus alalunga</i>) | 0 |
| 0302.32.00 00 Yellowfin tunas (<i>Thunnus albacares</i>) | 0 |
| 0302.33.00 00 Skipjack or stripe-bellied bonito | 0 |
| 0302.34.00 00 Bigeye tunas (<i>Thunnus obesus</i>) | 0 |
| 0302.39.00 30 Tunas, Bigeye (<i>Thunnus obesus</i>)* | |
| <i>Frozen fish</i> | |
| 0303.41.00 00 Albacore or longfinned tunas (<i>Thunnus alalunga</i>) | 0 |
| 0303.42.00 20 Yellowfin tunas (<i>Thunnus albacares</i>) – Whole fish | 0 |
| 0303.42.00 40 Yellowfin tunas (<i>Thunnus albacares</i>) – ‘Other’ – Head-on | 0 |
| 0303.42.00 60 Yellowfin tunas (<i>Thunnus albacares</i>) – ‘Other’ – ‘Other’ | 0 |
| 0303.43.00 00 Skipjack or stripe-bellied bonito | 0 |
| 0303.44.00 00 Bigeye tunas (<i>Thunnus obesus</i>) | 0 |
| 0303.49.00 30 Tunas, Bigeye (<i>Thunnus obesus</i>)* | |
| <i>Fresh, Chilled or Frozen Products</i> | |
| 0304.99.11.91 Tuna fillets and other meat (whether or not minced), fresh, chilled or frozen in bulk or in immediate containers weighing with their contents over 6.8 kg each (of genus <i>Thunnus</i> and of fish of the genus <i>Euthynnus</i> (<i>Katsuwonus</i>) <i>pelamis</i>) The code for this product was featured as 0304.99.1190 in USITC (2017b) and NMFS (2016) | 0 |
| 0304.99.1090 Tuna, in bulk on in immediate containers weighing ...* | |
| <i>Frozen Products</i> | |
| 0304.87.00.00 Frozen fillets of Tunas (of the genus <i>Thunnus</i>), skipjack or stripe-bellied bonito (<i>Euthynnus</i> (<i>Katsuwonus</i>) <i>pelamis</i>). However, other sources record this as ‘Tuna, non-specific, fillet, frozen’, and thus does not specify species± | 0 |

*This code was not included in the official *Harmonized Tariff Schedule* but it was featured in the Tariff and Trade DataWeb

± Additional information sourced from NMFS (2016)

Sources: USITC 2017a and 2017b

The main species of fresh tuna consumed in the US is yellowfin.¹⁵⁸ Table 2.18 shows the value and volume of this import market for fresh bigeye and yellowfin tuna. Suppliers include several countries in Latin America, Indonesia, Vietnam and even Senegal. US trade data show very low values of fresh chilled tuna being imported from the four case study countries. The combined market is worth around USD 190 million per year (averaged over 2012-16) and the four East Asian countries did not have more than 0.5% market share for either species in any year during the period.

Table 2.18: USA total import value and volume of fresh bigeye and yellowfin tuna, 2012-16

| | | 2012 | 2013 | 2014 | 2015 | 2016 |
|-----------------------------------|------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Fresh bigeye | US dollars | 33,433,000 | 35,508,000 | 35,615,000 | 45,174,000 | 36,915,000 |
| | Tonnes | 3,724 | 4,023 | 4,127 | 5,024 | 4,217 |
| Fresh yellowfin | US dollars | 152,664,000 | 156,585,000 | 155,736,000 | 146,756,000 | 150,957,000 |
| | Tonnes | 15,829 | 16,031 | 16,161 | 15,532 | 16,549 |
| Total bigeye and yellowfin | US dollars | 186,097,000 | 192,093,000 | 191,351,000 | 191,930,000 | 187,872,000 |
| | Tonnes | 19,553 | 20,054 | 20,288 | 20,556 | 20,766 |

Source: USITC 2017b using HS codes: 0302.32.00 and 0302.34.00

According to the USITC data (cited in Table 2.18 immediately above), the average import price per tonne is a lot higher than that reported as the average US import prices from Oceania (excluding Australia and New Zealand). Table 2.19 compares these two sets of prices. It suggests that there may be a problem with the recording of value in US customs data (all US imports of these products are duty free).

Table 2.19: Comparing NMFS price data with inferred price from USITC trade data, 2011-2016 (USD per tonne)

| | | 2012 | 2013 | 2014 | 2015 | 2016 |
|------------------------|---------------------|-------|-------|-------|-------|-------|
| Fresh bigeye | USITC volume/ value | 8,978 | 8,826 | 8,630 | 8,992 | 8,754 |
| | FFA price data | 3,957 | 3,957 | 3,957 | 3,957 | 3,957 |
| Fresh yellowfin | USITC volume/ value | 9,645 | 9,768 | 9,637 | 9,449 | 9,122 |
| | FFA price data | 5,261 | 5,261 | 5,261 | 5,261 | 5,261 |

Sources: USITC (2017b) Table 2.19, volume divided by value; FFA Fisheries Development Division using NMFS database

¹⁵⁸ Seafish 2009

In regard to the US import market for frozen albacore, the case study countries have a more significant position. The combined market share of China, Japan, South Korea and Taiwan was 37.5% in 2012, 14.1% in 2013, 18.9% in 2014, 13.4% in 2015 and 15.7% in 2016. The peak in share in 2012 is likely because the total market contracted in that year (see Table 2.20).

Table 2.20: USA import of frozen albacore tuna by selected partners, 2012-16 (in US dollars)

| Partner country | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|------------------|------------------|------------------|------------------|------------------|
| China | - | 64,000 | 133,000 | 120,000 | 161,000 |
| Japan | 3,000 | 176,000 | 360,000 | 198,000 | 73,000 |
| Korea | 856,000 | 360,000 | 102,000 | 88,000 | 435,000 |
| Taiwan | 119,000 | - | - | - | - |
| Total US imports (World) in USD | 2,609,000 | 4,270,000 | 3,141,000 | 3,036,000 | 4,256,000 |
| Total US imports (World) in tonnes | 1,178 | 2,199 | 1,362 | 1,373 | 2,240 |

Source: USITC 2017b using HS code: 0303.41.00

The US import market for frozen yellowfin tuna was worth an annual average USD 21.6 million during the period 2012-16.¹⁵⁹ But the four case study fleets had a marginal share at almost zero in 2013-15, and 1.4% in 2016. Their combined share peaked in 2012 at 3.8% when Korea exported USD 0.6 million and Taiwan USD 0.4 million.

The picture for frozen bigeye tuna is entirely different, although the total market is a lot smaller than for frozen yellowfin. Crucially, according to USITC data the market seems to have collapsed in 2015 and 2016 – it is not known why.¹⁶⁰ As shown in Table 2.21, only South Korea and, to a far lesser extent, Japan emerge as suppliers of this product. Korea's market share is at times dominant at 60% in 2012 and 55% in 2015, and at times almost complete at 92% and 81% in 2013 and 2014, but it fell off to 14% in 2016.

Table 2.21: USA import of frozen bigeye tuna by selected partners, 2012-16 (in US dollars)

| Partner country | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|------------------|------------------|----------------|---------------|---------------|
| Japan | - | - | 58,000 | 10,000 | - |
| Korea | 728,000 | 938,000 | 552,000 | 12,000 | 13,000 |
| Total US imports (World) in USD | 1,218,000 | 1,017,000 | 685,000 | 22,000 | 91,000 |
| Total US imports (World) in tonnes | 580 | 498 | 338 | 6 | 36 |

Source: USITC 2017b using HS code: 0303.44.00

¹⁵⁹ USITC 2017b combining data from HS codes: 303420020, 303420040 and 303420060

¹⁶⁰ These USITC data were cross-checked with NMFS (2017) records of US import statistics and the downward tendency is the same; albeit with some differences in numbers (e.g. NMFS data does not combine the three HS codes for frozen yellowfin tuna and appears to only detail one of these).

As in Japan, the HS code category of 'fillets' may include several product types. This is not helped by the ambiguity of the HS code 0304991190, which includes fresh, chilled or frozen tuna 'fillets', packed in volumes greater than 6.8kg. It is *assumed* that this product is chilled vacuum packed, skinless and boneless tuna loins, which are then processed and pre-packed in the USA according to specification.¹⁶¹ These are likely to be sold either to retailers as chilled pre-pack and fresh loins for their fish counters and cut in front of customers or to wholesalers aimed primarily at the restaurant sector. Fresh loins have an advantage over pre-cut fresh tuna steaks because of the loss of flesh colour (e.g. 'browning') and perceived freshness of the latter.

Table 2.22: USA import of fresh, chilled or frozen tuna 'fillets' in bulk (>6.8kg) by selected partners, 2012-16 (in US dollars)

| Partner | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| China | - | - | 20,000 | 74,000 | 1,760,000 |
| Japan | 428,000 | 359,000 | 735,000 | 82,000 | 422,000 |
| Korea | - | 56,000 | 1,343,000 | 389,000 | 550,000 |
| Taiwan | 485,000 | 3,000 | 67,000 | 139,000 | - |
| Total US imports (World) | 31,739,000 | 14,480,000 | 16,812,000 | 14,147,000 | 19,575,000 |

Source: USITC 2017b using HS code: 0304991190

USA frozen tuna 'fillet' imports is a major market; worth USD 323 million in 2016. All of the four case study countries are suppliers to this market, as shown in Table 2.23. The HS code here is unclear as USITC (2017a) specifies the species as skipjack, while NMFS (2016) notes only 'tuna'. If the species used is skipjack, the product is highly likely to have been caught by purse seine and thus beyond the direct scope of this study. However, two factors suggest that this is not the case: (1) as noted earlier, it is known that the US is a major importer of frozen *yellowfin* loins for cutting into steaks;¹⁶² and (2) the relatively very high labour costs in supplier countries (especially Japan, South Korea and Taiwan), indicates that this is a profitable segment, which is less likely for pre-formed skipjack steaks, and more likely for high quality yellowfin and bigeye loins (e.g. used in top-end foodservice).

¹⁶¹ However, NMFS (2016) lists this as '0304.99.1190 Tuna, *frozen* in bulk or in immediate containers weighing with their contents over 6.8 kgs each'.

¹⁶² Walsh 2012 and 2012

Table 2.23: USA import of frozen ‘fillets’ by selected partners, 2012-16 (in US dollars)

| Partner | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|
| China | 3,361,000 | 1,633,000 | 2,524,000 | 6,439,000 | 14,075,000 |
| Japan | 8,343,000 | 3,436,000 | 3,681,000 | 5,932,000 | 8,824,000 |
| Korea | 6,259,000 | 4,817,000 | 4,648,000 | 4,969,000 | 5,826,000 |
| Taiwan | 2,420,000 | 956,000 | 1,295,000 | 8,002,000 | 11,167,000 |
| Total US imports (World) | 286,391,000 | 212,560,000 | 224,925,000 | 294,506,000 | 323,805,000 |

Source: USITC 2017b using HS code: 0304.87.00

Finally, it is worth noting growing, albeit niche, interest in the US market for fair trade product. While Fair Trade’s efforts have largely centred on agricultural products, in 2014, Fair Trade USA launched its first standard for capture fisheries after four years of development. The standard was developed to provide access to Fair Trade markets for small-scale fishers and communities through the establishment of fishers’ cooperatives or partnerships with ‘Market Access Partners’ (e.g. an exporter, processor or supporting organisation). The standard is centred on four principles – empowerment, economic development, social responsibility and environmental stewardship;¹⁶³ it was the first wild capture fisheries certification programme to include both social and environmental benchmarks.

In February 2015, US supermarket chain, Safeway and Fair Trade USA announced a new partnership to launch Fair Trade-certified tuna into the North American market. Anova Food, a recently acquired subsidiary of Bumble Bee, has imported Fair Trade-certified yellowfin tuna from four associations representing 120 small-scale fishermen in Indonesia’s Moluccan (Maluku) Islands who fish with single handlines, including sometimes attached to handmade kites. Anova Food specialises in high-quality frozen tuna and launched Fair Trade yellowfin products under their Natural Blue range through Safeway stores in Northern California, Portland and Seattle in 2015. As additional supply becomes available, Anova Food has indicated plans to expand supply to other areas. For every Fair Trade-certified tuna sold, the fishermen receive a 10% premium on the dockside (ex-vessel) price that they can invest into community development programmes.¹⁶⁴

¹⁶³ Fair Trade 2014

¹⁶⁴ Undercurrent News 2015

2.5 EU Market for High-value Tuna

Spain, Italy and France are the principal markets for fresh and frozen tuna for direct consumption in the EU, especially in these countries' urban centres. The main product type is steaks of yellowfin and albacore, believed to total around 40,000 mt. The main source of supply is the Western Indian Ocean, which is supplemented by some volume from the Atlantic and Pacific.¹⁶⁵ There is a growing demand for ULT tuna products in some EU markets but the trade is limited by a lack of supporting infrastructure. However, where infrastructure it is available, such as in Belgium, the Netherlands, Spain and the UK, it is legally permitted to sell defrosted ULT fish as 'fresh'; although packaging must make clear that it was originally frozen. CO treated tuna is illegal in the EU.

Yellowfin tuna is the most important fresh-chilled species for all European countries, although there is demand for albacore in Spain, Italy and France. Steaks and sushi are the main product forms, and differences in prices with frozen tuna are considerable. Fresh tuna products are chilled at 0°C. The form of presentation and packaging varies but largely consists of whole (headed and gutted) and fresh vacuum-packed 2-5 kg skinless and boneless loins sold to wholesalers, which are processed into steaks and pre-packed in the EU according to retailer specifications.¹⁶⁶ Retail packaging is mostly in trays in portions of between 100 and 500 grams.¹⁶⁷ Table 2.24 provides some examples of fresh tuna retail products and prices.

Table 2.24: Examples of European retail prices for fresh tuna products in 2016

| Product | Price (€/kg) | Country |
|---|--|-------------------------|
| Tuna steak | 10.90 - 28.60 | Spain, Italy |
| Tuna steak | 15 (non-MSD certified) 30 (MSD certified) | Netherlands |
| Tuna steak in plastic container | 29.43 - 29.99 | Belgium, United Kingdom |
| Tuna steak in vacuumed packaging | 18.00 | Spain |
| Defrosted tuna steak in plastic container | 26.98 | United Kingdom |
| Tuna belly | 7.99 | Spain |
| Tuna tartare | 32.90 | Spain |
| 2 pieces of tuna medallions on plastic tray | 8.53 | Spain |

Source: CBI 2017a

EU import statistics are only available for a very limited number of fish products falling under HS codes 0304/5. Fresh or chilled tuna 'fillets' do *not* have a unique HS code and it is assumed that they are imported under 0304.49.90 and/or 0304.59.90 (see Table 2.25). However, the number of species included under this code is unknown and may contain several non-tuna species. This data gap is supplemented by two recent guides to exporting fresh and frozen tuna products to the EU produced by the Netherlands Enterprise Agency.¹⁶⁸ Frozen tuna 'fillets' do have a unique HS code and are discussed below.

¹⁶⁵ Garrett and Brown 2009; Orsini 2010.

¹⁶⁶ In trade statistics, this product type is classified as 'fillets' rather than chilled loins (see below).

¹⁶⁷ CBI 2017a

¹⁶⁸ CBI 2017a and 2017b

Imports into the EU of fresh and frozen ‘fillets’ and ‘meat’ of all tuna species are hit by an MFN tariff of between 15 and 18 percent (Table 2.25), which makes trade preferences potentially commercially valuable. It is assumed that these tariffs act as a form of effective protection to EU industry, especially at the higher end because the proportion of the tariff will be higher (see Section 5.7 on the EU-Korea FTA).

Table 2.25: EU Tariffs for Selected Fish Products under HS Code 0304/5

| HS code/ Description | MFN |
|---|-----|
| <i>Fresh fish</i> | |
| 03023190 – Albacore or longfinned tuna (<i>Thunnus alalunga</i>) ‘other’* | 22 |
| 03023290 - Yellowfin tuna (<i>Thunnus albacares</i>) ‘other’ | 22 |
| 03023490 - Bigeye tuna (<i>Thunnus obesus</i>) ‘other’ | 22 |
| <i>Frozen fish</i> | |
| 0303.41.10: Albacore longfinned tuna (<i>Thunnus alalunga</i>) ‘For the industrial manufacture of products of heading 1604’ | 22 |
| 03034190 – Albacore longfinned tuna (<i>Thunnus alalunga</i>) ‘other’ | 22 |
| 03034242 - Yellowfin tuna (<i>Thunnus albacares</i>) ‘other’ Weighing more than 10 kg each | 22 |
| 03034248 - Yellowfin tuna (<i>Thunnus albacares</i>) ‘other’ ‘other’ | 22 |
| 03034490 - Bigeye tuna (<i>Thunnus obesus</i>) ‘other’ | 22 |
| <i>Fresh or Chilled Products</i> | |
| 03044990 - ‘other’ | 18 |
| 03045990 - ‘other’ | 15 |
| <i>Frozen Products</i> ¹⁶⁹ | |
| 03048700 - Tuna (of the genus <i>Thunnus</i>), skipjack or stripe-bellied bonito (<i>Euthynnus</i> (<i>Katsuwonus</i>) <i>pelamis</i>) | 18 |
| At the ten-digit level this also includes:# 0304 87 00 10 - - - Atlantic bluefin tuna (<i>Thunnus thynnus</i>) 0304 87 00 20 - - - Bigeye tuna (<i>Thunnus obesus</i>) 0304 87 00 90 - - - Other | |
| 03048930 - Fish of the genus <i>Euthynnus</i> , other than the skipjack or stripe-bellied bonito (<i>Euthynnus</i> (<i>Katsuwonus</i>) <i>pelamis</i>) mentioned in subheading 0304 87 00 | 18 |

* I.e. not for the industrial manufacture of products of heading 1604

These codes are not specified in Eurostat (2017) or in EU (2014)

Source: EU TARIC (2017), line-by-line search; EU (2014) *Official Journal of the European Union*, L 312, Volume 57, 31 October 2014

¹⁶⁹ The *Atuna* website suggests the HS codes 0304.10.38 for tuna ‘fillets’ and 0304.10.98 for tuna ‘meat’. See: <http://www.atuna.com/index.php/en/trade/38-tuna-import-regulations>

EU consumption of fresh tuna is dominated by intra-EU trade (around 81% of supply), mainly by Spain and France. The leading extra-EU supplier is the Maldives.¹⁷⁰ Sri Lanka used to be the leading supplier but was barred from the EU GSP+ scheme (which gave duty free access) and received a yellow card under the EU IUU regulation in 2012 and was delisted as a supplier of fish and fish products in 2015.¹⁷¹

Fresh tuna imports by the EU from the four East Asian case study countries (plus Vanuatu-flagged boats) was insignificant. The annual average extra-EU28 import of fresh albacore (not for canning)¹⁷² between 2012-16 was 152 mt, valued at €656,858. None of the supply came from the four East Asian case studies. Annual average extra-EU28 import of fresh yellowfin (not for canning)¹⁷³ between 2012-16 was 3,170 mt, worth an average €24 million. But the four East Asian case studies did not contribute to this except for Japan: 0.9 mt in 2013 and 0.6 mt in 2016. For fresh bigeye tuna,¹⁷⁴ annual average EU28 imports in 2011-16 were 72.6 mt, valued at €548,872; and only South Korea figured in this data, with 0.7 mt in 2015.

EU28 imports of albacore for canning¹⁷⁵ are shown in Table 2.26. Of the four country case studies, only China registered as a significant supplier. China's share of total EU28 imported albacore for canning fluctuates considerably: at 14.4% in 2012 and 9.9% in 2013, dropping to 1.3% and 1.1% in 2014 and 2015, before hitting a peak at 16.2% in 2016.

Table 2.26: EU28 import of frozen albacore for canning, 2012-16

| | | 2012 | 2013 | 2014 | 2015 | 2016 |
|-------------------------|--------|------------|------------|------------|------------|------------|
| China | Euro | 5,839,219 | 4,137,693 | 348,750 | 466,388 | 6,732,075 |
| | Tonnes | 2,274 | 1,701 | 160 | 149 | 2,391 |
| Total extra-EU28 | Euro | 43,142,215 | 38,825,143 | 25,441,126 | 37,832,230 | 43,646,812 |
| | Tonnes | 15,816 | 17,248 | 12,124 | 13,421 | 14,754 |

Source: Comext

In regard to frozen albacore for uses other than canning,¹⁷⁶ the total EU28 import market was worth an annual average of €3.9 million (1,465 mt) between 2012-16. Only Japan figured in this data – but generally at only 1% volume market share. Its peak was in 2014, but that was when the bottom dropped out of the market (459 mt was imported).

China increased its share of the EU import market for frozen *large* yellowfin >10kg (not for canning).¹⁷⁷ Worth a steady annual average of €23.6 million (or 6,572 mt) in 2012-16, China's volume share of this market grew from being negligible in 2012 and 2013 to 8% in 2014, before dropping off to 5% and 3% in 2015 and 2016. There are no records of imports of this product for the other three case studies. The EU import market for *smaller* frozen yellowfin

¹⁷⁰ CBI 2017a

¹⁷¹ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015D0200&from=EN>

¹⁷² 03023190 – Albacore longfinned tuna (*Thunnus alalunga*) 'other' [i.e. not for the industrial manufacture of products of heading 1604]

¹⁷³ 03023290 - Yellowfin tuna (*Thunnus albacares*) 'other'

¹⁷⁴ 03023490 - Bigeye tuna (*Thunnus obesus*) 'other'

¹⁷⁵ 03034110 - Albacore longfinned tuna (*Thunnus alalunga*) 'For the industrial manufacture of products of heading 1604'

¹⁷⁶ 03034190 – Albacore longfinned tuna (*Thunnus alalunga*) 'other'

¹⁷⁷ 03034242 - Yellowfin tuna (*Thunnus albacares*) 'other' Weighing more than 10 kg each

<10kg (not for canning)¹⁷⁸ is smaller at an annual average value of €7,760,539 for 2,018 mt, and again China figures as a supplier, with 12% volume share in 2013, 7% in 2014 and 14% in 2015; albeit with zero in 2012 and 2016. Taiwan supplied a marginal volume in 2016 (700kg).

Finally, for whole round tuna, the EU import market for frozen bigeye (not for canning)¹⁷⁹ was worth an annual average of €11,337,215 for 6,284 tonnes. Here Japan and South Korea played a very minor role, supplying between 0.2% and 1.5% of the volume in the years 2014-16.

There are three main types of **imported frozen tuna product**, most of which are yellowfin:¹⁸⁰

- Wholesale products which include 2-5kg vacuum-packed loins, individually wrapped packed steaks and steaks in plastic bags of around 1kg. Loins and steaks already processed and pre-packed in the exporting country.
- Frozen tuna products ready for retail are mostly steaks, vacuum-packed in cartons or plastic bags in portions of between 250 and 1000 grams
- Saku blocks of ULT tuna processed and prepacked in the supplier country.

Retail prices for these products vary considerably, as shown in Table 2.27. Profit margins are reportedly highly varied. One set of estimates puts margins for low-end products at 5% for suppliers and 10% for retailers. While for high-end products, margins are up to 20-25% for processors, and even up to 100% importers and retailers.¹⁸¹

Table 2.27: Examples of European retail prices for frozen tuna products in 2016

| Product | Price (€/kg) | Country |
|--|---------------|----------------|
| 2 pieces of frozen tuna loin vacuum- packed | 8.25 | Spain |
| Tuna loin | 23.17 | France |
| Sliced tuna in paper box | 10.38 | Spain |
| Tuna fillet suitable for sashimi | 70.51 | United Kingdom |
| Tuna fillets in paper box | 14.24 - 25.48 | Spain, France |
| Tuna fillets in vacuumed packaging | 16.99 | Germany |
| Tuna steaks in plastic packaging | 10.3 | United Kingdom |
| Tuna steaks in paper box | 13.74 - 19.16 | United Kingdom |
| Tuna steaks without skin | 44.99 | Germany |
| Tuna for sushi (Saku block) | 26.99 | Germany |
| Tuna belly (toro) suitable for sashimi | 164.81 | United Kingdom |

Source: CBI 2017b

Data for frozen tuna 'fillets' are presented in Table 2.28. South Korea is the leading supplier to the EU of this product. It had a value share of the total import market of 22% and 23% in 2012-13, 33% in 2014, 39% in 2015 and 42% in 2016. (A search was not done to identify the other suppliers, but the high share makes South Korea among the market leaders.) There are

¹⁷⁸ 03034248 - Yellowfin tuna (*Thunnus albacares*) 'other' 'other'

¹⁷⁹ 03034490 - Bigeye tuna (*Thunnus obesus*) 'other'

¹⁸⁰ Draws from CBI 2017b

¹⁸¹ CBI 2017b

five principal EU markets for this product, constituting an annual average of 94% of all EU28 imports in the period 2012-16. South Korea's value share of each of these individual import markets averaged the 5 year period is: France (51.6%), the UK (17%), Italy (11.3%), Spain (10.3%) and Germany (3.3%).

Table 2.28: EU28 imports of frozen tuna 'fillets' by selected partner (in Euros)¹⁸²

| | 2012 | 2013 | 2014 | 2015 | 2016 |
|-------------------------|------------|------------|------------|-------------|-------------|
| South Korea | 15,246,482 | 17,817,317 | 31,115,396 | 52,031,803 | 69,731,871 |
| China | 535,031 | 623,805 | 350,227 | 236,867 | 168,905 |
| Taiwan | 86,344 | 110,718 | 208,935 | 62,563 | 441,513 |
| Japan | 2,921 | 11,385 | - | 41,807 | - |
| Total extra-EU28 | 70,737,247 | 76,846,449 | 93,870,588 | 134,224,596 | 165,646,549 |

Source: Comext

In general, Western Europe has seen a shift in fish and fish product consumption to more convenience products and sushi, especially among younger consumers.¹⁸³ A selected number of leading sushi chains are detailed in Table 2.29. The main locations for sushi consumption in the EU are Paris, London and Dusseldorf.¹⁸⁴

Table 2.29: Selected major sushi chains in Western Europe

| Brand (principal market) | Value in 2014 (USD mn) | Value Growth 2013-2014 | Category; Primary offering |
|------------------------------|------------------------|------------------------|----------------------------|
| Sushi Shop (France) | 213.7 | 5% | Fast food sushi |
| Yo! Sushi (UK) | 109.4 | 37% | Full-service; sushi |
| Planet Sushi (France) | 95.8 | 12% | Full-service; sushi |
| Wasabi (UK) | 61.1 | 20% | Fast food sushi |

Note: This selection of companies excludes several major players such as Matsuri (France), Itsu (UK).

Source: Friend 2015

¹⁸² A Comext search (which is limited to 8-digit HS codes) specifies only 0304.87.00 tuna of the genus *Thunnus*, skipjack or stripe-bellied bonito (*Euthynnus* (*Katsuwonus*) *pelamis*)). However, other species (such as bigeye tuna) are specified at the 10-digit level for this code and it is thus assumed that the import data incorporates this and other species under 0304.87.00 (see Table 2.27). There is an EU HS code for 'fillets' of species 'other than' skipjack. (i.e. 0304.89.30 - Fish of the genus *Euthynnus*, *other than* the skipjack or stripe-bellied bonito (*Euthynnus* (*Katsuwonus*) *pelamis*)). But, total EU28 import data for this product is almost non-existent and none of the four East Asia countries are recorded as having supplied product under this code. This would suggest that EU Member states' customs authorities are not fully applying the range of HS codes available for tuna 'fillets', which is perhaps an outcome of 2014 changes in nomenclature.

¹⁸³ EUMOFA 2017

¹⁸⁴ Friend 2015

Spain is the EU's largest non-canned tuna market,¹⁸⁵ but had experienced a decline in seafood consumption that parallel's the national economy's recent turmoil.¹⁸⁶ The French were reportedly 'the second biggest sushi eaters in the world in 2015, just behind the Japanese'.¹⁸⁷ There has been growth in promotion and purchase of sushi kits in supermarkets and it is predicted that there will be growing demand for more premium sushi. Unlike canned tuna and value-added shelf-stable seafood products, sales of fresh and frozen seafood in France are not dominated by supermarkets. Eating out plays an important role for both fresh and frozen segments and institutional catering has a major share in consumption of frozen seafood. The average Italian consumer has shifted expenditure to lower cost protein, but there is some indication of increased imports of frozen tuna steaks, especially from China.¹⁸⁸

In Germany, greater consumer emphasis on convenience, better quality and healthier food has contributed to the growth of sushi consumption. The first sushi chain opened in Germany in 1990 and by 2014 there were over 800 sushi chain outlets there.¹⁸⁹ This includes fast-food chain Nordsee, which focuses on fish dishes including sushi¹⁹⁰ and has the 14th largest number of outlets in Germany,¹⁹¹ and specialised restaurant chains such as Sushi Circle and Sushi Factory.¹⁹² In the context of Germans continuing to increasingly eat out (2016 saw a value growth of 3% in full service restaurants), at more expensive establishments and more expensive items,¹⁹³ there is scope for growing demand for quality tuna.

Longer shelf-life is an important preference for UK consumers of chilled tuna products as they tend to store after buying, compared to Japanese consumers who buy fresh to eat immediately. Supermarkets demand a shelf life of six days, which limits sourcing to direct airfreight (i.e. from Sri Lanka) or ULT (but in very small volumes). As in the USA, UK consumers tend to be guided by the colour of the flesh as an indicator of quality/ freshness. In the late 2000s, fresh tuna sales through food service were estimated to be around 1,300 tonnes (worth £125 million) and retail sales were around 4,500 mt (valued at £54 million); supplied almost entirely (except for a small volume UK albacore fishery) by imports, which were (then) roughly 5,900 tonnes (valued at £70m).¹⁹⁴ The UK has seen growth in the sophistication of appreciation for quality sushi and sashimi, especially for lunch in and around London, and is riding off of a perception of Japanese food as being healthy.¹⁹⁵ Major chains such as Itsu and Wasabi are challenging long-standing market leaders such as Yo! Sushi and are looking to grow outside of London.¹⁹⁶ However, the economic downturn and austerity policies have seen reduced household purchasing power and a focus on 'value for money' and concomitant reduction in seafood consumption at home.¹⁹⁷ This in part explains the 35% decline in volume sales of chilled tuna products in UK supermarkets between 2008 and 2016 and a slowdown in sales volume growth of chilled sushi in the same period. Nonetheless, the sushi retail segment was still worth £69.6 million in 2016 and chilled tuna products stood at £40.5 million.¹⁹⁸

¹⁸⁵ Orsini 2010

¹⁸⁶ Asúa and Barranco 2012

¹⁸⁷ Cheve 2015

¹⁸⁸ Notari and Carminati 2013

¹⁸⁹ EUMOFA 2017; Rath 2015

¹⁹⁰ <http://www.nordsee.com/de/sushi.html#/alle-produkte>

¹⁹¹ BMI 2017a; Passport 2017c

¹⁹² See: <https://www.sushi-circle.de/> and <http://www.sushi-factory.com/>

¹⁹³ Passport 2017a

¹⁹⁴ Garrett and Brown 2009

¹⁹⁵ Passport 2017b

¹⁹⁶ <https://www.itsu.com/> and <https://wasabi.uk.com/> and <https://yosushi.com/>

¹⁹⁷ EUMOFA 2017

¹⁹⁸ Seafish 2016

2.6 Implications for Pacific Island Countries

Japan sashimi market

- Four companies dominate Japan's import market for ULT tuna. They bypass the traditional auction system and sell G&G and processed sashimi products to Japanese supermarket and restaurant chains. PICs might consider better understanding these firms and the value chain that they are part of to gain insights into market structure and opportunities.
- Record high prices were recorded in Japan during the country visit (April 2017) for bigeye and yellowfin. Buyers were sourcing -35°C fish just to make contracts/orders.
- Fresh and frozen tuna products for household consumption are largely bought in Japan's highly concentrated supermarket sector. Evidence suggests that these retail chains capture the lion's share of the retail price.
- Farmed bluefin tunas now provide a lower-cost source of competition for high-value fatty tuna and is available year-round, which is a key market advantage.
- Albacore is increasingly used for sashimi and sushi products, and is said to contribute to supermarket sales of packaged sashimi products.
- Around 80-90% of catch from the Japanese pole-and-line fleet (skipjack and albacore) is supplied to Japan for use in lower-end sashimi products (i.e. seared tuna (*tataki*) and minced tuna (*negitoro*)) and 20% is PS1 grade and used for sashimi. The remaining skipjack catch is utilised for *katsuobushi* production.
- *PS Special* whole round yellowfin (normally above 10 kg) is produced by purse seiners and is increasingly used for sashimi products in Japan (minced sashimi, *saku* blocks, *tataki*), primarily for sale to supermarkets and sushi restaurant chains.
- Longline industry representatives in China and Taiwan did not express any concern about potential competition from this PS special product.
- Japan is importing ever larger volumes of processed sashimi tuna products, including bigeye and yellowfin sashimi loins and saku blocks (recorded as 'fillets' in the trade data). This market is dominated by South Korea and China, followed by Indonesia, Taiwan, and Fiji, which is a leading supplier. In 2016 Fiji was listed in trade data as being fifth largest supplier of bigeye fillets by volume and value and fourth largest yellowfin fillets in volume (fifth in value).

US canned albacore market

- There are no major changes in the US market for canned albacore. Although the current pressure on the big three canned tuna brands over price fixing is yet to be worked out in terms of the commercial impacts (e.g. fines under anti-trust legislation).
- It is not known whether or not this will bring new opportunities or constraints to PICs at this stage.
- It seems likely that Thailand will continue to be a major market for frozen albacore for export-oriented processing to the USA and the EU.

EU and US high value tuna markets

- The number of sushi restaurants outside of Japan is experiencing steady growth, globally from 54,700 in 2013 to 88,650 in 2015,¹⁹⁹ suggesting that the global market for sashimi-grade tuna is likely to continue to expand. The largest growth has been in Asia, which includes China, South Korea and Taiwan. The second largest growth has been in North America.
- Western Europe continues to import large volumes of tuna 'fillets' (fresh and frozen), in part, feeding a growing taste for sushi, as well as supplying a long-established market for tuna steaks.
- South Korea is a major supplier of ULT sashimi tuna products to the EU, which suggests a possible market for PIC exporters should they be able to source and support usage of ULT containers and comply with strict EU public regulations and the private standards of big supermarkets, especially in Northern Europe.

¹⁹⁹ Kawamoto 2017

3 JAPAN'S DISTANT WATER TUNA LONGLINE INDUSTRY

3.1 Introduction

Japan's pre-industrial longline fishery initially targetted Pacific bluefin tuna in local waters, then expanded to seasonal fisheries in the Midway Islands, the Ryukyus and the southwest Pacific. In 1914 the first powered longliners (30-70 GRT) began fishing in the western Pacific Ocean.²⁰⁰ The pre-World War II longline annual catch was estimated at 4,500 mt in the years 1936-40.²⁰¹

Japan's early distant water tuna fisheries were initiated by state-sponsored experimental fishing trips in the 1910s, which were quickly followed by the creation of commercial fishing bases in colonial Southeast Asia (e.g. for pole-and-liners), initially to supply burgeoning local markets. This investment was welcomed at the time by the British and Dutch as it allowed for colonialism on the cheap. But by the late 1930s investment in new industrial vessels allowed Japanese firms to land fish caught in Southeast Asian waters in Japan and its (then) colony Taiwan.²⁰² In parallel, the Treaty of Versailles gifted Japan colonial territories in Micronesia—the South Pacific Mandate—and by the 1930s it had developed bases for fishing operations in other Pacific Islands, employing around 7,600 Japanese fishers. Many of these fishers were from the Miyako Islands – close to Taiwan and annexed by Japan in 1897, which were considered a periphery of the already peripheral Okinawa prefecture.²⁰³

The growing geographical reach of Japan's tuna fisheries until World War II was supported by extensive government subsidies, what some have called 'the pelagic empire'.²⁰⁴ Supports included a distant water incentive scheme from 1896 and fiscal subsidy act for fisheries in 1922.²⁰⁵ This included government financing of the mechanization of its national fishing fleet with engines, refrigeration equipment and radios. World War II, however, saw this world-leading industrial capacity decimated.

After World War II the Japanese longline fishery has been characterized by three major vessel classes – distant water (DW), offshore and coastal. This system of classification was originally established to minimize geographic interaction between vessel classes.²⁰⁶ Japan started requiring the licensing of longliners in the late 1940s, which complemented an already-existing limited-entry system using the total GRT of the fleet.²⁰⁷ With the 1952 relaxing of the MacArthur Line when the Japan-US Peace Treaty took effect, Japan's longliners became a leading segment of its fishing fleet and became active in offshore and distant waters.

A combination of serious post-War domestic food shortages and a government intent on export-orientated re-industrialisation saw government provide a range of supports to re-develop a national fishing fleet.²⁰⁸ By 1954 Japan had extended its fishing grounds to include the entire Pacific and Indian Oceans; a repeat, at least commercially, of the geographic reach of the 1930s.

²⁰⁰ Miyake 2005a

²⁰¹ Shapiro 1950

²⁰² Butcher 2004

²⁰³ Doulman 1987; Barclay 2008

²⁰⁴ Tsutsui 2013

²⁰⁵ Shima et al. 2007; Butcher 2004.

²⁰⁶ Gillett and McCoy 2007

²⁰⁷ Miyake 2005b

²⁰⁸ Barclay and Koh 2008; Bergin and Haward 1996; multiple interviews with Japanese government and industry, 2006.

Initially, Japan's longline-caught tuna were exported for canning because freezing capacity (at -20°C) meant that the flesh was brown and thus unsuitable for sashimi. The development in 1965 of -40°C freezing capacity and then -55°C by 1969 meant that Japan's longliners became principally a sashimi fleet shifting effort from canning species (yellowfin and albacore) to high-value sashimi species (bluefin and bigeye).²⁰⁹

Longline catches peaked in the WCPO in 1962 for Japan's offshore/distant water fleet (~162,000 mt) and during 1993-97 for the coastal longline fleet (41,300 mt).²¹⁰ Both classes of fisheries are now at much lower catch levels and continue to decline. Japan's limited-entry system had allowed for increases in the longline fleet's total GRT until the 1970s, after which it was frozen and from 1982, reductions were introduced,²¹¹ culminating in the setting up of the Organization for the Promotion of Responsible Tuna Fisheries in 2002.

In the 1970s Japanese trading companies (*sogo shosha*) financed South Korean and Taiwanese fishing companies, which also received substantial supports from their own governments. These new industrial longline fleets were locked-in to the *sogo shosha* through fixed supply contracts and/or loans repaid in fish assuring a diversified source of fish for their Japanese clients.²¹² While this practice declined in significance with the boom in global industrial longline capacity in the 1980s onwards, it provided the finance and marketing networks necessary to making South Korea and Taiwan among the leading industrial longline fleets in the world, competing directly with Japanese boats, especially in the Pacific Ocean.²¹³ With relatively small volumes of domestic sashimi consumption and minor export-oriented fish processing, these new industrial fleets provided raw material to Japan's sashimi market.

Due to the fact that Japan's market is at the centre of the global longline industry the discussion of price trends, market dynamics and major buyers features in Section 1.5, and is not repeated here.

3.2 National Regulation and Industry Support

The peak governance body for Japanese tuna fisheries is the Fisheries Agency of Japan (FAJ) within the Ministry of Agriculture, Forestry and Fisheries. FAJ has various functional divisions such as Fisheries Management and International Affairs. As Japanese vessels fish in all ocean areas, Japan is a member of all five tRFMs - ICCAT, IOTC, WCPFC, IATTC and CCSBT.

The Japan fishing fleet is reported to be highly subsidized by the government, both historically and today. An EU commissioned study suggested that total subsidies paid by Japan to the fisheries sector in 2015 were USD 1.3 billion, mainly (>80%) in the form of indirect subsidies such as infrastructure and insurance, of which an estimated 99% went to the capture sub-sector. This is a major decline from USD 2 billion in 2008 and it should also be noted that 2015 was a spike compared to 2013 and 2014. This was because of the devastating impact of the Great East Japan Earthquake and the subsequent need to replace fishing vessels and provide working capital to fishing businesses hit by the disaster. In sum, subsidies amounted to around USD 200 per tonne for Japan's marine capture fisheries in

²⁰⁹ Miyake 2005a

²¹⁰ WCPFC 2016

²¹¹ Miyake 2005b

²¹² Comitini 1987; Haward and Bergin 2001; Chang et al. 2010; multiple interviews with Japanese government and industry, 2006.

²¹³ Chang et al. 2010; Haward and Bergin 2000; Hong et al. 2000; Hamilton et al. 2011.

2013.²¹⁴ A different study of subsidy payments to the Japan-flagged tuna fleet (all gears) in the WCPO *alone* claims that fuel subsidies were USD 68.9 million and total non-fuel subsidies were USD 236.2 million.²¹⁵

The majority of offshore/distant water longliners are members of the Japan Tuna Fisheries Cooperative Association, or Japan Tuna (Nikkatsukyo). Most offshore longliners are members of the National Offshore Fisheries Association of Japan (Kinkatsukyo). The remaining distant water longliners (possibly less than 10 vessels) are represented by the National Ocean Tuna Fishing Association (Enkatsukyo). These associations play a significant support role in representing Japanese longline industry interests to the Japanese Government, RMFO's and coastal states.

Offshore/DW longliners and offshore pole-and-line vessels (208 total in 2016) are also members of the international Organization for the Promotion of Responsible Tuna Fisheries (OPRT), along with all major distant water and PIC longline fleets. OPRT was established as a non-governmental organization by Japan as a response to the FAO International Plan of Action for the Management of Fishing Capacity and Japan's initial reduction of licences allocated to its longliners by 20%.²¹⁶ Its initial actions included Japan and Taiwan calling back FOC longline vessels owned by their nationals, many of which were scrapped.²¹⁷ Since then registering a vessel on the OPRT list has been essential to gaining access to Japan's market for longline products (see Section 1.2.4).

3.3 Fleet Description and Status

Japan's longline fleet is divided into distant water, offshore and coastal classes, but there are considerable interactions among them – especially the distant water and offshore classes. The small coastal longliners, mostly 1-20 GRT, only fish in Japan's coastal waters and are not included in this analysis. The offshore longline vessels are divided into two sub-categories: (a) small offshore (10-20 GRT) which can range widely outside the Japan EEZ, within the WCPO and even to the EPO, and (b) (medium) offshore longliners (20 -120 GRT, but mostly > 50 GRT) which fish in similarly extensive areas. Distant water longliners (120 GRT and up) can fish in all oceans (Atlantic, Indian and Pacific, Eastern and Western), typically with some restrictions. In many analyses and data presentations (e.g. WCPFC Japan AR Part 1), **the (medium) offshore and distant water longliners are grouped because of operational similarities.**

The WCPFC Register of Fishing Vessels (RFV) currently has 476 Japan longline vessels authorized to fish in the WCPFC-CA, with offshore distant water vessels making up 235 (49%) of these. The number of active longline vessels fishing in the WCPFC-CA (from Japan Annual Report to WCPFC - Part 1) for 2015 is given as 338 - 111 offshore/DW and 227 small offshore, as above. The FFA Regional Register of vessels licensed to fish in member countries' waters was only 69 (35 > 120 GRT, 34 < 20 GRT), reflecting the shift towards increasingly fishing outside FFA members' EEZs (see below).

The **distant water (DW) longline** vessels utilize ultra-low temperature (ULT) freezers for catch storage, and mostly target bigeye (and to a lesser extent yellowfin and bluefin, seasonally). Vessels are constructed from steel, the average size is around 400 GRT (by international

²¹⁴ MRAG et al. 2016

²¹⁵ Sumalia et al. 2014

²¹⁶ Miyake 2005; IPOA (Capacity) <http://www.fao.org/docrep/006/X3170E/x3170e04.htm>;

²¹⁷ Miyake 2007

standards), and with hold capacities ranging from 300-400 mt. Annual average catch per vessel (all species) is around 250-300 mt for vessels targeting bigeye and yellowfin (around 1-1.5t/day)²¹⁸, whereas catch volumes are lower (around 0.5t/day) for vessels seasonally targeting higher value southern bluefin which are also constrained by strict quota limits.

The total number of **offshore longliners**, excluding coastal longliners, has fallen steadily over the past five decades, from peaks of 1,901 offshore-distant waters vessels in 1963 and small offshore vessels from a peak of 940 in 1972, to 160 and 272 respectively in 2011, and declining further in recent years to 111 and 227 in 2015.²¹⁹ The biggest decline has been seen in the medium offshore longliners, whose numbers have declined from 757 in 1980 to 28 in 2017 (96% decline), and small offshore vessels from 420 to 236 (44% decline).²²⁰ whereas distant water (DW) longliners (> 120GRT) declined over the period 1980-2012 from 943 to 270 (70% decline) and further to around 80 in 2017.²²¹

All Japanese **offshore/DW longline** vessels were constructed in Japanese shipyards. The year of vessel construction ranges from 1979 to 2016, with the average age of the offshore/DW fleet 22 years, and thus ageing. Nonetheless, 25 new vessels have been constructed since 2011 (6 in 2012, 14 in 2013, and 4 in 2014). The average GRT of the offshore/DW fleet is 360 GRT, with 444m³ fish hold capacity, and an average LOA of 45.6m.



Fibre reinforced plastic (FRP) longliner, Choshi, Japan.
Photograph: Mike McCoy

²¹⁸ Including all species

²¹⁹ SPC/WCPFC Fisheries Yearbook

²²⁰ Kinkatsukyo data

²²¹ disaggregated data for medium longline and DW vessels not available

3.4 Longline Catch, Effort and Transshipment

3.4.1 Global fishing operations

Japanese distant water longline vessels are permitted under Japanese regulations to fish in the Atlantic, Indian and Pacific Oceans, provided they have the necessary authorizations in place to fish and observe domestic regulations. Hence, in theory, a single vessel may fish in all three oceans. In practice, some vessels may shift between two oceans (i.e. between the WCPO and the Indian Ocean, or between the WCPO and the Atlantic), but on the whole, most vessels usually operate in one ocean because of the cost considerations of shifting between oceans.²²²

Japan's longline fishing effort (millions of hooks) in all oceans (excluding small offshore) declined from around 560 million in 1981 to 130 million in 2014, with a corresponding decline in catches.

In 2015, the tuna catches by Japanese distant water longline vessels in the four main ocean areas were all in the range 12,000 - 20,000 mt, as follows:²²³

- Indian Ocean was 12,864 mt for all tuna species, which consisted of 4,929 mt bigeye, 3,149 mt yellowfin, 2,918 mt albacore, and 1,868 mt southern bluefin.
- Atlantic Ocean was 19,698 mt of tuna, which breaks down into 12,409 mt bigeye, 3,545 mt yellowfin, 1,773 mt Atlantic bluefin, and 1,970 mt albacore
- Eastern Pacific Ocean in 2014 was 17,074 mt of tuna, which is made up of 13,468 mt bigeye, 2,652 mt yellowfin; 239 mt albacore, and 715 mt Pacific bluefin.
- WCPO (2015): 14,727 mt, consisting of 5,742 mt bigeye, 3,927 mt yellowfin, and 5,058 mt albacore (southern bluefin catch was not listed)

While total Japanese longline tuna catch in WCPFC waters for all vessel classes is the highest of all four ocean areas (around 37,000 mt in 2015, plus SBT), the EPO and Atlantic Oceans account for higher tuna catch volumes for large distant water longliners than the WCPO, as well as the highest catches of the primary target species, bigeye.

3.4.2 WCPO fishing operations

Catch and effort data are aggregated by Japan for medium offshore and distant water vessel classes, as noted. In 2015, the total catch of the main tuna species in WCPFC waters was 14,727 mt (Table 3.1). Bigeye accounted for 39% (5,742 mt) of the tuna catch, yellowfin 27% (3,927 mt), and albacore 34% (5,058 mt). With the addition of billfish catches of around 4,600 mt and provisional shark catches, mostly blue shark, of over 10,000t, the total catch (all species) was just over 30,000 mt.²²⁴ This is compared to 48,226 mt in 2010, a decline of nearly 40%.

²²² Interviews, Japanese longline industry representatives, June 2010 and March 2017.

²²³ Data extracted from RFMO websites – IOTC, ICCAT, IATTC and WCPFC respectively

²²⁴ WCPFC Tuna Fishery Yearbook 2015

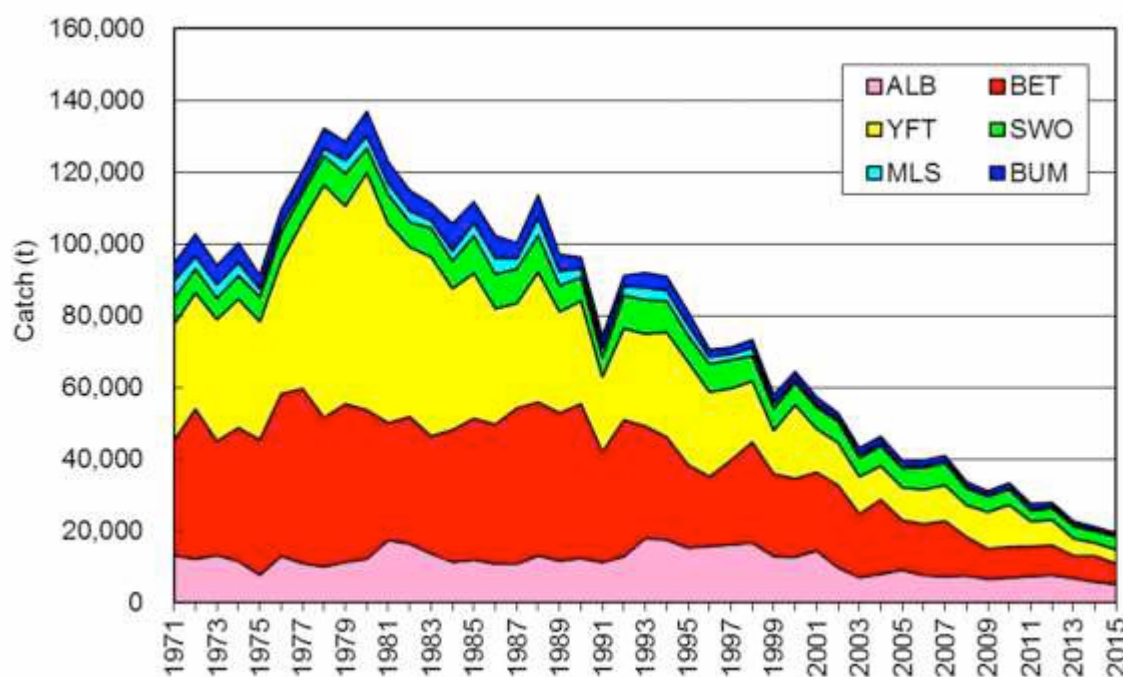
Table 3.1: Japan distant water and offshore longline fleet - total tuna catch in WCPFC-CA by species (2011-2015)

| | Yellowfin | Bigeye | Albacore | Total |
|------|-----------|--------|----------|--------|
| 2011 | 7,033 | 8,255 | 7,351 | 22,639 |
| 2012 | 7,065 | 8,375 | 7,585 | 23,025 |
| 2013 | 4,761 | 6,269 | 6,779 | 17,809 |
| 2014 | 3,653 | 7,211 | 5,757 | 16,621 |
| 2015 | 3,927 | 5,742 | 5,058 | 14,727 |

Source: SPC Catch and Effort Database, March 2017

Japan's total tuna longline catch has thus steadily declined over the past five years, continuing a long term trend, and in step with the comparable decline in vessel numbers. Figure 3.1 shows the decline in tuna catch since 1971 for all major tuna and tuna-like species, from a high of close to 140,000 mt in 1980, to less than 15,000 mt currently. Catch composition has remained relatively stable, with bigeye dominating as the main target species, but with the yellowfin proportion declining and albacore increasing slightly.

Fig. 3.1: Japan distant water and offshore longline catch (not including small offshore) in WCPFC-CA



Key: ALB: albacore, BET: bigeye, YFT: yellowfin, SWO: sword fish, MLS: striped marlin, BUM: blue marlin. 2014 and 2015 data are provisional.

Source: WCPFC Annual Report Japan Part 1, 2016

The area fished by the offshore/DW fleet in the WCPFC-CA is determined to some extent by access agreements in place, and the cost of those agreements. Table 3.2 below shows that the majority of the catch is taken in high seas areas (60% in 2015, and close to 60% on

average 2011-2015) and the extensive Japan EEZ (15%) stretching to the east and south-east of Japan, with additional catches in FSM, RMI, Palau and Solomon Islands EEZs. Effort shifts seasonally, but with aggregate effort mostly north of 10°N, in high seas areas and the Japan EEZ, with very little effort south of the equator nowadays. In several quarters, there is effort in the Tasman high seas area targetting southern bluefin tuna until quota, now back over 6,000 mt for Japan, is reached. These vessels then shift to southern equatorial waters, notably Solomon Islands, although the extent of this relocation has fallen off in recent years.

Table 3.2: Japan distant water and offshore longline fleet - total tuna catch in WCPFC-CA by area (2011-2015)

| AREA | 2011 | 2012 | 2013 | 2014 | 2015 |
|--------------------|---------------|---------------|---------------|---------------|---------------|
| FSM | 2,444 | 2,675 | 1,852 | 4,163 | 2,810 |
| KIRIBATI - GILBERT | 119 | 85 | 95 | 32 | 0 |
| KIRIBATI - LINE | 9 | 153 | 142 | 19 | 0 |
| KIRIBATI - PHOENIX | 165 | 237 | 46 | 112 | 0 |
| JAPAN | 933 | 1,094 | 1,059 | 1,289 | 2,156 |
| INDONESIA | 2 | 3 | 0 | 0 | 3 |
| MARSHALL IS | 1,204 | 472 | 28 | 486 | 446 |
| NAURU | 163 | 214 | 60 | 175 | 0 |
| PALAU | 934 | 1034 | 1022 | 651 | 307 |
| SOLOMON ISLANDS | 3,123 | 3960 | 2465 | 382 | 141 |
| TUVALU | 58 | 135 | 0 | 0 | 0 |
| PHILIPPINES | 0 | 0 | 1 | 13 | 0 |
| HIGH SEAS | 13,485 | 12,964 | 11,038 | 9,300 | 8,864 |
| TOTAL | 22,639 | 23,026 | 17,808 | 16,622 | 14,727 |

Source: SPC Catch and Effort Database, March 2017

The species taken also vary to some extent by area, with swordfish predominating in waters close to Japan, bigeye (and yellowfin) in tropical waters and albacore (and bigeye) in subtropical latitudes.

The offshore/DW longline fleet also fishes extensively in the EPO, with catches often split about 60/40. The 2014 and 2015 catch of bigeye by Japan longliners in the EPO was however over 14,000t, and the Japan bigeye quota is also much higher for the EPO (32,372 mt, cf. 16,860 mt for the WCPO in 2017). The proportion of EPO fishing has increased as Japan DW vessels have fished less frequently within the EEZs of PICs. The tuna catch in the WCPO/EPO overlap area (150°W - 135°W) is very small (< 500 mt), with most EPO effort distributed around this area to the north and east.²²⁵

Japanese DW vessels operating in WCPO waters are authorized to undertake high seas **transshipment**, but typically return to Japanese ports at the end of a voyage and only occasionally tranship on the high seas. This can in part be explained by a long-term 'understanding' between the Japanese government and the distant water fleet owners that

²²⁵ Japan WCPFC AR Part 1 2016

catch is landed directly in Japan,²²⁶ and also because of maintaining quality in the ULT cold chain, which the Japan longline fleet has mastered.

Data on transshipment in 2016 shows that only 1,210 mt (all species) caught within the WCPFC-CA, or less than 10%, was transhipped either in high seas within the WCPFC-CA (762 mt, 63%) or in high seas outside the WCPFC-CA. This is quite different from the other distant water longline fleets' strategy, and any at-sea transshipment ban is likely to impact less on Japanese longline fleet operations in the WCPO than other fleets.

Japan's small offshore and medium sized offshore vessels are permitted to fish beyond Japan's EEZ in WCPO waters. Catch is stored using RSW²²⁷ and is usually landed fresh in Japan, especially with the contraction of the operational area closer to Japan, and is increasingly less often offloaded to selected offshore longline bases in the WCPO (e.g. Guam) to be air-freighted to Japan. Given that catch is sold into the fresh sashimi market with an emphasis on high quality, trip lengths are for a maximum of 25-30 days, whereas the medium size vessels may undertake trips of 30-45 days.

While the majority of small offshore vessels operate in eastern and south-eastern Japanese EEZ waters and adjacent high seas, some have historically ventured further south around Palau and FSM. Medium offshore vessels, now small in number, typically operate in sub-tropical waters to the east of Japan to Hawaii and in tropical waters from east of the Philippines to around the international dateline.

The area fished by the **small offshore** longliners has contracted considerably in recent years, with the various prefectural fleets choosing differing strategies. The Miyazaki fleet (70 vessels) fishes south and then east of Japan in mostly high seas and EEZ waters, targetting bigeye hot spots seasonally. No more fishing by this fleet occurs in Palau or FSM waters. The fishing pattern adopted by the Kochi vessels (74 vessels) is similar. The smaller Kesennuma fleet (3 small vessels, plus 13 medium size vessels, now mostly targets striped marlin and shark east of Japan, with some seasonal bigeye. The Okinawan fleet (63 vessels) fishes mostly high seas areas, but it is the only fleet still to fish FSM waters and the adjacent high seas pocket (HSP), with some unloading in Guam. If the HSP were to be closed then unloading in Guam would no longer be viable for this fleet.²²⁸

There is now no fishing by any small offshore boats south of the Equator and very little in the EEZs of PICs. As a result, and with the offshore/DW vessels fishing less and less in EEZ waters, very few Japanese vessels overall have subscribed this year to the PNA longline VDS as few fish any longer within PIC EEZs.

In recent years, the catch composition of small offshore longline vessels has changed significantly, but both offshore vessel types target albacore in sub-tropical waters, bigeye and yellowfin in equatorial waters and swordfish nearby to Japan. In 1980s-1990s, yellowfin and bigeye were the main target species, with yellowfin accounting for the largest proportion of catch (around 40%). However, in the last ten years, albacore has become the predominant species caught (40% of catch), despite fresh bigeye and yellowfin prices being higher than fresh albacore. This relates largely to declining catch rates of bigeye and yellowfin in tropical

²²⁶ Campling et al. 2007

²²⁷ Previously, there were some ULT vessels in the 20-120 GRT category, but these vessels ceased operations in the early 2000s as they were unable to compete with larger ULT distant water vessels who were supplying the same market. Interview, Japan longline industry representative, June 2010.

²²⁸ Industry source

waters, which has resulted in offshore vessels fishing more in temperate waters targeting albacore.

Table 3.3 below summarizes the catch by the major species for the years 2011- 2015. Whilst data for the most recent years are provisional, the dominance of albacore in the catch (>40% in all years and mostly >50%) is clear. Bigeye and yellowfin continue to make significant contributions, but during the 1980s and 1990s these two species made up >50% of the catch.²²⁹ The small offshore vessel longline fleet now takes more of the key tuna species – bigeye, yellowfin and albacore – in the WCPO than the DW fleet, but less than that fleet when EPO DW catches are included.

Table 3.3: Small offshore longline catches in WCPFC-CA by major species, 2011-2015

| | 2011 | 2012 | 2013 | 2014* | 2015* |
|----------------|---------------|----------------|---------------|-----------------|-----------------|
| Yellowfin | 3,909 | 2,965 | 3,056 | (2,449) | (3,616) |
| Bigeye | 8,630 | 7,158 | 5,679 | (7,356) | (6,585) |
| Albacore | 16,098 | 17,668 | 15,110 | (15,701) | (12,142) |
| Swordfish | 892 | 981 | 819 | (993) | (1,076) |
| Striped Marlin | 720 | 780 | 857 | (616) | (715) |
| Blue Marlin | 1192 | 988 | 1,161 | (838) | (627) |
| Blue Shark | 459 | 524 | 764 | (736) | (468) |
| Salmon Shark | 12 | 78 | 169 | (268) | (368) |
| TOTAL | 31,912 | 31,1462 | 26,615 | (28,957) | (25,597) |
| No. Vessels | 274 | 261 | 257 | 246 | 227 |

*2014-2015 data are provisional

Source: WCPFC AR Japan Part 1, 2016;

3.5 Indicators of Operating Costs

In general, Japanese businesses focused on marine fisheries reported more losses in 2014 compared to the previous year while non-fishing profits (from fish processing, etc.) have been on the rise, up 25% year-on-year to 11.75 million yen in 2014.²³⁰

Numbers of Japanese **offshore/distant water** longline vessels have steadily declined since the mid-late 1990s, largely in response to economic hardship. In 2000, 529 vessels were in operation; whereas in 2016, this number had decreased markedly to 268.²³¹ High fuel prices coupled with stagnant fish prices have impacted negatively on vessel profitability and driven a considerable number of operations into bankruptcy. In addition, capacity reduction programs implemented to address global longline fishery overcapacity issues have also contributed to declining vessel numbers. In 1998-1999, 132 distant water longline vessels

²²⁹ WCFC Tuna Fishery Yearbook 2015; Kinkatsukyo data, March 2017

²³⁰ FAJ 2016

²³¹ OPRT list of registered Japanese longline vessels, translated data provided by M. Nakada, FFA.

(around 20% of the fleet) were scrapped under a Japanese Government vessel buy-back scheme. A further 64 vessels were scrapped in 2009, under a similar scheme.²³²

Each offshore/DW longline vessel carries 22-24 crew, the majority of which are Indonesian, besides five to seven Japanese nationals who are required under Japanese government regulations to fill officer-level positions, the number depending on the size class of vessel.

Limited data have been obtained on **small offshore** longliners, but the great majority are 19 GRT in size, with 6-9 crew, and all are assumed constructed in Japan ports. The age structure of the fleet is not known, nor are details of any recent construction of new vessels. The struggles of particularly medium but also small offshore longline vessels have seen declines in overall catch rates and catch rates of bigeye and yellowfin. Combined with an increasing reliance on albacore, this has impacted the landed value of catches for this fleet – reporting a 60% decrease in landed value of catch from 1990 to 2012. Increased fuel prices, associated with the declining value of the Yen, have seen sharp increases in operating costs. This cost-price squeeze has been relatively more detrimental for the larger medium offshore longliners, especially the freezer vessels which have all but disappeared.

3.6 Corporate Governance and Company Profiles

Very different types of companies make up Japan's longline industry. At one end of the spectrum is owner-operators with one offshore boat, and at the other are *sogo shosha* holding companies such as Mitsubishi, which are typified by a diverse range of multinational companies that are financially interlocking, but operationally autonomous. In-between these poles are specialized longlining companies that own four to six vessels (see Table 2.4) and seafood multinationals such as Nissui (Nippon Suisan Hyakunen), for which sashimi products are one component of their activities.

The 235 **offshore/distant water** vessels on the RFV are owned by 122 Japanese companies, with the number of vessels owned ranging from one to a maximum of six, with 78% of the companies owning just one or two vessels. Ownership is thus quite disparate rather than concentrated, and operations are typically family-owned businesses. Frozen domestic vessel landings (71,000 mt) from the Japan DW fleet are dominated by yellowfin (31,500 mt) and bigeye (25,400 mt), with smaller amounts of albacore (11,700 mt, mostly North Pacific) and 2,400 mt of southern bluefin tuna drawn from the quota and fished in the Southern Ocean. Landings are assumed to occur in the vessels' home ports, as detailed earlier.

A summary of the 19 companies (16%) owning four to six vessels is provided in Table 3.4, these make up 28% of Japan's total offshore/distant water fleet. One third are based in the northern Tohoku region, one quarter in Kyushu in the south, with the remainder based in the south-central area. The most populated ports appear to be Ichikikushikino (Kagoshima), Kesenuma (Miyagi) and Miura (Kanagawa). This geographical distribution of the larger fleets is largely representative of the total fleet, with the top ports in terms of the number of registered vessels being Kesenuma (42 vessels), Ichikikushikino (36), and Miura (16), with Yaizu (15), Tsukimi (12) and Iwaki (12) also prominent. With medium offshore longliners removed (13),²³³ Ichikikushikino (Kagoshima) would be the top port for offshore/distant water longliners as confirmed by industry sources.

²³² Hamilton et al. 2011

²³³ Kinkatsukyo data

Table 3.4: Number of vessels by companies operating four or more offshore/distant water longline vessels, by company base/ registered port, and prefecture

| Company | No. of Vessels | Company Base/ Registered Port | Prefecture |
|--|----------------|----------------------------------|------------|
| Tohoku Region (7 companies, 32 vessels) | | | |
| Hamako Suisan Co. Ltd. | 6 | Kamaishi | Iwate |
| Kouei 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 Kaisha | 4 | Shiogama | Miyagi |
| Marukichi Co. Ltd. | 4 | Hachinohe | Aomori |
| Kyushu Region (5 companies, 23 vessels) | | | |
| 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 |
| Kanto Region (3 companies, 15 vessels) | | | |
| Sumiyoshi Gyogyo Kabushiki Kaisha | 6 | Miura | Kanagawa |
| Kotoshiro Gyogyo Kabushiki Kaisha | 5 | Miura | Kanagawa |
| Nanyo Suisan Kabushiki Kaisha | 4 | Miura | Kanagawa |
| Chubu Region (3 companies, 14 vessels) | | | |
| Fukukyu Gyogyo Kabushiki Kaisha | 5 | Yaizu | Shizuoka |
| Kabushiki Kaisha Fukuseki Maru | 5 | Yaizu | Shizuoka |
| Ogino, Seiichi | 4 | Tonami | Toyama |
| Other Region (1 company, 5 vessels) | | | |
| Chokyu Maru Co. Ltd | 5 | Owase | Mie |
| TOTAL | (89) | | |

Source: WCPDFC RFV March 2017

The same analysis has not been done for **small offshore** vessels on the RFV but Kinkatsukyo data obtained suggests that in January 2017, 28 medium offshore vessels were still operating, and 236 small offshore vessels. The distribution of operating bases by prefecture, and the number of fishing days by each prefectural fleet, is given in Table 3.5 below.

The **medium offshore** longline fleet, which has declined drastically from 757 vessels in 1980, is now at 28 vessels and may dwindle further. Most of the fleet used to be freezer vessels but the remainder are now mostly fresh fish vessels using refrigerated sea water (RSW). The few

freezer vessels which remain, 4-5 vessels in Kesennuma (Miyagi), are gradually being sold off. The remaining vessels are mostly based in Miyagi (Tohoku) and Oita (Kyushu), at opposite ends of Japan.

The **small offshore** longline vessels, mostly 19 GRT, have been more stable numerically over time, with 236 remaining in 2017. The main prefectural bases are Kochi (Shikoku) - 72 vessels, Miyazaki ((Kyushu) - 70 vessels, and Okinawa - 63 vessels, with the remaining 31 vessels (13%) scattered along the east coast of Japan. In terms of effort (days fished), these 3 fleets account for 80% of the total effort, with the Miyazaki fleet on top. The fleets show distinct seasonal patterns in areas fished, and in the species composition of the catch which has changed significantly over time.

Table 3.5: Distribution of medium and small offshore vessels in 2017, by prefecture, with numbers, and days fished in 2016.

| Prefecture | Medium Offshore | | Small Offshore | |
|--------------|-----------------|--------------|----------------|---------------|
| | Number | Days | Number | Days |
| Chiba | 1 | 164 | 1 | 126 |
| Kanagawa | | | 5 | 671 |
| Kochi | 1 | 158 | 72 | 11,580 |
| Kumamoto | | | 1 | 104 |
| Mie | | | 9 | 1,408 |
| Miyagi | 13 | 2,175 | 3 | 443 |
| Miyazaki | | | 70 | 12,031 |
| Oita | 10 | 1,614 | 4 | 704 |
| Okinawa | | | 63 | 10,698 |
| Toyama | 3 | 457 | 4 | 603 |
| Wakayma | | | 4 | 668 |
| Total | 28 | 4,568 | 236 | 39,036 |

Source: Kinkatsukyo, January 2017

3.7 Recent Developments and Future Prospects

The continuing decline in vessel numbers experienced by the Japanese **distant water** longline fleet stems from a number of factors – high fuel prices, modest increases in fish prices, declining sashimi consumption levels in the Japanese market, increasing competition from farmed bluefin, and declining bigeye and yellowfin catches in most oceans due to stock sustainability issues, high vessel maintenance costs, reluctance of banks to grant loans for constructing replacement vessels and difficulties attracting young Japanese crew members.

On the other hand, piracy issues in the Indian Ocean have faded and bluefin stocks in the Atlantic and Southern Oceans are showing some signs of recovery.

Some of these issues also apply to offshore longliners but maybe less severe. The shift in species composition of landings to lower priced albacore, with declines in stocks (and catch rates) of yellowfin and bigeye, and increasing fuel prices in combination with a depreciated Yen, have been the main negative factors impacting the fishery.

In the case of the distant water fleet, industry sources indicated in 2010 that currently only 30% of distant water longline vessels were profitable, 30% were borderline and 30-40% were struggling and on the road to bankruptcy, with a prediction that less than 100 or so vessels will survive in the next few years. This substantially still applies 7 years on, with around 80 DW vessels still fishing. Those vessel owners (mostly the larger companies) with diversified business interests (i.e. vertically integrated tuna operations with complimentary processing and/or retail operations and/or other non-tuna related businesses) are likely to be in a stronger position, than small family-run businesses consisting exclusively of only one, at most, three vessels. Industry sources also felt that several of these factors may potentially result in some distant water vessels changing their traditional fishing grounds. The current key industry priorities identified by Japan Tuna Fisheries Cooperative Association (Nikkatsukyo) are: i) to secure fishing grounds; ii) to attract new, young crew members; iii) facilitate new vessel construction to replace ageing vessels; and, iv) sashimi market stimulation.

'Islandisation' projects (i.e. Pacific Islands-based joint venture fishing operations) were identified in 2010 as a potential means of addressing several of these issues, if suitable local partners can be identified. It was believed that islandisation could assist in securing access to fishing grounds, with potentially cheaper licence fees. In addition, basing operations outside of Japan would enable vessels to avoid restrictive Japanese Government regulations concerning crewing, vessel construction, maintenance and safety. Being in closer proximity to fishing grounds would also reduce fuel costs. This has however not been taken up to any extent, with decreasing unloading in Guam, minimal effort by offshore vessels in PIC EEZs anymore, and distant water vessels fishing mostly in high seas areas in the WCPO and EPO.

Apprehension was expressed in Japan concerning the introduction of a PNA longline vessel day scheme (VDS), as well as the banning of at-sea transshipment under WCPFC.²³⁴ The PNA longline VDS was introduced this year but with very little fishing in PIC EEZs, only limited participation has been evident so far, as costs are regarded by industry as excessive.

High fuel prices, as well as the ageing of experienced officers and problems with recruiting young Japanese crew members were identified as the two most serious factors which will continue to impact the Japanese longline (and likely pole and line fleet) in the future.

The devastation associated with the tsunami of 2011, which seriously damaged some key ports in the Sendai area (e.g. Kesunnuma) has been largely overcome in the intervening six years, although complete recovery will never be achieved and fleet size and supply levels are yet to recover to previous levels.

²³⁴ Unlike the Korean and Taiwanese distant water longline fleets which generally tranship at sea into ULT carriers, Japanese vessels operating in WCPO waters typically return to Japanese ports at the end of a voyage or offload in selected Pacific Island country ports. Hence, an at-sea transshipment ban is likely to impact less on Japanese longline fleet operations in the WCPO than other fleets.

Key Points: Japan longline fleet

- The number of vessels has continued to decline further in all fleets since 2010 - the offshore-distant vessel numbers from 160 in 2010 to 111 in 2016, and small offshore vessels from 272 in 2010 to 228 in early 2017. The sharpest decline over time has been in the medium offshore longline vessels (50-120 GRT, and included in the offshore DW) down to just 28 vessels in 2017.
- it is unclear how many of these vessels are operating profitably and the decline in numbers can be expected to continue. High fuel prices, as well as the ageing of experienced officers and problems with recruiting young Japanese crew members were identified as the most serious factors which will continue to impact the Japanese sashimi fishing fleets in the future.
- the catch has similarly declined from 48,226 mt (all species) in 2010 to 30,777 mt in 2016 for the offshore/DW fleet, and from 34,524 mt to 26,114 mt for the small offshore fleet
- the area fished by the DW fleet is now mostly high seas areas in both the WCPO and EPO, with 25% of the tuna catch taken in the PIC EEZs in 2015 and even less in 2016; small offshore vessels activity has largely contracted to the Japan EEZ and adjacent high seas areas, with just one component of the fleet continuing to fish in Micronesian waters (the Okinawa longliners).
- the species composition of the catch has also changed over time, with the bigeye proportion of the DW total catch now around 20%, and albacore and yellowfin slightly lower. The small offshore catch is now dominated by albacore (close to 50%) with declining catch rates for yellowfin and bigeye

3.8 Implications for Pacific Island Countries

- Fragmented ownership and a declining fleet makes the role of the Japanese industry associations and government crucial to dealing with the Japan longline fleet, including keeping transaction costs of agreements low, and to indirect PIC gains (OFCF, etc).
- However, because the Japan longline fleet is mostly active in high seas, economic gains to PICs from this fishery are currently relatively limited.
- Japan is quite different from the other distant water longline fleets' strategy, in that vessels typically return to Japanese ports to unload, rather than transshipping at sea. Hence, any at-sea transshipment ban is likely to impact less on Japanese longline fleet operations in the WCPO than other fleets.
- Japanese vessel owners with diversified business interests (i.e. vertically integrated tuna operations with complimentary processing and/or retail operations and/or other non-tuna related businesses) are in a stronger position to weather cost and/or price squeezes, than small family-run businesses consisting exclusively of only one, at most, three vessels.
- Commercial decline in segments of the Japan DWF might see some vessels change their traditional fishing grounds.
- Japan 'Islandisation' projects (i.e. Pacific Islands-based joint venture fishing operations) have not been promoted to any extent in the longline sector. The major reasons are the decline in overall vessel numbers, a lack of interest by vessel operators to invest in or operate from overseas bases in the PICs, and unlike the purse seine sector, minimal need for access to PIC EEZs since vessels fish mostly in high seas areas in the WCPO and EPO.

4 TAIWAN'S DISTANT WATER TUNA LONGLINE INDUSTRY

4.1 Introduction

Taiwan's fishing industry is heavily reliant on distant water (DW) activities, which constitute over 50% of the industry's marine capture production.²³⁵ Tuna longlining is the largest value segment of Taiwan's fisheries outside of its EEZ at 31%, followed by tuna purse-seining (25%), the saury torch light net fishery (23%), squid jigging (15%), and others.²³⁶ The Pacific Ocean was the initial fishing ground for Taiwanese tuna fisheries,²³⁷ but the longline fleet is now a global operator and is active in all of the major tuna fisheries.

The development of the Taiwan tuna longline fleet began in 1913. Like that of South Korea, it was initially supported by Japan, including during its 50 years of colonial rule between 1895 and 1945. Japan was motivated by several factors: to export its over-population from fishing villages, to supply domestic food demand, and to bypass the 1922 International Conference on Naval Limitation (Washington Naval Conference) with a DW fishing fleet that could act as a naval reserve. During this period, Kaohsiung (known as Takao during the Japanese period) became the centre of colonial Taiwan's industrial fishing fleet given its relatively closeness to major fisheries. Tuna longlining was the most important fishing industry in colonial Kaohsiung, accounting for 80% of motorised vessels based in the port. In the late 1930s, 81% of colonial Taiwan's tuna longline catch was by boats based in Kaohsiung. Tuna was transported by rail and road for consumption in Taiwan and shipped by steamer to be sold in Tokyo's fish markets. But these were largely offshore fisheries and it was only during the mid-1960s that Taiwan's distant water tuna longline fleet was developed.²³⁸

During the developmental state period from the early 1960s to the 1980s, the Taiwanese government actively supported the industrialization of the distant water fishing, largely as an export-oriented industry. Initially this was supported by Japanese shipyards (including via the provision of low interest loans), although Japan cut diplomatic ties with Taiwan in 1972.²³⁹ Taiwan also built its own steel-hulled longliners at a state-owned shipyard. Expansion of fishing capacity was supplemented by the purchase of second-hand vessels, including from Japan; a practice that the government no longer allows. Taiwanese distant water longline catch initially targeted albacore and yellowfin for canneries. But declining prices and the ready availability of ULT technology saw some of the Taiwanese fleet switch to bigeye and yellowfin for the Japan sashimi market during the 1970s. The fleet would take-off in the 1980s to become the world leader.²⁴⁰

²³⁵ <https://www.ofdc.org.tw/>

²³⁶ TFA 2015, *Fisheries of the Republic of China(Taiwan)*. Available at: <https://www.fa.gov.tw/en/FisheriestoROC/index.aspx>

²³⁷ Chinese Taipei (Taiwan) WCPFC Annual Report – Part 1 2016 (AR1)

²³⁸ Haward and Bergin 2000; Chen 2006; Yeh et al. 2015

²³⁹ Since then, bilateral relations have been administered by two non-governmental authorities (Yeh et al. 2015).

²⁴⁰ Lee and Pearson 1987; Haward and Bergin 2000; Chang et al. 2010

4.2 National Regulation and Industry Support

The Taiwan government manages its commercial fisheries through the Taiwan Fisheries Agency (TFA).²⁴¹ TFA and the industry also receive assistance from the not-for-profit Overseas Fisheries Development Council (OFDC), which is supported by funds from the Taiwanese government and industry. Established by Taiwan's Council of Agriculture in 1989, the OFDC supports the international dimensions of Taiwan's distant water fleet (which includes small-scale, 'offshore' longliners). This includes 'striving for fishing rights and interests in international fora', assisting owners in fisheries disputes (such as boat detention), and the collection, analysis and sharing of information.²⁴²

The Taiwan government will continue to implement a limited entry policy in tuna fisheries to ensure fleet size is commensurate with available fishing possibilities.²⁴³ In addition, between 2005 and 2007 the government supported a vessel reduction scheme resulting in the scrapping of 183 large-scale tuna longline vessels.²⁴⁴

Reportedly, the Taiwan government does not directly provide subsidies, either for operations or capital expenditures. One industry executive remarked that from the vessel owners' point of view, the government will not put in money to make the industry attractive for future investment.²⁴⁵ While this may now be the case, it is known that Taiwan directly subsidized its fishing industry, and to some considerable degree. An EU commissioned study estimates that total subsidies paid by Taiwan to the fisheries sector in 2013 were USD 29 million; subsidies to the marine capture sub-sector (all species, all gears) constituted around 88% this. In sum, subsidies amounted to around USD 29 per tonne in Taiwan's marine capture fisheries in 2013.²⁴⁶ A study of subsidy payments to the Taiwan-flagged *tuna* fleet (all gears) operating in the WCPO estimated non-fuel subsidies at USD 35.6 million and fuel subsidies at USD 18.6 million.²⁴⁷

The distant water Taiwan longline fleet is organized into two industry associations: the Taiwan Tuna Association and the Taiwan Tuna Longline Association. The Taiwan Tuna Association (TTA) represents large-scale longliners of >100GT (all steel hull boats). Government regulation requires that *companies* are members of this Association. However, for tax purposes and following Taiwan company law, each *boat* is individually incorporated (i.e. it is legally 'owned' by a single corporation even though beneficial ownership of several boats may fall to one person).²⁴⁸ The main stated purpose of the TTA is to be a bridge between vessel owners and government, especially the Taiwan Fisheries Agency. It assists in areas like VMS implementation, the new e-logbook system, and explaining management measures. TTA states that it does not (and legally, cannot) get involved in commercial work on behalf of members, including high seas transshipment.

The Taiwan Tuna Longline Association is for vessels of 20-99GT. Most of these boats are made with fibre reinforced plastic (FRP). The Association explained in an interview in March 2017 that membership is by *boat* and there are 466 member-vessels. About 70% of vessels are from

²⁴¹ <https://www.fa.gov.tw/en/>

²⁴² <https://www.ofdc.org.tw/>

²⁴³ From Chinese Taipei (Taiwan) WCPFC Annual Report – Part 1 2016 (AR1)

²⁴⁴ MRAG et al. 2016

²⁴⁵ Interview with company executive, March 10, 2017

²⁴⁶ MRAG et al. 2016

²⁴⁷ Sumalia et al. 2014

²⁴⁸ About 8 or 9 boats of the albacore segment of this fleet have owners based in Donggang. The practice in Donggang for these vessels is for owners to operate by themselves and not under a company structure. For these owners, it is optional for them to join the TTA.

Donggang, 15% from Kaohsiung, and 15% percent elsewhere.²⁴⁹ There are three types of vessels in this Association: (a) the majority, of between 200-300 which have -35°C freezers; (b) between 100-150 that have ULT (-60°C) freezers; and (c) fresh boats (ice or RSW), which are the minority. Given the limited resources available to these owner-operators, the Association plays a vital role in informing of and explaining new regulations at regular monthly or bimonthly meetings, as well as providing circulars and communications assistance where required. A recent undertaking by the Association was to familiarize boat owners with Taiwan's new e-logbook system.

The European Commission's issuance of a 'yellow card' under its IUU Fishing Regulation in October 2015 had a large impact on Taiwan's management of its fishing vessels. According to the EC, the yellow card was based on:

...serious shortcomings in the fisheries legal framework, a system of sanctions that does not deter IUU fishing, and lack of effective monitoring, control and surveillance of the long-distance fleet. Furthermore, Taiwan does not systematically comply with Regional Fisheries Management Organisation (RFMO) obligations.²⁵⁰

The EU decision on the matter provided a long and detailed set of criticisms of Taiwan's governance of its distant water fisheries.²⁵¹ As a result, in 2016 Taiwan promulgated the Act for Distant Water Fisheries that became effective in January 2017.²⁵² The Act covers most if not all aspects of Taiwan's distant water fishing activities, including a monitoring centre for VMS, the use of E-logbooks, a distant water fishing permit issued by ocean (where previously a Taiwan fishing licence would suffice), jurisdiction over Taiwan's citizens working on foreign flag vessels, and government authorization of each transshipment operation whether in port or at sea. In the past there were 70+ landing ports approved by TFA, but to enhance the government's ability to monitor activities these were scaled back to 31 ports covering all Taiwan flagged fisheries, not just tuna. The authorized Pacific Island ports include: Noro, Honiara, Suva, Majuro, Palau, Rabaul and Pago Pago. The Act also significantly increases the amounts of fines for contravention of the Act or fisheries regulations.

The new Act for Distant Water Fisheries requires Taiwanese investors to get government approval if seeking to operate under a foreign flag. The TFA estimates that are around 200 such vessels registered in 10 different countries, but this includes longliners, purse seiners, squid boats, and others. This aspect of the Act requires that owners report catch and sales figures annually, and that they must abide by all flag state requirements. Contravention of these provisions of the act can result in being charged under *Taiwan* law and an administrative fine assessed. If operators continue to operate after being charged, it becomes a criminal violation.

4.3 Fleet Description and Status

In general, Taiwanese longline vessels operating in the WCPO do so in a more itinerant manner than, for example Chinese vessels, all but the very largest of which tend to operate from bases in the Pacific islands. With the exception of a few large fleets, ownership is mainly vested in individual vessel owners, owning from one or two up to five or six vessels. Many

²⁴⁹ There is another association, the Donggang Fisheries Association for coastal fishers irrespective of the number of boats they operate.

²⁵⁰ http://europa.eu/rapid/press-release_IP-15-5736_en.htm

²⁵¹ EU 2015

²⁵² An English translation is available at <https://www.fg.gov.tw/en/LegalsActs/>

Taiwanese longliners may switch fisheries between albacore and bigeye targeting that can entail geographic relocation or changes in country of registration. Operational patterns for the freezer vessels can also change, for example unloading in port or at sea depending on the situation.

As with the longline fleets of Japan and China, categorizing vessel type by area of operation (i.e. 'distant water' vs. 'coastal') is of limited utility. The Taiwan Tuna Longline Association, representing 'offshore' longliners of 20-99GT, has around 1,300 boats active in the WCPFC-CA (see Table 4.1). The Association stated that none of these offshore longliners fish in the Taiwan EEZ. The Taiwan Tuna Association, representing 'distant water' longliners of >100 GT, has between 70-80 vessels active in the WCPO over the last 2 years. About 50 are targeting sashimi grade tuna and the remaining 20-30 are albacore-targeting boats, largely for canning.²⁵³ The Taiwan Fisheries Agency's vessel classes match the WCPFC Yearbook (SPC) classifications – i.e. small scale tuna longline fleet (STLL) and large scale tuna longline fleet (LTLL).²⁵⁴ This is appropriate because it eliminates the 'offshore' misnomer since all of these boats are 'distant water' in relation to their flag state and have 'distant water' characteristics in that at-sea autonomy enables operations beyond coastal or "offshore" areas (see also Box 4.1).

Both fleets, STLL and LTLL operating in the WCPO peaked in size some decades ago. The largest number of small-scale vessels in the WCPO was 2,238 in 1997; and for large-scale vessels this occurred far earlier at 182 boats in 1980.²⁵⁵ Mirroring this long-term decline is a medium-term drop in the number of active Taiwan longline vessels in the WCPFC convention area. Table 4.1 shows a 6% decline in vessel numbers between 2011 and 2015. The largest decline was in the LTLL category, from 95 down to 76, representing a 20% decline, although there was a slight recovery in vessel numbers in 2015 from 2014. 2011 may represent an artificially high baseline because the number of LTLL was an increase on previous years due to a shift of vessels from the Indian Ocean that was likely caused by piracy problems. As piracy-related problems have declined, some vessels have been moving back to the Indian Ocean. In 2014, 9 vessels temporarily ceased operating due to financial loss.²⁵⁶ It is noted that, there were more vessels on the WCPFC register than actively fished in 2015 (1,539 vs. 1,382).



Taiwan small scale tuna longliner.
Photograph: Mike McCoy

²⁵³ Interviews, March 2017.

²⁵⁴ See Chinese Taipei WCPFC Annual Report, Part 1, August 2016

²⁵⁵ WCPFC Yearbook 2015

²⁵⁶ AR1 – Part 1 2016

Importantly, there are considerably fewer vessels on the FFA register than actively fished in the WCPFC-CA in 2015 (126 vs. 1,382). This is presumably because a large number of vessels, especially STLLs, are fishing in high seas areas and not in FFA EEZs.

Table 4.1: Taiwan large scale and small scale longline fleets – number of active fishing vessels in WCPFC convention area (2011-2015)

| Year | Large scale 100 GT+ | Small scale 20-99 GT | Total |
|------|------------------------|-------------------------|-------|
| 2011 | 95 | 1,376 | 1,471 |
| 2012 | 87 | 1,326 | 1,413 |
| 2013 | 82 | 1,296 | 1,378 |
| 2014 | 73 | 1,275 | 1,348 |
| 2015 | 76 | 1,306 | 1,382 |

Source: WCPFC AR-1 - Taiwan 2016

The FFA Vessel Register indicates all of the Taiwan-flagged longline fleet were constructed in Taiwan shipyards. However, since only 126 Taiwan longline vessels are on this register, this information may not be representative.²⁵⁷ However, based upon these data, the top three longline ship yards are Jian Yuan Shipbuilding (22 boats), Shing Sheng Fa Shipbuilding (15); and Lien Fong Shipbuilding (8). In terms of new construction in 2011-2016, 7 out of 11 boats were built by Jian Yuan Shipbuilding.

The vast majority of the Taiwanese fleet is registered in Taiwan, however there are owners that use open registries ('flags of convenience') such as Vanuatu. It is believed that beneficial ownership of all such vessels rests with Taiwanese individuals or companies, although investment in the latter by foreigners cannot be ruled out.

²⁵⁷ WCPFC RFV does not provide data on the shipyard name.

Box 4.1: A note on Taiwan's longline vessel categorization

Domestically, Taiwan groups vessels by 'CT' number which are categories of gross tonnage (GT). This characterization has not changed for decades, although characteristics of vessels have mostly trended towards increased capacity within categories. The CT3 and CT4 categories represent vessels from 20-50 GT, and CT4 is 50-99 GT respectively. Those over 100 GT fall into the LTLL category and are designated CT-5, CT-6 and CT-7 depending on GT. For purposes of internal administration the Taiwan Fisheries Agency groups vessels by size of vessel, fishing area and target species. As an example, for large scale longliners operating in the Atlantic there is a northern albacore target group, a southern albacore target group, and a bigeye target group.

Longliners described as STLL by Taiwan's Fisheries Agency that are active in the WCPO (see Table 4.1) belong primarily to the CT3 and CT4 class of vessels. CT3 vessels are typically fresh fish vessels, using either refrigerated seawater (RSW) or ice, with freezer holds for bycatch. According to government officials they expect the numbers of these smaller vessels to diminish in the future due to market, operational and economic factors.

Some Taiwan longline companies have re-flagged or operate their vessels under charter arrangements in Pacific Island Countries. The motivation for doing is partly to seemingly support PICs domestic development aspirations and in doing so, gain concessional fishery access. However, more importantly in recent years, re-flagging or chartering has enabled Taiwan (and other distant water fishing nations) to obtain PIC bigeye catch quota in the WCPO. Under WCPFC requirements, small island developing states (SIDS) are encouraged but not required to establish a bigeye catch quota in their zones. Meanwhile, DWFNs are subject to flag-based annual bigeye catch quotas. In addition, PIC Governments can issue ICCAT certificates for bigeye exports to Japan from re-flagged and chartered vessels, which addresses the issue of there not being enough bigeye quota allocated to Taiwan to cover the entire Taiwanese fleet. Without an ICCAT certificate, bigeye will not be accepted in Japan.

4.3.1 Large scale tuna longline fleet in the WCPO

The LTLL fleet active in the WCPO is registered in two ports, the vast majority in Kaohsiung (105 of 110), with the remaining 5 in Keelung (which is not a tuna port or base for major companies, but is presumably used for administrative purposes).²⁵⁸ Ownership is registered under company names and typically only 1-2 vessels are listed per company name in the WCPFC RFV. There is some indication of several larger longline firms owning more than 1-2 vessels, as multiple vessels share the same registered address, despite having a different owner listed. For example, in the WCPFC RFV, two owners have the same registered address for 9 vessels each. Seventy-three (of 110) have retained the same name since construction; 37 (33%) have been registered previously under different names, which may indicate a change in ownership. All boats have retained the Taiwan flag since they were constructed.

The entire LTLL fleet was built in Taiwan between 1974 and 2016 with an average age of 20 years. Ten LTLL vessels (9% of the LTLL fleet) were constructed in the last five years, from 2012 to 2016. This is an indication of ongoing investment and at least some confidence in this

²⁵⁸ The total Taiwan LTLL fleet is much larger: 298 boats are on the OPRT white list: http://oprt.or.jp/-eng/whitelist3/TF1_result_creator.cgi

segment, especially in 2016.²⁵⁹ While the larger boats in the LTLL class have the advantage of larger fish holds, they are more sensitive to upward shifts in gasoil price. For the entire LTLL fleet, gross tonnage ranges from 104 to 1,128 GT (averaging 487 GT), fish hold capacity is up to 1,201 m³ (averaging 540 m³); overall vessel length ranges from 25.9 to 75.8 metres (averaging 49.4m), and engine power ranges from 395 to 2,600 horse power (1,259 hp average). The average number of crew on LTLL vessels is 28, indicating relatively high labour costs per boat. The majority of the LTLL fleet have blast freezers (84 of 110 boats), which allow them to access the premium sashimi markets for ULT products. Importantly, 20% of this fleet is not authorised to tranship on the high seas; while 88 of 110 boats do have authorization. None of the boats in the LTLL fleet are under charter, at least according to the WCPFC RFV.²⁶⁰

4.3.2 Small scale tuna longline fleet in the WCPO

There are 10 registered ports for the STLL fleet, but the registered office of longline vessel owning companies are mainly in Kaohsiung (967; 68%) and Keelung (396; 28%). This fleet operates in the WCPO and Indian Ocean. Port Louis, Mauritius is the main base in the Indian Ocean. Ownership of the STLL fleet on the WCPFC Register of Fishing Vessels (RFV) is under individual people's names. Typically, there are only 1-2 vessels per individual, but, the correlation between some vessel names and registered addresses indicates common ownership beyond 1-2 vessels by some individual fleets. In terms of vessel name, 723 of 1,429 have retained the same name throughout their lifetime; with 706 (49%) carrying different names previously, which is assumed indicates a change in ownership. All of these boats retained the Taiwan flag.²⁶¹

The STLL vessels listed on the RFV were all built in Taiwan between 1972 and 2016. The average year of construction was 1994, so vessels are over 20 years old, on average. In terms of newer vessels, 133 were constructed in the last five years (2012-16), totalling 9% of the STLL fleet, with the greatest investment in 2012-13.²⁶² The gross tonnage ranges from 20 to 99 GT (averaging 60 GT) and fish hold capacity is up to 223 m³ (averaging 63 m³). The overall vessel length ranges from 15 to 30 metres (averaging 23 metres) and engine power is 70 to 1,138 horse power (with a 620 hp average). The average number of crew is 12 on these sometimes relatively very small boats. Of the 1,429 boats on the WCPFC RFV, 622 use ice and 808 use refrigerated seawater or blast freezers. Only 428 of the 1,429 vessels are authorised to tranship on the high seas. A total of 37 are registered as under charter: 4 in Samoa (Apia Deep Sea Fishing Co. Ltd.); 32 in Palau (5 with the Kuniyoshi Fishing Company and 27 to Palau International Traders inc.); and 1 in Papua New Guinea (Coco Enterprise Ltd.).

STLL vessels can switch target species depending on seasonality, resource availability, access conditions, etc. For example, in March 2017 when interviews were conducted in Taiwan, it was the *mahi mahi* season northeast and east of the Philippines on the high seas and some Taiwan longliners had moved to fish there. The STLL fleet sell their catch in various ways, depending upon the owner. Some go to a fish base and offload for processing or export via containers, while others tranship at sea to carriers for delivery to Japan or Korea. They can also split their sales, selling albacore to one buyer, and sashimi yellowfin and bigeye and/or bycatch to another.

²⁵⁹ 2 were built in 2012; 3 in 2013; 1 in 2014; 0 in 2015; and 4 in 2016.

²⁶⁰ WCPFC RFV – 13 April 2017

²⁶¹ WCPFC RFV – 13 April 2017

²⁶² 19 were built in 2012; 12 in 2013; 9 in 2014; 9 in 2015; and 3 in 2016.

Beginning in the 2000s an undetermined, but believed to be significant, portion of the vessels classed as CT-4 (part of the STLL category found in Taiwan's WCPFC annual reports, see Box 4.1) enhanced their freezing and fish hold capacity. These improvements enable higher quality bigeye and yellowfin to be held at -55°C rather than -35°C or -40°C. One industry expert estimated that up to half of Taiwanese CT4 vessels are now capable of ULT freezing (-55 or -60°C). The result is an increase in autonomy at sea (i.e. lengthening trips) and expanded markets to include those for sashimi. The consequences of this shift include greater ability to shift targets (albacore vs bigeye), and a greater reliance on at sea transshipment for those vessels operating on the high seas. The segment of the Taiwanese fleet delivering frozen albacore to Fiji for processing at PAFCO ceased those operations during this decade, resulting in nearly all of PAFCO's supply coming from Chinese longline vessels.

4.4 Longline Catch, Effort and Transshipment

The fishing effort of the Taiwan longline fleet dropped over the five-year period, 2011-2015 (Table 4.2). Total days fished by the large scale tuna longline fleet declined by 28%, from 23,526 days in 2011 to 16,897 in 2015. The small scale tuna longline fleet declined by 42%, from 47,660 days in 2011 to 27,555 in 2015. It should be re-iterated that 2011 was a 'peak' year because of the threat of piracy in the Western Indian Ocean; LTLL effort in the WCPO is now more stable, despite fewer boats.

Table 4.2: Taiwan longline fleet – total days fished in WCPFC convention area (2011-2015)

| Year | Large-scale (100 GT+) | Small-scale (20-99 GT) |
|------|--------------------------|---------------------------|
| 2011 | 23,526 | 47,660 |
| 2012 | 17,355 | 31,849 |
| 2013 | 18,921 | 45,763 |
| 2014 | 15,401 | 30,939 |
| 2015 | 16,897 | 27,555 |

Source: SPC Catch and Effort Database, March 2017

4.4.1 Large scale tuna longline fleet (LTLL)

The LTLL fleet can be divided into two groups based on target species – one group targets bigeye and operates mainly in tropical area (15N-15S) conducting round-the-year trips, and relying on transshipment for offloading catches and refuelling/provisioning. The other group targets albacore in subtropical/temperate waters and enter PIC ports twice a year for landing catches, refuelling and re-supplying.²⁶³ Observer coverage in 2015 on the LTLL fleet was 8.5%. Logbooks are collected when vessels call into port or tranship and the LTLL fleet used to report weekly. But with the introduction of e-logbook reporting for LTLL since 2014, vessels are required to transmit catch, effort and position data daily.

²⁶³ Chinese Taipei (Taiwan) WCPFC Annual Report – Part 1 2016 (AR1)

The total tuna catch of the LTLL fleet decreased from 2011-2013, then registered a minor recovery in 2014 and 2015 (Table 4.3). There was, however, an overall decline of 18% from 2011 to 2015 (from 16,685mt to 13,795mt). The average tuna species breakdown in the period 2011-2015, was bigeye 41% of total tuna catch; yellowfin 16%, and albacore 42%. This indicates that the switching of target species between tropical bigeye/ yellowfin and sub-tropical albacore is a practice among some boats in the fleet; although vessels without ULT capability would be unlikely to switch target to bigeye. Mirroring the absolute decline in tuna catch, there were reductions across all three species in 2011-2015: yellowfin fell by 10%, bigeye by 19%, and albacore catch saw the marginally larger decline at 20%.

Table 4.3: Taiwan large-scale tuna longline fleet - total tuna catch in WCPFC-CA by species (2011-2015)

| Year | Yellowfin | Bigeye | Albacore | Total |
|------|-----------|--------|----------|--------|
| 2011 | 3,167 | 6,579 | 6,939 | 16,685 |
| 2012 | 2,290 | 5,770 | 5,656 | 13,716 |
| 2013 | 1,441 | 5,486 | 6,533 | 13,460 |
| 2014 | 2,057 | 6,005 | 5,487 | 13,549 |
| 2015 | 2,848 | 5,331 | 5,526 | 13,705 |

Source: SPC Catch and Effort Database, March 2017

The majority of the LTLL fleet's catch was in high seas areas. The average high seas catch as a proportion of total WCPFC-CA catch in 2011-2015 was 74%. The most important EEZs in this period were the Kiribati Line and Phoenix Groups, and the Solomon Islands between 2011 and 2013, but this dropped off in 2014 and 2015. It is assumed that the Solomon Islands remains important, but that catch was by vessels chartered by Solomon Islands with catches attributed to Solomon Islands flag during these years.

Albacore fishing by the Taiwan flag fleet has mostly been in the high seas between 20°S-40°S, and to a lesser extent high seas around the Line Islands, with catches in Cook Islands and Solomon Islands EEZs'

Table 4.4: Taiwan large-scale longline fleet - total tuna catch in WCPFC-CA by area (2011-2015)

| Area | 2011 | 2012 | 2013 | 2014 | 2015 |
|--------------------|---------------|---------------|---------------|---------------|---------------|
| Cook Is. | 12 | 2 | 2 | 0 | 1 |
| Fiji | 2 | 0 | 0 | 0 | 43 |
| Kiribati - Gilbert | 101 | 28 | 20 | 153 | 62 |
| Kiribati - Line | 1,377 | 1,554 | 1,177 | 1,896 | 1,624 |
| Kiribati - Phoenix | 310 | 522 | 571 | 779 | 10 |
| Niue | 0 | 0 | 0 | 19 | 4 |
| PNG | 241 | 420 | 10 | 33 | 111 |
| Solomon Is. | 2,525 | 2,793 | 1,134 | 205 | 0 |
| Tokelau | 104 | 0 | 0 | 0 | 0 |
| Tuvalu | 22 | 9 | 128 | 2 | 0 |
| Vanuatu | 402 | 54 | 25 | 0 | 0 |
| High Seas | 11,590 | 8,335 | 10,393 | 10,463 | 11,851 |
| Total | 16,686 | 13,717 | 13,460 | 13,550 | 13,706 |

Source: SPC Catch and Effort Database, March 2017

4.4.2 Small scale tuna longline fleet (STLL)

The STLL fleet change fishing grounds and target species based on fishing season and market price; ice vessels target yellowfin/bigeye for fresh sashimi markets; and freezer vessels target albacore/billfish.²⁶⁴ Observer coverage in 2015 on the STLL fleet was 2.5%. Logbooks are collected when vessels call into port or tranship and STLL boats operating outside of the Taiwan EEZ are required to report monthly. With e-logbook reporting introduced in 2015 for the STLL fleet, these vessels are now required to transmit data daily.

The total tuna catch of the STLL fleet fluctuated between 2011-2013; then saw a significant decline between 2013-2014, which flattened out in 2015 (see Table 4.5). This was an overall decrease of 32% between 2011 and 2015 (from 24,072mt to 16,296mt). The average tuna species breakdown in the period 2011-2015, was yellowfin at 47% of total tuna catch; bigeye at 20%, and albacore at 37%. Tropical bigeye and yellowfin were the main target, but there was some opportunist switching to albacore. As to be expected from the absolute decline in tuna catch, there were sharp reductions across all three species in 2011-2015: yellowfin fell by 23%, bigeye by 28%, and albacore catch saw the largest decline at 45%.

²⁶⁴ Chinese Taipei (Taiwan) WCPFC Annual Report – Part 1 2016 (AR1)

Table 4.5: Taiwan small-scale tuna longline fleet - total tuna catch in WCPFC-CA by species (2011-2015)

| Year | Yellowfin | Bigeye | Albacore | Total |
|------|-----------|--------|----------|--------|
| 2011 | 11,170 | 4,087 | 8,815 | 24,072 |
| 2012 | 7,906 | 4,615 | 7,922 | 20,443 |
| 2013 | 10,313 | 4,389 | 9,569 | 24,271 |
| 2014 | 8,880 | 3,136 | 4,336 | 16,352 |
| 2015 | 8,564 | 2,919 | 4,813 | 16,296 |

Source: SPC Catch and Effort Database, March 2017

Like the LTLL fleet, the majority of the STLL fleet's catch was in high seas areas. The average high seas catch as a proportion of total WCPFC-CA catch in 2011-2015 was 66%. The most important EEZ in 2011 to 2013 was the Solomon Islands, but this dropped off in 2014 and 2015. The Solomon Islands remained an important EEZ, as Taiwan vessels fishing in Solomon Islands EEZ were chartered to Solomon Islands, with catches attributed to Solomon Islands during those years. The next two most important PIC EEZs were Palau and FSM, where catch tended to be more stable compared to the 2014-15 drop for the Solomon Islands.

Table 4.6: Taiwan small-scale longline fleet – total tuna catch WCPFC-CA by area (2011-2015)

| Area | 2011 | 2012 | 2013 | 2014 | 2015 |
|--------------------|---------------|---------------|---------------|---------------|---------------|
| Cook Is. | 243 | 373 | 0 | 0 | 0 |
| Fiji | 5 | 1 | 3 | 2 | 16 |
| FSM | 366 | 905 | 818 | 1060 | 410 |
| Kiribati - Gilbert | 0 | 27 | 3 | 389 | 200 |
| Kiribati - Line | 30 | 0 | 0 | 100 | 281 |
| Kiribati - Phoenix | 0 | 134 | 25 | 393 | 8 |
| Indonesia | 80 | 102 | 112 | 64 | 2 |
| Marshall Is. | 131 | 218 | 176 | 221 | 60 |
| PNG | 20 | 7 | 6 | 1 | 44 |
| Philippines | 0 | 0 | 0 | 0 | 6 |
| Palau | 1,964 | 2,123 | 1,846 | 1,533 | 924 |
| Solomon Is. | 3,365 | 4,649 | 4,022 | 487 | 0 |
| Tonga | 19 | 1,124 | 1,755 | 327 | 1,146 |
| Tuvalu | 18 | 0 | 0 | 2 | 0 |
| Vanuatu | 1,704 | 613 | 604 | 111 | 1 |
| High Seas | 16,126 | 10,166 | 14,901 | 11,662 | 13,198 |
| Total | 24,071 | 20,442 | 24,271 | 16,352 | 16,296 |

Source: SPC Catch and Effort Database, March 2017

Transshipment data is reported by fishing and carrier vessels via WCPFC Transshipment Declarations. The OPRT also collects market state data from fish traders at foreign ports.²⁶⁵ In 2015, Taiwan's longline fleet made 155 high seas transshipments of catches from the WCPFC CA, totalling 12,542 mt. In the same year, Taiwan reported to WCPFC that the fleet made 406 transshipments in-port of catches.²⁶⁶

4.5 Indicators of Operating Costs

No major indications of costs were obtained during interviews. Generally, it is believed that the same issues are facing the Taiwan longline fleet as for Japan and South Korea. While fuel costs are now stable, bait is usually available but sometimes hard to get in desired sizes/species, and good crews are hard to find and retain. For a CT4 class longliner 10 to 15 crew are required, and CT5 and CT6 class vessels need 18-20 (see Box 4.1).

The majority of foreign longline crew are from Indonesia, Philippines and Vietnam.²⁶⁷ They are usually employed using a local agent in their home countries. Foreign crew salaries are reportedly around USD 450 per month – or at least, that is the salary level estimated at being able to retain crew. Bonuses are paid based upon quantity of tuna caught and the level of bonus depends on the type of catch (i.e. fresh, -35°C or ULT). But there are long standing and serious problems around crew agencies taking an extortionately high cut of salaries – a problem that is far from unique to Taiwan or to tuna fisheries. A recent Greenpeace investigation found that the average salary was USD 300 per month, but that after deductions this ranged between USD 100 and 170, averaging out at \$ 0.50 per hour.²⁶⁸ This and several other reports have also documented serious labour abuses on Taiwanese-owned boats.²⁶⁹

Public funding was previously available to assist in attracting Taiwanese to work on the distant water fleet. But it reportedly did not work in recruiting Taiwanese on longliners and the focus has shifted to encouraging employment on purse seiners. In addition, the 2016 Act for Distant Water Fisheries has introduced minimum requirements for hiring of crew effective in January 2017, including a minimum monthly salary, compulsory insurance for crew, and mandatory rest time. Any distant water fisheries operator intending to hire abroad any foreign crew member must obtain permission from the competent authority. If they fail to comply they will be fined between 50 thousand and 250 thousand New Taiwan Dollars (~USD 1,500 to 8,000), and the fishing license may be suspended for up to one year.²⁷⁰ Previously, according to the ILO, the strongest regulation for migrant crew was basic safety training.²⁷¹

²⁶⁵ Chinese Taipei (Taiwan) WCPFC Annual Report – Part 1 2016 (AR1)

²⁶⁶ AR1 2016 for 2015

²⁶⁷ Shen (2013) reports the proportion of migrant workers on Taiwan's DW boats as follows: Indonesia (49.8%), Philippines (25.7%), Vietnam (12.3%), Cambodia (0.4%), and Other (11.8%).

²⁶⁸ Greenpeace 2016

²⁶⁹ Henley 2016; Tierney 2016

²⁷⁰ <https://www.faa.gov.tw/en/LegalsActs/index.aspx>

²⁷¹ ILO 2014

4.6 Corporate Governance and Company Profiles

There are often strong social connections among longline owners in Taiwan.²⁷² Many have families who have known each other for generations and are from the same town or area. Around 50% of owners and most of the captains are reportedly originally from Taiwan's offshore islands such as Liuqiu and Penghu.

The 70-80 vessels of the large scale tuna longline (LTLL) fleet active in the WCPO are controlled by around 30 companies which are members of the Taiwan Tuna Association. Some of the firms involved are quite large and there is evidence of concentration of ownership in the WCPFC Register of Fishing Vessels. While boats are registered as individual legal entities for tax purposes, some owners share the same registered address. For example, 2 companies with 9 vessels each share the same address.

In contrast, the smaller longliners (STLL, vessels of 20-99 GT) are operated by their owners who generally have only one or a few boats (i.e. not big fleets). These are members of the Taiwan Tuna Longline Association. There is a distinction in the Taiwan administrative system between companies owning vessels and individual owners.²⁷³ Some boatowners have 4 or 5, but most have just 1 or 2. These are predominantly family operations.



Weighing frozen billfish in Donggang, Taiwan. Photograph: Mike McCoy

²⁷² See Ta-Yaun Chen 2007, *Taiwanese Offshore (distant Water) Fisheries in Southeast Asia, 1936-1977*. Thesis for the Degree of Doctor of Philosophy Murdoch University.
<http://researchrepository.murdoch.edu.au/id/eprint/652/2/02Whole.pdf>

²⁷³ Akin to 'sole proprietors' in the administrative and tax systems of some other countries.

But the Taiwan longline industry is not limited to boat ownership. Some Taiwanese vessel owning businesses are also involved in fish trading, processing, and cold chain logistics. The following provides snap-shots of selected companies considered to be among the most important Taiwanese players.

FCF

FCF is a large Kaohsiung-based trader active in purse seine and longline fisheries worldwide. The company handles about 600,000mt worldwide. FCF's trade in longline tuna is about 80,000mt per year of which, roughly, 50,000mt is albacore and 30,000mt sashimi grade yellowfin and bigeye.

FCF's involvement in the sashimi trade is generally handled on a commission basis only (i.e. they do not trade on their own account). FCF longline clients include boat owners from Taiwan and China as well as Vanuatu and other flags of convenience. The majority of purchases are done under supply contracts, but are also done on the spot market. As part of its services for longliners, FCF will arrange refrigerated carriers as well as fuel, bait and other supplies to be delivered at sea or in port. FCF also handles albacore purchased from mostly Chinese longliners for the PAFCO plant in Suva, as well as some sales to Bangkok and American Samoa.

Ming Dar Fishery (Vanuatu) Co Ltd

There are a significant number of Taiwanese longliners flagged in Vanuatu that are active in the WCPO. Vanuatu longliners with Taiwanese owners also operate in the EPO, and Vanuatu is a member of IATTC as well as WCPFC. Commercially, there is no association representing these vessels whose primary market is Japan. Rather than an association, the 31 Taiwanese owners covering 49 Vanuatu-registered but Taiwan-owned vessels are represented by Taiwanese Ming Dar Fishery (Vanuatu) Co. Ltd. Although not strictly an association, Ming Dar fulfills an association role in that it represents the interests of various vessel owners.

Ming Dar's principal sits on the Vanuatu delegation to annual WCPFC meetings. Ming Dar also acts as a representative of Taiwanese owned, Vanuatu-flagged vessels with respect to membership in OPRT. As discussed in Chapter 1, the OPRT has been used by Japan to limit the flow of frozen sashimi-grade tunas from non-Japanese vessels. This is accomplished through commercial arrangements and unofficial assistance to producing countries, especially in the form of support in developing their own domestic markets for sashimi tuna. According to an industry source, Ming Dar has agreed with Japan to limit the amount of frozen bigeye that Vanuatu flag vessels may export to Japan.

Yuh Yow Fishery Co. Ltd

Yuh Yow is part of a large family-owned fishing company founded by a major participant in the development of Taiwan's distant water tuna industry in the Indian and Pacific Oceans. In the WCPO longline fishery Yuh Yow operates 19 CT4 and CT5 fibre reinforced plastic (FRP) longliners, but only 4 are Taiwan flag. The other 15 vessels are operated under the flags and in companies it has set up in Vanuatu, Samoa, Cook Islands, and Kiribati.²⁷⁴

Of Yuh Yow's current longline fleet, 6 boats have ULT capacity, while the remainder are equipped with -35°C freezers. The company and its affiliates and subsidiaries also own several purse seiners in the WCPO purse seine fishery, including three purse seiners built in 2014 (1)

²⁷⁴ Interview with company official, March 2017

and 2015 (2) operating under Solomon Islands flag (Southern Seas Logistics Co Ltd). Like many Taiwanese fishing firms, the company describes itself as a harvester only, and is not involved in downstream processing.

Yuh Yow has operated or now operates in several Pacific Island countries. Until 2015 it had a small base in Port Vila, Vanuatu (Yuh Yow Marine Vanuatu Co. Ltd), which closed because of poor fishing, lack of good logistics, and other problems. That same year it created Apia Deep Sea Fishing Co Ltd and opened a small base and export operation in Apia, Samoa. The company's Solomon Islands operation, South Seas Investments Ltd, has been operating for many years, first in Tulagi and later Honiara. The company's small base in Honiara was engaged in the export of fresh sashimi-grade fish sent by air to Australia and elsewhere, but that activity ceased in 2016. The company is now involved only in transshipment of frozen tuna by container or carrier as well as a shipping agency business aimed at Taiwanese and Chinese longliners.

Lung Soon Fishery Co Ltd (LS)

Lung Soon Fishery Co Ltd is the fishing arm of the Lung Soon Ocean Group, a family-owned fishing, processing, and retail firm based in Kaohsiung. The company currently operates 14 large ULT tuna longliners in high seas areas of the WCPO and EPO.²⁷⁵ Other companies in the Group are engaged in squid and saury fisheries (one 1,200 GT vessel), and the WCPO tuna purse seine fishery (two PNG-flagged purse seiners).

The company operates its own ULT 5,000 GT refrigerated carrier, and has a 2,000 mt ULT cold store and food service processing facility in Kaohsiung. Its retail arm in Taiwan consists of several sashimi and sushi restaurants operating under the Soon Yi brand in Kaohsiung, Taipei and other major cities. A marine products trading company owned by the company operates out of Seattle, USA, and includes a processing factory for US-caught fish in Astoria, Oregon.

The integrated nature of Lung Soon's business is atypical of most Taiwan family-based fishing operations. The processing operation utilizes bycatch as well as tuna, and is venturing into e-commerce in Taiwan through the company website.

4.7 Market Dynamics

Little information is available on Taiwan's market for tuna sashimi. It was estimated at around Taiwan 5,000 to 8,000 mt in the mid-2000s and in 2010.²⁷⁶ The Japanese fast food market is considered to be mature in Taiwan. Sushi remains a popular item in the foodservice sector, and is led by the Sushi Express Group chain, which has 164 outlets.²⁷⁷ In 2014 Sushi Express was in 26th place in Taiwan's general foodservice sector with 0.3% value share and 15th place in fast food with 1.2%. It imports around 65% of its raw material (e.g. salmon from Norway) and the rest is sourced locally (e.g. tuna from Kaohsiung).²⁷⁸ It processes in a central kitchen to ensure standardization across outlets

²⁷⁵ Interview with company official, March 2017

²⁷⁶ Shima and Kawamoto 2008; OPRT 2010

²⁷⁷ Passport 2017e

²⁷⁸ Passport 2015

Interestingly, while chains dominate the fast-food sector, it is only in fish fast food that independent operators appear to perform better than chains, with 22.7% growth between 2011 and 2016, and a forecast for year-on-year growth into 2021. But the value of this market is minuscule compared to meat, baked and 'Asian' food outlets (which is believed to include sushi) at 0.1% of total fast food sales in 2016.²⁷⁹

4.8 Implications for Pacific Island Countries

- Taiwan's flagged and beneficially owned boats (i.e. using FOC) are the largest component of the WCPO longline fleet.
- Some Taiwanese firms have good relationships with some PIC governments. But the history of Taiwan's longline industry as a specialized fishing fleet with no or minimal shore based investment outside of Taiwan means there has been limited interest in onshore investment in PICs. These attitudes will probably continue to dictate the Taiwan industry's approach to such investment, at least under current economic and regulatory conditions.
- It is worth noting that there are considerably fewer vessels on the FFA register than actively fished in the WCPFC-CA in 2015 (126 vs. 1,382). This is presumably because a large number of vessels, especially STLL, are continuing to fish mostly high seas areas and not FFA EEZs.
- The predominance of <100 GT vessels in Taiwan's WCPO fleet can provide opportunities for shore-based servicing if such services are connected with unloading for processing or transshipment.
- In spite of the large number of vessels active in the WCPO, employment opportunities for Pacific Islanders onboard are limited owing to (1) competition from and Taiwanese preference for crew from Indonesia, Philippines and elsewhere in Southeast Asia, and (2) limited leverage to require crewing as a condition of access because of Taiwan's reliance on fishing in the high seas.

²⁷⁹ Passport 2017f

5 SOUTH KOREA'S DISTANT WATER TUNA LONGLINE INDUSTRY

5.1 Introduction

The Korean longline fishery started in the Indian Ocean in 1957 with one boat, began operations in the Pacific Ocean the next year, and has been in the Atlantic Ocean since 1967.²⁸⁰ South Korea's global longline fleet grew rapidly, peaking in 1980 with 472 boats, dropping to 276 in 1990, 197 in 2000 and stabilizing at 149 and 145 in 2010 and 2015 respectively.²⁸¹ The decline is explained primarily through growing costs (fuel, labour) and declining prices, mainly on the Japan sashimi market.²⁸² The 60th anniversary of the longline industry was being celebrated during the country visit for this report.

The South Korean longline fleet was developed as an export-oriented industry to supply Japan's rapidly growing and profitable sashimi market. The fleet's development was part-financed by Japanese trading companies (*sogo shosha*) to whom the fleet provided a diversified source of fish for their Japanese clients.²⁸³ It was also supported by the active intervention of the 'developmental state', especially under the Park Chung-hee regime (1963-79), which provided a wide range of subsidies to support rapid industrialization, which encouraged the development of family-controlled conglomerates called *chaebols* such as Dongwon Industries, Hyundai and Samsung. For example, in late 2004 the Dongwon Group was split into two entities (financial and food) by its chairman who gave his two sons control of each new group's holding companies.²⁸⁴

The combination of foreign finance and domestic supports contributed to making South Korea among the leading industrial longline fleets in the world, competing directly with Japanese boats. It is worth noting that the South Korean industry was not always a 'follower' – it was the first to use deep longlines in the Pacific and Indian Oceans in the early 1970s, quickly imitated by the Japan fleet.²⁸⁵

5.2 National Regulation and Industry Support

The industrialization of South Korea's fishing fleets benefitted historically from an extensive programme of subsidies. Direct subsidies were provided at the national and local scales and made up around 95% of total dispersals in 1999 of around USD 884 million,²⁸⁶ while indirect subsidies in the form of reduced interest rate loans made up the remainder. Tax free gasoil was the largest item, accounting for 40% of the total in 1999.²⁸⁷ A study commissioned by the EU found that total subsidies paid by South Korea to the fisheries sector in 2014 were USD 1.7 billion, 20% higher than in 2009; subsidies to the marine capture sub-sector (all species, all

²⁸⁰ AR Part 1 WCPFC -SC12-AR/CCM-12

²⁸¹ Lee 2016

²⁸² Lee 2014

²⁸³ Comitini 1987; Haward and Bergin 2001; Chang et al. 2010; multiple interviews with Japanese government and industry, 2006.

²⁸⁴ *The Hankyoreh*, 'Cross-shareholdings and inheritance deals facilitate murky wealth transfer', 17 May 2006. The chaebol system is currently under political scrutiny in South Korea and corruption, involving bribes paid by Chaebols to the Park Geun-hye regime, who was impeached in March 2017 and is currently standing trial.

²⁸⁵ Ward and Hindmarsh 2007

²⁸⁶ Converted to US dollar from 1 trillion 16.3 billion won using end of year (1999) exchange of USD1 to Won 1,150 are available here: <https://www.federalreserve.gov/releases/H10/19991206/>

²⁸⁷ MyongSopa and MoonBae 2002

gears) constituted over 90% this total between 2009 and 2014. In sum, subsidies amounted to around USD900 per tonne for South Korea's marine capture fisheries in 2013.²⁸⁸

South Korea has been very active in its opposition to a ban on fuel subsidies in WTO debates on fisheries subsidies disciplines,²⁸⁹ which indicates that fuel supports remain important. This is confirmed in a recent study of subsidy payments to the Korea-flagged tuna fleet (all gears) in the WCPO *alone* – fuel subsidies were estimated at USD 79.03 million and total non-fuel subsidies were USD 157.51 million.²⁹⁰

The longline fleet are members of the Korean Overseas Fisheries Association (KOFA) which acts on behalf of Korea's overseas fishing operations.

Recent development in domestic fisheries regulation appear to have been, in part, triggered by the EU 'yellow card' under its IUU Regulation. While the EU market is not of major direct importance – it is crucial indirectly for the Korean purse seine fleet's supply of canning grade tuna to Bangkok and directly in regard to exports of lower grade sashimi products to the EU. Two major initiatives should be noted. First, Korea created a new Fishery Monitoring Center in Busan, which is a state-of-the-art e-monitoring system generating real time reporting on the fleet. Second, it now provides detailed and complete operational fishery data to WCPFC/SPC, and is the first DWFN to do so. With these and other moves, South Korea has emerged as a leading good citizen in global tuna fisheries.

There was some concern among Korean boat owners that, following recent revelations of poor treatment of workers in the global fishing industry (e.g. in Thailand), 'crew rights is a new big challenge', and a limit to working hours in particular would be 'a big burden, especially for small and medium longliners'. This issue is likely to remain in the spotlight given labour scandals on Korean-owned chartered boats in New Zealand waters and National Human Rights Commission of Korea reports of abuses of migrant workers in the Korean distant water fleet.²⁹¹ However, since 2012 the Korean government has rolled out a number of reforms to try to address the problem, including notable amendments to the Distant Water Fisheries Development Act.

5.3 Fleet Description and Status

The Korean longline fishery is entirely comprised of large distant water vessels with ULT capacity. There are no smaller fresh or frozen tuna longline vessels operating in the Korean EEZ or adjacent waters in the North Pacific. In 2015, the global Korean tuna longline fleet consisted of 148 vessels, steadily decreasing from 202 in 1999, and 276 in 1990.

The great majority of the Korean fleet was built/bought new, with only 22 out of 117 having previous owners/flags (14 Korea, 6 Japan, 2 Taiwan). KOFA data indicate 95 % of the current fleet of 105 vessels is however older than 26 years (94 = 26-30 years, 6 = 31+ years), with three 20-25 years, and 2 at 16-20 years. There are reportedly no plans to build new vessels due to the high construction cost not being justified by current or future economic returns. No new vessels have been built since 1991.

²⁸⁸ MRAG et al. 2016

²⁸⁹ TN/RL/W/245, Communication from the Republic of Korea, 24 November 2009

²⁹⁰ Sumalia et al. 2014

²⁹¹ Stringer et al. 2015; Seafish 2015a

Despite the age of the fleet, one view was that, given continuing diligent maintenance and quality timely repairs as necessary, there was still considerable working life left in the fleet.²⁹² But clearly this is not for the long-term and with no succession plan in place the Korean longline industry may fall behind that of China, where considerable recent investment has been made.

All vessels on the WCPFC RFV are large, with 405 GT average (ranging from 353 to 488 GT), an average length overall of 48.8 metres (ranging from 32 to 51 metres), and fish hold capacity averaging 400 mt (range 239-574 mt). The vessels have slurry, blast and freezing capacity to -60°C, are able to handle 8-10 mt of fish per day, with ULT storage of the frozen product. High quality freezer capability and associated engineering maintenance skills are key features of the operations



Busy Busan port area near Gamcheon tuna port. Photograph: Antony Lewis

The WCPO vessels originally targetted albacore and operated from overseas bases, but since 1999, with enhanced freezer capacity and increasing vessel size, have operated from home base (Busan) in distant water mode, transshipping catch in selected ports, within EEZs and on the high seas (see below). (The increasing vessel size of boats in the Korean fleet built up until 1991 obviated the need for foreign bases.) There is considerable processing of high quality ULT product prior to export (see Section 2.2), which occurs in the home ports, mostly Busan, and some landings are for domestic consumption.

The number of vessels actively fishing in the WCPFC-CA has been recently stable in recent years, following a steep decline during the 1990s and 2000s from a peak of 220 in 1991.²⁹³ During 2011-13, vessel numbers were between 124-126, and in 2015, the active vessel numbers in the WCPO (and EPO), were 98, a correction from the provisional 2016 Annual Report Part 1 figure (85), and 97 in 2016.²⁹⁴ This is likely to be similar in 2017, with 113 vessels potentially active. The Korean Overseas Fisheries Association suggests 105 vessels were operating in the WCPO (and EPO) in 2017. The current WCPFC RFV (Register of Fishing

²⁹² Sajo maintenance section, Busan, March 2017.

²⁹³ There was an earlier peak of 270 in 1974, a dip to 94 in 1985, then the 1991 peak; numbers during the period 1992 to 2013 fluctuated between 184 and 108 (SPC Fisheries Yearbook).

²⁹⁴ NIFS data from electronic reporting system (ERS).

Vessels) shows 117 Korean longline vessels authorized to fish in the WCPFC Convention Area, and the FFA Vessel Register records 95 vessels licensed to fish in FFA members' EEZs. Current details will be available in the 2017 AR Part 1 with 2016 data.

5.4 Longline Catch, Effort and Transshipment

The global catch of the Korea longline fleet vessels was 38,439 mt in 2014²⁹⁵ and may have declined slightly since that time. The great majority of Korean longline activity now occurs in the Pacific Ocean, where more than 80% of longline vessels fish, with around 20 vessels in the Indian Ocean, and less than 5 vessels in the Atlantic. Although there is no Korean government regulation in place that restricts vessel movement between oceans, seasonal shifts between ocean areas no longer occur, largely because of the increased operational costs in doing so. Some vessels recently relocated from the Indian Ocean to the Atlantic, and WCPO vessels have fished more frequently in the EPO since 2016, and more so in 2017 (see below). Other vessels (11) were also registered with the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) to fish for southern bluefin tuna, which are included in the vessels above.

WCPO fishing operations

Korea longline catch in the WCPO has declined since the 2000s, in line with the fall in vessel numbers. Total annual WCPFC-CA catches have been in the range of 19,000 mt to 28,000 mt in the last five years, 2011-15 (see Table 5.1), which is well below the historical high of 54,599 mt in 2002.

The catch is dominated by bigeye and yellowfin, the target species (95% on average of the total tuna caught in 2011-15), with only minor catches of albacore (Table 5.1). The 2015 catch of albacore has however been the highest for several years. The yellowfin catch seems liable to more inter-annual fluctuation, whereas the bigeye catch as the primary target species is more stable, but subject to the reducing quota established under CMM 2012-01 (see Section 1.2.1).

The target species (bigeye and yellowfin) are transhipped gilled and gutted, whereas albacore are traded whole round. There appears to be increased demand for high quality albacore in the main sashimi market – Japan (see Section 2.2). The retained catch of non-target, associated and dependent species, which is dominated by blue marlin and swordfish, comprises 15-20% of the catch,²⁹⁶ which is lower than levels seen in coastal longline fisheries. Recorded swordfish catches declined in 2014 and 2015, the two most recent years.

²⁹⁵ KOFA website

²⁹⁶ Republic of Korea Annual Report Part 1, 2016, WCPFC-SC12-AR/CCM-12

Table 5.1: South Korea longline fleet - total tuna catch in WCPFC-CA by Species (2011-2015)

| Year | Yellowfin | Bigeye | Albacore | Total |
|------|-----------|--------|----------|--------|
| 2011 | 7,881 | 15,282 | 670 | 23,833 |
| 2012 | 7,832 | 18,823 | 1,264 | 27,919 |
| 2013 | 5,716 | 12,818 | 1,155 | 19,689 |
| 2014 | 8,642 | 12,779 | 766 | 22,187 |
| 2015 | 10,783 | 10,785 | 1,327 | 22,895 |

Source: SPC Catch and Effort Database, Mar 2017

Korean longline vessels are large ULT vessels, storing sashimi-quality fish at temperatures around -60°C. Typically 350-500 GRT in size, they undertake trips of twenty months or more in length, with refuelling, bait replenishment and transshipment occurring at sea. Around 1-1.5 transshipments per year is typical.²⁹⁷ With this distant water mode of operation and the ULT freezing of catch, trips are typically 18-24 months, before return to Busan, the home port of all vessels. Vessels are bunkered and provisioned at sea or in port.

The vessels deploy mostly ~3,500 hooks per set, and 20-30 hooks per basket; the line is set and hauled around the clock, with just 3-4 hours soak time. The preferred bait is squid, but at increasing cost; bait may account for 10% of total operating costs²⁹⁸ - mackerel and sardines are increasingly used, with even some recycling of bait after each set.

The record of total effort over the last five years in the WCPFC-CA is detailed in Table 5.2. This represents a 40% decline in days fished. However, the productivity of those days seems to have increased given the relatively stable total catch (Table 5.1).

Table 5.2: South Korea longline fleet - total days fished in WCPFC Convention Area (2011-2015)

| Year | Total Days Fished | No. of Hooks (x 10 ³) |
|------|-------------------|-----------------------------------|
| 2011 | 31,457 | 75,715 |
| 2012 | 33,400 | 75,060 |
| 2013 | 24,203 | 62,852 |
| 2014 | 22,086 | 55,759 |
| 2015 | 18,910 | 32,551 |

Source: SPC Catch and Effort Database, March 2017; WCPFC AR-1 - Korea 2016

Korean longline catch is regularly **transhipped** to carrier vessels, either in port, at sea within EEZs, or on the high seas. All Korean vessels are authorized to tranship on the high seas. During 2015 total transshipment of Korean longline catches from WCPFC area was 13,658 mt (all species). For yellowfin, bigeye and albacore caught in the WCPFC-CA the volume transhipped in 2015 was 11,729 mt, which is around 70% of total tuna catch – the remainder

²⁹⁷ Based on WCPFC AR-1 – Korea 2016; in 2015, 84 LL vessels conducted 123 transshipments

²⁹⁸ KOFA business analysis presented 27th March Seoul

might be returned to the home port (Busan) onboard the vessel. This constituted a total 95 longline transshipments of catches in the WCPFC area: in port (x15); EEZ (x17); and high seas (x63). The volume of fish moved (all species) at this points correlates closely to the number of transshipments: in port – 2,387 mt (17%); at sea within an EEZ - 2,470 mt (18%); and on the high seas - 8,800 mt (65%).²⁹⁹

South Korea provides detailed reports of **catches of species of special interest**. Shark catches of key species were recorded by the vessel captains and exceeded 200 mt in 2015, comprised mostly of blue and thresher sharks, with others making up 128 mt. Oceanic white tips (327) and silky sharks (933) were reported released in accordance with CMM 2011-4 and 2013-08. All Eastern Tropical Pacific species caught by Korean longliners were reported released unharmed and included 34 leatherback turtles, 6 olive ridley and 6 others not positively identified. No bycatch of seabirds was reported, as expected at the tropical latitudes fished. No whale sharks were taken by longline but significant numbers were taken by purse seine vessels (21 in 2015) and released.

The Korean longline fleet targetting bigeye (and yellowfin) has traditionally fished in an equatorial band from 160°E to as far as 120°W in the EPO, and between 10°N and 15°S, where bigeye catch rates have been high, seemingly reflecting the species' adult biomass distribution. Table 5.3 shows the spatial distribution of catch by EEZs and the high seas for the years 2011-2015. Prior to 2014, most of the catch was taken in the high seas (> 70%) with significant but smaller amounts in Solomon Islands and Kiribati EEZs, reflecting access agreements in place. In 2014, this situation reversed with 60-70% of catches originating from the three Kiribati EEZs.³⁰⁰ This appears to be related to improved access arrangements between Kiribati and Korea, during which time a number of Korean purse seiners switched to Kiribati flag.

Table 5.3: Estimated Korea longline fleet catch by area (EEZs and high seas) for 2011-2015

| Area | 2011 | 2012 | 2013 | 2014 | 2015 |
|--------------------|---------------|---------------|---------------|---------------|---------------|
| Cook Islands | 0 | 0 | 0 | 0 | 3 |
| Fiji | 100 | 0 | 50 | 0 | 2 |
| Kiribati - Gilbert | 2,012 | 2,810 | 1,165 | 3,774 | 11,245 |
| Kiribati - Line | 1,948 | 2,794 | 1,966 | 3,199 | 2,456 |
| Kiribati - Phoenix | 949 | 1,100 | 703 | 7,249 | 1,617 |
| Solomon Is. | 497 | 769 | 1,095 | 1,244 | 1,113 |
| Tuvalu | 388 | 115 | 68 | 1,043 | 573 |
| High Seas | 17,938 | 20,330 | 14,642 | 5,676 | 5,884 |
| Total | 23,832 | 27,918 | 19,689 | 22,185 | 22,893 |

*2015 data incomplete but assumed to be representative

Source: SPC Catch and Effort Database, March 2017

²⁹⁹ WCPFC AR-1 - Korea 2016

³⁰⁰ relative catch by these EEZs - Gilberts, Phoenix, Line is not available

In 2016, however, due to a combination of deteriorating access conditions and spatial shifts in favourable fishing conditions,³⁰¹ the situation may have reversed again, with the majority of the WCPO catch being taken once again in high seas areas, accompanied by some movement into the EPO. Final figures for 2016 are not yet available but are expected to confirm this spatial shift in effort.

The situation is likely to change again in 2017, with the introduction of the PNA VDS scheme so far being unsubscribed by distant water fleets who continue to fish outside EEZs for the time being, and the situation in Kiribati, which has opted to stay out of the VDS and establish its own Catch Management Scheme (CMS) with a reported levy of \$700 per mt which has gained no traction with distant water fleets. No parties attended recent auctions for VDS shares, although one operation in Kiribati receives reduced rates since an onshore joint venture plant has been established.

It remains to be seen how this situation will play out, but some voices in the Korean industry feel that a viable fishery could be maintained without EEZ access, provided the EPO remains open and bigeye longline quotas in the WCPO and EPO are not further reduced.

5.5 Indicators of Operating Costs

Operating cost data was provided by KOFA and is reproduced in Table 5.4. These data are not audited and thus may not be fully representative (e.g. it may not include fiscal incentives), but they are useful indicators of proportions in this fleet's cost structure. Fuel and labour costs together make up 60% of total operating costs, and there is an increase in bait costs, currently around 11%. Ageing of crew is an ongoing problem. The ILO reports that, across the South Korean fishing industry as a whole, over one third of the 171,000 Koreans employed as fishers were 60 years old or more.³⁰² New recruits between 1980 and 2010 numbered less than 19,000, making it difficult to find the required number of nationals to crew the Korean fishing fleet.

Around 70% of crew working on Korea's distant water fishing vessels are migrant workers.³⁰³ Deck crew are mostly Indonesian (70-80%), with others from a range of nationalities including Vietnam, Philippines and Myanmar. There are few Pacific Island crew except where this may be encouraged as a condition of access agreements (e.g. Kiribati). The average trip port-to-port is 16-18 months or 18-24 months (a maximum of 24 months). Korean and foreign crew stay *all* trip with the reported exception of Pacific Island crew. The industry is seeking to employ more foreign crew because of the difficulty and relative cost of recruiting young Koreans given the dangerous, uncomfortable and isolating nature of work on longliners. There is, however, resistance from the Korean fisherman's trade union to increasing the proportion of foreign crew.

Access fees are included in 'Others'. Costs here reportedly depend upon the ratio of high seas and Kiribati EEZ catch versus access to the Tuvalu and Solomon Islands EEZ. The Korean industry has a long-term access agreement with Kiribati where each vessel reportedly pays \$35,000–40,000 a year, including all fees (observers, etc.). This explains why most Korean longliners have a Kiribati licence.

³⁰¹ KOFA staff pers.com

³⁰² ILO as cited by Seafish 2015a

³⁰³ UN General Assembly 2015

However, fish prices have remained relatively flat in the main market, Japan whereas the Yen has depreciated against most major currencies, including the US dollar and Korean won (see Chapter 1 and below). This is borne out in Table 5.4 in terms of the Korean fleet struggling to maintain profitability in recent years, in the face of declining catches and increasing costs, with 2012 the last year when the average vessel was profitable. The KOFA data suggest that that 2016 was also profitable but during round-table discussions it was indicated that the showing of profit in 2016 was an error because the 2016 sales data in Table 5.4 was based on 18 months of catch.

Table 5.4: Business analysis of an ‘average’ South Korean longliner, 2012-2016

| | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|------------------|------------------|------------------|------------------|------------------|
| Sales | 3,602,125 | 3,440,644 | 2,565,398 | 2,673,172 | 3,340,707 |
| Operational Costs | 3,314,919 | 3,696,309 | 2,900,571 | 2,695,364 | 3,266,389 |
| Labor Cost (sub-total) | 613,529 | 775,429 | 593,237 | 683,079 | 891,178 |
| <i>Labor Cost (Korean)</i> | <i>290,948</i> | <i>439,871</i> | <i>300,459</i> | <i>328,807</i> | <i>474,244</i> |
| <i>Labor Cost (Foreign)</i> | <i>295,638</i> | <i>244,259</i> | <i>262,313</i> | <i>312,598</i> | <i>333,745</i> |
| <i>Labor Cost (retirement allowance, paid leave expenses)</i> | <i>26,942</i> | <i>91,299</i> | <i>30,465</i> | <i>41,674</i> | <i>83,189</i> |
| Marine Gas Oil Expenses | 1,364,924 | 1,395,144 | 1,292,385 | 1,144,482 | 1,095,708 |
| Bait Expenses | 338,111 | 402,175 | 298,674 | 255,093 | 326,963 |
| Employee Benefits | 101,848 | 217,497 | 90,913 | 100,278 | 110,363 |
| Fishing Gear Expenses | 64,306 | 105,172 | 50,621 | 49,592 | 53,853 |
| Fixtures & Supplies Expenses | 106,607 | 47,115 | 122,455 | 114,297 | 137,405 |
| Repair & Maintenance Expenses | 156,489 | 482,053 | 154,784 | 148,527 | 135,741 |
| Insurance Fee | 33,015 | 55,475 | 24,717 | 18,774 | 106,899 |
| Freight Charge | 208,516 | 60,279 | 92,677 | 107,446 | 137,819 |
| Others | 143,133 | 155,970 | 157,091 | 73,796 | 183,743 |
| Depreciation | 184,442 | - | 23,017 | 0 | 86,718 |
| Profit/ loss | 287,206 | -255,665 | -335,173 | -19,939 | 74,318 |
| Fishing Period | 2011.03-2012.11 | 2012.12-2014.08 | 2013.07-2014.12 | 2014.03-2015.10 | 2014.11-2016.08 |
| Catches(mt) | 598 | 683 | 451 | 443 | 517 |
| Price per mt (USD) | 6,023 | 5,031 | 5,684 | 6,027 | 6,461 |
| Annual Profit (USD) | 181,393 | -153,399 | -236,593 | -13,657 | 42,876 |

Source: KOFA (2017) ‘Korean Longline Fisheries & Challenges’

5.6 Corporate Governance and Company Profiles

Four companies/groups dominate the ownership of Korean longline vessels on the WCPFC RFV, as shown in Table 5.5 below. All vessels registered in Busan (Gamcheon) port. The Sajo group (51 longline vessels), Dongwon Industries (15), Dongwon Fisheries (12) and Silla (11) make up 75% of the fleet numbers. However, unlike the South Korean purse seine fishery where three large companies dominate completely, many smaller companies own and operate longline vessels.

The Sajo Group started out in tuna longlining in 1973 and is now reportedly the ‘world's largest (sashimi) tuna longline fleet’ with boats operational in the Pacific, Indian and Atlantic oceans. It is also highly diversified, active in other types of deep sea fishing, a wide variety of processed seafood products (including 14% volume share of the Korean market for canned tuna³⁰⁴), cooking oils and flour milling.³⁰⁵

While a smaller relatively player in the Korean longline industry, Dongwon Industries is the most powerful firm of the four. As noted earlier, *chaebol* (family-controlled conglomerates) wield considerable political and economic power in South Korea, and Dongwon Industries is a leading example of this type of corporate governance³⁰⁶ and is part of a complex network of companies.³⁰⁷ It is South Korea's biggest fishing entity and is diversified into canning, where it dominates the local market for canned tuna (72% volume share³⁰⁸) and owns the number one brand in the USA – StarKist.

Dongwon Fisheries is not to be confused with Dongwon Industries and is an entirely independent entity. It started out tuna longlining and trawling in 1970. Its boats are concentrated in the WCPO, although it also has at least two longliners operating in the Indian Ocean.³⁰⁹ Dongwon Fisheries owns two tuna processing factories in Busan, producing sashimi grade tuna products for Japan, two cold stores (one at 21-25°C and one ULT), and a breadcrumb processing plant to supply their own fish products and for sale to other firms. It also has two diversified fish processing factories in China and a cold store in New Zealand, both joint ventures with Sanford (the New Zealand firm).

Silla Group started out in 1967 as an import-export business and began trawling in the North Pacific Ocean in the early 1970s. It has been a specialized deep sea fishing company ever since, beginning its first tuna longlining operation in 1988 in the WCPO.³¹⁰ It owns a sashimi restaurant in Seoul and also has investments in the distribution of steel products.

Dongwon Industries, Sajo/Oyang, Silla and Hansung also operate purse seine vessels in the WCPO, where Korea is currently the best performing fleet. Silla has joint ventures in purse seining in Ghana (since 2002), Kiribati (2011) and PNG (2013). Dongwon Industries and Sajo also operate tuna canneries based in South Korea. Some of the larger Korean companies also operate other types of distant water vessels in various ocean areas (e.g. demersal trawl, squid jigging, saury stick-held dip net), utilizing overseas bases and receiving strong support from KOFA.

³⁰⁴ Lee 2014

³⁰⁵ See: <http://www.sajo.co.kr/eng/company/sajoIntro.asp>

³⁰⁶ Jae-chul Kim founded the conglomerate in 1969 and owns 24.5% of Dongwon Enterprise, a holding company of Dongwon Group, alongside his son and successor, Nam-jung Kim, who owns 68%. See: <https://coffmanlawfirm.com/wp-content/uploads/2017/05/Packaged-Seafood-Affiliated-Foods-Second-Consolidated-Amended-Complaint-REDACTED-05.08.2017-1.pdf>

³⁰⁷ For a snapshot of its interests see: <https://www.dongwon.com/eng/content/04010100>

³⁰⁸ Lee 2014

³⁰⁹ See: <http://www.dongwonfish.co.kr/eng/about01.php>

³¹⁰ See: http://www.sla.co.kr/eng/index_e.htm

Table 5.5: Korean companies operating longline vessels, with vessel numbers

| Company/group | No. vessels |
|--|-------------|
| Sajo Group <i>Sajo Industries (34), Sajo Seafood (4), Sajo Oyang (7), Sajo Daerim (6)</i> | 51 |
| Dongwon Industries | 15 |
| Dongwon Fisheries | 12 |
| Silla Co. | 11 |
| Daehae Fisheries | 8 |
| Kyung Kang | 6 |
| Agnes Fisheries (4) Hangsung Enterprises (4) | 8 |
| GoGo Fisheries (3) 3T Ocean (3) | 6 |
| Namgung Tuna | 2 |
| Sojin | 1 |
| Total | 120 |

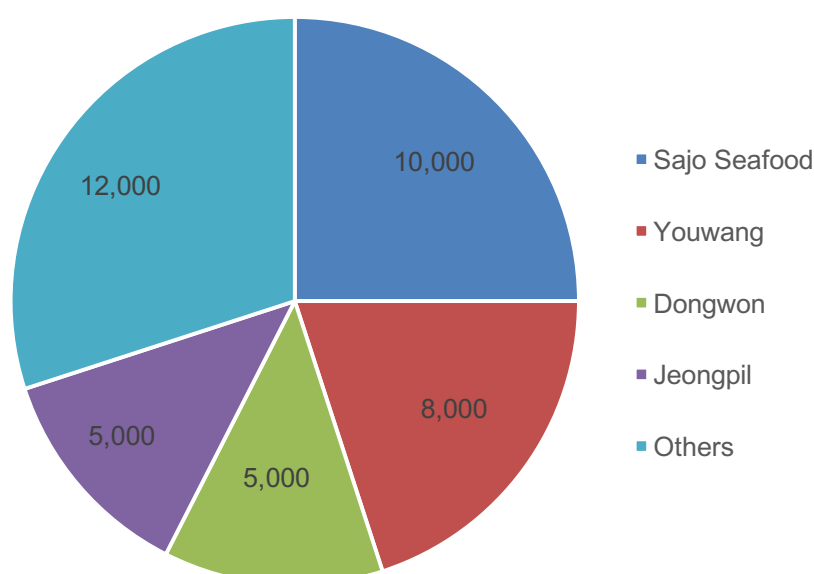
Source: WCPFC RFV (19 March 2017) and company interviews, March 2017

5.7 Market Dynamics

Japan remains the main market for Korean sashimi tuna, accounting for approximately 70% of Korean frozen (sashimi quality) exports.³¹¹ Virtually all high quality tuna intended for export is processed and packed at ULT cold storage plants in Busan port, following grading, skinning and slicing. Four companies constitute 70% of domestic processing of tuna sashimi products – 28,000 mt of a total 40,000 mt (see Figure 5.1). About 10% of the total catch is landed direct in Japan ports, rather than in Korea, where it is subject to a small import tax (3.5%).

³¹¹ Interview, Korean industry representatives, May 2010.

Figure 5.1: Tuna sashimi production in South Korea



Source: Lee 2014

At Sajo CS, which accounts for nearly half of the production for export,³¹² the current product breakdown (April 2017) was 60-70% loins, 20-30% blocks of various shapes and 5% saku blocks. This breakdown indicates an increase in the share of loins and decrease in saku compared to 2010. Product destined for EU markets was generally vacuum-packed. Red meat and off-cuts are also processed into by-products (i.e. petfood, fish paste) and a small amount of albacore (~1,600t) is believed to be canned in the Busan area and subsequently exported.

Seventy per cent of the product landed in Busan is re-exported, with 70% of these exports destined for Japan, with most of the balance to the US, the EU and China. Total exports of longline fish in 2014 (all oceans) comprised 23,146 mt, worth USD 178 million.³¹³ This represents a decrease in both volume and value since 2010 (29,360 mt, USD 300 million). It is assumed tuna of sashimi quality comprises the great majority of this, from fleets of all longline fishing companies and oceans. It is not known how much of this is WCPO fish, but it is assumed to be close to 20,000 mt or ~ 80%.

Korean exports of tuna sashimi products are a significant proportion of the globally dominant Japan sashimi market. South Korean product is acknowledged as high quality and as such attracts strong demand, second only to Japan ULT longline fish, and commands corresponding higher prices than competing Taiwan and Chinese product. The product, as noted, is processed and packed, with loins dominating. Sales are made to a number of buyers in Japan, but two companies are reported to dominate purchases –Toyo Reizo (Mitsubishi) and Sojitz/Try (see Section 2.2.5).

³¹² Supply from 53 vessels globally, with 48 in the WCPO.

³¹³ KOFA website 2017.



Shaving loins in -60°C room in Busan. Photograph: Antony Lewis

The market is price sensitive with little elasticity, and some control of the market by the buyers who usually act in concert to maintain stability. With the decline of the Yen in value, actual returns to Korean exporters have been decreasing.

The relative Korean share of the market is reducing along with declining catches, whilst supplies from Taiwan and particularly China have been increasing. If the total sashimi market for bigeye and yellowfin for Japan was 243,000t in 2014,³¹⁴ then Korean imports may now represent less than 20% of that market.

The lower quality and lower value EU sashimi market became more accessible to Korea with the free trade agreement (FTA) in 2011 and continues to grow. The EU MFN tariff for frozen tuna 'fillets' (which includes ULT sashimi grade blocks) is 18%, but with the FTA this was reduced to 3% for South Korean exporters.³¹⁵ There is an apparent preference in the EU for yellowfin (sashimi and steaks) over bigeye because of the better colour stability of second grade fish and the lower incidence of blood spotting. Little information is available on the relatively small volume of exports to the US and more recently, China.

The remaining 30% of landed (tuna) product is directed to domestic sashimi consumption, with billfish and other by-catch also going to local buyers. One estimate of domestic consumption of longline caught tuna suggests five-fold growth from 3,000 mt in 1990 to 15,000 mt in 2008.³¹⁶ The overall figure of 10-15,000 mt for local sashimi consumption is

³¹⁴ T Kawamoto, Infomark presentation 2016

³¹⁵ 'Free trade Agreement between the European Union and its Member States, of the one part, and the Republic of Korea', *Official Journal of the European Union* L127, Volume 54, Legislation 14 May 2011

³¹⁶ Lee 2009

accepted by industry players, but is believed to include billfish and perhaps small amounts of other species (e.g. Pacific bluefin) formerly taken in the mackerel fishery.³¹⁷ South Koreans are significant consumers of sushi and sashimi and there are reportedly 'thousands of sushi restaurant chains varying in size and budget ... [and] the number of restaurants keeps growing'.³¹⁸ Supermarkets sell packaged sushi and prepared or semi-prepared chilled fish (e.g. tuna steaks, fish cakes) to attract consumers who are increasingly seeking convenience in the context of an increase of double-income households, which has reduced time available for cooking.

Nonetheless, a 2012 survey of consumer seafood purchasing preferences found 41% of Korean's favouring traditional markets; although this is closely followed by 39% who prefer buying at supermarkets. (The South Korean supermarket sector has exacting quality standards and the 'shopping experience' is world class.) The latter figure is likely to rise as the supermarket sector is ripe for intensified consolidation – the top five supermarkets control less than 25% of the Korean grocery market,³¹⁹ which is a very low rate of concentration (e.g. the top five in France, Germany and the UK each control ~80% of the national grocery markets).³²⁰

Although the domestic sashimi market had been growing, recent industry opinion was that in the current depressed economic situation, consumption had levelled off, or even declined slightly.

5.8 Future prospects

Vessel numbers in the Korean DW longline fishery have stabilized to some extent in the past few years, and the decline seems to have bottomed out for the time being, despite increased regulation, declining profitability and uncertainties regarding the resource base. Fishing activity is increasingly moving to high seas areas in both the WCPO and the EPO, where bigeye quotas will continue to limit catches of the main target species (see above)

Demand in the main market (Japan) reportedly remains strong for the ULT Korean product, with traditional ties and respect for the quality of Korean product, but there continues to be some unease in Korean industry about high reliance on a single market, impacts of the economy on high-grade sashimi consumption, and a perceived softening of demand for sashimi amongst younger Japanese. The development of and expansion into alternative markets (EU, US and China) is seen as very desirable, although it is unclear how realistic these aspirations might be, especially in regard to higher value sashimi.

Present and future challenges as identified by industry in discussions in 2017 were as follows:

- reduced access to fishing grounds within PIC EEZs as result of the introduction of the PNA VDS or catch management schemes which the fleet feels are beyond its financial reach to subscribe to. There is a resignation to fishing more and more outside EEZs on the high seas, for as long as good catches can be maintained.
- concerns re continued overfishing of bigeye stocks.

³¹⁷ Interview, industry representatives, May 2010.

³¹⁸ Agriculture and Agri-Food Canada 2015

³¹⁹ South Korean total grocery market share by the top five in 2013 was: Lotte Shopping 7.3% share, Shinsegae at 6.5%, the UK giant Tesco at 4.8%, GS Retail 2.9% and BGF Retail 1.8% (Agriculture and Agri-Food Canada 2015).

³²⁰ Havice and Campling 2017

- the ageing of the longline vessel fleet, with the average age now close to 30 years, and no plans to replace or build new vessels, although there is optimism in some quarters that the vessels can continue to fish effectively in the short-medium term as they have been well maintained and repaired as necessary.
- recruitment of young Koreans to replace ageing vessel officers is difficult, as longlining is not seen as a desirable career path, with the very long periods at sea and difficult working conditions. Replacement by non-Koreans is probably not an acceptable option.
- increasing focus on crew working conditions is seen as a potential threat, only because the necessary long working hours, essentially around the clock, are an accepted cornerstone of distant water tuna longline fishing
- heavy reliance on a single market (Japan) where the market price has been stable but undermined by the depreciation of the yen against the USD, and downward pressure on profitability
- recent suggestions to consider a ban on high seas transshipment might be the ultimate blow for a fishery which is highly reliant on such transshipment during the very long voyages (18-24 months) for economic efficiency, with transshipments ports often long distances from fishing areas, especially in the EPO and eastern WCPO where most fishing occurs

Continuing strengths and even advantages held by the fleet were seen as the continuing very high quality of product landed and processed by Korean industry, and the growing reputation of Korea as a corporate good citizen in regional fisheries, with good compliance with measures and regulations (e.g. the new Fishery Monitoring Center and being the first DWFN to provide full operational fishery data to WCPFC/SPC). Concerns were expressed about the economic advantages enjoyed by some less compliant fleets which continued to expand, often with the apparent benefit of subsidies. The general mood for the future in this 60th year of operation of the Korean longline fleet was not optimistic.

Key Points: Korea

- In 2015, the global Korean longline fleet was around 148 vessels (compared with 276 in 1990), with a total global catch of over 38,000 mt. Most are large ULT DW vessels, typically 350-500 GRT in size.
- In 2016, around 100 Korean longliners operated in the WCPO, catching around 24,000 mt of the man species; 50% of the retained catch was bigeye and 30% yellowfin.
- an increasing portion of the catch in most recent years has been taken in high seas areas in both the WCPO and EPO, rather than within the EEZs of PICs, a situation which is likely to be exacerbated by the introduction of VDS ad catch management schemes which marginally profitable fleets feel unable to afford.
- The majority of Korean longline catch is exported to Japan following processing (70% of exports), as well as 10% of the total catch being landed directly in Japan ports. The EU, US and China are minor export markets, whilst significant volumes of landed product are supplied to the domestic sashimi market.
- The main commercial challenge is growing highly-subsidized competition from other fleets, especially from China
- Given most of the Korean longline catch is taken in WCPO and adjacent EPO waters, future prospects for the Korea's longline fleet closely relate to ongoing developments in the region. Continuing high seas transshipment is seen as critical to the viability of the Korean fleet. Hence, Korean vessel owners are particularly concerned about the possible prohibition of at-sea transshipment in the WCPFC Convention Area.

5.9 Implications for Pacific Island Countries

- The South Korean longline fleet is ageing. While careful maintenance and repairs are reported to ensure a considerable future working life in the fleet, this is not for the long-term. With no new investment in place, the Korean longline industry may fall behind that of China, where considerable recent investment has been made.
- The decline of the South Korea fleet has important implications for PICs given the longline fleet's good record of compliance and as a corporate player. Its decline may open space for less compliant boats.
- South Korea was the leading supplier of processed ULT sashimi products to Japan; an import market worth ¥17.3 billion in 2016 (around USD 158 million). South Korea is also the leading supplier to the EU of frozen tuna 'fillets' product, with a value share of 42% in 2016. This suggests some potential for some PICs to follow Fiji's lead in processing sashimi grade products, but it requires a high level of investment, technical expertise and market networks.

6 CHINA'S DISTANT WATER TUNA LONGLINE INDUSTRY

6.1 Introduction

The Chinese longline fleet first started fishing in 1988 with 7 vessels.³²¹ Its subsequent pattern of development was almost identical to that of Taiwan and South Korea during the 1980s.³²² The fleet grew rapidly during the early 1990s as many vessels previously engaged in China's coastal fisheries began longlining in the WCPO in association with the now defunct Taiwan company Ting Hong. Ting Hong operated bases and fish export operations in Palau, FSM, and the Marshall Islands until the mid-1990s. Much of the impetus for China's entry and expansion in the tuna industry, both in the WCPO and globally, came initially from state-owned enterprises. These firms possessed adequate capital for expansion and received government subsidies for fuel and shipbuilding that assisted new and existing operations.

The number of vessels in the active fleet during this phase peaked in 1994 with 456 vessels. Vessel numbers fluctuated after 1994, with the growth trend starting again in 2008 as purpose-built tuna longline vessels entered both Pacific Island-based and high seas fisheries, primarily targeting albacore. Between 2009 and 2015 the number of vessels active in the WCPO increased from 219 to 429.³²³ Many of these vessels target albacore for canning, but a significant number of around 90 vessels are deep freezer vessels targeting higher value sashimi markets for both albacore and bigeye.

6.2 National Regulation and Industry Support

The movement of China's fishing industry into distant waters has been dated from 1985. This expansion was justified based on the growing need for food in general and, with increased affluence, seafood in particular.³²⁴

The management and regulation of China's distant water fisheries is today controlled by the Ministry of Agriculture. Liaison with the industry and assistance with regulatory implementation is provided by the China Overseas Fisheries Association (COFA).³²⁵ All companies fishing outside of China, whether in high seas areas or coastal state EEZs, are required to be members of COFA. COFA actively participates in RFMO meetings and provides coordination and support to China's distant water and overseas-based fleets, including assistance with access agreements, tracking the use of China's fishery quotas in all oceans, and VMS operation. COFA is often seen as China's 'public face' representing its distant water fisheries, but overall control and policy guidance remains within the Ministry of Agriculture. China adopted a limited-license system in 2001.³²⁶

A striking feature of COFA is the relatively small number of personnel associated with its tasks in support of China's extensive distant water fisheries. Part of COFA's ability to successfully function with limited resources is its reliance on compliance and support from China's state owned enterprises (SOEs), which are self-regulating to a degree and probably do not require the level of oversight of purely private enterprise because SOE senior managers, all or most of

³²¹ China WCPFC Annual Reports, Part 1, 2010 and 2016

³²² Miyake 2005a

³²³ WCPFC Yearbook 2015

³²⁴ Mallory 2013

³²⁵ Formerly the Distant Water Fisheries Branch of the China Fisheries Association.

³²⁶ Miyake 2005a

whom are members of China's Communist Party, are more likely to follow central government policy directives.

All Chinese distant water vessels are subject to an annual review (audit) to ensure they have complied with all government regulations, including the submission of logbooks and compliance with RFMO requirements. Company management personnel are expected to be familiar with the fishery and with other countries interacting with their company during the course of business. It is a requirement that company management must obtain a certificate of training on these and other subjects every 5 years.

The Ministry of Agriculture issues fishing licenses to a company in respect of its vessels, but such permission to operate is not attached to the vessel. As a means of better controlling the industry at the company level, the government instituted a consolidation policy in 2013 that is unique to the country's distant water fisheries.³²⁷ The policy requires that distant water vessels be registered annually and pay a deposit (bond) equal to CNY30 million (about USD 5 million) to cover 6 vessels or 2,000 gross tons. This requirement effectively forces smaller companies to join together as a 'group', pool their resources and cease to operate independently. According to COFA officials, this requirement effectively prohibits larger companies from dividing into smaller ones and makes government oversight more effective. It also provides the government with the ability to better enforce certain requirements, because if one vessel in a company is caught contravening the law, all vessels in the company must stop operations until an investigation is completed.

An important function of COFA is managing quota for the longline fleet. In the case of bigeye in the WCPFC convention area this represents about 7,000 tons. The Chinese government apportions quota based on historical company data and vessel catch records that are compiled at COFA. When quota changes, the increase or decrease is applied equally to all vessels.³²⁸

State subsidies are central in Beijing's drive to transform China 'into a powerful distant water fishing nation'.³²⁹ This has been an official priority since the late 1990s and supported by extensive subsidies such as tax breaks, direct subsidies and soft loans,³³⁰ but has been intensified during the 2010s. A report in 2012 by China's Ministry of Agriculture, spelled out the country's distant water tuna fisheries development strategy in some detail:

China must promote the orderly development of the marine fishing industry, and further strengthen its share of and development capacity for fishery resources in international waters. Strive to obtain and expand tuna catch quotas, steadily develop ultra low-temperature [ULT] longline tuna fishing and tuna purse seine fishing, moderately expand fresh, frozen and ultra low-temperature tuna longline fishing, and adopt feasible collaborative measures to develop tuna resources in the central and western Pacific Ocean, Indian Ocean, and island nation waters.³³¹

This strategy has been pursued in practice with considerable expansion in the longline fleet, including in the ULT segment. A wide range of supports were provided at the central government and provincial level between 2011 and 2015, as detailed in a US submission of 44

³²⁷ There was a 4-year transition period under which companies could adjust their operations that has now expired.

³²⁸ From discussion with COFA official, April 26, 2017

³²⁹ Opinions of the Ministry of Agriculture Regarding the Promotion of the Sustainable and Healthy Development of the Distant Water Fishing Industry (Nongyufa [2012] No. 30), 11 July 2012. Reproduced in Delegation of the United States to the WTO (2016).

³³⁰ Xue 2006

³³¹ Reproduced in Delegation of the United States to the WTO (2016).

pieces of legislation to the WTO detailing subsidy and other support programs in China.³³² It seems highly likely that these programmes contributed directly to China's tuna fishing capacity: one commentator estimated that China's tuna fleet (all gear types) grew by 500% between 2012 and 2015.³³³

A study commissioned by the EU found that total subsidies paid by China to the capture fisheries sector at the federal scale alone were USD 5,469 million per year, averaged over 2011-2013. Additional subsidies are available at the provincial level, and for Zhejiang province alone an annual average of USD 266 million was paid to the capture sector in the same period. About 90% of the federal subsidy is as an exemption on fuel tax. In sum, subsidies were estimated at around USD 90 per tonne for China's capture fisheries.³³⁴ A separate study of subsidy payments to the China-flagged tuna fleet (all gears) in the WCPO *alone* estimated fuel subsidies at USD 35.6 million and total non-fuel subsidies at USD 47.5 million.³³⁵

Crucially, the logic of China's expansion of its tuna fisheries is not solely about fish. The development of its distant water fleet is designed to take pressure off fish populations in its coastal fisheries,³³⁶ to provide work for its ship yards, and to supply raw materials to domestic fish factories, especially in their targeting of export markets. Distant water fishery expansion was a component of China's Going Global strategy, which was launched by Beijing in its 11th five-year plan (2006-2011). The strategy continues today and actively supports domestic enterprises in their efforts to internationalize in a dual strategy of supporting 'national champions' to compete on the world market and of procuring natural resources from abroad. Finally, and of growing relevance in the context of heightened tensions over contested sovereign rights in the South China Sea and elsewhere, China is using its DWF as one element in its strategy to make claim to 'national maritime rights and interests, strengthening China's status and influence within relevant international territories',³³⁷ and thereby extend its geopolitical reach.

Modernization of China's longline fleet over time has been the result of technology transfer from some additions to the fleet from primarily Japan, later followed by vessels built in China. In the early 2000s, 90% of China's larger high seas fishing vessels were secondhand and its tuna fleet was very small.³³⁸ As China developed its fleet, Japan initially allowed export of refrigeration equipment and technology only. In the mid-2000s changes in Japanese policies allowed China to obtain used fishing vessels, primarily larger longliners with ultra-low temperature freezing capabilities.

A total of 421 of 516 Chinese longliners listed on the RFV were built in China. An additional 76 vessels, mostly larger sizes from 48 to 50 metres in length and above were built in Japan. The remainder of the Chinese longline fleet was built in Taiwan (15) and Korea (4).

Of the 374 active longline vessels built in China after 2000, 192 or 51% were built during the years 2011-2014 when the largest expansion of the fleet occurred. Since 2014, just 22 longliners have been constructed, all of which are said to have been replacement vessels for those retired from the fishery. According to China's regulations, the vessel to be replaced must be scrapped entirely, and no equipment can be transferred to the replacement vessel.

³³² Almost 300 pages of legislation are available in translation here: <https://ustr.gov/sites/default/files/US-submission-Chinese-fishery-subsidy-measures.pdf>

³³³ Redmayne 2016

³³⁴ MRAG et al. 2016

³³⁵ Sumalia et al. 2014

³³⁶ Another stated strategy is to increase aquaculture production (Xue 2006).

³³⁷ China's Ministry of Agriculture 2012

³³⁸ Xue 2006

Regulations are also in place to avoid a situation where long dormant vessels may be used to obtain a replacement. If a vessel has been inactive for over one year, the company cannot obtain a replacement vessel. If a vessel is inactive for two years, the boat will permanently lose its license eligibility and is essentially rendered useless to its owners. Permission to build new (replacement) vessels must be granted at various levels of government culminating with a review by the Ministry of Agriculture.

6.3 WCPO Fleet Description and Status

Of the 503 China longline vessels that record a date of construction on the WCPFC Registry of Fishing Vessels, 74% were built in 2000 onwards, and 46% were built in 2010 onwards. Like other national fleets in the WCPO longline fishery, many of the newer Chinese vessels are built with advanced features, including improved refrigeration, navigation, and communication systems. Lower freezing and holding temperatures in the later generations of some vessels built for the WCPO fishery can lessen high-grading of that portion of the catch formerly held as fresh, as well as diversify markets for the frozen catch. For example, vessels built with deep freezer refrigeration systems but targeting albacore can take advantage of an emerging Japan market for low-temperature sashimi-grade albacore.

China has reported to WCPFC that, 'There are two types of tuna longline vessels, ice fresh tuna longline (IFLL) including those targeting albacore (albacore vessels) and deep frozen tuna longline (DFLL).'³³⁹ These two general categories are actually somewhat more diverse than the labels indicate.



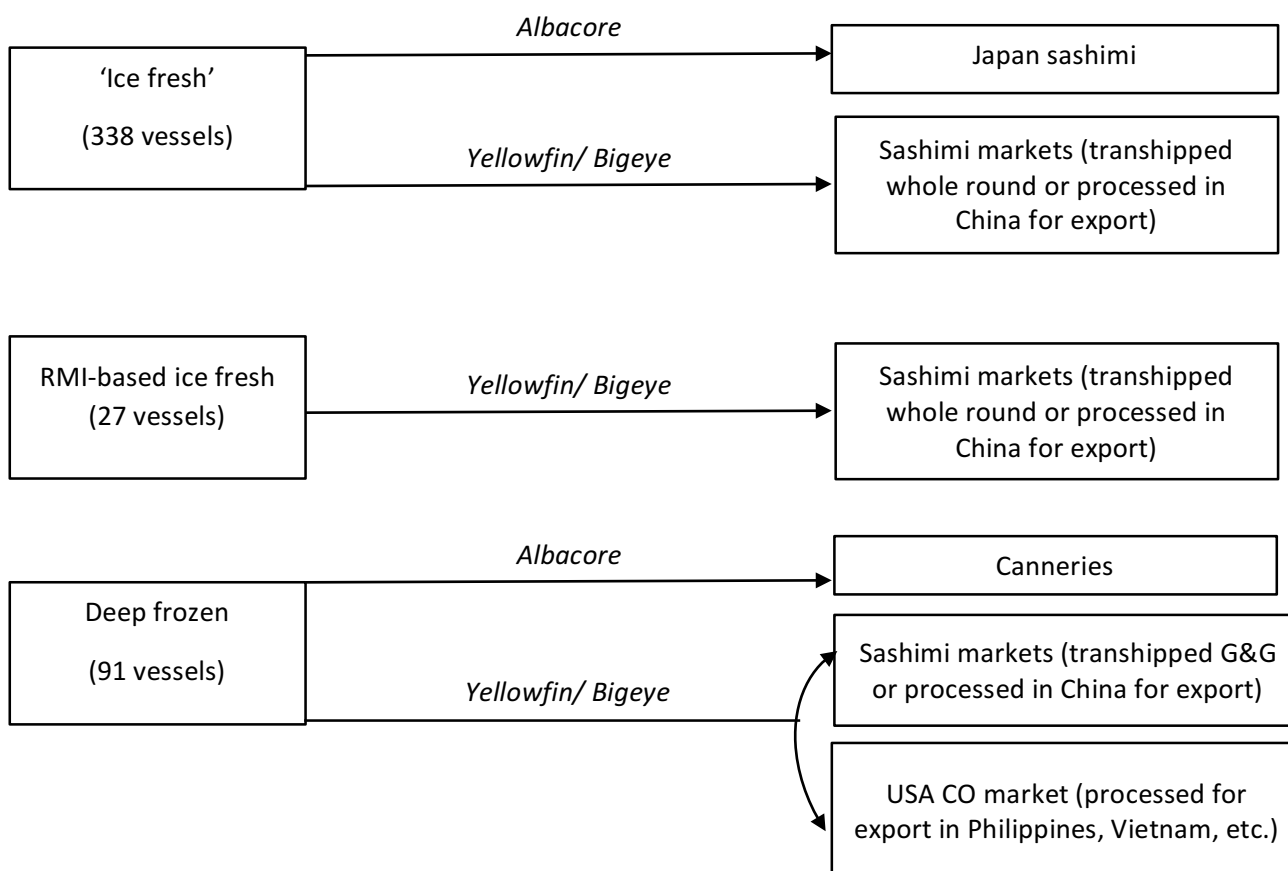
Bridge of a China flagged albacore longliner. Photograph: Mike McCoy

³³⁹ China 2016 WCPFC Annual Report Part 1

There are two components to the ice fresh tuna longline category. The first currently consists of 27 Marshall Islands-based vessels that utilize ice only and target bigeye and yellowfin. These vessels belong to two subsidiaries of Luen Thai Fishing Venture (LTFV) and typically fish in the Marshall Islands EEZ and surrounding area, making trips lasting from 10 days to two weeks. The second, much larger component is comprised of 338 vessels, some with reportedly both freezer and ice capability that target primarily albacore for cannery use. Those with ice capacity are said to have the capability to deliver fresh albacore, yellowfin and bigeye for non-cannery uses from the final few sets. A subset of this component includes vessels with deep freezing (-55°C) or ULT (-60°C) capabilities. Fishing activities take place primarily in the high seas for these vessels³⁴⁰ as well as in the EEZs of Solomon Islands and Vanuatu for some vessels. The distinction between deep freezing at -55°C and ULT is not always clear in terms of which market segment the product is distributed into – it is feasible that -55°C product enters the ULT cold chain, especially given the latter’s price premium.

The deep frozen tuna longline component consists of vessels that wholly freeze their catch, whether targeting albacore or bigeye/yellowfin. China’s WCPFC Annual Report Part 1 reports 91 vessels in this segment of their fleet, some of which may operate in the Eastern Pacific Ocean as well as parts of the WCPO, including the overlap area. It appears that much, if not all of the catch of these vessels is transhipped at sea.

Figure 6.1: Schematic of the China longline industry operating in the WCPO



³⁴⁰ China 2016 WCPFC Annual Report Part 1, section 2.1

According to COFA, in 2012 the government of China capped the total number of distant water longline vessels at 580.³⁴¹ The WCPFC Record of Fishing Vessels (RFV) lists 516 Chinese vessels as authorized to fish in the WCPFC Convention Area – high seas & EEZs (see Table 6.1). Of those 516, 429 actively fished in 2015. There were considerably fewer vessels on the FFA register than those that actively fished: 279 vs 429, indicating that a large number of vessels were fishing in high seas areas (perhaps 35%).

Table 6.1: China longline fleet - number of fishing vessels

| Year | Fresh - Ice | Freezer | Total* |
|------|-------------|---------|--------|
| 2011 | 182 | 93 | 275 |
| 2012 | 202 | 84 | 286 |
| 2013 | 272 | 107 | 379 |
| 2014 | 245 | 108 | 353 |
| 2015 | 338 | 91 | 429 |

* Includes Chinese vessels under charter by another flag state
Source: WCPFC AR-1 - China 2016

Of the total 516 vessels on the RFV, 133 are listed as chartered and flagged to other CCMs, although the cessation of chartering as a means of granting access by Solomon Islands in 2016 may lower the chartered number (Table 6.2). Of those 516, far fewer Chinese longliners are listed on the FFA Regional Vessel Register (279) and thus eligible to be licensed to fish in FFA members' EEZs than are listed on the RFV (516).

Table 6.2: Chartered Chinese Longline Vessels in the WCPO

| 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: WCPFC RFV at March 30, 2017

³⁴¹ At a meeting with COFA officials April 24, 2017 they explained that since IOTC has a tonnage limit, that is taken into consideration when calculating the overall vessel limit.

In the North Pacific, 10 Chinese longline vessels target albacore, while in the South Pacific 70 vessels target albacore below 20° South latitude.

According to COFA, the government considers that for all distant water fisheries there has been sufficient uptake in knowledge and development of skills so that the government will no longer promote more expansion of the fleets concerned. Although not a firm policy, COFA says when industry voices concerns about increased regulation in the WCPO, the government encourages the industry to consider operations more in high seas areas and the Eastern Pacific Ocean albacore fishery where there are fewer coastal state restrictions.

Some mention should be made of what are perceived by many to be Chinese-affiliated longline vessels operating in Fiji. The Fiji national fleet, i.e. those contributing to Fiji's attributed catch under WCPFC, consists of (1) vessels that are foreign flagged and chartered by local companies (Table 3.2) and (2) Fiji flagged vessels, a large portion of which cannot access Fiji's EEZ but are authorized to fish exclusively beyond Fiji's areas of national jurisdiction. In 2016, 50 vessels were registered to Fiji flag by 15 Fiji companies that are believed to have some direct or indirect connection to China. The beneficial ownership of those 50 vessels is not known, but for some can be surmised.³⁴² The government of China considers all these companies and the vessels connected to them to be beyond its national jurisdiction.³⁴³

6.4 Longline Catch, Effort and Transshipment in the WCPO

Total tuna catch in the WCPFC Convention Area (CA) by the China longline fleet saw some fluctuation within the five-year period 2011-2015. As detailed in Table 6.3, it peaked in 2012 at 42,154mt, declined in 2013 and 2014, but then stabilized in 2014 and 2015. The average tuna species breakdown in the period 2011-2015 was 52% albacore, 31% bigeye and 46% yellowfin. Catch trends by species between 2011 and 2015 saw a 26% increase in albacore, 26% decline in bigeye and a 47% increase in yellowfin.

Table 6.3: China longline fleet - total tuna catch in WCPFC-CA by species (2011-2015)^a

| Year | Yellowfin | Bigeye | Albacore | Total |
|------|-----------|--------|----------|--------|
| 2011 | 4,598 | 11,139 | 11,996 | 27,733 |
| 2012 | 6,004 | 11,324 | 24,826 | 42,154 |
| 2013 | 4,638 | 10,671 | 24,162 | 39,471 |
| 2014 | 5,949 | 9,370 | 14,643 | 29,962 |
| 2015 | 6,756 | 8,210 | 15,122 | 30,088 |

^a May include catches by China-flagged vessels operating under chartering arrangements.

³⁴² For example Xin Shi Ji Fisheries Ltd is likely connected to Zhejiang Ocean Family, and Winfull Fishing Co Ltd is likely connected to Shanghai Fisheries General Corporation.

³⁴³ When a vessel is chartered, typically flag-state responsibility transfers to the chartering state, as well as catch attribution. This can be murky though. For example, some vessels are only chartered to another chartering state when fishing in a particular EEZ. They then return to flag-state responsibility when fishing in high seas and other EEZs. In the case of China, the government maintains that chartered vessels become the full responsibility of the chartering state

COFA China tracks catch by China owned but non-China flag vessels (e.g. charters that change flag such as the Fiji examples noted above) where catch attribution is to the flag state. This is the official line since 2016, when the WCPFC CMM on chartering (CMM 2016-05) was amended to explicitly state that catches should be attributed to the chartering state. But it may not be the case before 2016. Previous versions of the chartering CMM were less clear, resulting in some inconsistent handling of catch attribution. Some flag states counted catches from chartered vessels; others attributed to chartering states; for some fleets SPC was not notified on the chartering catch attribution, so there were incidences of double-counting or misallocation to the flag state rather than chartering state.

Table 6.4 provides a summary of the total tuna catch by area in the WCPO from 2011 to 2015. Kiribati, Vanuatu and Cook Islands were the top EEZs in terms of catch. Given the geographic locations of the catch it can be surmised that the catch in the Kiribati EEZ came predominantly from distant water vessels that also fished in the high seas, catch in the Vanuatu EEZ from Fiji-based vessels, and the Cook Islands EEZ catch from vessels that fish there seasonally and land most of their catch in Samoa or American Samoa.

Table 6.4: China longline fleet - total tuna catch in WCPFC-CA by area (2011-2015)

| Area | 2011 | 2012 | 2013 | 2014 | 2015 |
|--------------------|---------------|---------------|---------------|---------------|---------------|
| Cook Is | 211 | 4,731 | 2,644 | 4,858 | 4,876 |
| Fiji | 354 | 509 | 415 | 318 | 864 |
| FSM | 412 | 334 | 2 | 728 | 878 |
| Kiribati - Gilbert | 88 | 10 | 15 | 57 | 879 |
| Kiribati - Line | 3,816 | 4,565 | 4,483 | 4,201 | 6,331 |
| Kiribati - Phoenix | 264 | 266 | 64 | 624 | 127 |
| Marshall Is | 1,587 | 2,141 | 2,168 | 3,227 | 2,050 |
| Nauru | 0 | 0 | 101 | 103 | 0 |
| Solomon Is | 1,690 | 2,410 | 3,965 | 336 | 0 |
| Tonga | 0 | 13 | 211 | 167 | 125 |
| Tuvalu | 242 | 2 | 3 | 209 | 249 |
| Vanuatu | 2,883 | 3,642 | 6,133 | 5,462 | 5,575 |
| High Seas | 16,186 | 23,531 | 19,270 | 9,672 | 8,135 |
| Total | 27,733 | 42,154 | 39,474 | 29,962 | 30,089 |

Source: SPC Catch and Effort Database, March 2017

A number of trends are identified in these data. The most important PIC EEZs in 2011-2015 were Kiribati – Line Group, the Cook Islands, Vanuatu, and Marshall Islands. However, over the period the majority of the China longline catch was in the high seas. The average high seas catch as a proportion of total WCPO catch in the period 2011-2015 was 44%. However, high seas catch as a proportion of total catch has decreased: it was 58% in 2011, dropping to 27% in 2015. Indications are that the high seas portion of total catch dropped even further in 2016. The majority of the high seas catch was in the southern hemisphere below Pacific Islands' EEZs, to the north/west/east of New Zealand; around Kiribati's Line Group and east of RMI/Kiribati. In 2015, the high seas between Fiji, Solomon Islands and Vanuatu became more important and between Kiribati's Phoenix and Line Groups.

Total days fished by the China longline fleet in the WCPFC Convention Area fluctuated during the period 2011-2015. It peaked in 2013 at 53,818 and declined considerably in 2014 and 2015, which represents a 41% drop from 2013 to 2015 (Table 6.5).

Table 6.5: China longline fleet - total days fished in WCPFC-CA (2011-2015)

| Year | Total Days Fished |
|------|-------------------|
| 2011 | 41,881 |
| 2012 | 52,205 |
| 2013 | 53,818 |
| 2014 | 35,268 |
| 2015 | 31,497 |

Source: SPC Catch & Effort Database, March 2017

In 2015, a total of 18,451mt (tuna and non-tuna species) was transhipped 'at sea' during 234 transshipment events to WCPFC registered carriers by the Chinese large-scale longline fleet.³⁴⁴ While the majority of transhipped fish was caught in the WCPFC convention area, 53% of transshipments took place in WCPFC waters, 32% in the WCPFC/IATTC overlap area and 15% in IATTC waters. This reporting does not specify if 'at sea' transshipments took place within high seas or EEZs, but presumably most transshipment occurred in the high seas.

6.5 Indicators of Operating Costs

The three major distant water longline operating expenses usually cited irrespective of vessel nationality are crew, bait, and fuel. China's distant water longline fleet is not immune to many of the problems confronting fleets from other nations, but extensive programs of subsidies at central and provincial government levels are believed to have been available to China's fleet.³⁴⁵

6.5.1 Crew

Interviews with several executives from several large fishing companies indicated that retaining skilled Chinese crew is a major problem, and that there is no large source for deck crew in China as there was a decade or more ago. Deck crew were usually (and to a limited degree still are) recruited from inland China where cash jobs are not as available as in the larger cities. The distant water fishing industry cannot compete with large cities which offer employment in a variety of industries. As a result, Chinese companies are turning to the Philippines and Indonesia, and searching elsewhere such as Sri Lanka.³⁴⁶ One company stated that even though the Chinese companies consider the levels of pay are sufficient (average of USD 400 per month) they still cannot retain crew, particularly those that become skilled at

³⁴⁴ WCPFC AR-1 - China 2016

³⁴⁵ Delegation of the United States to the WTO 2016.

³⁴⁶ According to one industry source there is an understanding with the government (but not a regulation) that foreign crew should make up not more than 30 percent of total crew onboard.

their job.³⁴⁷ Given that the median wage of rural migrants in China – normally young women housed in dormitories – is USD 450 per month,³⁴⁸ the claim around sufficient pay might be questioned. Despite the fact that rural migrant workers tend to be highly exploited, the risks associated with their working lives are considerably less than those facing longline crew. This helps to explain the growing number of Philippine and Indonesian crew working on China's longliners.

A particular problem cited by a SOE executive is that foreign crew and their families do not receive all of the remitted salaries and that is causing additional friction. The company wishes to pay labor agents separately from crew but they say to do that would result in losing any opportunity to hire crew, owing to the systems in place in Philippines and Indonesia.³⁴⁹ Good captains in particular are very hard to obtain for many companies. The SOE executive believes that his firm has an advantage over private companies because of their size in that they are always able to pay crew on time, whereas some private companies experience cash flow problems and are unable to pay their employees in a timely manner. There is a regulation that all distant water vessels must make at least one port call every 8 months, but officials at COFA acknowledge that this is not always strictly followed. Regular periodic return to China is not a strict government requirement, but is left up to the company. Some companies require distant water vessels to return every 2 years while others may delay up to 4 years depending on the needs of the vessel.

A universal practice on distant water vessels is to enable crew to purchase their own food supplies before departure from port in addition to those provided by the vessel. One industry participant explained that this practice can lead to misunderstandings with Pacific Island crew who are hired later during a voyage, since they interpret the practice as providing better or more varied meals to the other crew when in fact those supplies have been purchased by the crew themselves.

6.5.2 Bait

Bait is usually available and can be obtained through contracts with Chinese traders or on the spot market. Important considerations are bait species and size. Companies queried during the study said that even if bait is available, it is often hard to find the correct size (e.g. 150 grams/piece for ULT vessels, 100 grams for smaller boats targeting albacore). Sardine and mackerel (*muro-aji*) can be obtained in China while other sources include East Africa and elsewhere. The price of bait fluctuates with supply and demand; one price quoted (April, 2017) was USD 1,500 per ton. Mackerel is deemed best by one company, but comes at a high price. Bait supply contracts are usually executed with traders in China. Reportedly, there is a 13% VAT refund available, but only trading companies are eligible.

³⁴⁷ Crewing regulations are said to apply to Chinese citizens onboard only, not to foreign crew.

³⁴⁸ Andrijasevic Rutvica, Sacchetto Devi and Pun Ngai 2017, 'One Firm, Two Countries, One Workplace Model? The case of Foxconn's expansion from China to the Czech Republic', unpublished presentation.

³⁴⁹ For example, the Philippines state sponsors a national system of crewing agencies where 80% of earnings must be remitted to a bank account in the Philippines



China built monofilament longline reel on a distant water albacore longliner. Photograph: Mike McCoy

6.5.3 Fuel

Most distant water Chinese longliners bunker at sea and commercial arrangements for fuel purchase are likely done between the vessel's home office and fuel companies or brokers handling the transactions.

A significant but unknown number of China's beneficially-owned longline fleet habitually use Suva for bunkering, unloading and provisioning. For the approximately 50-60 vessels that are based in Suva, fuel acquisition on shore is characterized by spot purchases from the two local distributors, Total and Exxon Mobil. The Taiwanese company FCF also provides fuel and provisions to itinerant as well as Suva-based vessels. As with fuel supply in many other fisheries, the terms of sale can be as important as the price. For some longline vessels operating on the high seas and spending long periods at sea, timely cash flow can be a problem unless the buyer assists in payment. This situation may not be as major a concern for large company fleets as it is for individual or small fleet owners. One operator of Chinese longliners described Santo in Vanuatu as an alternative location for fuel acquisition when logistics and/or price are unfavorable in Suva, but Suva remains the primary source of shore-based supply.

6.5.4 Fleet Management Costs

Fishing fleets incur overhead costs related to support staff that handle supply logistics, ship repair, human resources, fish sales, government compliance requirements and other tasks. As shown above, company fleet size can vary considerably in China's longline industry. Economies of scale in all areas of fleet management are not necessarily achieved by companies with large fleets. Large fleets within vertically integrated operations are in a better

position to control management costs than companies that solely operate as fishing companies. For example, existence of accounting services or human resources departments charged with recruiting labor for other departments within a vertically integrated company can also take care of tasks related to the company's fishing component.

The large firms which are parts of large conglomerates operating internationally can also have an advantage over smaller companies because they can have access to such activities as foreign exchange risk management and identification of appropriate pools of labor that may not be available to smaller firms.

The need to interface with local government entities can also be time-consuming for fishing companies. This is partly the reason why the headquarters for many companies with vessels in the distant water fishery are often situated in buildings close to the offices of local government departments most often visited in the course of usual business.

6.6 Corporate Governance and Company Profiles

6.6.1 Corporate Governance

The structure of companies in China's tuna longline industry are by no means unique to the fishing industry, but rather echo much of the transformation within China's business sector during the past 3 decades. Companies can be generally categorized as those wholly or substantially owned by large state owned enterprises engaged in fisheries and those companies that are funded by and operate fully in the private sector. Large SOEs have tended in recent years to create listed stock companies engaging in specific fisheries from subdivisions within their operations while retaining a controlling interest in those listed companies.

Private sector companies can be privately-held or listed stock companies. In general, the smaller private firms are those that have had experience in other fisheries and have expanded or switched their activities to tuna. The larger wholly private companies are mostly those with extensive experience in tuna and other fisheries. A unique company is Luen Thai Fishing Venture (LTFV), part of a growing industrial conglomerate that had limited experience in fisheries but devised a unique business plan that draws support from other aspects of the parent company's business.

The motivation for domestic investment from both government sources and private capital in China's tuna longline fisheries are varied. Generally investment can be seen in the context of government encouragement to expand China's global reach to access resources and the guidance given companies, both SOEs and private, operating within the sector. In the case of tuna, the objectives of such guidance have included heightening China's global presence, promoting China's position as an influential participant in the fishery, and gaining access to a significant portion of available resources and more than just "a seat at the table" in regional tuna management organizations.

Investment in the sector has been encouraged by various subsidies granted by the central government as well as provincial governments. Some of these subsidies have been granted at the provincial level to diversify a region's economic base, others to jump-start companies that may not have otherwise invested in the longline sector. It cannot be denied that substantial impetus to the industry was gained through such subsidies and that a diversity of programs

continue to exist. But the degree to which they occurred or the value of current dispersals are not fully known.³⁵⁰

China's fishing companies active in the WCPO have invested in facilities in Fiji, Kiribati, Palau, FSM, Marshall Islands, and most recently in Samoa. The extent of such investment is variable, but primarily done to gain access (to both fishery access and quotas) and to the Pacific Island EEZs concerned, and secondarily to support or enhance operations in the region.

6.6.2 Company Profiles

Chinese companies with more than 10 vessels authorized to fish in the WCPO tuna longline fishery are listed in Table 6.6.³⁵¹ The 351 vessels owned by the 19 companies listed represent 68 percent of all authorized Chinese longline vessels, and 82 percent of the number reported as active in 2015. The largest component of the fleet (72 vessels) consists of two sister companies, CNFC Overseas Fishery Co. Ltd and Zhongyu Global Seafood, both of which are majority owned and controlled by the China State-Owned Assets Supervision and Administration Commission through an SOE, the China National Fisheries Corporation. The second largest group consists of Liancheng Overseas Fishery (Shenzhen) Co. Ltd and China Southern Fishery Shenzhen Co. Ltd (53 vessels) which are components of privately held Luen Thai Fishing Venture.

Rongcheng Ocean Fisheries Co. Ltd (29) is an umbrella company covering several operators that are based in Shandong and sponsored by the Rongcheng municipal government. Two other private firms are Pingtairong Ocean Fishery Group Co. Ltd (24 vessels) and the two sister companies of Zhejiang Ocean Family and Zhoushan Pacific Tuna Pelagic Fishery Co Ltd (21).

Table 6.6: China longline companies with significant numbers of vessels

| 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 |

³⁵⁰ These subsidies are in addition to vessel operational subsidies that are granted by the central government on a fisheries-sector wide basis and not just to tuna fisheries specifically. See the documentation submitted by Delegation of the United States to the WTO (2016).

³⁵¹ The official company names are in Chinese. The name in English is sometimes preceded by the physical location of a company's headquarters to better identify the firm.

| Company (number of vessels) | Total No. of Vessels | Company Base | Registered Port |
|--|----------------------|--------------|-----------------|
| 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: WCPFC RFV and company information

Six of the top eight companies in terms of vessels owned listed in Table 6.6 above are described below. These firms represent a variety of ownership and organizational structures in both the public and private sectors. COFC is a public company with controlling interest held and management provided by the SOE giant, China National Fisheries Co. Ltd. Liancheng Overseas Fishery is also a public company, but part of a much larger privately-held company, Luenthai Fishing Ventures, that is itself part of a private conglomerate active in sectors other than fisheries. Pingtairong Ocean Fishery Group is a family-owned operation that has focused almost exclusively on fishing but has lately entered the processing sector. Zhejiang Ocean Family and its subsidiary, Zoushan Pacific Tuna Pelagic Fishery Co. Ltd are also privately held and part of a large industrial conglomerate, although at one time the company was a Zhejiang provincial SOE.



Taiwanese freezer longliner, Princes Wharf, Suva, Fiji. Photograph: Liam Campling

CNFC Overseas Fisheries Co Ltd (COFC)

COFC is a listed company belonging to the large SOE China National Fisheries Co (CNFC). The parent, CNFC, was founded in 1984 by merging three companies owned by the Ministry of Agriculture. Since 2004 CNFC has been a part of the China National Agricultural Development Group which is directly controlled by the State-owned Assets Supervision and Administration Commission of the State Council. CNFC has a global reach with the company or its subsidiaries operating in the Pacific and Atlantic as well as owning a variety of businesses in China. In addition to the Pacific tuna longline fishery, COFC operates in the Southeast Pacific and Southwest Atlantic for squid and saury.

COFC is listed on the Shenzhen stock exchange with the major stockholder (59%) being the State-owned Assets and Supervision and Administration Commission. Other investors include the Fosun Group, headed by billionaire investor Guo Guanchang (14%) and Taiwanese aquaculture company Sino-Aqua. COFC's subsidiary companies include a fish processing facility in Xiamen acquired in 2014, and a Beijing real estate company purchased in 2015³⁵². COFC sister company Zhongyu Global Seafood Co. Ltd has 23 vessels in the longline fishery and operates as a subsidiary of COFC.³⁵³ Zhongyu Global also owns and operates three Chinese flag tuna purse seiners in the WCPO purse seine fishery.

COFC estimated that net profit in fiscal year 2016 would be CNY 25 million to CNY 34 million (approximately USD 3.85 million to USD 5.23 million). The company credited expanding trade business and government subsidies as the main reasons for the forecast.³⁵⁴ In fact, a press report said that COFC had reported receiving a CNY 75 million (approximately USD 12.2 million) subsidy in a December, 2016 company filing³⁵⁵. The article also mentioned that stock exchange rules force a company to de-list if the firm reports three consecutive years of losses, and that in four of the past six years subsidies have enabled CNFC to report a profit, with the largest subsidies during the period coming in 2012 when subsidies to CNFC approached CNY 100 million (~USD 15 million).³⁵⁶

COFC's China branches are located in Zhoushan, Yantai and Dalian. In Zhoushan the company owns a wharf and surrounding area containing ship chandlers and associated supply companies while in Dalian it operates Dalian Nancheng Ship Repair Ltd. Total company employees number about 1,000. In addition to tuna fisheries COFC is engaged in squid and saury fishing. In 2015 sales of tuna represented about 59% of company income, with squid 31% and saury about 7%.³⁵⁷

In the Pacific Islands COFC has a base yard and office in Suva's Wailada industrial estate as well as an office connected to a state of the art fish processing and freezing facility outside of Port Vila, Vanuatu. The facility was built and commissioned by COFC, then handed over to the Vanuatu government several years ago, but has never been fully functional due a variety of locally unresolved circumstances. COFC operates its vessels in Solomon Islands as Solong

³⁵² The real estate company was purchased from CNFC's government-owned parent and the acquisition may represent a re-allocation of government assets rather than active entry of COFC into the real estate business. This sort of exposure to non-fisheries logics may provide a cushion in poor fishing periods or when price is low, but it may also contain negative potential effects should, for example, the real-estate bubble in China burst.

³⁵³ www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=270547283

³⁵⁴ www.reuters.com/finance/stocks/000798.SZ/key-developments/article/3510642

³⁵⁵ Harkell, L. Large Chinese fishing firm turns loss into profit with \$12.2 m subsidy, Undercurrent News, January 20, 2017 www.undercurrentnews.com/2017/01/20/one-of-chinas-largest-fisheries-receives-cny-75m-govt-subsidy-turns-loss-into-profit/

³⁵⁶ Harkell, L. *ibid*. The article does not specify that the subsidies went specifically to COFC but rather to parent CNFC.

³⁵⁷ Business summary at www.4-traders.com/CNFC-OVERSEAS-FISHERY-CO-19165546/company/

Seafood Development and has built a small office near South Seas Investment's wharf at Honiara's Point Cruz.

COFC's vessels target albacore and operate primarily on the high seas and in the EEZs of Vanuatu and Solomon Islands. The firm is aware of the Tokelau Arrangement's quota system and the PNA Longline Vessel Day Scheme. COFC feels confident that it can operate within these two systems, although an executive expressed concerns about the unloading requirements of Solomon Island licenses in particular.

Liancheng Overseas Fishery (Shenzhen) Co Ltd and China Southern Fishery Shenzhen Co. Ltd

Liancheng Overseas Fishery (Shenzhen) Co Ltd and China Southern Fishery Shenzhen (CSFC) are China-based subsidiaries of Luen Thai Fishing Venture Ltd (LTFV). LTFV is a component of an industrial conglomerate that includes Hong Kong-based Luen Thai International Group, and the holding company Luen Thai Enterprises Ltd, both family-owned business with affiliated or subsidiary companies in China, Guam, Southeast Asia and elsewhere. Through its subsidiaries Luen Thai engages in footwear manufacturing (in joint venture with Sketchers, USA in China and South Korea), fishing, real estate ownership and development in Hong Kong and elsewhere, hotel ownership, travel and tours, and wholesale distribution businesses in China, Guam Micronesia, North America, Japan, Philippines, and elsewhere in the Asia-Pacific region. The company's operations also include supply-chain, ocean, and air cargo services; and fresh and frozen seafood products production and distribution.

For discussion here the fishing operations are referred to as LTFV, and includes the vessels enumerated in Table 6.6 above, fishing bases and/or processing facilities in Majuro, Pohnpei, Kosrae, Palau, and Samoa, the affiliated air cargo carrier Asia Pacific Airlines (APA), and sales offices in Japan, USA, and Europe. In addition to the two named subsidiaries in Table 3.6, LTFV also has subsidiaries Marshall Islands Fishing Venture and Liancheng Overseas Fisheries (FSM) that charter LTFVs vessels from SZLC and CSFC for fishing in the WCPO.

LTFV first started in 1994 when it took over defunct or underperforming fishing bases in Majuro, Palau and Pohnpei, using its existing air cargo service to move fish through Micronesia to Japan, Hawaii and the mainland USA. The company was given a boost by China's policy of subsidizing new fishing vessel construction and operation during the latter part of the last decade, and the company now owns its own fleet as well as purchasing fish and providing services to Taiwanese vessels in Palau and elsewhere.

Through its various parent and sister companies LTFV is able to provide a level of support and logistics to its fishing and processing operations in the WCPO that would not be easily available to a purely fishing operation. Where it cannot undertake activities on its own, the parent company has the financial resources and knowledge to form strategic alliances and ventures with other companies that can complement its fishing and other activities. In shipping for example, its partnership in regional shipper Mariana Express Lines with Singapore-based Pacific International Line provides access to the one of the latter's sister company, a large shipping container manufacturer that can provide custom freezer and cargo containers suited to LTFVs needs.

LTFV currently operates bases in Majuro, Kosrae, Pohnpei, Palau, and Samoa. The Micronesian base in Majuro supporting vessels delivering fresh fish includes a processing facility with products going to Hawaii and the mainland USA. Kosrae has a small slipway for basic ship repair and an associated LTFV facility for transshipment of frozen purse-seine caught

fish from LTFV's four FSM-flag purse seiners. Palau's base is primarily for purchase of fresh fish from Taiwanese vessels for export to Japan via air. The Samoa base handles frozen albacore for transshipment by container that is landed by LTFV's vessels fishing in the Cook Islands. Pohnpei currently handles only frozen fish transhipped via container.

LTFV has followed two major strategies, one operational and one in marketing, in the development of its WCPO operations. The first is to utilize its own vessels to conduct operations based in Pacific Island countries and to fish primarily in the EEZs of those countries (i.e. Marshall Islands, FSM, Cook Islands, less so for Palau). The company's interaction with the relevant PICs in this manner has enabled it to identify business opportunities and develop relationships with local governments that would otherwise be unavailable.³⁵⁸ As a result, although they are concerned with imposition of the PNA longline VDS, they do not seem as concerned as perhaps some of the other distant water longline companies, particularly those from Taiwan, of the ability to retain fishery access for their operations.

A major marketing strategy employed by LTFV is to market all its own fish and augment supplies with those purchased from others, such as from Indonesia and Taiwan-caught fish in Palau. Whole fresh fish exported to Japan are marketed outside of the traditional Japanese auction system (see Section 2.2). The company's logistics takes advantage of APA's route from Hawaii to Guam via its bases with transshipment in Guam to international carriers to Japan. Guam has flights to many Japanese cities, including those in the Kansai region (Osaka, Nagoya) that tend to prefer yellowfin over bigeye for sashimi. APA also holds mail contracts to deliver air mail to Majuro, FSM and Palau and can also accept inward-bound cargo.

A further marketing strategy has been to pursue Marine Stewardship Council certification for its fleet production of albacore and yellowfin to enable access to key market segments in the EU and potentially the USA. LTFV has been successful on both counts and is the first Chinese tuna fishery to be certified (2015) and now is believed to be the world's largest MSC certified longline fleet.³⁵⁹

Pingtairong Ocean Fishery Group Co. Ltd (PTR)

Pingtairong Group was established in 2007 with headquarters in Zhoushan, a fishing vessel base, ship repair, and processing center situated in an archipelago of islands in Zhejiang province, a relatively wealthy province south of Shanghai. Zhoushan had been a center of fish processing for coastal fisheries due to its strategic location, but as those resources dwindled the processing industry switched to squid, tuna and other species produced by China's distant water fleets. The PTR Group is said by a company executive to have about 600 employees, including the crews on its 24 distant water longliners, factory workers and administrative staff.

The privately held company focuses on distant water tuna longlining with 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. Four of the vessels operate under charter to Kiribati Fish Ltd and have access to the Kiribati zone and

³⁵⁸ A recent example is its lease of a defunct shore base and fuel tanks in Yap that could enable its operations to move there; a consideration given Palau's impending closure of a major portion of their EEZ to commercial fishing.

³⁵⁹ <https://www.msc.org/newsroom/news/cook-islands-albacore-longline-fishery-achieves-msc-certification>

four have purchased access to the Cook Islands EEZ. The remaining vessels fish exclusively in the high seas.

In citing its reliance on high seas areas for its operation, a company official said that in terms of albacore targeting in an operation such as theirs, the relative lack of the need for EEZ access was a consideration. Their vessels come back to China only once every 4 years with port calls in the Pacific Islands or South America as needed. There are currently no plans to invest in the Pacific Islands, although an investigation was carried out at Christmas Island as a potential base. The company was encouraged by the geographic position, but felt that the lack of infrastructure to support a base was a hurdle too large to surmount by a company such as theirs.

Previously, all PTR Group albacore catch went to its cannery, but in 2014 it started to sell sashimi grade to Japan. In 2017, 10 factories in Japan were reportedly asking for albacore sashimi, to which PTR is trying to sell to directly. The company has just completed building two large ULT carriers for their own use and as of April 2017 were still awaiting paperwork from China's government to enable listing with IATTC and WCPFC. The intention is for the carriers to support their own fleet and were built to improve efficiency and avoid the high cost of transshipping at sea by other carriers. The use of their own carriers also supports their intention to pursue more independent marketing whenever possible.

Until 2014 the company sold all its catch as cannery grade. In 2014 they expanded to producing sashimi grade albacore for the Japanese market in their factory in Zhoushan under a subsidiary company, Zhejiang Rongzhou Marine Industry Co Ltd. The factory includes a 1,000 ton capacity -55°C storage freezer built in 2015 and three processing lines that employ about 60 people in total. Albacore for sashimi processing is bled onboard and handled differently than cannery grade. The most desirable fish come from the more southern latitudes with those caught closer to the equator being cannery grade. The company estimates that from 40% to 50% of the overall catch is sashimi grade, including some bigeye and yellowfin.

The deep frozen albacore is processed into loins exclusively for the Japan market, although a portion of the fleet has been approved for export to the EU and some product will be sent there in the future. PTR is not the only factory in China that produces deep frozen albacore, with factories in Dalian and Yantai also involved.³⁶⁰ In fact, PTR gained its expertise from one such factory and sometimes sends a portion of their catch to that plant when there is a shortage of raw material there.³⁶¹

Zhejiang Ocean Family (ZOF)

Zhejiang Ocean Family is part of the Hangzhou-based Wanxiang Group a large privately-held conglomerate with more than 40,000 employees that has the manufacture of auto parts as one of its major activities along with subsidiaries involved in agribusiness, real estate and finance and other activities.³⁶² Prior to its acquisition by Wanxiang Group in 1999, the company operated as Zhejiang Ocean Group, an SOE of Zhejiang province. ZOF company headquarters are in the city of Hangzhou.

³⁶⁰ A company official estimated that there are about 10 factories in China processing deep frozen albacore, although all may not operate at one time or at full capacity.

³⁶¹ The inference is that the firm assisting in knowledge and information on ULT processing of albacore is connected to an unnamed SOE.

³⁶² Forbes magazine listed Wanxiang's founder Lu Guankui as China's 21st richest person in 2016 with a net worth of \$6.2 billion. (www.forbes.com/china-billionaires/list/#tab:overall)

ZOF's activities include fishing vessels (36 ULT tuna longliners, 4 tuna purse seiners, and 9 squid vessels), tuna processing (skipjack loining and canning, ULT tuna loining) and wholesale and retail distribution of marine products. Mitsubishi buys all of the ULT loins. ZOF is also believed to own 4 Taiwan-flagged tuna purse seiners. Except for two older Japan-built vessels and one older Taiwan-built, vessels in ZOF's longline fleet were all built in China between 2001 and 2014 and range from 40 to 49 metres in length. Operational areas include the Pacific and Indian Ocean. Registered ownership of the company's distant water longline vessels and their authorized fishing area are shown in Table 6.7.

Table 6.7: Zhejiang Ocean Family Longline Fleet

| Company | Number of Vessels | China Government and RFMO Authorized Area of Operation | Fishery Access in WCPO |
|---|-------------------|--|------------------------|
| Zhejiang Ocean Family Co Ltd | 10 | Pacific Ocean, Indian Ocean | Kiribati (9 vessels) |
| | 8 | Indian Ocean | — |
| Zhejiang New Times International Fisheries Co Ltd | 4 | Pacific Ocean | Kiribati |
| | 3 | Indian Ocean | — |
| Zhoushan Pacific Tuna Pelagic Fisheries Co Ltd | 11 | Pacific Ocean | Kiribati (5) |
| Total | 36 | | |

ZOF's tuna processing facilities are located in Xikou and the Beilun Free Trade Zone in Ningbo, described as the world's 7th largest port by freight handled. In 2013 ZOF and Mitsubishi formed a joint venture, Zhejiang Daling Seafood (ZDS), with ZOF holding 75% ownership and Mitsubishi 25%. ZDS engages in various seafood product exporting and importing as well as operation of a fish processing facility in Ningbo for ULT longline-caught tuna in conjunction with ZOF subsidiary Ningbo Feng Sheng Foodstuffs Co Ltd.³⁶³

Labor costs at the Ningbo facility are estimated by the company to be about 25% of overall processing operating costs. The factory operates under Chinese government regulation that requires all such industrial activities to provide housing for their workers and sets wages based on the tier ranking of a city.³⁶⁴

ULT raw material volumes for processing range from 5,000 to 6,000 tons per annum, with about half coming from the Atlantic (COFC vessels and others), 30 percent from the Pacific, and 20 percent from the Indian Ocean. The skipjack processing lines handle around 10,000 tons of skipjack per year. About 2,000 tons (raw material) of the ULT tuna is for the Chinese market; the major portion is still exported to Japan.

Marketing of domestic canned tuna, imported marine products and ULT sashimi for the domestic market are carried out through ZOF's marketing and distribution network including a chain of specialty shops and supermarket counters. The strategic partnership with Mitsubishi enables ZOF to tap into a larger supply of marine products for domestic sale in

³⁶³ Ningbo Feng Sheng also produces frozen cooked loins from purse seine-caught skipjack.

³⁶⁴ Ningbo/Zhejiang is ranked as tier 2, with minimum wages set at a level about equal to those in Eastern Europe according to company officials. (It is worth noting that manufacturing workers in Eastern Europe are often paid above the national minimum wage, which is not deemed sufficient to support a family (Rutvica et al. 2017).) ZOF emphasizes that in order to maintain a stable and skilled labor force the company pays above minimum wage and offers other benefits.

China as well as a guaranteed outlet in Japan for processed (loined) ULT bigeye caught by the company's vessels.

Shanghai Deep Sea Fisheries Co Ltd (SDSF)

Shanghai Deep Sea Fisheries Co Ltd operates as a subsidiary of Shanghai Fisheries General Corporation (Group) Ltd, a large SOE based in Shanghai. Unlike its sister company, Shanghai Kaichuang Marine International, a purse seiner and processing owner (including Pan Pacific Foods, Majuro), SDSF is not a listed stock company.

SDSF operates 3 large (50 metre length) ULT ex-Japanese longliners in the WCPO and Eastern Pacific. The company also has 5 albacore freezer longliners fishing in association with Kiribati Fish Ltd (KFL) in Tarawa, and two albacore longliners with some fresh capacity also connected to KFL. In Fiji the company has a joint venture processing operation, Golden Ocean, with a former Chinese now Fijian citizen.³⁶⁵ Three of SDSF-owned vessels are based in Fiji, operating under the Winfull and Yavusa companies.

Kiribati Fish Ltd (KFL) started at the end of 2012 and consists of a processing plant in Tarawa that is owned by the government of Kiribati (40%), Golden Ocean Fish Ltd of Fiji (40%), and SDSF (20%)³⁶⁶. SDSF partial ownership of Golden Ocean ensures it has a significant if not controlling interest in KFL. In addition to processing, KFL also acts as agent for several Chinese purse seine companies with access to the Kiribati EEZ.

The KFL plant started operations in 2014, and news reports estimate total employment at 300.³⁶⁷ Initially it was hoped to export fresh fish via Fiji but logistics were not favorable and so now the plant focuses on longline-caught frozen fish only. A test run with Korean purse seine-caught low temperature yellowfin was undertaken and the company hopes that such a supply source could provide larger volumes for processing in the future.

Several drawbacks to the current operation persist, including limited infrastructure, continued logistics problems, and high cost of operation. In spite of disadvantages such as the need for the company to provide its own electrical power source, SDSF believes that companies which invest in shore based development in Pacific Island countries will be better placed in the future to be assured fishery access. According to SDSF, KFL has submitted a second phase proposal to the Kiribati government and hopes to be able to expand operations if land and finance can be secured.

SDSF is also closely watching the Kiribati situation with the yellow card issued by the EU to see how that situation may impact future plans. Kiribati's potential for exporting to the EU was bolstered in June 2017 when it became the fourth Pacific Island Country to gain approval from the European Union's Directorate General for Health and Food Safety (DG SANTE) to export fishery products to the EU. The next step required is for Kiribati's fleet of tuna fishing vessels, comprised of 13 purse seiners and one longliner, plus its Tarawa based processing facility, Kiribati Fish Ltd. (KFL) to be inspected by the competent authority to be added to the EU's list of approved establishments and issued with EU sanitary numbers. After this, Kiribati will have fully met DG SANTE's requirements for tuna exports to the EU.

³⁶⁵ China does not allow dual citizenship.

³⁶⁶ Anecdotal evidence suggests that at least a portion of the funds for plant construction came from the Chinese government as a subsidy to SDSF or its parent company.

³⁶⁷ Pacific press release, December 14, 2016; however an interview with SDSF in April 2017 put the number of employees at closer to 100, including 5 I-Kiribati citizens on each of the company's affiliated longliners.

Other China Distant Water Fishing Companies with Significant Fleets in the WCPO

In addition to the companies described above, there are other Chinese companies operating longliners in the WCPO. A brief description of some of these companies is provided in Table 6.8.

Table 6.8: Other China Longline Companies with Fleets in the WCPO

| Company | Number of Vessels | Notes |
|--|-------------------|---|
| Rongcheng Ocean Fisheries Co. Ltd. | 29 | Municipal umbrella company for independent fishing companies in Rongcheng City |
| Dalian Ocean Fishing Co. Ltd. | 17 | Withdrew 2014 stock offering for "China Tuna Industry Group" |
| Shandong Lidao Ocean Technology Co. Ltd. | 16 | Privately-held company with some albacore vessels in Fiji |
| Weihai Changhe Fishery Co. Ltd. | 16 | Privately-held company |
| Shenzhen Shengang Overseas Industrial Co. Ltd. | 15 | Privately-held, formerly not involved in fisheries invested in tuna fisheries as new entrant in 2007. |
| Qingdao Furui Fisheries Co. Ltd. | 14 | Privately-held. |
| Rongcheng City Rong Yuan Fishery Co. Ltd. | 14 | Municipal umbrella company for independent fishing companies in Rongcheng City |
| Fujian Changfeng Fishery Co. Ltd. | 12 | Privately-held company, all albacore targeting |
| Rongcheng Mashan Ocean Fishery | 12 | Privately-held under a group of companies. Former coastal fisheries cooperative. |
| Zhoushan Haixing Ocean Fisheries Co. Ltd. | 10 | Organized as private company by a group of vessel owners |

Source: WCPFC RFV and China Overseas Fisheries Association

6.7 Market Dynamics

In 2014, China imported USD 9.1 billion in aquatic products, which was a 7.6% year-on-year growth, but much of this is for export-oriented processing (China is a net exporter).³⁶⁸ China's domestic sales of fish and fish products grew by an estimated 11.5% in 2014, 10.5% in 2005 and 10.7% in 2016, when sales totalled around CNY 1,011.3 billion (~USD 15 billion); and is forecast to grow by similar amounts annually until 2021.

The main channels for seafood are retail and foodservice. While more traditional seafood markets have declined, there are still over 300 in China, especially in metropolises and coastal cities. The shift to more convenient retail formats is a result of growing purchasing power, urbanization, and several food scares. Most imported seafood sold in China is distributed via wholesale markets.³⁶⁹ Supermarket retail is a tiny proportion of total grocery sales, and is dominated by a combination of domestic and foreign owned firms. By number of outlets for

³⁶⁸ Qiao 2015. Since 1 October 2015 imported food must meet safety standards. The General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) has specific systems in place for imported seafood.

³⁶⁹ Qiao 2015

which data are available, among the top 10 are Century Mart supermarkets (5,150 outlets, owned by Lianhua Supermarket Holdings), Vanguard supermarkets (4,127, owned by Hong Kong-based China Resources), NongGongShang (2,566), Watsons (2,088), WuMart (519), Walmart (439), R-T and Auchan (409, a joint venture of France's Auchan and Taiwan's Sun Art Retail Group), YongHui (337), Carrefour (204), and Renrenle (117).³⁷⁰

Japan has for several years been attempting to stimulate the marketing of high quality longline-caught tuna in China. The hope is to tap into China's growing elite and upper-middle class consumers. During the past decade several large cold stores were built in China (e.g. in Dalian and elsewhere), supported by technical assistance from Japanese companies and joint ventures between Japanese and Chinese firms.

Investment from Japan in China's ULT processing sector has continued, but indications are that the Chinese sashimi market for high value tuna has not grown substantially. A report by the OPRT in 2013 suggested that the China market for sashimi-grade tuna market has been at the same level for 'recent years' at around 12,000mt, which includes around 3,000mt of high quality product such as southern bluefin.³⁷¹ This is an increase over an OPRT estimate in 2010 which put China's sashimi market at between 6,000 to 10,000 mt/annum.³⁷²



ULT bigeye tuna for processing, Ningbo, China. Photograph: Mike McCoy

Explanations for the lack of significant growth include: competition with fresh salmon which is preferred by Chinese consumers because of price and tastes; less promotions and advertising for tuna compared to salmon; an insufficiently developed cold chain; the prohibition of CO-treated tuna; and the decline in public entertainment budgets following Beijing's crackdown on perceived corruption.³⁷³ Further, despite a period of interest in home delivery/ take-away sushi, this has seen dwindled in popularity.³⁷⁴ There have been prior attempts to bypass the cold chain barrier by air freighting fresh farmed bluefin from Japan³⁷⁵ and a very recent investment in increasing ULT cold storage and tuna processing in China.³⁷⁶

³⁷⁰ Draws on BMI 2017b and Qiao 2015

³⁷¹ OPRT, 'Current Situation of China's Tuna Fisheries', 15 November 2013. <http://oprt.or.jp/eng/2013/12/current-situation-of-china%e2%80%99s-tuna-fisheries/>

³⁷² OPRT 2010

³⁷³ On the last point, since the launch of anti-corruption policies in 2012, China's catering industry (with sales of CNY2.5 trillion in 2013) experienced its slowest growth rates since 1978. Nonetheless, growth in 2013 was still 9% (Qiao 2015)

³⁷⁴ Passport 2017d

³⁷⁵ Sojitz Corporation, press release, 'Sojitz Begins Shipping Takashima Bluefin Tuna to Chinese Markets', 10 March 2011. https://www.sojitz.com/jp/news/docs/110310_e.pdf

³⁷⁶ 'Sino-Japanese \$12 Million Plant Expansion', *Atuna*, 4 January 2017.

A relatively recent increase in the use of albacore as sashimi in Japan has driven some processing and fleet expansion in China in that market with very little consumption within China. Whether higher value bigeye or albacore, China's processing sector for ULT tuna will remain primarily focused on the Japanese market (see Section 2.2). In that regard, China's ULT export-oriented processing may be starting to challenge Korea's.

It may be some time, though, before China product reaches the same quality of Korean and Taiwan whole round supply; instead China exports are likely to focus on 'fillet' (block) product. All the more so given that Chinese processors are reported to receive a subsidy for exporting China-caught fish processed domestically. However, since the Japanese market overall has not expanded, China's growth will most likely reflect the void created as reductions in Japanese fleet production continue. In this regard, China-based ULT processors may emerge as an import market (e.g. for Taiwan-caught fish).

6.7 Implications for Pacific Island Countries

- LTFV, operates a fleet from Majuro that is China's only fully fresh tropical longline fleet. Other bases are located in Pohnpei (frozen bigeye and yellowfin), Palau (fresh longline from non-Chinese vessels), and Samoa (frozen albacore). The Majuro base includes a processing facility with products going to Hawaii and the mainland USA. Its business model pivots on close working relations with PIC governments. This appears to be a success given that it has become the largest supplier to the Japan import market for fresh bigeye and yellowfin.
- Kiribati Fish Ltd (KFL) started at the end of 2012 and consists of a processing plant in Tarawa that is owned by the government of Kiribati (40%), Golden Ocean Fish Ltd of Fiji (40%), and SDSF (20%)³⁷⁷. SDSF partial ownership of Golden Ocean ensures it has a significant if not controlling interest in KFL. SDSF believes that companies which invest in shore based development in Pacific Island countries will be better placed in the future to be assured fishery access.
- Some companies in China continue to seek other bases in PICs, encouraged by government policy and supports. An investigation of Kiritimati (Christmas) island by one firm seeking a base for its longliners found necessary infrastructure lacking at that location. This may signify a lack of interest in greenfield sites if all funding must come from China.
- Southern albacore catches by Chinese-flagged and beneficially owned vessels have increased over the past five years, largely in relation to growing vessel numbers within the fleet which are subsidized. Other fleets, particularly some PIC fleets, have experienced declining or fluctuating catches due to increased competition from subsidized Chinese vessels.
- Suva remains the primary source of shore-based supplies for the China albacore fleet; although Santo in Vanuatu was suggested by one company as an alternative location for fuel acquisition when logistics and/or price are unfavourable in Suva.
- Commercial concerns were expressed about the 100% local unloading requirements incorporated into Solomon Island licencing conditions.
- China's share of Japan's import market for processed ULT sashimi products grew from 30% in 2015 to 33.1% in 2016. In the first few months of 2017 it overtook Korea as the leading supplier.

³⁷⁷ Anecdotal evidence suggests that at least a portion of the funds for plant construction came from the Chinese government as a subsidy to SDSF or its parent company.

PERSONS CONSULTED

China

| Name | Organization | Position |
|--------------------|---|---|
| Dr. Liu Xiaobing | China Overseas Fisheries Association | Advisor/Executive Director |
| Zhao Gang | China Overseas Fisheries Association | Deputy Secretary General |
| Li Yan | China Overseas Fisheries Association | High Seas Dept Coordinator |
| Jing Chunde | CNFC Overseas Fisheries Co Ltd | Executive Vice-General Manager |
| Chen Qingbai | Liancheng Overseas Fishery (Shenzen) Co Ltd | General Manager Also acts as: Vice Chairman of Guangdong Overseas Fisheries Association; Executive Vice President of Shenzen Fisheries Trade Association; Vice Chairman of Shenzen Agricultural Industry Leading Enterprise Association |
| Bingo Zhang | Liancheng Overseas Fishery (Shenzen) Co Ltd | Freezer Fleet General Manager |
| Li Pan | Liancheng Overseas Fishery (Shenzen) Co Ltd | China Business Dept, Senior Manager |
| Maple Li | Liancheng Overseas Fishery (Shenzen) Co Ltd | Executive Assistant to Samuel Chou |
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| Ni Yangyi | Ping Tai Rong Ocean Fishery Group Co Ltd | Vice Chairman |
| Michelle Lin | Ping Tai Rong Ocean Fishery Group Co Ltd | Secretary of Fishery Dept General Office |
| Yongli ZHU | Ping Tai Rong Ocean Fishery Group Co Ltd | Deputy Manager, Offshore Fishery Dept |
| Ni Jianbo | Ping Tai Rong Ocean Fishery Group Co Ltd | Chairman/President |
| He Yanfang | Ping Tai Rong Ocean Fishery Group Co Ltd | Deputy Manager of Finance Dept, Risk Operation Department Deputy Director |
| Bob Shen, | Shanghai Deep Sea Fisheries Co Ltd | Vice General Manager |
| Liu Da Peng, Fleet | Shanghai Deep Sea Fisheries Co Ltd | Department Vice Manager |
| Prof. Dai XJ | Shanghai Ocean University | |
| Prof Fung Wu | Shanghai Ocean University | In charge of observer training |
| Prof Chen Xinjun, | Shanghai Ocean University | Dean of College of Marine Sciences |
| Wang Xiao Qing | Zhejiang Ocean Family Co Ltd | Fishery Projects Dept Manager |
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| Anon | Ningbo Fensheng Foods Co. Ltd | Involved in factory management |

Japan

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| Ryoichi Nakamura | Fisheries Agency of Japan, Ministry of Foreign Affairs | Asst Director Fisheries Management Division |
| Takahiro Fujiwara | Fisheries Agency of Japan, Ministry of Foreign Affairs | International Affairs Division (RFMOs) |
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| Anon. | Fukuichi GyoGyo Co Ltd | Deputy Managing Director |
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| Kiyoshi Kimura | Kiyomura Corporation | President |
| Kazutoshi Otsuka | Kiyomura Corporation | Division Manage |
| Tokihiro Sudo | Kiyomura Corporation | Advisor |
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| Dr. Yuji Uozumi | Japan Tuna/ <i>Nikkatsukyo</i> | Advisor |
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South Korea

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|---------------------------|--|--|
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| Ho-Jeung JIN | Korea Overseas Fisheries Association | Deputy General Manager, International Affairs Dept 1 |
| Il-Kang NA | Korea Overseas Fisheries Association | Manager, International Affairs Dept 1 |
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| Jun-Su SONG | Sajo Industries Co Ltd | Assistant Manager, Fishery 1 Team |
| Jin-Sok PARK | Sajo Industries Co Ltd | Asst Manager, Tuna 2 Team |
| Kwang-se ('Tuna Lee') LEE | Silla Co. Ltd | Executive Director |
| Sancho KIM | Silla Co. Ltd | Purse Seiner Team/ Manager |
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| Sang Doo KIM | Dong Won Fisheries Co. Ltd | Busan Branch Office President/Managing Director |
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| Taehi RI | Fish. Monitoring Center, Ministry of Fisheries | Director |
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| Yeong Choi LEE | Silla Co. Ltd Busan | Managing Director |
| Ki Jun KWON | Silla Co. Ltd Busan | GM, Fisheries Team |
| Nam Hun KIM | Silla Co. Ltd Busan | Fisheries Team |

Taiwan

| Name | Organization | Position |
|-------------------|---|--|
| Fred Muller | Government of the Republic of Marshall Islands' | Ambassador to Taiwan |
| Hsiangyi Yu Joy | Fisheries Agency, Council of Agriculture | International Fisheries Affairs Section, Deep Sea Fisheries Division |
| Chi-Chao Liu | Fisheries Agency, Council of Agriculture | International Fisheries Affairs Section, Deep Sea Fisheries Division |
| David C.S. Chang | Overseas Fisheries Development Council | President |
| Jemin Hou | Tri Marine International | Office manager, Kaohsiung |
| Tinghsin Huang | Tri Marine International | Sashimi buyer, Kaohsiung |
| Gary Chang | Tri Marine International | South Pacific Department |
| Alfred Tseng | Tri Marine International | South Pacific Department |
| Kevin Chen | Tri Marine International | South Pacific Department |
| Edward C.C. Huang | Taiwan Tuna Association | General Secretary |
| Tony Lin | Taiwan Tuna Association | Senior Officer |
| Penny Peng | Taiwan Tuna Association | Senior Officer |
| Chih Yuan Wang | Soon Yi Superfrozen Co. Ltd | |
| Martin Ho | Taiwan Tuna Longline Association, | Secretary General |
| Li Ming Sin | Taiwan Tuna Longline Association | Vice Chairman (and boatowner) |
| Jack Tien-I Chi | Global Fishery Ltd | |
| Wayne Tseng | Global Fishery Ltd | |
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| W.H. Lee | FCF Fishery Co Ltd: | Chairman and CEO |
| Max Chou | FCF Fishery Co Ltd: | Executive Vice President |
| Tony Yu | FCF Fishery Co Ltd: | Executive Vice President (Longline) |
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| F.L. Sang | FCF Fishery Co Ltd: | Senior Manager, Office of CEO |

Others

| Name | Organization | Position |
|-----------------|--|--|
| Dr Tim Adams | Pacific Islands Forum Fisheries Agency | Director of Fisheries Management |
| Russell Dunham | Tri Marine International | Director, Fresh & ULT Frozen Tuna |
| Amanda Hamilton | Tri Marine International | Senior Manager - Fisheries Policy & Regulation |
| Masao Nakada | Pacific Islands Forum Fisheries Agency | Manager of Japan Promotional Fund |
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The Tuna Longline Industry in the Western and Central Pacific Ocean and its Market Dynamics

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This report provides industry and market intelligence regarding the current status of the tuna longline industry in terms of distant water fleets (DWF) and other companies involved in the global value chains that these fleets supply. The study examines the DWFs of China, Japan, South Korea and Taiwan. The primary focus is on industry dynamics, that is, key companies and organisations, industry organisation and corporate strategies; and the secondary focus is on markets and marketing strategies.