



FFA



MARKET AND INDUSTRY DYNAMICS: WESTERN AND CENTRAL PACIFIC OCEAN DISTANT WATER TUNA PURSE SEINE FISHERY

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DISCLAIMER

The content of this report (including all analysis and opinions) are solely the responsibility of the consultants and do not necessarily reflect the position or thinking of the Pacific Islands Forum Fisheries Agency.

Front cover photo: US-flag purse seiner, Cape Finisterre.
Photo: Jonathan Curto

Back cover photo: Yellowfin in hopper on a Japanese purse seine vessel.
Photo: courtesy of Mike McCoy photo collection

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ACRONYMS

3IA	Third Implementing Arrangement of the Nauru Agreement
4IA	Fourth Implementing Arrangement of the Nauru Agreement
AR	annual report
ATA	American Tunaboat Association
BE	bigeye
BET	Bigeye tuna
BFAR	Bureau of Fisheries and Aquatic Resources (Philippines)
CA	competent authority
CA	WCPFC Convention Area
CN	China
CED	SPC Catch and Effort Database
CMM	conservation and management measure
CNFC	China National Fisheries Corporation
CNM	cooperating non-member
CNY	Chinese yuan
COFA	China Overseas Fisheries Association
COFC	CNFC Overseas Fisheries
COSI	Chicken of the Sea International
DW	distant water
DWFN	distant water fishing nation
EC	European Commission
EEZ	exclusive economic zone
ELAPS	Effort Limit Area for Purse Seine
ENSO	<i>El Niño</i> Southern Oscillation Index
EPA	Economic Partnership Agreement
EPO	Eastern Pacific Ocean
EU	European Union
FAD	fish aggregation device
FAO	Food and Agriculture Organisation of the United Nations
FCF	Fong Cherng Fishery Company Ltd.
FFA	Pacific Islands Forum Fisheries Agency
FIA	Papua New Guinea Fishing Industry Association
FIMS	Fisheries Information Management System
FMA	Fishery Management Areas
FOC	flag of convenience
FOS	Friend of the Sea

FSM	Federated States of Micronesia
FSMA	Federated States of Micronesia Arrangement
GenSan	General Santos
GGGI	Global Ghost Gear Initiative
GRT	gross registered tonnage
GSP	EU Generalized System of Preferences
GT	gross tonnage
HFO	heavy fuel oil
HS	high seas
HS code	Harmonised System code
HSP	high seas pocket
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
iFIMS	Integrated Fisheries Information Management System
IFO	Intermediate fuel oil
ILO	International Labour Organization
IMO	International Maritime Organization
IO	Indian Ocean
IOTC	Indian Ocean Tuna Commission
ISSF	International Seafood Sustainability Foundation
ITC	International Trade Centre
IQ	individual quota
IUU	Illegal, unreported, unregulated fishing
JFA	Japan Fisheries Agency
JICA	Japan International Cooperation Agency
JPF	Japan Promotion Fund
JPY	Japanese Yen
JV	joint venture
KAIMAKI	Kaigai Makiami Gyogyo
KFIMS	Korea Fisheries Information Management System
KFL	Kiribati Fish Ltd.
kgs	kilograms
KOFA	Korea Overseas Fisheries Association
KR	(Republic of) Korea
LBF	locally-based foreign
LL	longline
LSFO	low sulphur fuel oil

LTFV	Luen Thai Fishing Ventures
MCS	monitoring, control and surveillance
MEL	Marine Eco-Label (Japan)
MGO	marine gas oil
MIFCO	Marshall Islands Fishing Company
MIMRA	Marshall Islands Marine Resources Authority
MPA	Marine Protected Area
MSC	Marine Stewardship Council
mt	metric tonne
MTCs	Minimum Terms and Conditions
NFA	PNG National Fisheries Agency
NFC	National Fisheries Corporation (FSM)
NFDC	Nauru Fisheries Development Corporation
NGO	non-government organization
NOAA	National Oceanic and Atmospheric Administration (US)
NORMA	National Oceanic Resource Management Authority (FSM)
NRIFSF	National Research Institute of Far Seas Fisheries (Japan)
ODA	overseas development assistance
OFCF	Overseas Fishery Cooperation Foundation (Japan)
OFDC	Overseas Fisheries Development Council (Taiwan)
PBF	Pacific bluefin tuna
P&L	pole and line
PALM	Pacific Islands Leaders Meeting
PAE	Party Allowable Effort
PAFCO	Pacific Fishing Company
PH	Philippines
PICs	Pacific Island countries
PITIA	Pacific Islands Tuna Industry Association
PIPs	Pacific Island Parties
PNA	Parties to the Nauru Agreement
PNG	Papua New Guinea
PNMS	Palau National Marine Sanctuary
PPF	Pan Pacific Foods (RMI) Inc.
PS	purse seine
PS Special	Purse seine special
PSMA	FAO Port State Measures Agreement
RDTC	RD Tuna Cannery

RFMO	Regional Fisheries Management Organization
RFV	Record of Fishing Vessels of the WCPFC
RMI	Republic of Marshall Islands
RoO	Rules of Origin
RVR	FFA Regional Vessel Register
SAFAII	Soksargen Association of Fishing and Allied Industries Inc.
SB	spawning biomass
SIDS	Small Island Developing States and Territories
SKJ	skipjack
SOE	state-owned enterprise
SPTC	South Pacific Tuna Corporation
SPC	Secretariat of the Pacific Community
SPS	sanitary and phytosanitary standards
SSTC	South Seas Tuna Corporation
TAE	Total Allowable Effort
TAFCO	Taiyo A&F Co. Ltd. (Japan)
TFA	Taiwan Fisheries Agency
TMC	Taiyo Micronesia Corporation (FSM)
TPJ	Trans Pacific Journey (Philippines)
TSP	TSP Marine Industries (Philippines)
TTPSA	Taiwan Tuna Purse Seiners Association
TW	Taiwan
UK	United Kingdom
ULT	ultra-low temperature
US	United States of America
USA	United States of America
USD	US dollar
USMLT	US Multilateral Tuna Treaty
VDS	Vessel Day Scheme
VMS	vessel monitoring system
WCPFC	Western and Central Pacific Fisheries Commission
WCPFC-CA	Western and Central Pacific Fisheries Commission Convention Area
WCPFC RFV	Record of Fishing Vessels of the WCPFC
WCPO	Western and Central Pacific Ocean
WPEA OFM	West Pacific East Asia Oceanic Fisheries Management Project
YFC	Yaizu Fisheries Cooperative (Japan)
ZOF	Zhejiang Ocean Family (China)

EXECUTIVE SUMMARY

The purpose of this report is to provide industry and market intelligence to Pacific Islands Forum Fisheries Agency members regarding the current status of the Western and Central Pacific Ocean (WCPO) distant water purse seine tuna fishing industry. This report largely focusses on six major distant water fishing nation (DWFN) purse seine fleets operating within the WCPO – Japan, South Korea, Taiwan, China, US and the Philippines. Cross-cutting and fleet-specific industry dynamics are identified, and where possible, implications for PICs are drawn out.

WCPO Distant Water Purse Seine Fleet Overview

The Japanese pioneered tropical purse seine fishing in the WCPO, developing a commercial fleet in the mid-late 1970s. Several US purse seiners operating in the EPO commenced experimental voyages into the US-Pacific Trust Territory in the mid 1970s; by the early 1980s, the US purse seine fleet had shifted to the WCPO. Around the same time, the Philippines, Taiwan and Korea commenced purse seine fishing in the WCPO. China was the last Asian distant water fleet to enter the WCPO purse seine fishery in 2001.

From 1990-2006, the total number of purse seine vessels operating in the WCPO was relatively stable, ranging from 180-220 vessels. From 2007, vessel numbers increased gradually, when the vessel cap was replaced by a limit on fishing effort under PNA's Purse Seine Vessel Day Scheme (VDS). In 2015, purse seine vessel numbers peaked at 308, but have since declined steadily to 271 vessels in 2018. The number of Pacific Island domestic vessels (i.e. Pacific Island-flagged, chartered and locally-based foreign vessels) has gradually increased since the mid-1980s, reaching 126 in 2018.

In the mid-1980s, when the WCPO purse seine fishery was first developing, annual catch was 400,000-450,000 mt, accounting for around 40% of total WCPO tuna catch. In 2018, total purse seine catch was 1,910,725mt, accounting for 70% of total WCPO tuna catch. The WCPO fishery is essentially a skipjack fishery, accounting for 65-77% of purse seine catch; yellowfin accounts for 20-30% and bigeye only 2-5%.

WCPO purse seine vessels target skipjack and yellowfin in free-swimming schools and around man-made drifting fish-aggregation devices (FADs) and floating logs. There are long-standing concerns about high levels of incidental by-catch of juvenile bigeye and yellowfin by purse seiners fishing on FADs. While stock assessment results indicate both WCPO bigeye and yellowfin stocks remain healthy, the recommended scientific advice is that management measures which reduce fishing mortality of fisheries that take juveniles should continue to be considered.

The majority of purse seine catch in the WCPO is supplied to canned tuna processors in Thailand. Raw material is also supplied to canned tuna and cooked loin processors in American Samoa, Central/South America, Philippines, Korea, China, Vietnam and Japan. Around 100,000 mt/year is processed by plants based in PNG, Solomon Islands, and Marshall Islands. The largest markets for canned tuna remain the EU and US. Purse seine-caught skipjack from the WCPO is also used to produce the Japanese product, *katsuobushi*. Purse seine vessels with ultra-low temperature (-45 to -55°C) freezing capability also supply yellowfin for lower-grade sashimi products.

There are a range of developments and key issues which have impacted the WCPO purse seine fleet – some have emerged in recent years, others are long-standing: fleet expansion, Pacific Island countries' fleet development aspirations, FAD management, sustainability, traceability and labour requirements,

fisheries access, market access, EU-IUU Fishing Regulation, fish and fuel price fluctuations and changes to fisheries management and regulation.

Taiwan

The Taiwanese fleet and Taiwanese capital are major players in the WCPO. Since 2004, Taiwan Government has instituted a limit of 34 Taiwan-flag purse seine vessels. At the time of writing, there was also an estimated 29 Taiwanese beneficially-owned purse vessels operating under PIC flag (90% flagged to PNA countries), bringing the total fleet to 63 vessels. Fourteen vessels with significant Taiwanese investment also operate under US-flag.

Taiwan's purse seine vessel ownership is primarily family-based; most of the larger family-owned operations also own and operate vessels in other fisheries, notably, distant-water longline and squid/saury fisheries. The purse seine fleet (Taiwan flag and beneficially-owned) is relatively young, with between 50-60% of vessels less than 10 years old, four of which were constructed in the past 2-3 years.

In 2018, the Taiwan distant water purse seine fleet catch was around 193,000mt and ranged from 160,000-237,000 mt between 2013-2018. The majority of fishing takes place within PNA EEZs, with only 95 high seas days allocated to Taiwan flag vessels by WCPFC. Taiwan's purse seine fleets, whether flagged in Taiwan or elsewhere, are essentially transshipment fleets that do not deliver directly to processors; the majority of catch is sold to global marine products trading company FCF and is delivered to Thailand or other major tuna processing centres for canning.

Taiwan has faced considerable criticism from NGOs and others on the crewing conditions of its distant water fleets. Most of the criticism has focussed on distant water longliners, but the purse seine industry also feels some of that pressure. Some segments of the Taiwan fleet have sought commercial advantage by obtaining MSC certification.

Korea

The Korean distant water purse seine fleet is modern, efficient and largely profitable; Korean vessels are the highliners of the WCPO purse seine fleet, with average annual catches of over 10,000 mt per vessel. Total catch by the Korean flag vessels ranged from 246,000 – 270,000 mt/year between 2014-2018. The fleet fishes over a wide area of the WCPO, but with an increasing proportion of catch taken in eastern areas in recent years when *El Niño* conditions have predominated. Fishing in high seas is restricted by the WCPFC to 207 days per year.

In 2018, the Korean-flag fleet consisted of 27 vessels and has been relatively stable for some years. Since 2013, the number of beneficially-owned Korean vessels involved in PIC joint ventures has grown to 14 in four countries, taking the total Korean-owned fleet to 41 vessels. The re-flagged vessels have typically been replaced by newly constructed Korean-flag vessels. Korean onshore investment in PICs has been limited, despite proposals developed for PNG and Solomon Islands. For the Korean flag vessels, 17 of the 27 vessels (63%) are less than ten years old. By contrast, the PIC-flagged joint venture fleet is ageing, with 12 out of 14 vessels (85%) over 20 years old.

With the exception of one vessel, the Korean flag vessels are all owned by three large companies; two of which are vertically integrated into processing, whereas the third supplies two separately owned Busan-based canneries under contract. All companies have diverse interests beyond tuna fisheries.

The fleet tranships nearly all of its purse seine catch in PIC ports. A portion of the transhipped catch is returned to Korean ports for delivery to five domestic canneries for processing (120,000-130,000 mt/year), with the balance (~ 170,000 mt) going to canneries in other countries, primarily Thailand, Vietnam and Ecuador. Most Korean purse seine companies are reported to now have at least some of their vessels fitted with PS-special ULT refrigeration capability to produce lower-end sashimi markets in Korea and Japan.

Sustainability certification and ecolabelling have yet to gain much traction in the domestic processed fish market. However, there are some moves from fishing companies to obtain third-party sustainability certifications (MSC and Friend of the Sea) for export markets.

Japan

The Japanese fleet, early pioneers of industrial purse seine fishing in the WCPO, is no longer a dominant fleet, but remains a stable presence. The Japanese fleet has been relatively stable in terms of vessel numbers in recent years, as a result of government restrictions on distant water vessel numbers (capped at 35 since 1997). The fleet is comprised of 28 Japanese-flagged vessels and five vessels operating in joint venture under the FSM flag; the majority of the vessels are older and smaller than competing fleets from China, Taiwan and Korea. Historically, the Japanese Government has strictly regulated the size of the vessels. However, this policy has been relaxed in recent years, allowing for several larger vessels to be constructed (1,800 GT). The Japanese purse seine fleet is an ageing one, with 17 of the 28 active DW vessels (61%) over 20 years of age. Ownership is quite diverse, with two companies owning five vessels each, and the remainder of the companies owning 1-3 vessels each. The Japanese distant water purse seine fleet continues to operate primarily in the western part of the WCPO; it only has 121 high seas fishing days.

The Japanese tuna industry historically was involved in onshore investments in processing, founding two important Pacific Islands processing plants that are still operational today (though no longer with Japanese involvement): Soltuna in the Solomon Islands and PAFCO in Fiji. However, presently, those in the Japanese fleet have expressed little interest in either onshore investments or in further joint-venture operations.

The Japanese fleet primarily returns to Japanese ports to offload, and as such, does not rely on PIC transshipment ports. Though the Japanese Government has relaxed requirements to compulsorily offload in Japan, the fleet largely retains the practice. The additional costs of returning to Japan ports to unload for most of the fleet are claimed to be partly offset by the reduced VDS access fees (fewer fishing days required), and access to better maintenance and repair facilities needed for the ageing fleet than available in Pacific Island ports.

The Japanese-flag fleet caught 177,000mt in 2018. The fleet continues to supply the Japanese market, which includes a broader range of product types in comparison with other fleets. These include: *katsuobushi*, *sashimi* and canned tuna. All Japanese vessels now have varying levels of purse seine special capacity for storing a portion of catch for sale to higher value markets. No Japanese purse seine fisheries are known to be seeking MSC certification or participating in PNA's MSC program, likely a reflection of limited domestic consumer interest in eco-labelled product.

China

Since the early 2000s, the Chinese purse seine fleet has grown considerably through a combination of new construction and acquisition of used vessels. Vessels are either wholly or substantially owned by large state-owned enterprises or by private sector companies. There are currently fifteen vessels in the China-flag fleet operating in the WCPO, and an additional six beneficially-owned Marshall Island flag vessels, three of which were constructed in 2019. Fourteen of the fifteen China-flag vessels are currently chartered to Kiribati. The six Marshall Islands-flag vessels are associated with the Pan Pacific Foods Ltd. loining plant in Majuro, Marshall Islands. The total catch of the Chinese-flag and beneficially-owned WCPO fleet could be in the order of 150,000 mt/year based on current vessel numbers.

China government subsidies given to distant water tuna fisheries for operations (mainly fuel), replacement vessel construction and the building or expansion of overseas bases have encouraged increases in the fleet. As long as China requires a certain percentage of catch returned to China for processing by vessels receiving subsidies, and fishery access in PICs is available to Chinese purse seiners through bilateral agreements, joint fishing ventures and chartering, it is unlikely that Chinese firms engaged in the WCPO purse seine fishery will make any further large investments in processing in Pacific Island countries. The Chinese government's financial support for the establishment of bases has been primarily taken up by its longline industry in FSM, Marshall Islands, Kiribati and Samoa.

Recently, the fleet has been fishing mostly in eastern PNA EEZs - Kiribati, Marshall Islands and Nauru. China has only 26 high seas fishing days; however, the Marshall Islands-flagged vessels have unlimited high seas access. With the exception of small volumes delivered to Pan Pacific Foods in Majuro, catch is transhipped in PNA ports. The production of China's purse seine fleet is closely linked to China's tuna processing industry, which processes purse seine-caught tuna into loins for export and cans for both foreign and domestic markets. There is currently no production of ULT PS-special yellowfin within the fleet, although two vessels have ULT capability. The 10% tariff imposed by the US on loins imported from China was increased to 25% in May 2019. It is believed that the net result of these increases is greater export of Chinese purse seine-caught tuna to Thailand. So far, the domestic market in China for canned tuna has not taken off despite efforts to encourage growth.

In recent years, China has been making a concerted effort to be seen as a law-abiding participant in the WCPO purse seine fishery. Harsh penalties have been instituted for infractions of China's domestic laws, WCPFC management measures and other requirements.

USA

The US fleet has long been active in the WCPO. Since the 1980s, its fishing activities in the region have been facilitated by the US Multilateral Treaty, which provides the fleet with access to all FFA members' EEZs for up to 40 vessels. Prior to the introduction of the VDS in 2007, the US fleet had declined from 40 vessels to around 12-14, largely due to increased competition from lower-cost Asian distant water fleets.

As the VDS was designed to limit fishing effort and increase access fees for all distant fleets fishing in PNA EEZs, the US Treaty appeared to offer a refuge from uncertainty, as its terms continued to offer unlimited fishing access in all Pacific Island Party EEZs for pre-negotiated fishing license fees. To take advantage of this opportunity, owners of approximately 16 vessels – primarily from the Taiwan fleet – were added to the US flag in joint ventures with US citizens around 2010. This reinvestment, along with US flagged vessels that had previously left the WCPO and returned to the Treaty, revitalized the US fleet to 40 operational vessels. By 2017, however, that number declined with 34 US vessels active in

the WCPO. In the coming licensing period, a total of 31 US flagged vessels are expected. Eight vessels have been recently announced as being sold, citing uncompetitive conditions operating under the US flag and a lack of support from the US Government. If the sales are concluded, the US fleet will be further reduced to around 23 vessels. Operators within the US fleet have developed several responses to cope with changing access conditions under the US Treaty – purchasing some bilateral days in favour of multilateral fishing days, maximising high seas and US EEZ fishing days, re-engaging in the EPO fishery and leaving the US flag (through vessel sales and/or re-flagging). However, the future of the US Treaty remains uncertain. The fleet's total catch volume has steadily declined alongside vessel numbers – in 2014 total catch was almost 313,000 mt; by 2018 this had declined to 165,000 mt.

The US fleet has two distinct operating models, with one segment of the fleet (the 'old' fleet) typically fishing further in the eastern portion of the WCPO to serve American Samoa's processing sector (and for some, also EPO processors). The other segment (the 'new' fleet of Taiwan-built vessels) fishes throughout the WCPO and operates under a transshipment model, delivering to processing plants in Thailand and the rest of Asia and occasionally, Central/Latin America. The eastern high seas is a significant fishing ground, particularly for the 'old fleet', with 1,270 fishing days allocated.

Several non-state regulatory issues – including eco-labels and shifts in design to non-entangling and biodegradable FADs – are now firmly on the radar of US vessel owners. Vessels in both the 'old' and 'new' fleet hold MSC certifications for free-school caught skipjack and yellowfin. Members of the US fleet are taking note that social responsibility, particularly concerns over labour standards are gaining attention, though formal regulation is still in its infancy.

Philippines

The Philippine tuna industry was among the first to develop on a large scale in the WCPO. Today, the beneficially-owned Philippines purse seine fleet of 91 vessels is collectively the largest in the WCPO in terms of vessel numbers, with a total annual catch of over 300,000 mt. It is comprised of domestic purse seine vessels which fish mostly within Philippines and High Seas Pocket 1, Philippines flag vessels fishing mostly in PNG under distant water or locally-based foreign access arrangements and PNG-flag vessels beneficially owned by Philippines companies operating under charter to PNG-based canneries. These vessels are owned by four Philippines companies. In general, the Philippines flagged fleet is comprised of older vessels which are relatively small in size in comparison with other fleets, making it a relatively less efficient fleet.

Diverse Philippines tuna industry presence remains at the heart of the large PNG tuna sector, with around 60 locally-based foreign, PNG flag vessels and distant water purse seine vessels and ownership of four of the six operational canneries in the country. All of the fishing companies are key suppliers to canneries in the Philippines. Most of the plants in the PNG processing sector continue to operate well below capacity, despite the global sourcing component of the EU Rules of Origin, given that affiliated vessels export high volumes of catch to the Philippines. After several false starts and a crowded investment space, there seems little appetite to expand the Philippines involvement to other PICs, other than bilateral or multilateral fishing access.

Whilst the Philippines distant water fleet has not made a concerted as yet to move towards MSC certification, Philippines PNG vessel owners as a group are moving towards certification, independent of the existing PNA/Pacific MSC certification.

Implications for PICs

Fleet dynamics have largely settled out following the significant increase in fisheries access prices associated with the PNA Vessel Day Scheme. Issues surrounding vessel day price and conditions vary fleet by fleet. High cost operators express concern about the increasing price of fishing days. Some lower cost operators note that fishing day prices have affected their bottom lines, but expressed more concern over consistent availability than price *per se*. There is continued concern about inconsistency on the definition of a fishing versus a non-fishing day.

Increasing cooperation among PICs and the PNA, in particular, has generated impacts beyond the increases in access fees. First, it is evident that VDS is driving a continued need for improved efficiency in vessel design and fishing. This kind of capacity and effort creep is an expected outcome that PICs will continue to encounter as they work to collectively increase control of the fishery.

A second is that recent years have also seen modifications in fishing access relationships and dynamics. The VDS and the FSMA are important examples of these, but additional innovations have emerged in turn. For instance, the US Treaty has created a wider range of geographically specific fishing day options and some vessels have begun to participate in new sub-regional pooling arrangements with PNA members and Tokelau. As the price of fishing access under the VDS continues to increase there are further opportunities for such innovations. Notably, fleets are also beginning to think ahead to the spatial changes to fish stock distribution expected to emerge as the effects of climate change continue to develop, which also might forge new access relationships relating to an increase of fish biomass in the eastern high seas areas.

A third major dynamic that has emerged is growth in PIC-flagged and domestically registered vessels. This change has been driven by the potential opportunities for beneficial access relationships generally. More specifically, it also offers potentials for reduced fishing access prices compared to the VDS, other flexibilities such as exemptions from FAD closures and plays a role as an agent for the construction of new vessels for foreign states that otherwise have high seas effort limits and capacity limits on fleet size. Access relationships are influenced by considerations such as the prices and terms of access, as well as fish abundance and market access concerns.

1. INTRODUCTION

1.1 Background

The purpose of this report is to provide industry and market intelligence to Pacific Islands Forum Fisheries Agency (FFA) members regarding the current status of the Western and Central Pacific Ocean (WCPO) distant water purse seine tuna fishing industry. It aims to update and build on a major report published by FFA in 2011, *Market and Industry Dynamics in the Global Supply Chain*, which included a global overview of the purse seine fishing sector and profiled key purse seine fleets operating within and beyond WCPO.

This report largely focusses on six major distant water fishing nation (DWFN) purse seine fleets operating within the WCPO – Japan, (Republic of) Korea, Taiwan, China, US and the Philippines. These six DWFN fleets, together with Pacific Island country (PIC) purse seine fleets that with a few exceptions are largely beneficially-owned by companies originating from these DWFNs, represent the majority of purse seine vessels operating in the WCPO. Cross-cutting and fleet-specific industry dynamics are identified, and where possible, implications for PICs are drawn out. For the six purse seine fleets, details are provided on industry dynamics including ownership and management structures, vessel operations, flag state requirements, access arrangements with FFA members, major markets, linkages to trading companies and processing firms, recent developments and future prospects and the importance of fishing in WCPO and specifically, FFA members' waters.

The report is intended for: i) general use by the FFA Secretariat and FFA members to better understand the current structure of this sector of the tuna industry, key players and major industry drivers; ii) direct and immediate use in relations with DWFNs, including access agreements and shaping alternative arrangements to access arrangements including direct involvement in fishing and processing; iii) use in negotiations with foreign interests for fisheries-development related projects; and iv) understanding the market and industry implications of conservation and management measures relevant to the purse seine sector.

1.2 Approach

This study was undertaken by the following team:

- Dr. Elizabeth Havice – Associate Professor, University of North Carolina-Chapel Hill
- Dr. Antony Lewis – Fisheries Consultant, Independent
- Mr. Mike A. McCoy – Fisheries Consultant, Gillett, Preston & Associates

In April-June 2018, members of the consultancy team conducted in-country consultation with key tuna industry stakeholders in five out of six case study countries – Taiwan, China, Korea, Japan and the US. Industry consultation involved interviews with major tuna industry stakeholders, including vessel owners, fishing industry associations, trading companies and government agencies to collect information on changing industry and market dynamics. The Philippines distant water fleet was covered via desktop research, as it was an addition included by the consultancy team over and above the DWFNs required to be covered under the scope of this study, given the significance of this fleet in WCPO.

Secondary sources of information included industry press, company websites, conference presentations, consultancy reports and academic publications. Interviews and secondary information sources were also

supplemented by the consultants' own knowledge, having been involved in the aforementioned 2011 FFA study and various other relevant consultancies, as well as providing bi-monthly updates on industry and market-related developments to FFA members via *FFA Trade and Industry News* since 2008.

The study largely consists of a snap-shot from during the period of fieldwork (April-June 2019), but where possible, also incorporates an indication of change over the last five years. The tuna purse seine industry is dynamic, hence some information provided in this report may quickly become outdated.

Extensive interview data are used throughout. These are generally not referenced unless a specific factual piece of information is provided. Therefore, unless otherwise specified in a footnote, the reader can assume that information is from interviews and/or the author's own knowledge.

The report commences with an updated overview of the WCPO purse seine sector and key industry-level developments and issues affecting the fishery since FFA's 2011 publication of *Market and Industry Dynamics in the Global Tuna Supply Chain*.¹ Detailed commentary is then provided on six DWFN purse seine fleets, including PIC-flagged vessels with ownership and/or management links to these DWFNs. Key cross-cutting issues are elaborated in Boxes. The report concludes by identifying relevant general and fleet-specific implications of these purse seine sector developments for Pacific Island countries.

2. WCPO DISTANT WATER PURSE SEINE FLEET OVERVIEW

2.1 Fleet Overview

*Brief History*²

In the late 1950's, the US (California)-based pole-and-line tuna fishery was in financial crisis due to low tuna prices resulting from increasing competition from 200-300 Japanese pole-and-line vessels operating in Japan waters and further afield in the WCPO. The US fleet needed to be innovative to survive and discovered that use of purse seine gear for tuna fishing was feasible, resulting in the conversion of nearly 100 bait boats to tuna purse seiners, plus the construction of new boats. Purse seining yielded labour and fuel efficiency gains compared with pole-and-line fishing and did not require bait. By the 1970s, the US purse seine fleet peaked at 140 vessels operating in the Eastern Pacific Ocean (EPO). The Japanese then developed their own purse seine fleet, with net hauling gear based on US designs, and fished in temperate waters off the coast of Japan.

The Japanese pioneered tropical purse seine fishing in the WCPO, conducting experimental trials in Palau and Papua New Guinea (PNG) in 1972. By the mid-late 1970s, Japan had developed a commercial purse seine fleet operating in PNG, Federated States of Micronesia (FSM) and Solomon Islands, incentivised by a Japanese government vessel replacement policy in the late 1970s whereby five pole-and-line vessel permits could be swapped for one purse seine permit. Japanese purse seine vessels were the first to master pre-dawn sets on natural drifting objects in WCPO in the 1970s, a fishing technique that was then later adopted by other fleets and was the pre-cursor to the development of man-made drifting fish aggregation devices (FADs) (see Box 1 – FAD Management). Japanese purse seine vessels returned to Japan to unload catches, the majority of which were exported to the US for canning, with small volumes delivered to the domestic market (see Section 5 for further information).

¹ Hamilton et al. 2011

² Doulman 1986; Gillet 2007; Gillet, McCoy & Itano 2002

In the mid-1970s, several US purse seiners operating in the EPO, commenced experimental voyages into the US-Pacific Trust Territory (Palau, Northern Marianas, FSM and Marshall Islands) under funding from the US government and canning industry. These experimental voyages were largely unsuccessful, as the vessels continued to deploy shallow nets with heavy mesh. This technique proved inappropriate for WCPO fishing conditions with deeper thermoclines and clearer water than the EPO. In the early 1980s, the US purse seine fleet shifted to the WCPO, mostly due to difficulties arising from a strong *El Niño* event in 1982-83, coupled with environmental concerns and resulting regulations concerning purse seine tuna fishing associated with dolphins. New fishing techniques were adopted and gear modified to adapt to WCPO fishing conditions, including the use of helicopters to search for free-schools, upgrading of electronics for tracking floating logs and use of utility boats to tend and tow them, larger nets and corresponding installation of larger power blocks, purse winches and associated gear required for net hauling. With these improvements, the US purse seine fleet became the first major distant water competitor to Japan in the WCPO. US catches were typically transhipped at sea and, to a lesser extent, in Guam and the Northern Marianas for delivery to canneries in American Samoa and Puerto Rico (see Section 7 for further information).

In the early 1980s, the Philippines developed a purse seine fleet to meet the demand for raw material from its growing domestic canning industry. The Philippines fleet, was comprised mostly of group seining operations consisting of a vessel to deploy and haul the net, as well as several refrigerated fish carriers to preserve the catch and deliver to port. The Philippines extended its fishing operations beyond domestic waters into Indonesia, Papua New Guinea (PNG) and areas of the high seas. Taiwan and Korea also entered the WCPO purse seine fishery around the same time; catch from Taiwanese vessels was sent to canneries in Thailand via transshipment, while the Korean vessels originally supplied the newly developing Korean domestic tuna canning sector. In 2001, China was the last Asian distant water fleet to enter the WCPO purse seine fishery, with catches transhipped to Thailand and China (see Sections 3, 4, 6 and 8 for further information).

Appendix 2 provides additional details about the development of the WCPO purse seine fishing and processing sectors.

Fleet Size³

From 1990-2006, the total number of purse seine vessels operating in the WCPO was relatively stable, ranging from 180-220 vessels. This stability was largely due to a cap on foreign vessel numbers under the Parties to the Nauru Agreement (PNA) Palau Arrangement of 205 vessels.⁴ From 2007, vessel numbers increased gradually, when the vessel cap was replaced by a limit on fishing effort under PNA's Purse Seine Vessel Day Scheme (VDS). In 2015, purse seine vessel numbers peaked at 308, but have since declined steadily to 271 vessels in 2018 (Figure 1). In 2011, when the previous major FFA industry intelligence study was published, 279 vessels were active in the fishery.⁵

The number of Pacific Island domestic vessels (i.e. Pacific Island-flagged, chartered and locally-based foreign vessels) has gradually increased since the mid-1980s. This growth was stimulated in part by the adoption of the FSM Arrangement (FSMA) in 1994, which provided concessional multilateral access to PNA parties' waters for domestic vessels. In recent years, re-flagging and chartering of vessels has been also driven by some PNA parties giving preferential fishing access to companies that have invested locally in fishing and/or onshore processing operations. Also important is the availability of

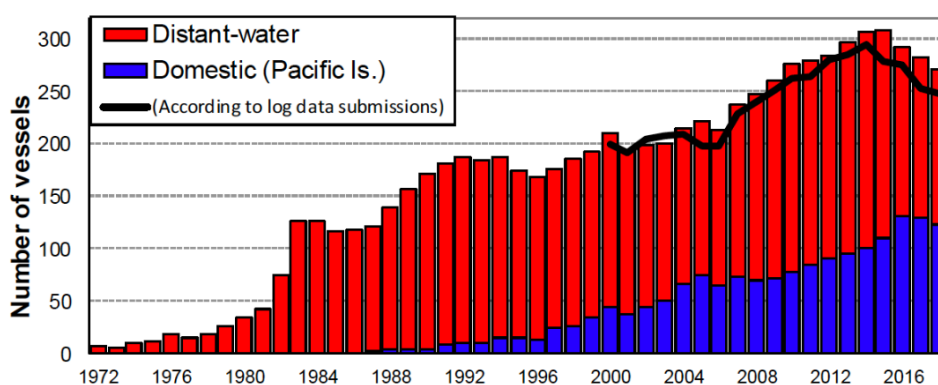
³ Williams & Reid 2019

⁴ The Parties to the Nauru Agreement - Solomon Islands, Tuvalu, Kiribati, Marshall Islands, Papua New Guinea, Nauru, Federated States of Micronesia and Palau – have collaborated on managing tuna stocks within their national waters since 1982. The Palau Arrangement is a multilateral treaty established by PNA in 1995 to manage purse seine fishing within PNA waters.

⁵ Excludes Indonesia, Vietnam and Philippines domestic purse seine/ring-net vessels.

exemptions for Small Island Developing States (SIDS) from several key WCPFC management measures, particularly vessel capacity limits, FAD closures and high seas fishing effort limits. The majority of growth in PIC domestic fleets has been through the re-flagging and chartering of vessels from Asian fleets, notably Korea, China, Taiwan and Philippines. In 2018, the Pacific Island fleet was comprised of 126 vessels, a slight reduction on the peak of 132 in 2016.

Figure 1 Number of Purse Seine Vessels Operating in the WCPO Purse Seine Fishery



Note: Excludes Indonesia, Vietnam and Philippines domestic purse seine/ring-net vessels.

Source: Williams & Reid 2019

Catch ⁶

In the mid-1980s, when the WCPO purse seine fishery was first developing, annual catch was 400,000-450,000 mt, accounting for around 40% of total WCPO tuna catch. By 2014, the fishery's annual catch exceeded 2,000,000 mt, resulting from an expanding and increasingly more efficient fleet. In 2018, the purse seine fishery accounted for 70% (1,910,725 mt) of total WCPO tuna catch (2,716,396 mt). This was the second highest purse seine catch on record since 2014 of 2,059,008 mt. Historically, the majority of purse seine catch was made by the four main DWFN fleets operating at the time – Japan, Korea, Taiwan and the US. Since 2003, the combined Pacific Islands' fleet catch has increased significantly reaching 782,731 mt in 2018, which was only around 40,000 mt lower than the combined catch from the four major DWFN of 820,216 mt. The remaining ~300,000 mt of catch in 2018 was caught by China, Philippines, New Zealand, EU, Ecuador and El Salvador flag vessels. Catch in PNA waters (1,482,194 mt) accounted for 78% of total WCPO purse seine catch, with average catch per unit effort (CPUE) across the fleet estimated to be 37 mt/day. From 2010-2018, around 80% of purse seine catch was taken from PNA waters and CPUE ranged from 23-37 mt/day.⁷

Unlike purse seine fisheries in other oceans which target a greater proportion of yellowfin, the WCPO fishery is essentially a skipjack fishery, accounting for 65-77% of purse seine catch; yellowfin accounts for 20-30% and bigeye only 2-5%. In 2018, the total purse seine skipjack catch was 1,469,530 mt (77%), yellowfin - 374,062 mt (20%) and bigeye - 64,119 mt (3%). The 2018 skipjack catch was the second highest on record and the bigeye catch was slightly higher than the past ten-year average, while yellowfin catch decreased 22% from the record catch in 2017, although was still one of the highest annual catches on record.

WCPO purse seine vessels target skipjack and yellowfin in free-swimming schools and around man-

⁶ Williams & Reid 2019

⁷ Clark 2019

made drifting FADs and floating logs. When tropical purse seine fishing first started in the WCPO in the 1980s, vessels fished predominately on floating logs. The proportion of unassociated sets/catch on free-schools increased as fleets became more skilled and equipped at finding free-schools and making successful sets. In the early 1990s, vessels started deploying and setting on man-made drifting FADs, which in time has largely replaced drifting log sets. The US fleet has historically yielded the highest catches on drifting FADs, while the Korean and Japanese fleets have focused primarily on free-school fishing. In 2018, 64% of sets were made on free-schools and 31% on drifting FADs; only 4% of sets were on natural logs. However, drifting FAD sets generally account for higher average catch rates per set than free-school sets (i.e. drifting FADs accounted for 44% of total catch from 31% of total sets in 2018). While free-school sets continue to be the dominant set type, the number of drifting FAD sets has increased in recent years, despite FAD closures being in place since 2008. 2018 had the highest percentage of drifting FAD sets since 1999 (35%). This is due to technology-related efficiency gains, coupled with vessels preferring drifting FAD sets because of higher skipjack catches and a higher overall success rate per set than free-schools (see Box 1 – FAD Management).

Spatial distribution of WCPO purse seine catch and effort is largely influenced by El Niño-Southern Oscillation Index (ENSO) events. Typically, fishing effort is concentrated in western fishing grounds during La Niña periods (e.g. PNG, FSM) and in the east during *El Niño* periods (e.g. Kiribati, eastern high seas); higher catch rates of large yellowfin (20kgs and over) generally occur during *El Niño* periods. In 2015, the strongest *El Niño* conditions in almost 20 years were experienced and continued into mid-2016, when conditions very quickly moved into a neutral state until 2017. *La Niña* conditions developed in later 2017 until early-mid 2018. Following a neutral state, weak *El Niño* conditions started in late 2018. At the time of writing, *El Niño* conditions prevail, with around a 50% chance of continuing for the remainder of 2019.⁸ Given the significance of climate conditions on the fishery, there is growing research to understand how climate change, ocean warming and food density changes will impact the spatial distribution of tuna and the future of the industry. Initial projections suggest that climate-induced shifts in WCPO tuna stocks will be towards the east and sub-tropical waters.⁹

Stock Status

Latest stock assessment results (2019) indicate that WCPO skipjack stocks are not overfished, nor is overfishing occurring. The stock is currently estimated to be around 44% of spawning biomass in the absence of fishing ($SB/SB_{F=0}$) which is above the limit reference point of 20% $SB/SB_{F=0}$ and close to the target reference point of 50% $SB/SB_{F=0}$.^{10,11}

The most recent stock assessment conducted for yellowfin was in 2017, with the next assessment scheduled for 2020. While yellowfin is not overfished, nor is overfishing occurring, stocks are approaching full exploitation in tropical regions. The stock was estimated to be at around 33% $SB/SB_{F=0}$ (median value), with a range of 20%-41%, indicating there is some level of probability that the 20% $SB/SB_{F=0}$ limit reference point is being approached.¹²

⁸ Becker 2019

⁹ See Dueri et al. 2014 & SPC 2019 for further information.

¹⁰ Target reference point (TRP) is generally defined as the optimal level of fishing mortality or biomass which permits long-term sustainable fishing; limit reference point (LRP) is the maximum fishing mortality or minimum biomass which must not be exceeded to avoid fishing becoming unsustainable. In the WCPFC context, TRP represents the level of fishing mortality or biomass that best achieves the management objective for the stock (or best compromise among competing management objectives); LRP represents the level of depletion of spawning biomass below which the risk of overfishing becomes unacceptable (i.e. 20%); Tim Adams, FFA, pers. comm., Sep 2019.

¹¹ Vincent, Pilling & Hampton 2019

¹² Pilling 2018

Previous stock assessments indicated that bigeye was overfished, with overfishing occurring. However, the 2017 bigeye stock assessment, which incorporated new bigeye growth functions into the model, indicated more optimistic results. Results indicated the bigeye stock is not overfished (with 84% probability) or subject to overfishing (with 77% probability).¹³ These results were consistent in a 2018 update which estimated the stock to be around 36% $SB/SB_{F=0}$, with zero probability of being below the limit reference point of 20% $SB/SB_{F=0}$ in 2019.¹⁴ A new bigeye stock assessment will be undertaken in 2020.

There are long-standing concerns about high levels of incidental by-catch of juvenile bigeye and yellowfin by purse seiners fishing on FADs negatively affecting adult biomass of these species. While stock assessments results indicate both bigeye and yellowfin stocks remain healthy, the recommended management advice is that WCPFC should continue to consider measures which reduce fishing mortality from fisheries that take juveniles, in order to maintain or increase spawning biomass.

Fisheries Regulation

The primary management tool of the WCPO purse seine fishery is the Purse Seine Vessel Day Scheme (VDS), which was first established under the PNA's Palau Arrangement and came into effect in 2007. The VDS is included in WCPFC's *Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna* (CMM 2018-01). The VDS is an effort control system under which a total collective limit is set on the annual number of fishing days in PNA EEZs (Total Allowable Effort - TAE). Each PNA member is allocated a proportion of the TAE that can be fished within their EEZ based on historical in-zone effort (Party Allowable Effort - PAE). Initially, the PAE formula also included a weighting for assessed in-zone biomass. Annual TAE in PNA EEZs has been set at 44,033 days since 2012 (based on 2010 effort levels in accordance with CMM 2011-01). In 2013, Tokelau, a non-PNA member, joined the VDS scheme, resulting in an additional 972 days being added to the TAE. Total TAE (PNA + Tokelau) was 45,005 days in 2018. This level has been provisionally adopted for 2019 & 2020.¹⁵ Since 2012, the total actual number of days fished in PNA EEZs has not exceeded the 44,033 days TAE. The number of days fished in 2012-2018 ranged from 32,259-43,948.¹⁶ VDS fishing days are allocated to purse seine vessels fishing in PNA waters under domestic, bilateral or multilateral access arrangements (i.e. US Treaty, FSM Arrangement and Sub-Regional Pool¹⁷).

The PNA applies additional purse seine management measures for vessels fishing in PNA waters through Implementing Arrangements. The Third Implementing Arrangement (3IA) sets out the following minimum terms and conditions: i) all bigeye, skipjack and yellowfin catches must be retained onboard; ii) no fishing on FADs for three months (1 July-30 September); iii) no sets on whale sharks; iv) no fishing in two high seas areas;¹⁸ v) 100% observer coverage and Automatic Location Communicator (ALC) reporting at all times; vi) minimum net mesh size; and, vii) no bunkering on the high seas.¹⁹ Effective 1 January 2020, the Fourth Implementing Arrangement (4IA) will come into effect which sets

¹³ McKeachie, Pilling & Hampton 2017

¹⁴ Pilling 2018

¹⁵ PNA 2019c

¹⁶ Clark 2019

¹⁷ Five PS VDS parties (FSM, Nauru, Solomon Islands, Tuvalu and Tokelau) have established a Sub-Regional Pool which provides vessels with multilateral access to these five fishing zones; Sub-Regional Pool fishing days are priced higher than bilateral fishing days.

¹⁸ The area of high seas bounded by the national waters of FSM, Indonesia, Palau and PNG; and the area of high seas bounded by the national waters of FSM, Fiji, Kiribati, Marshall Islands, Nauru, PNG, Solomon Islands and Tuvalu.

¹⁹ PNA 2008, amended 1 May 2019

out requirements for FAD buoy registration and FAD tracking.²⁰ WCPFC's tropical tuna measure (CMM 2018-01) also applies some compatible measures stemming from PNA's 3IA.

WCPFC's *Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna* (CMM 2018-01) applies to purse seine vessels fishing in EEZs and high seas within WCPFC's Convention Area largely between 20°N-20°S. Key binding measures applicable to the purse seine fishery include: i) zone-based effort controls (i.e. PNA VDS); ii) high seas effort controls for non-SIDs CCMs;²¹ iii) three-month FAD closure in EEZ/high seas, plus an additional two-months closure in high seas; iv) non-entangling FAD design and construction; v) limit of 350 drifting FADs with activated instrumented buoys per vessel; vi) full tuna catch retention; vii) 100% observer coverage; and, viii) capacity limit on the number of non-SIDS large-scale vessels to 2013 levels. CMM 2009-06 prohibits transshipment at sea for purse seiners. CMM 2016-05 requires purse seine vessel charters to be notified to the Commission, with catches attributed to the chartering state. There are also a number of WCPFC CMMs relating to bycatch mitigation for whale sharks, cetaceans, sharks and sea turtles.²²

Foreign purse seine vessels fishing within FFA member country waters must also fulfil FFA's regionally harmonized *Minimum Terms and Conditions for Access by Fishing Vessels* (MTCs) relating to fisheries management, monitoring, control and surveillance and most recently, labour standards for crew (on the latter, see Box 5 – Labour Conditions).

WCPFC, FFA, PNA and national requirements are typically executed via national legislation or licencing conditions.

WCPO Economic Conditions²³

Three key determinants are used by FFA to assess economic conditions for WCPO tuna fisheries – fish prices, fishing costs (excluding licence and access fee payments)²⁴ and catch rates; changes in each impact on the financial viability of fishing operations.

Following a sustained period of relatively poor economic conditions from 1999-2006, the purse seine fishery experienced an upward trend from 2006-2014, largely resulting from above average fish prices which more than offset increases in fuel costs. In 2014, economic conditions fell markedly in line with declines in fish prices, however conditions recovered to a level above the long-term average (1999-2014) in 2015 and 2016 due to increasing catch rates and low fuel costs. Favourable economic conditions prevailed in 2017, due to higher prices despite falls in catch rates. In 2018, a surge in catch rates offset falls in prices and increases in fuel costs, resulting in continued good economic conditions. Economic conditions for the WCPO purse seine fishery are projected to improve considerably to 2027, mainly on account of higher projected catch rates and above average fish prices.

²⁰ PNA 2019a

²¹ USA, EU, Korea, Japan, Taiwan, New Zealand, China, as per CMM 2018-01 Attachment 1 – Table 2.

²² CMM 2008-03 - sea turtles; CMM 2010-07 - sharks; CMM 2011-03 - cetaceans; CMM 2011-04 - oceanic white tip sharks; CMM 2012-04 - whale sharks; CMM 2013-08 - silky sharks.

²³ Williams and Reid 2019; Skirtun & Reid 2018

²⁴ FFA's assessment of economic conditions relate to WCPO tuna fisheries, not the harvesters. Hence, the relative ability of the fishery to generate rents over time (i.e. value of catch less cost of resources expended in taking the catch) is assessed. Licence/access fee payments are transfer payments between harvesters and coastal states, which do not impact on the economic performance of the fishery. Chris Reid, FFA, pers. comm., September 2019.



Markets

The majority of purse seine catch in the WCPO is supplied to canned tuna processors in Thailand (between approximately 550,000-650,000 mt annually). Raw material is also supplied to canned tuna and cooked loin processors in American Samoa (80,000 mt), Central/South America (100,000 mt), Philippines (110,000 mt), Korea (100,000 mt), China (150,000 mt), Vietnam (90,000 mt), Japan (40,000 mt) and others (100,000 mt). Around 100,000 mt is also processed by plants based in the Pacific region (PNG, Solomon Islands, and Marshall Islands).²⁵ Since the early 1990s, the majority of purse seine catch has been purchased from vessel owners by the 'big-three' trading companies – FCF, Tri Marine and Itochu – and sold and delivered to processors by carriers. The largest markets for canned tuna remain the EU and US, importing 730,000 mt and 208,000 mt respectively in 2018.²⁶

Purse seine-caught skipjack from the WCPO is also used to produce *katsuobushi* – flakes or shavings of dried and smoked skipjack tuna, used widely in Japanese cooking as a condiment and as a key ingredient in soup broths (*dashi*) and sauces. The total current raw material equivalent of *katsuobushi* consumed in Japan is around 175,000 mt; approximately 80,000 mt of which was supplied by Japanese purse seiners in 2018. Additional volumes of purse seine skipjack are also imported from some Marshall Islands and FSM flagged purse seine vessels (possibly up to 10,000 mt). In recent years, increasing amounts of ultra-low temperature (ULT) Purse Seine Special skipjack are used for *katsuobushi* production (see below). The remaining raw material is sourced largely from Japanese and Indonesian pole-and-line vessels; increasing volumes of processed product are also being imported. Japanese *katsuobushi* market demand is gradually declining and opportunities for export growth are very limited. Hence, overall raw material demand levels are likely to continue to stagnate or decline.

All Japanese and some Korean and Taiwanese purse seine vessels are equipped to freeze a portion of catch at ultra-low temperatures, typically -40 to -45°C for Japanese vessels and below -45 to -55°C on some Korean and Taiwanese vessels. Skipjack and yellowfin frozen in this manner are referred to as 'Purse Seine Special'. Purse Seine Special yellowfin is used for lower-grade sashimi products in Japan (minced sashimi, *saku* blocks, *tataki*), primarily for sale to supermarkets and sushi-train style restaurants (*kaiten-zushiya*). Purse Seine Special skipjack competes directly with pole-and-line caught skipjack for supplying Japan's *katsuobushi* processors and *tataki* for lower end sashimi markets. At the time of writing, there was no concrete data available on the total volume of Purse Seine Special fish available from WCPO purse seiners, but is likely to be less than 100,000 mt/year. Around 60,000-70,000 mt was estimated to be delivered by the Japanese purse seine fleet in 2018.²⁷ Another industry source indicated around 30,000 mt of PS-special yellowfin was purchased in Japan in 2018, 70% of which came from Japanese purse seine vessels. The volume of PS Special fish produced by Korean vessels for domestic consumption and export to Japan is unknown, but is reportedly increasing (see Section 4). Similarly, volumes produced by Taiwanese vessels are unknown, but are thought to be negligible at present. It is likely that volumes supplied by Korean and Taiwanese purse seine vessels for the Japanese market will remain fairly limited, given these fleets typically tranship catches to carriers for delivery to non-Japanese canners, whereas Japanese purse seine vessels return to Japan in between fishing trips and unload directly. The shortened time to delivery of PS Special fish by Japanese purse seiners enables the use of -40° to -45°C to preserve quality rather than more typical ULT temperatures of -55° to -60°C. As of 31 July 2019, PS Special skipjack (1.8kg up) was JPY 155/kg compared with JPY 125/kg for canning-grade (i.e. 25% price premium); PS Special yellowfin (10kg up) was JPY 362/kg compared with JPY 274/kg for canning-grade (i.e. 32% price premium).²⁸

²⁵ Amanda Hamilton & Marco D'Agostini, Tri Marine, pers. comm., July 2019; as at the time of writing.

²⁶ Finished weight; FAO 2018

²⁷ YFC 2018; Taro Kawamoto, FFA, pers. comm. August 2019

²⁸ Taro Kawamoto, FFA, pers. comm., August 2019

2.2 Fleet Developments/Issues

There are a range of developments and key issues which have impacted the WCPO purse seine fleet. Some of these have emerged over the past 3-5 years; several others are fairly long-standing and were identified in the 2011 FFA study. A brief summary is provided below, with a number of these issues further discussed in individual fleet sections and boxes.

- **Fleet Size/Capacity:** Since 2007, with the lifting of the 205-vessel limit on foreign-flag vessels under the Palau Arrangement, the number of vessels in the WCPO purse seine fleet has increased markedly from 180-220 vessels, reaching a high of 308 vessels in 2015 and declining back to 271 in 2018. This expansion in vessel numbers since 2007, coupled with increased hold capacity and technology-related fishing efficiency gains, has resulted in increased overall harvest capacity of the fleet. The capacity limit on large-scale purse seine vessel numbers adopted by WCPFC in 2015 has only been partially effective, given SIDS (and Indonesia) are exempted from these limits. This has provided an avenue for a number of older DWFN-flag vessels being transferred into PIC flags to free-up capacity for the construction of new DWFN vessels. Also, in some cases latent capacity from old, de-commissioned DWFN vessels has been 'scrapped' to accommodate new DWFN vessels which, while having equivalent carrying capacity/well volume to the scrapped vessels, are significantly more efficient in fishing. Capacity of the WCPO purse seine fleet needs to be carefully monitored and managed. Overcapacity can potentially result in increased pressure on tuna resources and/or can lead to an oversupply situation, where fish prices become depressed, impacting the profitability of individual fishing vessels and in turn, the ability of these vessels to pay access fees to PIC tuna resource owners.
- **SIDS Aspirations:** The WCPFC Convention, CMM for tropical tunas (CMM 2018-01) and PNA 3IA recognize the legitimate right of small island developing states and territories to develop their domestic fisheries. SIDS-flag purse seine vessels are eligible for exemptions from WCPFC high seas fishing effort limits and flag-based limits on purse seine vessel numbers. PNA-flag vessels are eligible for exemption from the three-month FAD closure in PNA EEZs under the 3IA, if a PNA member determines that it has suffered a disproportionate burden from the application of the closure and advises PNA members accordingly.²⁹ The re-flagging and chartering of DWFN vessels to PICs have been the primary pathways to facilitate the development of domestic purse seine fisheries in the WCPO (See Box 4 – Charters). As noted above, there has been considerable growth in the PIC fleet in recent years. While some DWF companies have genuinely committed to assisting PICs to develop their domestic purse seine fisheries, others are potentially less genuine and may be re-flagging/chartering vessels as a means of obtaining discounted fishing access and SIDS exemptions from key management measures. This has been a source of consternation for some DWF vessels outside of the PIC flags, many of which support the development aspirations of SIDS, but raise concerns that less-genuine re-flagging endeavours do not support economic development and create an uneven playing field.
- **FAD Management:** With the growing use of drifting FADs by purse seine vessels, there has been increasing focus on FAD management given negative impacts on juvenile bigeye and yellowfin tuna and vulnerable by-catch species, particularly sharks and sea turtles, as well as marine pollution risks. WCPO FAD-related management measures include FAD closure periods, limits on number of FADs deployed, specifications on design and materials for FAD construction and FAD buoy registration and tracking (see Box 1 – FAD Management).

²⁹ PNA 3IA

- **Sustainability, traceability and labour requirements:** In response to growing public concern and NGO lobbying, key tuna industry players have committed to and made considerable investments in developing dedicated initiatives relating to sustainable fisheries, transparency through comprehensive catch-to-plate traceability systems and ethical labour guidelines and practices (see Box 3 - Sustainability and Box 5 – Labour Conditions). The growing prevalence of such requirements suggests that they are now permanent fixtures of the industry and all players, including fishing vessels, will intersect with them to some extent. For example, there are currently four WCPO purse seine free-school fisheries with Marine Stewardship Council (MSC) Certification, with another two in assessment to meet the growing demand for certified sustainable tuna. Currently, MSC certified purse seine skipjack is typically fetching premiums ranging from USD 50 – USD 150/mt outside of the FAD closure period and MSC yellowfin up to USD 200/mt. However, as more fisheries obtain MSC certification these premiums are eroding.³⁰ On ethical labour standards, effective 1 January 2020, purse seine tuna vessels (and other fishing gears) supplying members of the Seafood Task Force³¹ (including Tri Marine, FCF, Thai Union, Bumble Bee and StarKist, Costco and Walmart) will need to implement and be third-party audited against the Seafood Task Force’s Code of Conduct for Tuna Fishing Vessels (see Box 5 – Labour Conditions). RFMOs and regulatory bodies are also making moves towards ethical labour standards for fishing vessels. In 2018, WCPFC adopted a resolution on labour standards for crew on fishing vessels (Resolution 2018-01); all vessels fishing in FFA waters will be subject to minimum terms and conditions relating to labour standards for crew effective 1 January 2020.³²
- **Market Access:** The EU remains the world’s largest market for canned tuna. In order to be eligible to export fish and fish products to the EU, a fishing vessel’s flag state must have an EU-approved national competent authority/ies (CA) established to effectively implement the EU’s IUU fishing and food safety regulations. The vessel itself must also be inspected and issued an approval number (‘EU number’) indicating compliance with the EU’s strict food safety requirements. Vessels without an EU number and/or flagged to countries that have not met the necessary CA requirements are not eligible to export fish to the EU. Currently, all vessels flagged to Marshall Islands, Nauru, Tuvalu and FSM are not eligible to export to the EU, plus some individual DWF vessels that do not have EU numbers. The marketability of a vessel’s catch is reduced if it does not have EU access (i.e. the vessel is unable to furnish an EU Catch or Health Certificate); traders indicate that fish is either categorised as ‘EU-eligible’ or ‘non-EU-eligible’. At times, processors specifically seeking EU-eligible fish may pay a higher price, in the order of USD 50/mt for skipjack and USD 200/mt for large yellowfin (20kg+).³³
- **EU-IUU Fishing Regulation:** The EU has issued ‘yellow card’ warnings to a number of countries for being potentially uncooperative with the EU’s requirements for curbing illegal, unreported and unregulated fishing (IUU). If adequate improvements are not made to a country’s legislative and operational systems for dealing with IUU, the ‘yellow card’ warning is upgraded to a ‘red card’, with access to EU markets for fish and fisheries products suspended. In recent years, yellow cards have been issued to six Pacific Island countries. Fiji, Solomon Islands, Vanuatu, PNG

³⁰ Industry Representative, pers. comm., July 2019

³¹ The Seafood Task Force is an independent global trade association with extensive representation from retailers, brands, vendors, manufacturers and raw material suppliers of tuna. It also works closely with governments. It was established in 2014 following allegations of forced labour and IUU fisheries products found in seafood supply chains, particularly shrimp and tuna. Seafood Task Force, 1 February 2019

³² FFA 2019

³³ Industry representative, pers. comm., July 2019

and Tuvalu have all had their warnings lifted, while Kiribati's still remains in place. Several other countries with significant WCPO purse seine tuna fishing, carrier and/or processing interests have also been warned. Philippines, Korea, Taiwan, Thailand and Panama's warnings have been lifted, while Vietnam's remains in place.³⁴ To have the yellow cards lifted by the EU, these countries have had to significantly strengthen national legislation and monitoring, control and surveillance systems applicable to vessels carrying their flags.

- **Price Fluctuations:** Projected long-term tightening of WCPO purse seine raw material supplies and associated long-term fish price increases due to the PS VDS have yet to come to fruition. Cyclical short-term price increases continue, as well as sharp decreases, in line with fish supply. At the time of writing, the Bangkok skipjack price reached an annual low of USD 1,000/mt for July deliveries (i.e. USD 750/mt to fishing vessels taking into account freight and other costs of around USD 250/mt) due to an over-supply of fish stemming from very good fishing conditions. The August 2019 Bangkok price recovered slightly to USD 1,200/mt and is projected to rise further in September, but not dramatically, as Thailand processors still have high inventories in cold storage. Typically, WCPO purse seine fish supply tightens during July-September due to the three-month FAD closure with a corresponding increase in fish price and then drops again for October-December deliveries when the FAD closure lifts. According to industry sources, the average break-even benchmark Bangkok skipjack price for the WCPO purse seine fleet is around USD 1,200/mt; when prices fall below this, fishing becomes unprofitable for some WCPO fleets.³⁵ As a general rule of thumb, Bangkok serves as a benchmark on price. Vessels offloading at American Samoa generally secure roughly the Bangkok price plus USD 150 and vessels supplying Manta, Ecuador secure roughly Bangkok price plus USD 100. Vessels transhipping to Bangkok generally get the Bangkok price less USD 250-300.³⁶
- **Fisheries Access:** Some purse seine vessel owners have raised ongoing concerns about fishing access under the PS VDS in terms of price, long-term security of access and calculation of non-fishing days. In 2014, PNA members established a minimum benchmark price for a VDS fishing day of USD 6,000 for foreign vessels; this was increased to USD 8,000 in 2015 and remains the same to date. However, fishing days are selling for considerably higher than this minimum benchmark. Bilateral fishing days are currently selling for USD 9,500 – USD 11,000, while multilateral days under the sub-regional pool and US Treaty are priced at USD 12,500 and USD 13,600, respectively. Currently, vessel days are sold by PNA members for a 12-month period on a 'use it or lose it' basis. PNA members are currently discussing options to offer fishing days on a multi-year basis, which would reduce uncertainty for both vessel owners and PNA members. Ongoing challenges exist around reconciliation of non-fishing days and tracking of fishing days usage for vessels with both bilateral and multilateral fishing days.³⁷
- **Changes to Management/Regulation:** Purse seine vessel owners and operators must adapt to ongoing changes to management and regulatory requirements, which have varied operational impacts. The most recent changes in the WCPO include the deployment of non-entangling drifting FADs (CMM 2018-01), a ban on purse seiners obtaining fuel from bunkers vessels in the high seas (PNA 3IA), FAD buoy registration and tracking requirements (PNA 4IA) and labour standards for crew (FFA MTC), all of which come into effect from 1 January 2020.

³⁴ FFA Trade & Industry News - various

³⁵ Industry representative, pers. comm., August 2019

³⁶ Industry representative, pers. comm., May 2019

³⁷ PNA fisheries official, pers. comm., July 2019

- **Fuel prices:** Fuel is the most significant operating cost for most purse seine vessels, ranging from around 30-50% of total operating costs. In 2015-2017, vessel owners benefited from around a 50% decline in fuel price from 2012-2014 levels, when the crude oil spot price dropped from record highs of over USD 100/barrel to USD 50/barrel. As at June 2019, the price was USD 59/barrel.³⁸

From 1 January 2020, the International Maritime Organization (IMO) will enforce a new 0.5% global sulphur cap on fuel content for ships, which is significantly lower than the current cap of 3.5%. Purse seiners already meet the IMO 0.5% sulphur requirement as they typically use marine gas oil (MGO) which is lower in sulphur than heavy fuel oil (HFO) used by cargo ships and intermediate fuel oil (IFO) used by fish carriers. Fish carriers are able to use MGO; however, it is significantly more expensive than IFO (currently, around 30-35% higher). Hence, carriers will likely switch to using Low Sulphur Fuel Oil (LSFO), which will be more expensive than IFO (potentially, USD 150/mt extra), but less expensive than MGO. This will result in higher transshipment costs which will be passed onto fishing vessel owners, potentially in the order of around USD 15/mt. Shipping lines are in the process of installing exhaust gas cleaning systems (scrubbers) on large container vessels which will enable them to continue burning high-sulphur fuel from 2020, while complying with the 0.5% sulphur limit. Container shipping costs will increase, with shipping companies expected to apply a 'Low Sulphur Bunker Adjustment Factor Surcharge'. The magnitude of this price increase is not yet known.³⁹

Box 1 FAD Management

While fish aggregation devices (FADs) have been used for several centuries by coastal fishermen to aggregate small and larger pelagic fish, it was not until the 1970s that FADs started being used in commercial purse seine fishing for tropical tunas in the WCPO. The Japanese distant water purse seine fleet, followed by others, started attaching reflectors and radio beacons to better track naturally floating logs. In the 1990s, fishing companies started constructing purpose-built drifting FADs. These have been increasingly used by all commercial purse seine fleets operating in the WCPO, such that it is unlikely that any purse seine vessel would now exclusively target free-schools. Use of FADs has markedly increased the efficiency of purse seine fishing. Tuna aggregating under FADs are easier to find and catch than sparsely distributed free-schools, reducing the time and fuel vessels spend searching for fish and with a higher successful set rate. Over time, FAD designs have evolved, resulting in continuous improvements in FAD fishing capacity. The most recent generation of FADs are equipped with satellite tracking buoys and echo-sounders that regularly transmit estimates of biomass beneath the FAD, enabling vessels to confirm the presence of a school prior to visiting the FAD. SPC estimates that 40% of WCPO purse seine catch is from FAD sets; in 2017 an estimated 38,000-48,200 active FADs were deployed in total, averaging 163 per vessel.

In 2008, WCPFC5 first integrated FAD management into the tropical tunas conservation and management measure (CMM 2008-01) in an effort to reduce purse seine mortality on bigeye by 30% (which at the time was assessed to be in an overfished state and subject to overfishing) and

³⁸ FFA Tuna Industry News price database, July 2019

³⁹ Industry representative, pers. comm., August 2019



reduce the risk of overfishing on yellowfin. A three-month closure was introduced prohibiting purse seine FAD sets in EEZs and high seas within 20°N-20°S in the WCPFC Convention Area. This followed PNA's adoption of a three-month FAD closure within PNA EEZs under the Third Implementing Arrangement (3IA). Between 2008-2018, there have been various iterations of WCPFC FAD closures for both EEZs and the high seas. At the time of writing, the three-month FAD closure still applies in EEZs and high seas, with an additional two months FAD closure applied in the high seas (5-months total) under CMM 2018-01. In 2017, a limit on the number of active instrumented drifting FADs per vessel was set at 350 and remains in place, although this limit is considerably higher than the average number of active drifting FADs typically deployed by individual vessels in WCPO waters.

In an effort to reduce entanglement of sharks, turtles and other by-catch species in drifting FADs, focus has increased on the design and construction materials of FADs. In 2017, WCPFC14 agreed to include non-binding provisions relating to non-entangling FADs in the tropical tunas measure (CMM 2017-01). CCMs were encouraged to utilise non-entangling designs and materials in the construction of FADs. In 2018, WCPFC15 adopted a binding measure, effective 1 January 2020, requiring any FAD deployed in, or that drifts into, the WCPFC Convention Area to comply with non-entangling design specifications for the raft (floating part on the sea surface) and tail (hanging part suspended in the water under the raft) (CMM 2018-01). WCPFC is also promoting the use of natural or biodegradable materials for FADs to reduce the amount of synthetic marine debris when FADs are lost, discarded or abandoned. The provisions on use of biodegradable materials currently remain non-binding, while research and the development of suitable materials and best practice guidelines are ongoing.

In May 2019, PNA Ministers agreed to implement a Fourth Implementing Arrangement (4IA) relating to FAD tracking and buoy registration to help better understand fishing behaviour on FADs, how many FADs are deployed in WCPO waters and the impact of FAD fishing on tuna stocks and the ecosystem. Under the 4IA, PNA will establish a FAD Buoy Register. No deployment or fishing will be permitted on FAD buoys in PNA waters or WCPO high seas between 20°N and 20°S, unless the FAD buoy is on the PNA register. All FAD buoys must be activated and reporting data twice a day; any FAD buoy which has not reported for 72 hours without acceptable advice will be suspended from the Register and must not be set on. Also, only FAD buoys of a make and model approved by PNA and purchased from an approved FAD Buoy Service Provider will be registered. These 4IA requirements will be effective from 1 January 2020 for all purse seine vessels licenced to fish in PNA and Tokelau waters. PNA will also seek to have these measures adopted by WCPFC. Meanwhile, PNA will continue to progress work on other FAD management initiatives including FAD recovery, ecological FADs and improved reporting on FADs by observers, vessels and PNA's Fisheries Information Management System (FIMS).

Several NGOs and industry groups have also been pro-actively engaged in FAD management-related initiatives. For example, the International Seafood Sustainability Foundation (ISSF) has led research on non-entangling and biodegradable FAD design in cooperation with FAO. The Global Ghost Gear Initiative (GGGI) has partnered with a commercial purse seine fishing company operating in the WCPO to explore the feasibility of responsible disposal, retrieval and potential recycling/re-use of end of life drifting FADs, to mitigate negative impacts associated with FAD loss and abandonment. The Pew Charitable Trusts has been working in partnership with PNA on developing options for recovery of lost and abandoned FADs. The WCPO purse seine fishing industry is also actively engaging in various FAD management-related trials relating to FAD tracking, recovery, marking and design.

Sources: Scott & Lopez 2014; Davies, Mees & Milner-Gulland 2014; Escalle et. al. 2018; WCPFC CMM 2017-01, 2018-01; PITIA 2019; PNA 2019a; PNA2019b

3. TAIWAN

3.1 Current Fleet Status

Brief History

Taiwan's distant water tuna purse seine industry began in 1982 with the introduction of a 'group' purse seiner based on similar Japanese operations in the WCPO. Shortly thereafter, used Japanese purse seiners were purchased by companies previously involved in other distant water fisheries such as trawling and tuna longlining. Two of the earliest companies to become involved in purse seining, Fong Kuo and Jih Yu, are still active and among the leaders in the Taiwan purse seine industry. The fleet continued to expand rapidly during the mid-1980s to early 1990s, with purse seining seen by some boat owners as a viable alternative to fisheries such as high seas drift netting and distant water trawling, the former banned by the Wellington Convention in 1989 and access for the latter phased out by governments such as Indonesia and Australia. Imported Japanese vessels, technology, and expertise was relied upon until the early 1990s when Taiwan began building its own purse seiners using the Japanese model, as well as in a few cases the US 'super-seiner' model. The evolution of locally-built purse seiners was accelerated by the Taiwan government's ban on further importation of second-hand vessels.

During the late 1990s and into the 2000s Taiwan used its experience to develop its own distinctive designs and specifications that utilized aspects of both the Japanese and US vessel models to produce vessels that are well-suited to the WCPO tuna purse seine fishery. Today, Taiwan shipyards continue to rely mostly on Japanese equipment for purse seiners, both for the deck as well as main engines. Taiwan shipbuilders have continued to fine-tune designs that improve efficiency and have led to greater profitability for the Taiwanese operational model where vessels exclusively tranship catch to carriers, rather than unloading at wharves (see Box 2 – Transshipment).

By 1992, the number of Taiwan-flagged purse seine vessels had reached 45, with much of the fishing activity in the WCPO centred on drifting logs in PNG, FSM and adjacent high seas pockets. Business strategies adopted by several Taiwanese companies subsequently saw an increase in registering vessels in PICs under flags of convenience (FOC).⁴⁰ Between 2000-2003 it was estimated that Taiwan's FOC purse seine fleet in the WCPO had expanded from 11 to 28 vessels.⁴¹ Bowing to pressure from Japan and others citing overcapacity in the fishery, the Taiwan government instituted a limit of 34 Taiwan-flag purse seine vessels in 2004 that has continued until the present time. This limit has resulted in Taiwanese fishing companies expanding their fleets through continuing the practice of building and operating boats flagged in Pacific Island countries.⁴²

Ownership and Management Structures

Taiwan's purse seine vessel owners are primarily family-based in the industrial city of Kaohsiung, many of whom have been involved in distant water fisheries prior to the introduction of purse seining in the 1980s. As the purse seine fleet expanded, investment in new vessels was sometimes carried out jointly among these families, with ownership shares taken up by a relatively small number of active owners-turned-investors. Not all ventures were successful, but those that were successful are still family-based and dominate this segment of Taiwan's fishing industry today.

⁴⁰ At the time, Taiwanese vessel owners were reflagging only in Marshall Islands and Vanuatu.

⁴¹ Allen et al. 2010. Another estimate, Gillett & Lewis (2003) put the number of Taiwanese FOC vessels at 24 in 2003.

⁴² According to Taiwan industry sources, at least one vessel was built by a Taiwan company in Taiwan operated for a period under Chinese flag until China prohibited the practice as their own fleet expanded.



FSM officials informally discussing Taiwan's plans to develop tuna purse seining in the WCPO with James T.P. Tsai, then Chairman of the Kaohsiung Fishing Vessel Owners Guild, Kaohsiung, 1982

Photo credit: M. McCoy



Fair Well's newest vessel, Vanuatu-flagged Win Win 707, in the final stages of construction at Jong Shyn Shipyard, Kaohsiung, May 2019

Photo Credit: M. McCoy



An exception to the family-owned structure of most Taiwanese purse seine fishing companies is Fong Kuo Fishery Co. Ltd. Fong Kuo is a stock company with many shareholders, many of whom are from families that are involved with or are otherwise familiar with the industry. Indicative of these close relationships is the connection between the company's founder and his participation in 1972 as one of the founders of Fong Cherng Fishery Co. Ltd (FCF), the large global tuna trading firm with close financial ties/holdings in some Taiwanese tuna vessels and several Pacific Island processing plants.

Ownership of the current 30 Taiwan-flag purse seiners (plus 4 licences to refurbish inoperative vessels or replace sunken vessels) is held by five companies, as well as three family operations apparently without umbrella companies. The four largest firms in terms of vessels owned are Fong Kuo (6 vessels), Fair Well (5 plus an additional license to build⁴³), Jih Yu (5 plus an additional license to build) and Win Far (4 plus an additional license to build). One of the family operations with no apparent single operating company also owns four vessels.⁴⁴

Most of the larger family-owned operations also own and operate vessels in other fisheries, primarily in distant-water longline and squid/saury fisheries. These firms are able to share purse seine-related general and administrative expenses with other company vessels and potentially reduce overhead costs across all their vessels. The government procedures for approval of new vessel construction in Taiwan, either for domestic use or export, can be involved and take considerable time, according to one shipbuilder. In at least one instance it was said that this situation resulted in a new entrant choosing to build his vessels in China, rather than Taiwan.

According to the Taiwan Fisheries Agency (TFA), in the case of inoperative or sunken vessels, the government operating licenses are retained by the original owners who may dispose of them on a commercial basis to others. Replacement certificates issued by the government for lost vessels are valid for three years.⁴⁵

In addition to registering their purse seiners in Taiwan, several of the companies named above have registered vessels in PICs under local companies partially or wholly-owned by the Taiwan vessel owner. Some other Taiwanese fishing firms without Taiwan flag purse seiners have also registered vessels in the PICs.

There are believed to be at least 29 such vessels registered in PICs (Table 1). Most conduct at least some fishing in the EEZs of the PICs to which they are flagged. One of the larger companies, Koo's Fishing Co. Ltd., is owned by a well-known and politically-connected family based in Taipei that is engaged in several non-fisheries businesses and financial activities. The company was established in the late 1990s and now has eight vessels registered in two PICs (FSM and RMI), with a ninth joint venture vessel with the Marshall Islands Marine Resources Authority (MIMRA). At the other end of the spectrum, the Vanuatu flag vessels utilize that country's open registry as a flag of convenience with no apparent interest in fishing within the Vanuatu EEZ or otherwise engaging with the host country on purse seine-related business.

The estimated total of 63 beneficially-owned purse seiners flagged in Taiwan and elsewhere represents a five-vessel increase over 58 vessels identified in the 2011 FFA study.⁴⁶

⁴³ Fair Well initially held two licenses to build or replace, then launched one new vessel in June 2019.

⁴⁴ Interview with TFA officials, 26 April 2019.

⁴⁵ Ministry of Justice 2019.

⁴⁶ Hamilton et. al. 2011.

Table 1 Number of Taiwan Beneficially-Owned Vessels Flagged to PICs, 2019

Parent Company	Flag (Number)	Also Own Taiwan Flag Purse Seiners (Y/N)
Fair Well	Vanuatu (3)	Y
Yuh Yow	Solomon Islands (3)	Y
Koo's	Marshall Islands (4)	N
Koo's	FSM (4)	N
Jong Shyn	FSM (4)	N
Lung Soon	FSM (2)	N
Fong Kuo	PNG (3)	Y
Shun He	PNG (2)	N
Others	PNG (4)	?
Total	29	

Source: TFA pers. comm., April 2019; author's own knowledge

The impact of the PNA Vessel Day Scheme and the need to access VDS days, particularly under the FSM Arrangement, has resulted in nearly 90% (26 out of 29) of the beneficially-owned Taiwanese vessels shown in Table 1 above being registered in PNA countries. This compares with just 28% a decade ago when most (18) were registered in Vanuatu, a non-PNA country. A special situation concerns the involvement of Taiwanese companies in the US purse seine fleet (see also Section 7). During the early 2000s the US purse seine fleet was reduced to 13 vessels, with the future of the US Treaty with FFA countries that had existed since 1986 in jeopardy. A solution was devised by US industry participants and endorsed by the US government that enabled US-Taiwanese joint investments in new vessels to be built in Taiwan or existing vessels purchased from Taiwan. These vessels were approved to be operated as US flag vessels under the US Treaty. At the time of writing there were 14 such vessels in the US fleet operating under the umbrella of the South Pacific Tuna Corporation (SPTC). In early July 2019, SPTC's US-based Executive Director announced it was selling eight of its vessels to unspecified buyers, attributing the need for the sale partly to a lack of support from the US government and its overly aggressive compliance and enforcement actions.⁴⁷ The extent of Taiwanese ownership of these US flag vessels is opaque but believed to be large, including significant investment by Fong Kuo, FCF, and others.

Industry Associations

The Taiwan Tuna Purse Seiners Association (TTPSA) is based in Kaohsiung and headed by an Executive Director with many years of experience in the tuna industry. Membership in the Kaohsiung-based TTPSA is by company, covering the 34 Taiwan flag vessels in the purse seine fleet and trading company, FCF. There are two major Taiwanese longline fishing associations for vessels operating in the WCPO in addition to TTPSA. An important function of all three associations is to act as a conduit of information between vessel owners and the Taiwan government. According to its Executive Director,

⁴⁷ Business Wire 2019

the Association’s other main services are to help organize vessel days under the VDS, arrange observer placements and coordinate with PNA and its members on various subjects. The Association also attends fishery access negotiations and consultations on behalf of, and with, its member companies, as well as deliberations of the Western and Central Pacific Fisheries Commission.

3.2 WCPO Fishing Operations

Taiwan’s purse seine fleets, whether flagged in Taiwan or elsewhere, are essentially transshipment fleets that do not deliver directly to processors. The Taiwan-flag purse seine fleet is relatively young, with a majority of vessels (57%) less than 10 years old. A significant component (36%) is over 20 years old. There were two newly built vessels added to the fleet as replacements in 2018. Likewise, the PIC-flagged Taiwan beneficially-owned fleet is also young, with 54% less than 10 years old. Only 19% is greater than 20 years old. Two new PIC-flag Taiwanese vessels were added to the fleet in 2017 and another was launched in 2019.⁴⁸

TFA uses PNA’s Integrated Fisheries Information Management System (IFIMS) to track vessel activities and regularly updates catch and vessel activities. In 2018, the provisional Taiwan distant water purse seine fleet catch was 193,682 mt; from 2013-2018 annual catch ranged from 168,098 mt – 237,156 mt (Table 2).

Table 2 Taiwan Distant Water Purse Seine Fleet Catch by Species, 2013-2018

Year	Skipjack	Yellowfin	Bigeye	Total
2013	168,058	35,694	8,728	212,480
2014	196,697	32,035	8,424	237,156
2015	150,189	37,718	6,342	194,249
2016	139,975	41,172	5,893	187,040
2017	118,988	43,528	5,582	168,098
2018*	160,599	28,427	4,656	193,682

* Provisional estimate. Sources: SPC CED, October 2018; WCPFC 2019e

In Taiwan’s 2018 Annual Report to WCPFC’s Scientific Committee, a continued increase of school fish sets was noted, accounting for 62.3% of total sets in 2018. Preliminary unofficial estimates indicate that slightly over half the total catch was from non-FAD sets. It is notable that the volume (28,427 mt) and proportion (14.7%) of yellowfin in the 2018 catch were the lowest in the last six years, a reversal in the trend of increasing yellowfin percentages from 2015-2017.⁴⁹

Taiwan has only 95 high seas purse seine fishing days allocated under WCPFC CMM 2018-01. Hence, Taiwan flag vessels fish predominantly in PNA EEZs (Table 3). Fishing in Kiribati has been limited to the Gilbert Islands chain; however the approval of Tarawa and Christmas Islands as authorized transshipment ports by TFA in April 2019 may change this situation.

⁴⁸ WCPFC RFV, April 2019

⁴⁹ WCPFC 2019e

At least one large company (and likely more) utilize what is described as a 'buoy system' that is becoming commonplace in WCPO purse seine fisheries and is utilized to increase the efficiency of FAD fishing. Information from FAD buoys deployed by vessels is transmitted via satellite to the home office which then directs vessels to those FADs most likely to produce significant catches. Captains can see their own buoy information, but not that of other vessels in the fleet. In addition to this practice, most vessels still rely on helicopters to search for schools, as well as to validate FAD information.

Table 3 Total Tuna Catch by Area for the Taiwan Distant Water Purse Seine Fleet, 2013-2017

Area	2013	2014	2015	2016	2017
FSM	45,674	26,905	28,783	20,525	24,788
Kiribati	32,603	89,771	110,581	65,289	51,450
Marshall Is.	5,753	15,343	4,729	14,324	6,868
Nauru	38,110	70,727	24,532	34,894	22,716
PNG	76,561	15,734	6,054	32,846	30,271
Solomon Is.	9,180	5,963	9,422	10,338	25,362
Tuvalu	3,846	11,197	5,224	5,093	4,391
High Seas	1,752	1,517	4,925	3730	2,156
Others	0	0	0	6	96
Total	212,2480	237,156	194,249	187,046	168,098

Source: SPC CED, October 2018

Crewing

Taiwan has faced considerable criticism from NGOs and others on the crewing conditions of its distant water fleets. Most of the criticism has focussed on distant water longliners, but the purse seine industry also feels some of that pressure (see Box 5 – Labour Conditions). What are termed 'ordinary crew' (i.e. deck hands and some engine room positions) are filled by Indonesian, Vietnamese and Philippine crew. Distant water purse seiners are required to have a minimum of five crew members who are Taiwanese citizens.

National regulations require enrolment in the government's health system and social security, but this applies to Taiwan citizens only and individual owners reportedly provide insurance for non-citizens. Current national regulations require the operator to provide crew with a copy of their contract. Purse seine operators must pay a minimum of USD 450 per month to non-Taiwanese crew, but it is acknowledged that there have been complaints from some crew that they do not receive the required amount. Operators often explain that agents in the crew's home country are the ones deducting from salary payments.⁵⁰

⁵⁰ Interview with TFA officials, 26 April 2019.

Flag State Requirements and Government Oversight

The Taiwan Fisheries Agency (TFA) of the Council of Agriculture is the primary government management body for Taiwan's distant water fisheries. Assistance is provided by the semi-government Overseas Fisheries Development Council (OFDC). OFDC provides liaison with the industry and handles some issues that arise overseas where it is impractical for the government to address concerns directly.

TFA is the agency that approves designated PIC ports for transshipment. Historically, major ports have been Honiara, Majuro, Pohnpei and Rabaul. Tarawa and Christmas Island were added to the list in 2019 making it easier for Taiwan-flagged seiners to operate throughout the PNA region. It is worth noting that Taiwan has diplomatic relations with all PNA countries except PNG and FSM. Diplomatic presence makes oversight of fleet operations somewhat easier, including the inspection of vessels by Taiwanese officials during port calls. Arrangements are also in place with FSM and PNG for Taiwan's inspectors to visit their ports for inspections when necessary, usually during transshipment operations. Inspections are carried out to ensure that government regulations (Taiwan's and the transshipment state) and WCPFC requirements are being met. Resident inspectors are located in Honiara, Palau, American Samoa and Fiji, the latter three focused on longline vessels, according to TFA.

Vessel Construction

As Taiwan's purse seine industry grew over the past quarter century so has its ability to build purse seine vessels. Local production of vessels is important because it eventually limited reliance on outside technology and means shipyard familiarity with the vessels during regular dry-docking. Also important are the financing options for domestic operators that might not be available elsewhere. Of the estimated 63 Taiwan-flag and Taiwan-affiliated vessels, only six have been built outside Taiwan.⁵¹ In addition, Taiwan-built unaffiliated purse seiners in the WCPFO have been supplied to other countries and now fish under flags of Philippines, Korea, and China.

As the purse seine shipbuilding sector has matured, prices for new vessels have increased dramatically. From an estimated average new vessel cost of USD 7 million in the late 1990s, prices climbed to around USD 15 million in 2014 and have more recently exceeded USD 20-22 million, as cited by some vessel operators. This has the effect of slowing the building of replacement vessels by Taiwanese companies for Taiwan flag operation. Recently some companies seeking to build new vessels not destined to operate under the Taiwan flag have either had vessels built or are considering building in China. One industry participant estimated that about 40% of new vessel financing for vessels built in Taiwan comes from the owner's own capital with the remainder from commercial loans.⁵²

When it comes time to dry-dock their vessels, Taiwan purse seine owners prefer to do so in Kaohsiung. Oversight is less expensive and easier, plus all original equipment manufacturers have offices and support services in Taiwan. Taiwan flag vessels are also allowed to use the Kaohsiung government-owned fisheries wharf at Chien Chen harbor at reduced cost for major refurbishment projects while in the water, thus lessening overall dry-docking costs.

⁵¹ All six have been built within the last six years in China and operate under Solomon Islands (3), FSM (2), and PNG (1) flags.

⁵² According to the industry source, banks can consider higher loan to equity ratios based on the usual factors: favourable business history of the owner, other assets, and an assessment of the future prospects for the industry.



Taiwan purse seiner undergoing refit at the Chien Chen fisheries wharf, Kaohsiung, May 2019

Photo credit: Mike McCoy

3.3 Major Markets & Supply-Chain Linkages

As mentioned, some of the participants in the Taiwan tuna purse seine industry have close and sometimes interlocking relations with the trading company, FCF. FCF is a privately-held company founded in 1972 that is one of the world's largest marine products trading companies. FCF has expanded its business beyond the trading of frozen tuna and operation of foreign fishing bases to vessel and processing factory ownership (Lae and Wewak, PNG). The company has over 30 subsidiaries, fishing bases and shipping agents throughout the world, including subsidiaries and offices in Japan, Thailand, Singapore and China, as well as American Samoa and Fiji in the Pacific Islands. In an interview in May 2019, a company official was quoted in the press as saying that in 2018 the company handled around 500,000 mt of tuna, down from a high of 700,000 mt a few years earlier. According to that same official, only about 25% of the tuna handled by FCF is from Taiwanese vessels.⁵³

In June 2018, FCF and the Marine Stewardship Council (MSC) announced certification for free-school fishing on skipjack and yellowfin for 27 vessels that FCF had organized into the 'Western Pacific Sustainable Tuna Alliance'. Included in the Unit of Certification are nine Taiwanese flagged vessels: five owned by Fong Kuo and four owned by Win Far. Others include 14 US-flag vessels operating under The South Pacific Tuna Corporation and four China-flagged vessels from Zhejiang Ocean Family.

⁵³ Seaman, 8 July 2018

Most of Taiwan's purse seine-caught tuna is sent to Thailand or other major tuna processing centres for canning purposes. Two of the family-owned companies, one with two Taiwan-flag vessels and one with eight flagged under two PICs, have historical business ties to Japan and are able to deliver and sell there directly. Although not always utilized, the Japanese destination market for these vessels is the *katsuobushi* processors.

At least two companies with newer boats say some of their vessels were built with freezing systems capable of producing ULT PS special yellowfin for the Japan market. The main constraint preventing implementation of their plans to market this product has been the logistics and cost of accessing the primary market, Japan. Taiwanese owners point out that Japanese vessels have a distinct advantage since their vessels deliver directly back to Japan, whereas Taiwanese vessels operate in transshipment mode from Pacific Island ports.

According to industry participants, four of the largest Taiwanese purse seine-owning companies, Fong Kuo, Fair Well, Win Far and Koo's, have their own refrigerated fish carriers active in the WCPO. The carriers are utilized for their own company's fish and occasionally provide space for FCF and other traders under charter when needed. A fifth company, Jong Shyn, has two carriers on long term charter operating in a non-fisheries trade elsewhere, but could bring them back into the WCPO purse seine fishery if conditions warrant. The ability of these companies to utilize their own carriers to bring supplies back to transshipment ports for their purse seine vessels can lessen their dependence on trading companies to provide such services.

3.4 Recent Developments & Future Prospects

Only one shipyard actively building purse seiners remains in Taiwan after the demise of Ching Fu Shipbuilding in Kaohsiung. Ching Fu's downfall was the result of a highly publicised case involving government contracts and defrauding government-owned banks in Taiwan during 2017-2018. Also caught up in the scandal and subsequent bankruptcies were several purse seine vessels owned by companies affiliated with the shipyard owners that were sold to domestic and foreign buyers, including a joint venture vessel with the Government of Tuvalu.⁵⁴

Even though most fishing companies are family based, the current trajectory of consolidation of purse seine owners into fewer companies in search of greater efficiencies is expected to continue. Those companies with four or more vessels are expanding while over time, companies with just one or two vessels have either dropped out or are having a difficult time financially.

TFA cites difficulty attracting qualified Taiwanese labour to positions onboard Taiwanese purse seiners as an increasing problem.

TFA is encouraging vessel owners to join programs that enhance marketability of their products and expects that more Taiwanese vessels will try to obtain MSC certification for their operations as that becomes more and more the norm in the industry (see Box 3 – Sustainability).⁵⁵

From the vessel owner side, at least one company with multiple vessels believes that the Taiwan industry needs to become more innovative and look for new markets, not just continue selling via traders

⁵⁴ See for example, Taipei Times, 13 February 2018; Havice et. al. November-December 2017

⁵⁵ Interview with TFA officials, 26 April 2019

to Thailand. Speaking of the current dearth of available carriers in the WCPO due to falling prices and backlogs in Thailand, a company official mentioned the need to look further into containerized shipping as a means of overcoming current transshipment problems, as well as opening up new markets to reduce the reliance on Thailand.

Major trader FCF, whose activities permeate much of the industry in Taiwan and elsewhere, believes that the trading business itself will come under increased pressure in the near future. This can be seen in the attitudes of vessel owners who in the past relied on traders for much of their logistical and short-term financial support. As their fleets have grown and some have acquired their own refrigerated carriers these owners are less dependent on traders for arranging supplies and logistics. With greater catch volumes comes more clout in the market and it is not a stretch to see a time when some companies become large enough to dispense completely with the more traditional services provided by traders. This could push trading companies to further increase their level of vertical integration into vessel ownership, processing and even branding.

Box 2 Transshipment and Containerized Shipping

The WCPF Convention defines transshipment as the unloading of fish onboard a fishing vessel to another fishing vessel (the definition of which includes refrigerated fish carriers and other support vessels). With relatively few processing facilities handling purse seine-caught fish in the Pacific Islands, transshipping has become the predominant mode of delivering WCPO purse seine catches to processing centres in Asia and elsewhere. Trading companies charter carriers and try to place them in the most logical ports for transshipment, given shifting fishing grounds and other factors. Some purse seine companies, notably those from Taiwan and Korea, operate their own carriers to support their purse seine vessels. Over time, a few Pacific Island ports have become dominant in the trade: Majuro, Pohnpei, Rabaul, Honiara and Tarawa have been those ports most frequently hosting transshipments over the past decade. Majuro has been the most important port for the last several years in terms of volumes transhipped. In 2018 it recorded about 307,000 mt coming from 402 transshipment operations involving vessels of 13 different nationalities.

A recent development has been the increased direct containerization of purse seine catches that are unloaded from purse seiners onshore (and thus not considered as transshipping as defined by the WCPF Convention). Volumes handled are still small, likely less than two or three percent of the catch currently transhipped by reefer carriers. Recent containerization of purse seine catches has taken place in Majuro and Kosrae in FSM, Apia in Samoa and Noro in Solomon Islands. Containerization theoretically offers the opportunity to sort catches by species and/or size, thus enhancing the opportunity for diversified marketing. However, there does not appear to be much of this segregating being carried out at present at sites where there has been direct containerization (i.e. unloading directly from the fishing vessel into containers and not to a cold store for later shipment). On the plus side, containerization onshore can make government monitoring of unloading easier and more precise. The systems that have been developed to load containers have evolved elsewhere in the industry and anecdotal information from Seychelles in the Indian Ocean suggests loading rates of 300-500 mt per day or more are not uncommon.

In comparison with onshore containerization, reefer carriers can theoretically operate autonomously in almost any approved port where they and purse seiners can safely anchor and conduct activities. For containerization to move forward in any large measure in Pacific Island transshipment ports, many will require improvements to port infrastructure and operation. In addition to having adequate

depth alongside wharves to accommodate container cargo vessels, ports will have to be capable of providing better, faster services and at less cost than traditional reefer carriers. Unloading at a port triggers a separate set of legal requirements for the port state in order for the exporter to maximize opportunities in world trade, and not all governments where transshipment currently takes place appear prepared to shoulder these additional responsibilities and costs. Taking all of these requirements together, containerization is expected to be an adjunct to, rather than a replacement for reefer carrier transshipment for the foreseeable future.

Sources: WCPFC 2019f

4. KOREA

4.1 Current Fleet Status

The Korean distant-water purse seine fleet became a significant player in the WCPO fishery from the early 1980s, after initially commencing operations in the EPO with three vessels in 1971, then expanding to the WCPO with ex-US vessels and fishing masters. By the late 2000s, the Korean fleet became the most productive in the WCPO in total catch terms. However, it was overtaken by the revitalized US fleet in 2014 and the combined PNG fleet in 2016. The average annual catch per vessel (CPUE) remains the highest in the WCPO, at over 10,000 mt per vessel in most recent years.

In 2018, the Korean fleet had 27 vessels and has been relatively stable for some years, fluctuating between 25 and 29 vessels since 2000, after peaking at 39 vessels in 1990.⁵⁶ Another vessel is reportedly operating in the Indian Ocean and Dongwon has two new vessels under construction, making up the full allocation of 29 vessels on completion.⁵⁷

Since 2013, the number of beneficially-owned Korean vessels involved in joint ventures (JVs) in PICs has grown to 14 in four countries (Kiribati (10), Nauru (2), Tuvalu (1) and Vanuatu (1)). These re-flagged or 'islandized' JV vessels were in many cases replaced by newly constructed Korean-flag vessels (see below).

Six purse seine vessels operated by Silla are based in Ghana and fish in the eastern Atlantic Ocean, whilst one or two Korean purse seine vessels operate in the Indian Ocean.

Most of the Korean flag vessels are owned by three large companies (Dongwon, Silla and Sajo) with a solitary single vessel owner (Hansung). A brief profile of the three companies is given in Table 4 below. Two are vertically integrated, supplying their own canneries for the most part, whereas the third supplies two separately owned Busan-based canneries under contract. All companies have diverse interests beyond tuna fisheries.

⁵⁶ WCPFC 2018c

⁵⁷ Jubilee (1,862 GT) launched 18 July 2019; FIS, 16 July 2019

The Korean purse seine fleet is now a modern one, with 17 of the 27 vessels (63%) less than ten years old, six (22%) are between 10-20 years old and just four (15%) are over 20 years. This compares with the situation in 2010, when 22 of the 28 vessels in the fleet at that time (79%) were over 19 years old.⁵⁸

Of the current fleet, 14 were constructed in Korean yards (7 at Sungdong), 6 in Taiwan yards (mostly by Ching Fu), 6 in various US yards and one in Chile. This origin of construction compares markedly with the 2010 situation when 22 of the 28 vessels were of US origin.

The average tonnage of the fleet is large at 1,379 GRT, with 7 of the 26 vessels in 2017 over 1,800 GRT and 4 super-seiners over 2,000 GRT. The vessels over 1,800 GRT have 1,200-1,300 mt of fish well capacity and up to 450 mt per day of freezing capacity.

By contrast, the PIC-based JV fleet is ageing with 12/14 (85%) vessels over 20 years, with just one less than 10 years old which was constructed in 2014.⁵⁹ Twelve of the 14 vessels were built in US yards, and represent the previous generation of Korean flag vessels now largely replaced by newly constructed vessels.

Table 4 Profile of Korean Purse Seine Fishing Companies, 2018

Company	No. of vessels	Base/Reg. Port	Details
Dongwon Industries	12	Seoul/ Busan	<ul style="list-style-type: none"> Huge industrial conglomerate established in 1969 Owner of StarKist in US and elsewhere since 2008; 15 LL vessels PIC JV (Kiribati Govt.) - 2 vessels Large cannery in Changwon (170 mt/day); links to a 2nd (Mapo)
Silla Co.	6	Seoul/ Busan	<ul style="list-style-type: none"> PIC JVs in Kiribati (3 vessels) and recently Nauru (2 vessels) Supplies 2 Ottogi canneries (140t/day) in Busan area
Sajo Industries*	6	Seoul/ Busan	<ul style="list-style-type: none"> PIC JVs in Kiribati (3 vessels), Tuvalu (1) and Vanuatu (1), with a second due soon) Supplies own Geosong cannery (60 mt/day) in Busan area
Hansung Enterprises	1	Busan/ Busan	<ul style="list-style-type: none"> Involvement in tuna and various other fisheries PIC JV in Kiribati (1 vessel)

* Note: Includes Oyang Corporation (1 vessel) which is part of the Sajo group of companies

Sources: Hamilton et. al. 2011; Havice and Campling 2018; WCPFC RFV April 2019; industry representatives, pers. comm., April 2019

⁵⁸ WCPFC RFV April 2019; Hamilton et .al. 2011

⁵⁹ WCPFC RFV, April 2109

The annual catch by the Korean fleet has exceeded 250,000 mt in four of the six years since 2014 and over 200,000 mt in every year since 2005 (Table 5). The species composition of the catch is typically 75-80% skipjack, 18-25% yellowfin and 2-3% bigeye.⁶⁰

Table 5 Korean Distant Water Purse Seine Fleet – Total Tuna Catch By Species, 2013-2018

Year	Skipjack	Yellowfin	Bigeye	Total
2014	220,757	44,258	5,032	270,047
2015	227,385	35,610	5,251	268,247
2016	218,271	50,928	9,256	278,455
2017	181,559	58,299	6,974	246,832
2018	233,729	29,480	4,339	267,548

Source: SPC CED, October 2018; WCPFC 2019d

The Korean Overseas Fisheries Association (KOFA) mediates overseas fishing operations and access arrangements on behalf of the fleet. Established by the *Distant Water Fishery Development Law*, it is “funded by members’ levies, with minimal financial support from government, but works closely with government in fisheries policy formulation and delivery”.⁶¹

4.2 WCPO Fishing Operations

The Korean purse seine fleet fishes over a wide area of the WCPO, but with an increasing proportion of the catch in eastern areas in recent years when El Niño conditions have predominated, particularly in Kiribati, Tuvalu, Tokelau and Nauru EEZs. The fleet also fishes seasonally in Solomon Islands and PNG when fishing conditions are productive.⁶² In 2017, 41% of the catch was taken in Kiribati EEZ, 9% in Tuvalu, 6% in Tokelau (56% total in eastern areas), with a combined 36% in PNG, Solomon and FSM.⁶³

Fishing in high seas areas within the WCPFC-CA is restricted to 207 days for Korean vessels under WCPFC CMM 2018-01. The total number of days fished in the WCPFC-CA has varied between 4,700-6,000 days since 2013.¹⁰ Helicopters have been used to aid fish location since 1979, especially on larger vessels.

While the Korean fleet was the pre-eminent free-school fishing fleet in former times, the proportion of catch taken on drifting FADs has steadily risen since 2008 to almost 40%, albeit with 60% of the catch still taken on free-schools.⁶⁴ This may be linked to the eastward shift in fishing areas, where free-schools may be less common, as well as the increased efficiency of instrumented drifting FAD fishing.

⁶⁰ WCPFC 2019d

⁶¹ Notes provided by KOFA during interview, Seoul, 26 April 2019

⁶² One Korean fishing master advised that a seasonal concentration of fish regularly targeted in the Solomon Sea and adjacent areas during December-March has not been fished for several years due to too many vessels operating in the area; seasonal transshipment in Honiara has also dropped off as a result.

⁶³ SPC CED, October 2018

⁶⁴ Williams & Reid 2018

In long term strategic thinking, there has been a determination to consolidate access to eastern areas, in anticipation of more frequent *El Niño* conditions and ultimately an eastward shift in biomass distribution under climate change predictions.⁶⁵

The Korean fleet tranships regularly in PIC ports. The main ports utilized are Majuro, Pohnpei, Tarawa and Kiritimati, but with significant transshipment in Honiara and Rabaul when fishing in areas further west. A portion of the transhipped catch is returned to Korean ports and canneries for processing (120,000-130,000 mt), with the balance (~ 170,000 mt) going to canneries in other countries, primarily Thailand, Vietnam and Ecuador.⁶⁶ Very little fish is delivered directly to Korean ports by the purse seine vessels themselves other than during maintenance or annual visits.

Access Arrangements with FFA Members

Korean vessels have bilateral access agreements with all PNA countries except Palau and also purchase some PNA sub-regional pool days under the VDS. In recent years, a small number of days have also been fished in Cook Islands EEZ. Some JV vessels have also acquired multilateral fishing days under the FSMA.

Operational Costs

A provisional cost and profit analysis provided by KOFA members for selected typical vessels for 2017 and 2018 showed operational costs (exclusive of depreciation, interest and statutory fees such as observers and transshipment) totalling between USD 16-17 million, with sales volumes of 9,250 mt in 2017 and 9,880 mt in 2018. The analysis showed a slight profit in 2017 and a loss of over USD 2 million in 2018, largely as a result of lower fish prices (USD 1,500/mt vs. USD 1,820/mt). Access fees, freight and fuel comprised the largest components of operating costs, with fees and fuel costs increasing 10.3% and 27.2% respectively, whilst the fish price declined by 17.6% between 2017 and 2018. These figures should be regarded as indicative only and were provided voluntarily as an example by the KOFA members.

Crewing

The PNA requirement is for a minimum of three PIC crew per vessel (10%),⁶⁷ whereas under the various JV arrangements in Kiribati, an aspirational target of five PIC crew per vessel has been set and is often achieved. The balance of the crew is likely a mix of Korean nationals and South East Asia nationalities, including Philippines, Vietnam and Indonesia.

This study is unaware of any labour issues onboard Korean distant purse seine vessels, although in the past, there were alleged human rights issues on mostly trawl vessels operating in the Atlantic and Southern Ocean.⁶⁸ Effective 1 January 2020, Korean (and all others) operating in FFA members EEZs will be subject to new labour MTCs (see Box 5).

Reporting and Monitoring

Korea's *Distant Water Fisheries Development Act* was revised in 2012, to *inter alia* improve data collection from distant fleets including the purse seine fleet. In 2015, the system was upgraded to e-reporting, together with the establishment of the Korean Fisheries Information Management

⁶⁵ Allain 2017

⁶⁶ Data provide by KOFA, April 2019

⁶⁷ It is uncertain if this requirement is being enforced; FFA pers. comm.

⁶⁸ Greenpeace 2013

System (KFIMS) to strengthen flag state monitoring, control and surveillance (MCS). The timely establishment of this system meant that the threat of an EU yellow card associated with inadequate IUU control in late 2013, notably in the Atlantic Ocean, was rapidly lifted. E-logbook coverage is now 100% in near real time. The system is regularly hailed as the best in the WCPFC, with Korea being the first WCPFC CCM to provide complete operational data in 2015. Compliance with all aspects of relevant CMMs, notably CMM 2018-01, is reported as good.

Joint Venture Arrangements

Joint venture arrangements have been strongly preferred to charter arrangements by the Korean companies, with JVs established directly with government (i.e. Kiribati) or government corporations (i.e. Nauru Fisheries Development Corporation (NFDC)). In some cases, another entity may be involved (e.g. Frabelle (Philippines/PNG) with part ownership of two JV Silla vessels in Kiribati). Equity is usually required to be purchased by the hosting government, in the range of 25-50%; vessels are renamed on re-flagging and a local name is applied to the JV company (e.g. Kirikore Fisheries, Kiribati and KT Fisheries, Kiribati and Sajo Fisheries). A Board of Directors is appointed and meets bi-annually to take decisions on policy issues and authorize payment of dividends etc.

Requirements of the agreements vary widely, apart from crewing and may be onerous. For example, Kiribati government reportedly requires 30% of all yellowfin be landed to Kiribati Fish Ltd. (KFL), a government part-owned processing and cold storage venture,⁶⁹ but with right of refusal and the possibility that this may increase to 100% in the future. In practice, various logistical and practical difficulties have limited the application of this requirement, especially with an additional eleven Chinese purse seine vessels under charter to KFL. On the positive side, JVs may be given priority access to VDS days, though reportedly, not involving any discount. They also may be eligible for SIDS exemptions to CMMs.

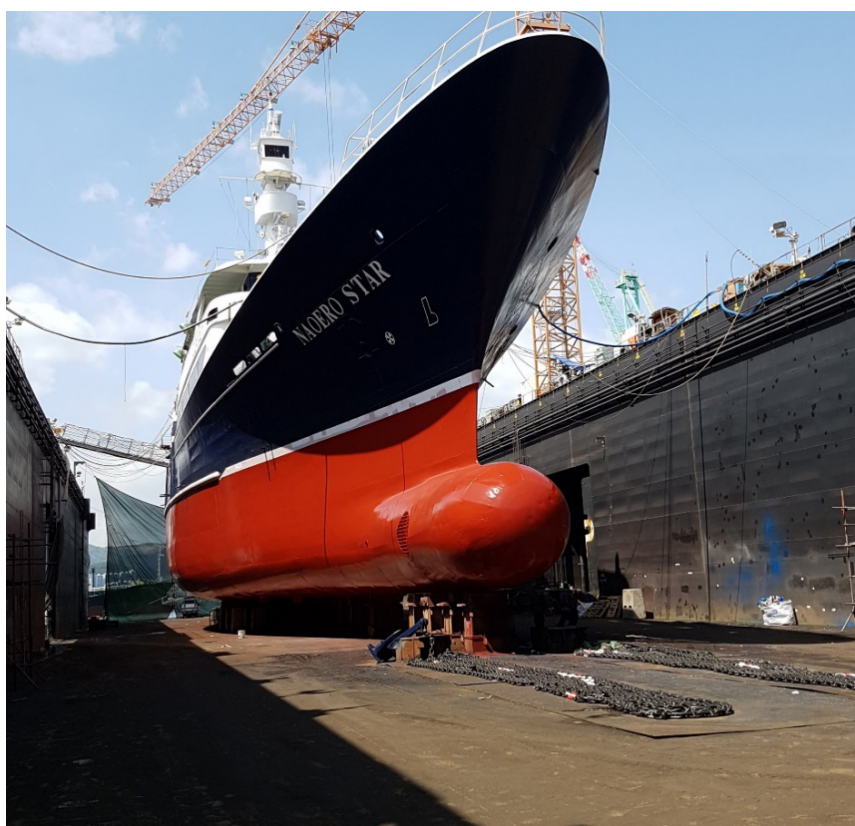
In general, various problems may be encountered and, in some cases the JV may break down. For example, Korean involvement in PNG where government requirements proved to be impossible to meet. Nonetheless, JV arrangements by Korean companies continue to proliferate with no sign that this policy will change.

Onshore Investment

Despite voicing a strong commitment to onshore investment in PICs, there are currently no significant onshore facilities in place. Canneries proposed for Lae (PNG) and Doma (Solomon Islands) have not eventuated and no other proposals are known to be in planning or development.⁷⁰ However, KOFA maintains that companies remain open to onshore investment possibilities with PICs. Benefits to PICs from the Korean purse seine fleet are currently derived from transshipment charges, landing fees, port charges and crewing, as well as access fees and some overseas development assistance (ODA).

⁶⁹ KFL ownership: 40% Kiribati government, 40% Golden Ocean Fish (Fiji) Ltd. and 20% Shanghai Kaichuang; KFL website, April 2019.

⁷⁰ There are unconfirmed reports of a small loining plant apparently under construction in Pohnpei, FSM, in cooperation with National Fisheries Corporation.



Newest addition to Nauru Fisheries Development Corporation & Silla joint venture, FV Naoero Star, during refit and maintenance at Orient Shipyard, Busan, April 2019.

Photo: Tony Lewis

4.3 Major Markets & Supply-Chain Linkages

As mentioned, in 2018 the total catch was almost 270,000 mt, with 120,000-130,000 mt catch returned to Korean ports and canneries for processing via carriers, with the balance (~ 170,000 mt) exported to other countries, mostly Thailand.

Four processors at five plants have a combined capacity of 480 mt/day, as follows:

- Dongwon, F & B (Changwon) – 180 mt/day
- Sansim (Mapo) – 80 mt/day (Dongwon-contracted associate)
- Sajo (Goseong) – 120 mt/day
- Ottogi (two plants – Goeje, Goseong) – 100 mt/day

Actual cannery production, which may be less than capacity, is believed to be almost entirely destined for domestic consumption. Local preferences are for packs in oil and increasingly, value-added packs. Canned tuna consumption is said to be stable or slightly decreasing, whereas sashimi consumption is increasing.⁷¹

⁷¹ KOFA meeting, April 2019

Korea is also identified as a producer of *katsuobushi*⁷² and associated products, with one large company (Daewang) in Gyeongsangnam province, near Busan, reportedly accounting for most of production.

Most Korean purse seine companies are reported to now have at least some of their vessels fitted with PS-special ULT refrigeration capability – dry freezers with -450C to -550C capacity – to produce product for lower-end sashimi markets in Korea and Japan. One of the three Silla JV vessels in Kiribati, for example, has PS-special capability. No specific information was available from the Korean purse seine industry on volumes and prices obtained. International Trade Centre (ITC) data for 2018 indicates 11,734 mt of frozen tuna fillets (HS code 030487) exported to Japan, but it is not clear how much of this volume is sourced from longline vs. purse seine vessels and what the species are. ITC data also shows 3,947 mt of frozen yellowfin (excluding fillets – HS code 030342) exported to Japan in 2018. Given the finite ULT market in Japan and the extent to which the viability of the Japan purse seine fleet is reliant on ULT fish, volumes delivered to Japan from Korean vessels are likely to be limited. Also, given the Korean fleet is largely a transshipment fleet, unless PS-special fish is unloaded into ULT containers in port or carriers with ULT capability (unlikely), catches will only be delivered when vessels return to their home port in Korea for maintenance/dry-docking.

Exports of fish transhipped in PIC ports by the Korean-flag distant water vessels in 2018 supplied processors in Thailand (94,000 mt (60%)), Vietnam (24,000 mt) and Ecuador (14,000 mt), with the balance (38,000 mt) to EU, US, and other Asian processors (e.g. Philippines (12,000 mt)).⁷³ Skipjack exports (50% of total skipjack catch) are mostly destined for Thailand and other South East Asian countries, whereas yellowfin, especially larger fish (20kg and up) are mostly exported to EU countries (Italy, Spain and France).

With the good quality reputation of Korean purse seine product, in terms of quality, no sanitary and phyto-sanitary (SPS) concerns are anticipated. No rapid alerts seem to have been associated with whole round and frozen tuna fillets (5,000 mt in 2018) exports of yellowfin to the EU.⁷⁴

Fish from the various JVs is assumed to be exported to similar overseas markets, with only a small percentage landed in Korean ports. ITC data for imports to Thailand show ~52,000 mt of frozen whole round tuna from Kiribati, with Philippines imports from Kiribati ~ 5,000 mt. This compared with the 2017 purse seine catch recorded for Kiribati in 2017 of 150,000 mt⁷⁵, from 10 Chinese-flag charter vessel and 10 Korean JV Kiribati flag vessels. It is assumed the exports of the JV vessels are attributed to Kiribati (60,000 mt), as would be the catch of the China flag-chartered vessels.

Linkages with Trading companies/Processors

Two of the three main PS fishing companies (of four total) are vertically integrated with their own processing plants (Dongwon and Sajo), whereas the other two find direct markets for their product in the southern Korea processing area.

Exports of transhipped fish to the various countries are almost entirely handled by the major international tuna traders, except for Dongwon which has some of its own carriers.

⁷² It is claimed that the top supplying countries are Japan, China and South Korea, which supply 59%, 28% and 8% of *katsuobushi* sales, respectively. Alibaba 2019

⁷³ Information supplied by KOFA; ITC Trade Map 2019

⁷⁴ ITC data 2019; HS code 030487

⁷⁵ WCP0 2019b

4.4 Recent Developments & Future Prospects

Korea is committed to maintaining its full allowance of distant water purse seine vessels at 29, with two new vessels currently under construction to add to the 27 currently registered to fish in the WCPO.

With no apparent limit on islandization/re-flagging to PICs, the size of the beneficially-owned Korean JV fleet continues to expand. The number currently stands at 14 in four countries, with at least one more vessel scheduled to join this roster in the near future.⁷⁶ These re-flagged vessels have thus far served as an enabling agent for construction of new vessels as part of the distant water purse seine fleet.

In recent years, most fishing by the Korean fleet has occurred in more easterly areas. Whilst these years have been primarily *El Niño* years, with the usual easterly shift in effort distribution, this seems to be part of a longer-term strategy anticipating predicted eastwards biomass shifts in response to climate change effects. Korean companies are hopeful that this may lead to the allocation of more fishing days in high seas areas that can be fished in the east, especially when considered with the recently revised and improved status of bigeye stocks.

With effective monitoring arrangements in place (i.e. e-logbook system with 100% coverage, KFIMS for MCS and ongoing e-monitoring trials) the Korean fleet appears well regulated. It is assumed the same applies to the JV vessels, although it is unclear how rigorously flag state responsibilities and catch documentation requirements are applied by the respective host countries. It is understood that Nauru has commissioned a WCPFC trust-funded project, drawing in-kind support from FFA, SPC and WCPFC Secretariats to establish mechanisms for ensuring full compliance with new flag state responsibilities.⁷⁷

Sustainability certification and ecolabelling have yet to gain much traction in the domestic processed fish market. However, there are some moves from fishing companies to obtain third-party sustainability certifications. Six Silla distant water purse seine vessels recently obtained Friend of the Sea certification.⁷⁸ In March 2018, Dongwon purse seine vessels entered into MSC full assessment for free-schools on skipjack and yellowfin (~160,000 mt).⁷⁹ It is anticipated that certified sustainable fish will largely be sold to export markets, rather than the domestic market.

Domestic demand for canned tuna, the main output of Korean tuna processing plants, appears to be stable or slightly declining, whereas the domestic sashimi market is reported to be expanding. This may be increasingly serviced at the lower end by growth in the amount of PS special/ULT product being produced by Korean PS vessels.

⁷⁶ Serena 2, Vanuatu flag; former Fong Seong 668

⁷⁷ FFA pers. comm., Sep 2019

⁷⁸ FOS, 19 May 2019

⁷⁹ Tropical Pacific Yellowfin and Skipjack Free-School Purse Seine Fishery; MSC 2019

Box 3 Sustainability Trends in the Purse Seine Sector

Recent years have seen strong calls globally from governments, NGOs, retailers and consumers for ecological improvements in tuna value chains. The result is a multiplication of state and non-state (private) regulations oriented around various dimensions of 'sustainability', several of which play centrally (or might in the future) in the WCPO purse seine sector.

Mounting dependence on and/or critiques of MSC certification: MSC is the dominant eco-label in the shelf-stable tuna market segment which is predominantly supplied by purse seiners. MSC certifications for canning grade tuna continue to expand as new purse seine operations enter into full assessment or into Fisheries Improvement Programs (FIPs) as a pathway to certification. Vessels from the Korean (March 2018) and PNG (February 2019) purse seine fleets are the most recent to enter into full assessment to obtain MSC fisheries certifications.

This growth is despite that fact that MSC continues to face scrutiny over its certification practices and rigour, particularly in relation to purse seine fisheries. In 2018, under pressure from a host of NGOs, retailers and UK parliamentarians as part of the 'On the Hook' campaign, the MSC announced intentions to only allow MSC-certified fishing activities to take place on a target stock in a single fishing trip (i.e. all purse seine set types made in a single trip would need to be MSC-certified; currently all but two purse seine MSC certifications only cover free-school sets). However, following pushback from industry that the standard would be economically and technically non-viable, the MSC back-tracked. It indicated it would revisit the issue but, in keeping with certification 'best practices', provide ample time for adaptation to any changes. In the meantime, MSC has opened the door to certification of drifting FADs with the Spanish Echebaster company's controversial Indian Ocean skipjack certification providing an illustration. Echebaster's is the first certification of fish caught on both free-schools and drifting FADs. This certification has raised ire because the same vessels are also catching yellowfin, which is in an overfished state in the Indian Ocean. The MSC has defended the certification on grounds that Echebaster will take extra measures to avoid bycatch, such as 100% observer coverage, new non-entangling FAD designs and new technologies to allow for quick release of unwanted catch.

The conflict among MSC market dominance and industry's dependency on it, coupled with the growing concern over its rigour and the ecological impacts of FADs might lead the sector in a range of directions. On one end of the spectrum, it could incentivise further improvements to FAD management and design with a focus on the thorny issue of reducing bycatch in multi-species fisheries to enable certification of fisheries using drifting FADs. On the other, this approach could continue to draw criticism from NGO groups and large buyers, eventually leading to purse seine fisheries to step away from MSC and develop other 'sustainability' options.

FAD-free product and 'ghost gear' concerns: Related to the above controversy, demand for FAD-free product is being driven by concern over by-catch from drifting FADs of juvenile bigeye and yellowfin and other vulnerable species. These concerns have resulted in strengthened FAD management measures in the WCPFC, as well as greater attention being paid to FAD designs and research on the ecological impacts of FADs (See Box 1 – FAD Management). Most notable for the purse seine industry is that FADs are a universal method for increasing fishing efficiency, and as such, reducing FAD use has economic consequences for fishing fleets. Thus, there is tension between the need to regulate and reduce environmental impacts of FADs and the economic imperative to retain their use.

FAD management is also closely linked to growing concern over the role that fishing plays in introducing pollution into the oceans, in particular, discarded FADs and other forms of fishing gear that can entangle animals and create ocean debris. The Global Ghost Gear Initiative (GGGI), established by environmental NGO World Animal Protection in 2015, began raising attention on this issue by assessing if and how tuna companies, primarily trading companies and branded manufacturers, some of which are also vessel owners, are addressing these forms of marine pollution. Tuna companies are being actively lobbied to participate in and develop initiatives to reduce ghost gear. To date, fishing firms have been less directly targeted, in part, because they are downstream participants in the supply chain and have a less prominent public profile. However, if reforms are demanded in this area, it will become another area for compliance for fishing vessels. This issue is also being picked up at the RFMO level. In 2017, WCPFC adopted a CMM on marine pollution (CMM 2017-04) which encourages fishing vessels to retrieve abandoned, lost or discarded fishing gear and prohibits the disposal of old fishing gear within the Convention Area.

Sources: Havice et. al. 2019; Jan-Feb, MSC 2019; Havice et. al. 2018, July-Aug; Undercurrent News, 9 November 2018; WCPFC CMM 2017-04

5. JAPAN

5.1 Current Fleet Status

The Japanese distant water purse seine fleet has been active in WCPO tropical waters since the early 1970s and pioneered the industrial purse seine fishery in the region. While no longer the dominant fleet, it retains a significant presence in the WCPO purse seine fishery.

The Japanese fleet has been relatively stable in terms of vessel numbers in recent years, as a result of government restrictions on distant water vessel numbers (capped at 35 since 1997). The current distant water fleet comprises 28 vessels, plus five operating from Pohnpei since 2012, all placed under FSM flag but still Japanese-owned.⁸⁰ Two to three vessels fish also in the Indian Ocean periodically (10 permitted) but have experienced poor catches recently and may not return.

In addition, there are a number of domestic vessels which operate seasonally in the coastal *kinkai* fishery (May to October typically). These vessels target two-year old skipjack which migrates north from southern waters, as well as other pelagics. Their fishing area is strictly defined as domestic. While they are not designated as distant water vessels for the purposes of the WCPFC RFV, their catch of oceanic tunas is included in catch estimates in the WCPFC Tuna Fishery Yearbook. Twelve of the distant vessels have been permitted to fish in the *kinkai* fishery seasonally but in recent years, very few have fished as result of reduced fish availability.

The Japanese fleet's total catch peaked at over 260,000 mt in 2007 and 2008, then steadily declined to around 165,000 mt in 2016 and 2017, with a slight recovery in 2018 to 177,000 mt,⁸¹ which is widely

⁸⁰ Taiyo Micronesia Corporation, a joint venture between TAFCO and FSM National Fisheries Corporation (NFC), operating five PS vessels

⁸¹ NRIFSF data, April 2019

acknowledged as a good fishing year for skipjack and yellowfin in the western Pacific (Table 6). The number of days fishing and searching for the fleet as a whole has declined from around 7,400 days in 2012 to around 6,000 days in recent years. Some of this drop is attributable to the relocation and re-flagging of five vessels to FSM, whilst some may be attributable more recently to introduction of the PNA PS VDS and the high cost of vessel days, engendering more frugal use of days and possible increases in efficiency. The catch composition remains at around 75% skipjack, with the remainder mostly yellowfin (23%), with small amounts, typically < 2%, of juvenile bigeye.⁸²

Table 6 Japan Distant Water Purse Seine Fleet – Total Catch By Species, 2014-2018

Year	Skipjack	Yellowfin	Bigeye	Total
2014	167,377	31,987	4,000	203,365
2015	146,375	35,498	3,970	185,843
2016	126,399	38,073	2,116	166,589
2017	128,265	34,410	2,644	165,320
2018	132,756	40,670	3,626	177,052

Source: SPC CED, October 2018; WCPFC 2019c

Until late 2017, the size of vessels was strictly regulated by Japan Fisheries Agency (JFA), with vessels limited to 1,096 GRT (700-800 mt hold capacity). An exception was granted in 2009 for three vessels (1,800 GRT; 1,100-1,200 mt hold capacity, the so-called 'Asian standard' class) constructed under a trial to increase competitiveness with other fleets.⁸³ These newer vessels were also typically equipped with helicopters to enhance searching capability. Since the further relaxation of the policy in 2017, three new larger vessels are under construction at Miho Shipyard⁸⁴ with construction of another 3-4 vessels under consideration by Japanese companies. Commissioning of these new vessels requires that each older vessel being replaced needs to be 'regularized' (i.e. scrapped or retired from the WCPO purse seine fishery).

The Japanese purse seine fleet is an ageing one, with 17 of the 28 active DW vessels (61%) over 20 years of age, 16 of the 28 (21%) 11-20 years old, and only 5 of 28 (18%) less than 10 years old including the four large vessels. All but one of the vessels⁸⁵ were constructed in Japanese yards, with Miho shipyards accounting for almost half of these (16) and several Niigata shipyards for most of the remainder (9). As noted earlier, Miho Shipyard is committed to the construction of at least three new vessels to replace ageing ones.

Ownership of the 28 vessels is quite diverse, with just two companies operating five vessels (Fukuichi, Kyokuyo), one company owning three vessels (Ohkura), five companies with two vessels and the remainder (five companies) with a single vessel. Although the vessels are registered in ten ports, 50% of purse seine unloading occurs in Yaizu and a similar combined amount in Makurazaki and Yamagawa (southern Kyushu), with minor amounts in Ishinomaki (Miyagi prefecture in northern Japan). Table 7 provides a profile of the two largest companies, as well as the beneficially-owned FSM joint venture, Taiyo Micronesia Corporation (TMC), both of which own five purse seine vessels.

⁸² WCPFC 2019c

⁸³ Wakaba Maru 7 (Kyokuyo), Shoyo Maru 18 (Ichimaru), Fukuichi Maru 83 (Fukuichi), Koyo Maru 88 (Tokai GKK)

⁸⁴ Visit to Miho Shipyard, Shimizu, 23 April 2019; Tokiwa Maru under construction, Fukuichi, Genpuku in planning/design stage.

⁸⁵ Koyo Maru 55 constructed in Taiwan (Jong Shyn shipyard).

The 28 distant water purse seine vessels are members of the Japan Far Seas Purse Seine Fisheries Association (Kaigai Makiami Gyogyo (KAIMAKI)), along with the five beneficially owned TMC vessels. The association assists with fisheries access negotiations and acts as an interface between its vessel owner members and the Japanese Government and PIC Governments. It also closely monitors developments in the industry and advises members on issues of concern, as well as emerging opportunities in the sector.

Table 7 Profile of the Three Major Japanese Purse Seine Fishing Companies

Company	Profile
Kyokuyo Suisan Co. Ltd	<ul style="list-style-type: none"> ▪ Parent company Kyokuyo Co. Ltd. – fishing company established 1937, evolved to become a vertically integrated marine products supplier; Kyokuyo Suisan the largest subsidiary. ▪ Commenced purse seine tuna fishing 1973; owns 5 vessels, including one large (1,800GRT) vessel built in 2009; annual catch ~33,000 mt in 2018 ▪ Sashimi tuna processing facility (own fish, as well as other sources) ▪ 8,000 mt cold storage; retail outlets ▪ JV in PNG 2010; withdrawn and company dissolved
Fukuichi Gyogyo Co.	<ul style="list-style-type: none"> ▪ Japan’s oldest fishing company, engaged in fishing for three centuries ▪ Operates 5 DW PS vessels, including one 1,800 GRT vessel (2009) ▪ Processing PS special, LL products ▪ Two large ULT cold storage facilities (16,000 mt total) ▪ Varied business interests: retail outlets, online sales, hotels, restaurants (fast seafood, fine dining including one in Singapore) ▪ JV with Kiribati (2010) failed
Taiyo A & F Co (TAFCO)	<ul style="list-style-type: none"> ▪ Parent company Maruha Nichiro; TAFCO took over fisheries interests ▪ 5 DW PS transferred to TMC (see below) ▪ Varied fishing interests with various gear types, in many countries ▪ 4 Japan offshore PS vessels (Niigata) ▪ Numerous overseas offices and fisheries JVs
Taiyo Micronesia Corp (TMC)	<ul style="list-style-type: none"> ▪ Established JV 2012 with National Fisheries Corp (NFC) in Pohnpei, FSM ▪ NFC holds 25% equity in TMC, with management fees and dividends payable ▪ 5 DW PS progressively re-flagged to FSM ▪ Annual catch ~40,000 mt pa; 75% of catch transhipped in FSM ports, 25% directly unloaded in Japan during intermittent visits ▪ <i>Katsuobushi</i> plant with container storage; fish meal facility established 2018 ▪ Processes 1 mt/day SKJ ▪ Plan to divert to pig feed production, with collection of transhipment discards, bycatch; aim to replace current feed imports of ~1,000 mt pa.

Source: Industry interviews, April 2019; Hamilton et. al. 2011

Japanese companies have not always had a particularly successful record of establishing purse seine joint ventures with Pacific Island countries, involving re-flagged vessels, and in some cases, shore-based operations. JV operations in PNG and Kiribati have failed for various reasons, including poor business performance and bankruptcy, insufficient VDS days allocation and immigration difficulties.⁸⁶ However, the TMC joint venture established in Pohnpei, FSM in 2012⁸⁷, now with 5 FSM-flagged vessels and a small arabushi plant, continues operations with apparent success (Table 7).

Onshore investment in PICs by Japanese companies is minimal at present, with little appetite for renewed involvement. However, good relations are maintained through the Pacific Island Leaders Meeting (PALM)⁸⁸ process and the supporting activities of Overseas Fishery Cooperation Foundation (OFCF) and ODA through Japan International Cooperation Agency (JICA). OFCF has recently agreed to provide, through the Japan Promotion Fund (JPF), new support to Pacific fisheries for observer training, maritime boundaries and new training initiatives.⁸⁹



Kaio Maru No. 118 unloading in Yaizu port, April 2019.

Photo: Tony Lewis

⁸⁶ Industry source, pers. comm., April 2019.

⁸⁷ Taiyo Micronesia Corporation (TMC), a subsidiary of Taiyo A & F Co., in turn a subsidiary of Maruha Nichiro, reportedly the world's largest seafood company.

⁸⁸ The Pacific Islands Leaders Meeting (PALM) is convened every three years since 1997, with the 8th PALM held on 19 May 2018 in Iwaki, Fukushima; MOFA 2019.

⁸⁹ FFA 2019b

5.2 WCPO Fishing Operations

The Japanese distant purse seine fleet continues to operate primarily in the western part of the WCPO, mostly in the waters of FSM, PNG, Palau and high seas in recent years. In 2017, these areas accounted for 41.6%, 37.4%, 4.2% and 5.9% of the total catch respectively.⁹⁰ In earlier years, a higher proportion of catch was taken in areas further east (i.e. Kiribati, Nauru, and the eastern high seas areas), but this has declined as result of increased effort and competition by other fleets in these areas.

As noted earlier, twelve distant water vessels are permitted to fish in the *kinkai* (home water) fishery each year, which accounted for 9.1% of the catch in 2017, but in 2018, only one vessel fished and catches were poor. The continuing decline of the home water fishery, especially for smaller inshore vessels utilizing various gears, has become a major political issue in Japan. This decline is often linked to increased catches in tropical waters and a resultant lessening of northwards migration although this is unproven, and the extent of the migration is more likely linked to variable oceanographic features and the location of the lower thermal limit presented by the 180C surface isotherm.⁹¹

The Japanese distant water fleet continues to return to Japan ports – Yaizu, Makurazaki and Yamagawa – for the most part, despite a relaxation of Government requirements to compulsorily unload in Japan. Vessels operate on a roughly 40 day trip cycle – steaming to and from fishing grounds (7-8 days each way), 2-3 weeks fishing and searching on the fishing grounds and one week in port offloading.⁹² As a result, the number of days fishing and searching per year is less than other fleets, resulting in savings in access fees, now a major expense.

All Japanese vessels now have varying levels of PS-special capacity (- 450C to - 550C ULT freezers) for storing a portion of the catch to supply higher value markets. All fish is initially frozen in brine (-180C), often fish from the first several brails during loading and is then moved to the ULT freezers. This PS-special capacity may be used for up to 40% of the catch, depending on the individual vessel's freezer hold configuration.

Operating Costs

Details of operating costs were not available, but the efficient fleet is believed to operate profitably in most years and is often partly insulated from the large variations seen in the standard (Bangkok) price for canning-grade skipjack and yellowfin. Higher prices usually prevail at Yaizu for regular brine-frozen fish and the considerably higher prices obtained for the PS-special portion of the catch (see below). Sale of the catch in Japan can also insulate the fleet from adverse fluctuations in currency exchange rates. In 2018, however, during the period of good skipjack catches, the Yaizu price briefly dipped below that of Bangkok.

The additional costs of returning to Japan ports to unload for most of the fleet are claimed to be partly offset by the reduced VDS access fees (fewer fishing days required), and access to better maintenance and repair facilities needed for the ageing fleet than available in Pacific Island ports.

The TMC vessels operating from Pohnpei have the advantages of being able to acquire VDS days at discounted prices. More fishing days are utilised, given most of the catch is transhipped (estimated 75%) in FSM ports, resulting in increased annual catch/vessel (~40,000 mt/year for the five vessels).

⁹⁰ SPC CED, October 2018

⁹¹ Kiyofuji et. al. 2019

⁹² Taro Kawamoto, FFA, pers com., April 2019

However, disadvantages include higher cost and more difficult maintenance and repairs, such that at least one trip to Japan is still made annually for unloading and maintenance/repairs, as well as refrigeration repairs/replacement, where necessary.

Crewing

One estimate of the total number of PIC crew onboard the entire Japanese distant water fleet is 100-110, mostly from FSM, Kiribati and PNG, based on an aspirational requirement of 2-3 crew (10%) per vessel under access or JV agreements.⁹³ A crewing agent based in Yaizu advised that around 9,000 foreign workers serve on Japanese vessels (all gears, including aquaculture), whilst up to 50,000 foreign nationals work in Japanese fish processing plants.

PIC crew face various issues when in Japanese ports, including homesickness and alcohol-induced problems, but the remittances sent home, typically 80% of the wages, make important contributions to domestic economies at the family level. A recent change to domestic legislation may see qualified PIC crew, if able to obtain five-year visas, become eligible for work on Japanese domestic vessels at Japanese award wages. It remains to be seen what impact this may have on the PIC maritime crewing situation in the future, but it is likely to be minimal.

Flag State Requirements

Japan still maintains strict control of distant water purse seine operations through the long-standing cap on distant water vessel numbers at 35, with requirements for scrapping or withdrawal from the WCPO fishery should a replacement vessel be constructed and begin operations.

Earlier restrictions on vessel size and transshipment in non-domestic ports have been gradually relaxed, to allow the fleet to become more competitive, but to date only five of the 33 distant vessels are the larger Asian standard 1,800 GRT. However, three new large vessels are under construction and a similar number of others are under consideration for the ageing fleet. There has been no uptake of the relaxation of transshipment requirement, with little incentive to do so.

Japan is in process of introducing output-based controls/individual quotas (IQs) for its domestic fisheries but distant vessels will still remain subject to RFMO, FFA and PNA requirements.

Access Arrangements

Japan continues to maintain bilateral access arrangements with various PICs under the VDS. As noted, most bilateral VDS days are obtained from FSM, Palau and PNG, with some access to multilateral FSMA days for the Pohnpei-based vessels and reportedly discounted rates for VDS days.

The fisheries access situation in Palau appears uncertain, where Japan distant water purse seine vessels have traditionally fished. The establishment of the Palau National Marine Sanctuary (PNMS), slated to enter into force on 1 January 2020, would close off 80% of the Palau EEZ to commercial fishing and effectively exclude purse seine fishing from the zone. Unless PNA party-to-party transfer arrangements can be made with PNA endorsement and the cooperation of adjacent states (e.g. PNG, FSM) or exemptions could be provided by Palau Government, then these VDS days (762 PAE days in 2019) would presumably be lost, with Japan the main loser. In a recent development, it appears that Japan purse seine vessels will be able to fish in 20% of the EEZ, in an area on the north-west side of the main island, Babeldaob.⁹⁴

⁹³ Taro Kawamoto, FFA, pers. com., April 2019

⁹⁴ Atuna, 21 June 2019

Reservations continue to be voiced that current VDS levies are too high and that prices continue to increase each year. There are also concerns about the effectiveness of effort control through the VDS, as overall fleet size (and effort) has increased since its introduction in 2007, largely due to islandization, which is seemingly unchecked.

5.3 Major Markets & Supply-Chain Linkages

The catch of Japanese distant water purse seiners supplies several markets, most important of which in volume terms is the *katsuobushi* market, followed by the lower grade sashimi market, made possible by the ULT/PS Special capacity on board virtually all vessels, and thirdly the canned tuna market, both domestic and overseas (Thailand), supplied by regular brine-frozen fish.

Data supplied by the Yaizu Fisheries Cooperative (YFC)⁹⁵ which handles around 50% of Japanese distant water purse seine landings and monitors landings in other ports, indicate that 50% of the landings were made in Yaizu port, with a similar combined amount in the two southern Kyushu ports, Makurazaki and Yamagawa. The catch is sold by auction, with YFC responsible for the sale, delivery and storage of fish, with a fee of between 2-3%, with agents playing a role in the selection of unloading port and timing, for a small additional fee.

Table 8 presents the market categories of Japanese distant water purse seine catch in 2018 (177,053 mt) by unloading ports.

Table 8 Japan Distant Water Purse Seine Fleet Catch – Market Categories and Unloading Ports, 2018

Market category	Overall (% of total landings)	Yaizu (50% of landings)	Yamagawa + Makurazaki (50% of landings)
Katsuobushi	46%	37%	56%
Sashimi	36%	36%	36%
Canned tuna	14%	20%	8%
Exports	3%	7%	0%
Other	1%	1%	0%

Source: YFC 2018; assumptions on % market share based on conversation with vessel operators; Taro Kawamoto, FFA, pers. com., April 2019

Supply to *katsuobushi* processors accounts for just less than half of the total purse seine landings, down from the 60% reported in 2011,⁹⁶ suggesting that the production (and demand) for *katsuobushi* may be declining in Japan. Processors in the Yaizu-Shimizu area tend to pursue bulk production of *arabushi* (semi-finished product) and packaged flakes, whereas the larger number of smaller producers in southern Kyushu focus on finished product – *hongarebushi* – with much longer production time (3-4 months for mould growth), but with a substantially higher end price. The Yaizu area reportedly accounts for around 30% of Japanese *katsuobushi*

⁹⁵ YFC 2018 (in Japanese; kindly translated and summarized by Taro Kawamoto, FFA)

⁹⁶ Hamilton et. al., 2011

production, whereas southern Kyushu, with a much larger geographical area accounts for 65%.⁹⁷ Yaizu processors are also diversifying into other value-added products such as *neribushi* (*katsuobushi* pellets), fish burger patties, petfood, tuna extract and fertilizer recovered from waste water. *Arabushi* profit margins are reportedly slim, driving this move towards alternative products and efficiently utilizing all parts of the processed tuna.

Katsuobushi plants were originally supplied by pole-and-line catches but this source has declined with reduced pole-and-line production and increased prices for that high-demand product, combined with the greater availability of good quality purse seine fish at lower prices. Some *katsuobushi* is imported from overseas processors (i.e. Indonesia, Philippines and Thailand) but this is not regarded as a threat to Japanese raw material supply because of generally inferior quality and the very small size of fish often processed.



Thawing skipjack awaiting initial processing for katsuobushi in a small processing plant, Yaizu
Photo: Tony Lewis

⁹⁷ Hitohide Terao, Kanetora Co. Ltd., pers. comm., April 2019

The lower grade *sashimi* (36% of landings), resulting from onboard PS Special capacity is consumed in the form of skipjack *tataki* (seared skin-on skipjack), *negitoro* (minced raw tuna, mostly yellowfin) and *saku* blocks for sale to supermarkets and sushi-train restaurants (*kaiten-zushi*). An estimated 70% of the Japanese purse seine yellowfin catch and 26% of the skipjack catch enters *sashimi* markets.⁹⁸ Demand in this sector of the market has limits, as companies consider 40% of the catch as the ceiling for PS Special production, without the development of additional markets. Nonetheless, the *sashimi* share of the market has grown from 20% in 2010, as reported by Hamilton et. al. (2011) to 36%, so must now be a vital component of distant water purse seine overall profitability. Japanese companies processing *sashimi* are aware of the need to develop new markets, with the South East Asian market mentioned by several as a possibility in view of growing consumption of sashimi products. Trial shipments have been made to both US and Europe, but non-tariff barriers and lengthy procedural requirements often pose an issue for exporters.

There is concern about competition from Korean purse seiners which are increasingly installing ULT/PS Special refrigeration equipment and are reportedly exporting product to Japan. It has been difficult to obtain data on the scale (and unit value) of imports but is believed to be increasing steadily (see Section 4.3).

The canned tuna market (14%) uses predominantly yellowfin for domestic production, with many of the larger canneries in Shizuoka prefecture (Yaizu/Shimizu). Skipjack is also utilized but mostly in flake packs.

The export (3%) of whole round frozen brined fish, mostly skipjack, occurs mostly from Yaizu to Bangkok in refrigerated containers. As noted earlier, very little transshipment in foreign ports occurs, despite the relaxation of Government requirements that fish be returned to Japanese ports for unloading. Even the TMC fish transhipped in FSM ports is mostly returned to Japan. In 2010, the cost of reefer shipment to Bangkok from WCPO transshipment ports was reportedly comparable to the Yaizu-Bangkok shipping cost. It is assumed this still pertains.

5.4 Recent Developments & Future Prospects

With the relaxation of size restrictions on purse seine vessels in late 2017 there has been a recent surge in the construction of larger 1,800 GRT Asian standard vessels, with three new larger vessels now under construction at Miho Shipyard and the building of another 3-4 vessels under consideration by Japanese companies. This should increase the competitiveness and annual catch of what is already regarded as an efficient and cost-effective fleet, despite its ageing status.

Despite the recent lifting of size restrictions on distant water vessels, the cap on vessel numbers remains firmly in place, in contrast to the continuing expansion of other fleets, mostly through islandization. There remains also a firm commitment to the scrapping or retirement from the fishery of older vessels being replaced by newer vessels.

Despite the lifting of earlier requirements to unload in Japanese ports, very little transshipment in overseas ports in the WCPO by Japan flag vessels has subsequently occurred. Despite the often narrowing gap between brine fish prices in Yaizu and Bangkok, this seems likely to continue, driven by the requirement to unload the higher quality purse seine special/ULT fish directly to sashimi processing plants, often in vertically integrated companies.

⁹⁸ YFC 2019; assumptions on % market share based on conversation with vessel operators; Taro Kawamoto, FFA, pers. com., April 2019

The operational mode of the fleet continues, with a greater focus on free-school fishing than almost all other fleets, with most fishing occurring in the western parts of the WCPO in recent years. This deployment may require re-assessment in the longer term, if the eastwards shift in the distribution of WCPO tuna biomass as predicted under climate change scenarios eventuates. The Japan fleet is well placed if restrictions on the use of drifting FADs (i.e. longer seasonal FAD closures), continue to increase.

There is greater reliance on ULT PS special fish, as *katsuobushi* production and consumption declines. PS special fish as a proportion of landings has almost doubled since 2010 and now underpins the economic viability of the fleet. However, there is recognition that there is a finite limit to what proportion of the catch can be processed as ULT and also that any continued growth in the lower-end *sashimi* market would be dependent on securing alternative overseas market outlets because of shrinking tuna sashimi consumption in Japan.⁹⁹ Efforts to explore these markets can be expected to increase.

There are few if any sanitary and phytosanitary (SPS) issues with the Japanese fleet, with its long-standing commitment to quality, good handling and low temperature storage onboard.

Ecolabelling of product and international sustainability certification such as MSC has gained little traction in the Japan domestic market, which does however have a Marine Eco-Label (MEL) Japan system, established in 2007, and which is applied to several tuna fisheries. Several pole-and-line fisheries and one albacore longline fishery are in Fishery Improvement Projects (FIPs) and at least one pole-and-line fishery was MSC-certified in the past. No Japanese purse seine fisheries are known to be seeking MSC certification or participating in PNA's MSC program, likely a reflection of limited domestic consumer interest in eco-labelled product.

Japan tuna fleets have long been reliant on PIC labour, with distant water purse seine vessels currently employing up to five seamen per vessel as required under aspirational manning targets. Issues with onshore problems and homesickness persist, despite the generally good name and work ethic of PIC seamen and the generally acceptable labour standards and onboard conditions prevailing. With the expected change in regulations allowing PIC seamen with appropriate documentation to work on domestic vessels at Japan award rates, potential opportunities for increase better remunerated employment may become available but may not gain much traction, as there will be no labour cost savings for Japanese operators.

Apart from specific purse seine marketing issues discussed above, a more general concern in an industry heavily reliant on domestic markets is the general downturn in seafood consumption, including tuna, by younger Japanese. Development of new products and innovative marketing approaches are becoming higher priority in the marketplace for processing companies, as well as fresh/frozen fish distributors.

⁹⁹ Campling, Lewis & McCoy 2017

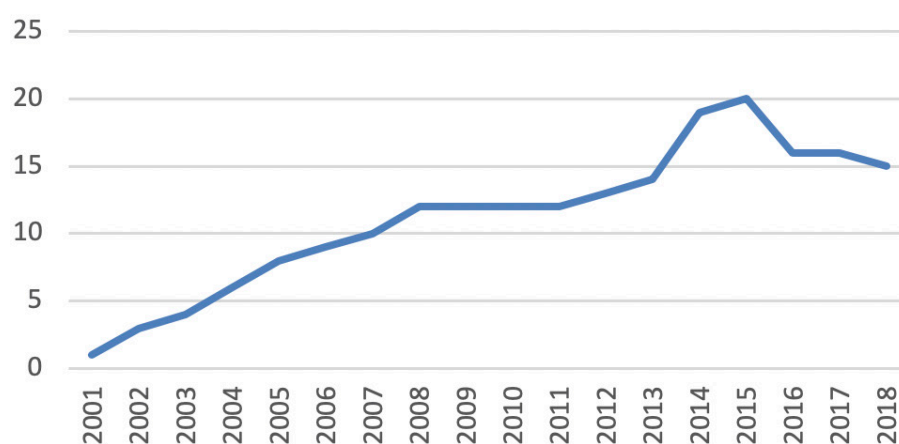
6. CHINA

6.1 Current Fleet Status

Brief History

In 2001, China's first tuna purse seine vessel was obtained used from Taiwan and began operations in Papua New Guinea. Over the next 10 years the number of vessels increased incrementally, primarily through the acquisition of former Taiwanese and Japanese purse seiners. Fishing took place predominantly in PNG and, to a lesser extent in FSM, during the fleet's formative years. Vessel numbers remained at 12-14 during the period 2009-2013, but by 2015 the number had increased to 20 through a combination of new building and continuing acquisition of used vessels, including those that replaced older vessels. At the end of 2018 there were 15 vessels in the China flag fleet operating in the WCPO and an additional three beneficially-owned by a Chinese company, but flagged in the Marshall Islands. This increased to six Marshall Islands flag vessels, with the addition of three new builds in 2019. Figure 2 shows the trajectory of China flag fleet expansion up to 2015, then an annual reduction as vessels were either scrapped in anticipation of replacement and one company ceased its purse seine operations.

Figure 2 China Flag WCPO Purse Seine Fleet Expansion, 2001-2018



Source: WCPFC RFV, COFA 2019

The 15 China-flag purse seiners are owned by five companies operating in the WCPO:¹⁰⁰

- Shanghai Kaichuang - 6 vessels (plus 6 flagged in the Marshall Islands)
- Zhong Yu Global - 2 vessels
- Zhejiang Ocean Family - 4 vessels
- Liaoning Pelagic Fisheries - 2 vessels
- Ningbo Yongfa Ocean Fisheries - 1 vessel

¹⁰⁰ The naming of these relatively large companies follows a convention of first citing the city or province where the company is situated (e.g. Zhong designates a national company with headquarters in Beijing).

The newest vessels, those built between 2012 and 2016 (6 vessels) were all built in China. The remaining 9 vessels were all built earlier, between 1986 and 2002. Six of the nine were built in Taiwan, two in Japan and one in Europe. According to the China Overseas Fisheries Association (COFA), the Government of China has prohibited further importation of used vessels. At least two of the Chinese purse seine-owning companies are planning on building one replacement vessel each in China in 2019.¹⁰¹ One of those companies, Shanghai Kaichuang has ordered a new 67 metre purse seiner to be built in China at a reported cost of CNY 162 million (USD 23.6 million), a substantial increase over the CNY 133 million per vessel cost for the three put into service in 2018.¹⁰² The new vessel is expected to be ready for launch in about 16 months as a replacement for an older EU-built vessel currently in Shanghai Kaichuang's China-flagged fleet.

Ownership Structure

There are two general categories of vessel ownership in China's tuna fisheries:

- Companies that are wholly or substantially owned by large state-owned enterprises (SOEs) either at the national, provincial or city level. Both SOEs and private companies engaged in purse seine fishing are very large and are typically involved in other fisheries as well as tuna. In recent years, some of the SOEs have divested specific activities related to fishing and created listed stock companies in which the SOE retains a large or controlling interest.
- Private sector companies that can be either completely privately-held or listed stock companies.

The three largest Chinese companies engaged in tuna purse seining in the WCPO have significant investments and activities in other fishing sectors as well, either directly or through sister companies. Two of these companies, Shanghai Kaichuang and Zhong Yu Global, are SOEs while the third, Zhejiang Ocean Family (ZOF), is privately owned. Of the three, only ZOF currently owns a processing facility in China focused on purse seine-caught tuna, although Shanghai Kaichuang is said to have plans to build a large processing plant in Zhoushan, Zhejiang province.

Shanghai Kaichuang Deep Sea Fisheries Corporation (6 purse seiners) is owned by Shanghai Kaichuang Marine International Co. Ltd, a listed company that is controlled by Bright Food (Group) Co. Ltd., a large Shanghai-based SOE. With annual sales over USD 1 billion from seafood alone, Bright is one of China's largest food conglomerates.¹⁰³ In addition to its six China-flag purse seiners, Shanghai Kaichuang also has six Marshall Islands-flagged purse seiners, including three that were added in 2019, that are connected to the company's loining plant (Pan Pacific Fisheries) in Majuro, and two refrigerated fish carriers of about 3,500 mt capacity. It also owns and operates 14 large-scale longline tuna vessels. Shanghai Kaichuang's sister companies are also invested in longline operations in Fiji (Golden Ocean), and Kiribati (Kiribati Fish Ltd.). The company has a trading department and, in addition to tuna, handles products from its vessels engaged in fisheries in West Africa, Argentina and elsewhere and recently purchased the tuna canner Albo in Spain. Financing for the company's purse seine operations and new vessel building can be handled in-house through the parent conglomerate's financial services arm.

Zhong Yu Global Seafood Corp. (2 purse seiners) is a subsidiary of China National Fisheries Corporation (CNFC), a large SOE based in Beijing. Zhong Yu Global operates a total of 23 large scale longline vessels in the Indian and Atlantic Oceans, as well as the Pacific. It is also active in West Africa where it has two purse seiners, as well as vessels engaged in trawl fisheries. It is a sister company of CNFC Overseas

¹⁰¹ A third company is also planning on building a new seiner, but it is not clear if it will be flagged in China.

¹⁰² Undercurrent News, 14 May 2019

¹⁰³ Shi Jing, 20 May 2017



Fisheries (COFC) that operates a longline fishing base in Fiji and distant water longliners and squid vessels. Together the two CNFC subsidiary companies owned a total of 72 distant water longline vessels in 2017, making them China's largest distant water longline fleet. COFC's activity in the tuna longline fishery increased recently with its purchase of a Zhejiang-based company that operates six large distant water longliners in the Eastern Pacific for a reported CNY 100 million (USD 14.5 million).¹⁰⁴

Zhejiang Ocean Family (ZOF), known in China as Da Yang Shi Jia (4 purse seiners) began as an SOE owned by the Zhejiang provincial government. It is now a part of the Hangzhou-based Wanxiang Group a large privately-held conglomerate with more than 40,000 employees that is engaged in the manufacture of auto parts, agribusiness, real estate, finance and other activities. The total sales revenue of ZOF was reported as CNY 3.276 billion (around USD 474 million) in 2018.¹⁰⁵

In addition to its purse seiners, the company owns 36 large scale longliners, of which 25 or so currently fish in the Pacific (EPO and WCPO), and nine squid jigging vessels. The company's tuna processing facilities include a loining plant focused on purse seine fish and a joint venture ULT tuna processing plant with Mitsubishi in Ningbo. The company owns 55% of a second loining plant located in Xikou near Ningbo. Other activities include seafood product exporting and importing, marketing and distribution, as well as a chain of retail shops and supermarket fish counters promoting various seafood products.

Liaoning Pelagic Fisheries Co. Ltd operates two older (1991 and 1986) Japan-built purse seiners. The company will reportedly replace one vessel in the future. In addition to its purse seiners, Liaoning Pelagic Fisheries also has a fish carrier, squid boats and a trawler engaged in the krill fishery.

Ningbo Yongfa Ocean Fisheries Co. Ltd had operated three purse seiners, but sold two and now has only one. In addition to its purse seiner, the company has two 5,000 mt capacity refrigerated fish carriers that operate in the WCPO, as well as several distant water squid/saury vessels.

Since 2017, one large company, Qingdao-based Shandong Zhonglu Oceanic Fisheries Co. Ltd, has ceased operating in the tuna purse seine fishery. The company is listed on the Shenzhen stock exchange and has continued its activities in other sectors: longlining, trawling, refrigerated transport, import and the export and import of various fish products.¹⁰⁶

¹⁰⁴ Harkell, 7 June 2019

¹⁰⁵ Zhejiang Ocean Family Company website, accessed April 2019; sales revenue also likely includes revenue from other fishing operations and business ventures.

¹⁰⁶ Reuters 2019

6.2 WCPO Fishing Operations

Regulatory Environment

Ultimate management and control of China's distant water fleets reside with the Bureau of Fisheries, within the Ministry of Agriculture and Rural Affairs. Given the Bureau of Fisheries has limited staff, the Beijing-based quasi-government China Overseas Fisheries Association (COFA) acts as a conduit between the government and fishing companies engaged in overseas fisheries, as well as monitoring many of China's regulatory measures aimed at distant water fisheries. To enable COFA to carry out its mission, the Government requires membership in COFA by all Chinese companies fishing outside of China's EEZ, irrespective of fishery.

Although organized outside of government, COFA carries out some government-like functions, including the operation of a vessel monitoring (VMS) centre for all China flag distant water fishing vessels. Among COFA's other activities are providing assistance in situations overseas when diplomatic solutions are impractical, managing the distribution of fishing quotas and representing companies in overseas fishery access negotiations and participation in RFMO meetings. COFA is effectively a filter through which companies must pass to gain access to global fisheries.

According to COFA, China has formalized within their fishing regulations or laws certain fisheries management policies that were put in place in 2017. There have also been new requirements for distant water vessels such as participation in China's global vessel monitoring system for overseas fisheries. All Chinese companies operating distant water vessels, including tuna longliners and purse seiners, are required to undergo an annual government review to ensure they have complied with all relevant government regulations and are in compliance with RFMO and other requirements.¹⁰⁷

In addition to the regulatory requirements of the flag state, the participation of China flagged purse seiners in the WCPO is circumscribed by several management measures emanating from the WCPFC and the PNA. Two important WCPFC conditions are the limit of 20 vessels described above in Section 6.1 (CMM 2018-01, para. 45) and the limited number of high seas days available to the China-flag fleet of 26 days (CMM 2018-01, para. 26 and Attachment 1 – Table 2).

The combination of these regulatory conditions has resulted in the operator with the largest fleet of Chinese flag purse seiners, Shanghai Kaichuang, flagging an additional six of its vessels in the Marshall Islands even though China, in principle, does not allow Chinese vessel owners to take advantage of flags of convenience.¹⁰⁸ The Marshall Islands situation is described by COFA as a special case because the vessels are directly connected to an onshore fishery development activity, the Pan Pacific Fishery loining plant owned by the same company. As a result of being flagged in the Marshall Islands, Kaichuang's six vessels can fish on the high seas and are also eligible to obtain regional fishery access covering all PNA zones under provisions of the FSM Arrangement.¹⁰⁹

¹⁰⁷ In practice, China's government has targeted primarily the smaller companies engaged in distant water fisheries, including tuna longliners, with these regulations so as to gain greater control over their activities. Such close supervision is not considered as necessary with the large SOEs and private companies engaged in capital-intensive fisheries such as tuna purse seining as it is with the smaller companies.

¹⁰⁸ The Marshall Islands operates an open registry and in 2018 was the second largest ship registry in the world behind only Panama; Lloyds List, 10 December 2018.

¹⁰⁹ This enables vessels nominated by a PNA 'home party' the ability to obtain regional fishery access covering all PNA zones.

In 2014, nine Chinese purse seiners were first chartered to Kiribati under the WCPFC Charter Scheme set out in CMM 2016-05.¹¹⁰ As of April 2019, 14 of the 15 vessels in the China flag fleet were chartered to Kiribati; a reduction from 16 in 2016 (See Box 4 – Charters).

The Kiribati charters enable the vessels to fish on FADs within the Kiribati EEZ during the entire year, which one company's officials described as an incentive to charter there. In an interview with a different company it was stated that there was a surcharge imposed by Kiribati for FAD fishing during the FAD closure period. A second incentive noted by another company was the perception in China that fishing grounds are changing from historically FSM/PNG to Kiribati/Nauru and that an adequate number of VDS days are available from those countries. Neither company said they prioritized the purchase of multiple zone 'pool' days, but preferred bilateral days, if available. In responding to a question on the VDS price to chartered vessels, they said they do not obtain any discount on purchase of the days and appeared more concerned with availability than price. However, they did express serious concern with a lack of a consistent definition of fishing day versus non-fishing day and said that the uncertainty had cost them a considerable amount of money in 2018.

Box 4 Charters in the WCPO Purse Seine Fishery

Vessel chartering arrangements have featured prominently in the WCPO purse seine fishery since early in the history of the fishery and are intended to increase PIC participation by chartering foreign vessels. Usually a wholly owned corporation is set up in a PIC and vessels are registered as domestic or the PIC corporation charters the vessels which in some cases are classified as 'locally-based foreign'.

Another approach involves the establishment of joint ventures involving a foreign investor (or investors) and a PIC partner. JVs exist in many forms in PICs most often involving the purse seine and/or processing sectors. Details of these commercial arrangements are difficult to obtain and as a result, JVs are not further discussed here.

"Acknowledging the important contribution of chartered vessels to sustainable fisheries development in the Western and Central Pacific Ocean, and *concerned* with ensuring that charter arrangements do not promote IUU fishing activities or undermine conservation and management measures", a WCPFC CMM to require charter notification procedures was first established in 2008 and has been upgraded four times since then with the most recent (CMM 2016-05) due to expire at the end of 2019, unless renewed.

The CMM provides inter alia for the following:

- Formal notification by CCMs and Participating Territories that charter, lease or enter into other mechanisms with fishing vessels and bunkers/carriers for the purpose of conducting fishing operations in the Convention Area as an integral part of the domestic fleet of the chartering Member of Participating Territory;
- Listing on the WCPFC Record of Fishing Vessels and not on the WCPFC IUU vessel list or IUU list of another RFMO;

¹¹⁰ The charter scheme is set to expire 31 December 2019. However, it is generally understood that the mutual benefits of the scheme, including catch attribution to the Pacific Islands country charterer party, means it will be extended or renewed.



- Each year the Executive Director shall present a summary of all notified chartered vessels to the Commission for review; and
- Catches and effort of vessels notified as chartered under CMM 2016-05 shall be attributed to the chartering Member or Participating Territory.

The 2018 WCPFC summary of notified chartered vessels (28 November 2018), listed 383 longline vessels, twelve purse seine vessels and no fish carriers. Of the twelve purse seine vessels listed, all were Chinese, with ten chartered to Kiribati and two in Marshall Islands. According to an industry source, all twelve are now chartered to Kiribati.

Another fourteen vessels beneficially-owned by Philippines and nineteen Philippines flag vessels in the PNG fleet are operated by companies other than the vessel owners. While these arrangements are not notified as charters to WCPFC, catches are still attributed to PNG. Contrary to popular understanding, charters as defined by WCPFC play only very minor role in the WCPO purse seine fishery, contributing only a very small % to overall catches, but play a much larger role in the longline fishery.

A much larger number of purse seine vessels operate under joint venture arrangements and are flagged to PICs. This appears to be the model preferred by Korea (10 in Kiribati, 2 in Nauru, one in Tuvalu) and Japan (5 in FSM). An analysis of the relative benefits accruing to PICs from these arrangements is not undertaken here, for lack of complete information on operational aspects and corporate structure in most cases.

Sources: WCPFC 2018d

Government Subsidies

It is generally recognized that government building and operating subsidies given to distant water tuna fisheries have encouraged increases in the fleet. It is accepted that there are subsidies from both the central and in some cases provincial governments for such things as operations (mainly fuel), replacement vessel construction and the building or expansion of overseas bases. China's subsidies to distant water fishing are available to all fisheries including tuna purse seine. It has been reported that China spent CNY 20 billion (USD 3 billion) in 2014 alone in subsidies for distant water fleets. That amount has reportedly been reduced, with funds previously used for fuel subsidies diverted to drive investment in port facilities. The same report says China spent CNY 6.4 billion (USD 515 million) on distant water fuel subsidies in 2018.¹¹¹ Two notable recipients of various subsidies active in the distant water tuna purse seine industry have been Shanghai Kaichuang and COFC.¹¹²

The withdrawal of subsidies, primarily fuel subsidies from ongoing operations, has become an integral part of the Chinese government's crackdown on IUU fishing by its global distant water fleet. Other punishments have included cancellation of certificates for distant water fishing and the blacklisting of some companies and captains.

¹¹¹ Godfrey, 8 July 2019

¹¹² For details, see Havice, Campling & McCoy 2017, July-August.

Catch

In 2013, the total WCPO tuna catch of China-flag purse seiners was around 81,828 mt (14 vessels), declining to 59,406 mt in 2014 and reaching 15,475 mt in 2017.¹¹³ While the Chinese fleet may have experienced catch reductions from 2013-2017 following similar trends experienced by other distant water fleets, the significant decline in reported catch for the China-flag fleet relates to catch attribution for vessels operating under charter arrangements.

The bulk of catch by China's chartered purse seiners in the last few years has been attributed to Kiribati under the WCPFC Charter Scheme (CMM 2016-05), while the catch of Chinese beneficially-owned Marshall Islands-flag vessels has been attributed to Marshall Islands. Both these countries also have their own flagged purse seiners owned by non-Chinese interests, making the estimate of total catch by Chinese vessels on an annual basis difficult to ascertain from public sources. Assuming an average annual catch of 7,000 mt per vessel, the total catch of the Chinese-flagged, chartered and beneficially-owned fleet of 21 vessels could be in the order of 150,000 mt. It is believed the company with the largest catch in 2018 was Shanghai Kaichuang with around 82,000 mt produced by its total nine vessels (6 China flag, 3 Marshall Islands flag), fishing mostly in Kiribati.

According to industry sources, China's purse seine vessels operating in the WCPO in 2018 fished predominantly in the EEZs of Kiribati, Nauru and the Marshall Islands.

Operating Costs

According to one company, fuel and fishery access licenses are the major costs incurred and represent about 70% of total operating costs. Of that total, fuel represents 30% and VDS around 40%. The remaining 30% is consumed by maintenance, crewing, and other operating costs. A second company stated that their highest operational cost was purchase of VDS days when calculated at USD 10,000 per day. As an example of the level of these expenditures, a company representative said that they had apparently bought 350 days for one vessel in their fleet and 265 days for another two vessels. Both companies pointed out the negative impact that the VDS had on operating costs because of lost days due to the short time horizon available for purchase and uncertain definitions of non-fishing days.

In interviews with two purse seine companies, the increase in the cost of fuel in 2018 over 2017 was cited as a major drain on profits. Average price paid for fuel taken on the high seas in 2018 was USD 727/mt, compared with USD 550/mt in 2017. As an example, the company stated that the average vessel from its fleet used about 1,500 mt at a cost of around USD 1.83 million in 2018. The increase in fuel cost was cited as one of the drivers for greater FAD use. Brokers are often employed to obtain high seas fuel, with longer payment conditions sometimes preferred due to the time required to obtain government foreign exchange permission. At this stage, it is unknown if the PNA ban on high seas bunkering which comes into effect on 1 January 2020 will result in increases in fuel prices.

Crew costs are said to have increased, in part, due to some competition with other companies for key crew, but primarily from Chinese government requirements to provide certain benefits to Chinese crew such as insurance and social security, with the latter coming into effect in 2017. One company's average annual per vessel crew costs across their fleet in 2018 was pegged at CNY 5.25 million (around USD 765,000).

¹¹³ SPC CED, April 2019

Two SOEs, Kaichuang and CNFC, are known to have received considerable subsidies in the past, but it is not clear what role or the extent to which government subsidies might play in meeting the operational costs of those companies' purse seiners.¹¹⁴

Crewing

Crewing regulations in China require an inspection of crew and documents prior to leaving port in China and annually outside of China, if the vessels are based overseas. The manning requirement for purse seiners is for seven Chinese officers (captain, chief mate, electrician, engineer, etc). Government inspectors check all documents and certificates of officers to ensure compliance with China's crewing regulations. In general, China's crewing regulations prohibit the employment of foreign crew on Chinese flagged fishing vessels. This has the potential to cause some administrative problems because at least one Pacific Island country (Kiribati) requires crewing of their citizens as a condition of access, but apparently practical solutions have been found.

If there are inconsistencies between the coastal state and flag state laws or regulations, these have not apparently created any serious impediments to vessel operation or other problems. The company that operates Marshall Islands-flag vessels says that although flag state laws apply, the company considers Chinese law to cover Chinese citizens working onboard the vessels. Others, including Marshallese, Filipinos, and Indonesians are covered by Marshall Islands' laws. Of note is that due to the Marshall Islands open registry and the very large number of ships registered, the Marshall Islands has not imposed requirements for withholding (i.e. income) tax or social security payments from non-Marshallese crews employed on Marshall Island-flagged purse seiners.

Transshipping

The catch of China flag purse seiners is transhipped to carriers predominantly in Majuro and Tarawa. Pohnpei had been utilized more extensively for transshipment in the past, but there appears to be less interest in Pohnpei and increased activity in Tarawa. According to the Chinese companies queried, the main reason for using Tarawa is its proximity to available fishing grounds within the Kiribati EEZ. They also cited a USD 50 per metric tonne penalty for fish transhipped outside of Kiribati by chartered vessels.

Majuro has been preferred by captains as a transshipment port due the larger amount of commercial activity than Tarawa, including amenities for crews compared to Tarawa. Majuro is also the location of Shanghai Kaichuang's loining plant which offers administrative support. Some unloading takes place to the plant from Shanghai Kaichuang's Marshall Islands flag vessels, but overall that amount probably represents less than 10% of the company's overall catch of both China and Marshalls flagged vessels.

6.3 Major Markets & Supply-Chain Linkages

The production of China's purse seine fleet is closely linked to China's tuna processing industry, which processes purse seine-caught tuna into loins for export and cans for both foreign and domestic markets. According to COFA, China's tuna processing capacity is growing, with around 50 factories authorized to process tuna at least some of the time. Many of these factories, most of which are privately owned and located primarily in Zhejiang and Shandong provinces, also produce other products as well as loins and/or canned tuna. Production at a few large facilities is primarily for export and dominated by frozen cooked loins destined for canning elsewhere.

¹¹⁴ For a discussion of past subsidies to these companies, see Havice, Campling & McCoy 2017, January-February.

There is currently no production of ULT PS-special yellowfin within the fleet, although Shanghai Kaichuang says that two of their vessels are capable of producing the product. The company cites the expense of getting such a product to the major market, Japan, as the primary reason for foregoing this product at the present time. Kaichuang does say, however, that some large frozen yellowfin are unloaded to the Kiribati Fish Ltd. plant in Tarawa for processing and export.

In 2018, China's exports of loins and canned tuna totalled around 106,000 mt, not all of which was produced by Chinese domestic vessels. The largest market for China's canned tuna and loins was the US, which took around 23%, a drop of 10% from the previous year, owing to tariff measures placed on food goods between China and the US that began in April 2018. In comparison, Spain's share of China's exports increased 50% from the previous year to nearly equal the amount sent to the US in 2018.¹¹⁵ It is believed that Spain's increase was absorbed primarily by Shanghai Kaichuang's Spanish cannery acquired in 2016.

The 10% tariff imposed by the US on loins imported from China was increased to 25% in May 2019. It is believed that the net result of these increases is greater export of Chinese purse seine-caught tuna to Bangkok, exacerbating an oversupply situation in Thailand at the time of writing, that has had ripple effects on fish price, adversely affecting purse seine companies operating in WCPO.

According to officials at COFA, government-owned fishing companies must bring or send back 80-90% of their catch to support domestic processing and to encourage re-exports. It is unclear what the requirements are for privately-owned companies. Some in the industry have mentioned that 30% must be returned to China, while a published report says 65% with the objective of "ensuring jobs at home".¹¹⁶ In any case, it is clear that there is a requirement and that it is likely linked to subsidies provided by the government.

So far, the domestic market in China for canned tuna has not taken off despite efforts of some companies, foreign and domestic, to encourage growth. Consumer resistance to canned fish products and a preference for fresh, unprocessed fish has been cited as one of the major reasons for a lack of acceptance. An official of Shanghai Kaichuang was quoted in the press as saying that although domestic firms have made forays into canned products for the home market, it could still take five to ten years for canned tuna to become mainstream.¹¹⁷

The vertically-integrated company, Zhejiang Ocean Family, owns two loining plants, one in Ningbo and another about 50 km away in Xikou through its subsidiary, Feng Sheng Foodstuffs Co. Ltd. ZOF directs nearly all of the production from its four purse seiners to those plants and in 2018 sent just one carrier load to Bangkok. The company's major customer for loins is the US, where it supplies Bumble Bee Foods, among others. The recent US tariff impositions are a concern to ZOF as well as other processors. It is too early to determine what impacts there will be from the US tariffs, but in conversations with a company official in April 2019 it was clear the company was deeply concerned.

Pan Pacific Foods, the loining plant operated by Shanghai Kaichuang in the Marshall Islands, processes only fish from the company's Marshall Islands-flagged purse seiners. It is generally recognized that operation of the plant is undertaken to assure access to fishery resources in the Marshall Islands as well as high seas and elsewhere under the FSM Arrangement for Regional Fisheries Access administered

¹¹⁵ Harkell, 26 March 2019

¹¹⁶ Godfrey, 17 January 2018

¹¹⁷ Harkell, 16 November 2017

by the PNA. Production of loins has never approached the plant's capacity since beginning of its operation by Kaichuang in 2008. Of the 5,710 mt reported to have been unloaded to the plant in 2017, two thirds were exported whole round and just 384 mt of loins produced and exported from the remainder.¹¹⁸

6.4 Recent Developments & Future Prospects

The leading Chinese company engaged in WCPO purse seining is clearly Shanghai Kaichuang. The company has expanded the fastest among the companies involved in purse seining and continues to expand with an aggressive program of building new seiners, replacing older ones and forging an alliance with Kiribati, currently the most important PIC to China in terms of fishing grounds. In 2018 Kaichuang's reported revenues were around CNY 1.91 billion (USD 278 million), nearly three times that of COFC's revenue of CNY 626 million (USD 90.6 million). Both are listed in the top ten Chinese seafood companies, with Kaichuang at number three and COFC number ten.¹¹⁹

Technical Advances

Participants in China's tuna industry have been shown to be quick learners. Starting from imported used fishing vessels to building their own seiners did not take long. In 2012, Kaichuang launched what it called at the time China's first self-designed large-scale tuna purse seiner built entirely in China, the 75-metre Jin Hui 8 built by the Dalian Fishing Vessel Company for Kaichuang as part of a two-vessel order.¹²⁰ Subsequently, Kaichuang built two more vessels in 2014 and 2016 in a shipyard subsidiary of its parent company, and then following that, Zhejiang Ocean family built two in 2015 at a shipyard in Fujian, and Kaichuang then built three additional vessels at that shipyard.

All vessels built in China externally appear to be similar to Taiwanese-designed and built vessels in the past decade. With the ban imposed by the government on importing second-hand boats, it can be expected that future purse seiners will likely be built in China. Financing for building new vessels can come from state-controlled banks, shipyards which are subsidiaries of large corporations that can offer financing, and in the case of SOEs, the parent companies of the fishing companies themselves.

China's Government has not addressed overall tuna fishing capacity. Fishing companies say VDS is driving a continued need for improved efficiency in vessel design for new vessels. The results can be seen in the production of Kaichuang's vessels, where in a fleet of 9 purse seiners active in 2018, 3 of 4 vessels that caught over 10,000 mt were all built in China in 2010 or later. It can be expected that replacement of older second-hand purse seiners will result in increased efficiency (i.e. larger catches and better economic performance).

Overseas Investment

Access to resources has driven China's fishing industry to seek opportunities for investment worldwide. In Pacific Island countries, the only example of shore-based investment linked to purse seining so far is Kaichuang's Pan Pacific Fisheries plant with its associated purse seiners in the Marshall Islands. The company readily admits that its investment in and operation of the PPF plant were done to gain fishery

¹¹⁸ Lack of reliable labour has been cited as one of the major reasons for limited production at the plant. For additional production figures, see Graduate School USA 2018.

¹¹⁹ Harkell, 30 April 2019

¹²⁰ Plastic Pipe 2019

access. In fact, for a variety of reasons the facility has operated at far below capacity since Kaichuang took over. The total volume of frozen cooked loins in 2018 from PPF was just 804 mt¹²¹ compared with a high of 4,118 mt in 2000 when the former plant owners, PM&O Processing Co., supplied loins to StarKist in American Samoa.¹²²

China's subsidies to its fishing industry are known to include support of overseas bases. So far, except for the Kaichuang activity in the Marshall Islands, the Chinese Government's financial support for the establishment of bases has been primarily taken up by its longline industry, notably Shenzhen-based Luen Thai for bases in Palau, Yap, Pohnpei, Kosrae, Majuro and Apia, Samoa, and Kaichuang in Kiribati through its Fiji-based affiliate Golden Ocean.

At least one other Chinese fishing company is looking for ways to participate in a joint venture including shore-based development with the intention of gaining access benefits. The company hopes to arrange for shore-based investment in Kiribati because approval from the host nation could enable the company to expand its fleet by building a vessel or vessels in China for foreign flagging. Whether or not such an investment makes financial sense given the limited available infrastructure in Kiribati and other considerations remains to be seen.

With a limit of 20 domestic-flagged vessels and minimal WCPO high seas fishing days, vessel replacement would appear to be currently the only avenue for domestic investment on the fishing side. Other investment in domestic development of the sector is most likely to be seen in processing for export until a better domestic market for canned tuna eventuates. Kaichuang, an industry leader which already owns a tuna canner in Spain, has said that any increase in processing by them will most likely be done by buying established processors in China or elsewhere rather than the establishment of facilities in developing countries. Compliance with government requirements to return a certain percentage of fish from vessels built with subsidies no doubt plays a part in decision-making. Domestic development in processing facilities in China for purse seine-caught fish by Chinese vessels has not greatly expanded, however. In 2018, Kaichuang announced plans for construction of a large processing plant in Zhoushan, however those plans are currently on hold for unspecified reasons according to the company.¹²³

Investment capital is also likely to be directed to Taiwan's distant water purse seine industry. According to a person with extensive experience in the Taiwan fishing industry, there are between four to six vessels currently in Taiwan's purse seine fleet beneficially owned by Chinese interests. This is not necessarily unusual, as there is also cross-investment between Taiwan and China in other fisheries, including Taiwan's distant water squid fishery where some Chinese companies are said to be investing to secure product for Chinese processing factories.

¹²¹ B. Muller, MIMRA, pers.comm., 10 July 2019.

¹²² Gillett 2003

¹²³ Company officials, pers. comm., 23 April 2019

7. UNITED STATES OF AMERICA

7.1 Current Fleet Status

Brief History

The US fleet has long been active in the WCPO. Since the 1980s, its fishing activities in the region have been facilitated by the multilateral US Treaty (USMLT), an international legal agreement between the US fleet, the US State Department and FFA Members, referred to for the purposes of the Treaty as Pacific Island Parties (PIPs). Prior to the introduction of the Purse Seine Vessel Day Scheme (VDS), the US Treaty granted up to 40 US-flagged vessels unlimited access to fish across all PIPs' waters in exchange for licensing fees paid by industry and a development assistance package supplied by the US State Department and shared across all of the Pacific Island Parties to the Treaty. In recent years, over a series of interim agreements and most recently, a re-envisioned six-year arrangement, the US Treaty has been modified dramatically in order to adapt to the changing terms of access since the PNA countries introduced the VDS (see below).

The US fleet is comprised of two parts, each with distinct operating models and market outlets. The general vessel composition is outlined in Table 9. The 'old', or 'Pago-based' fleet is comprised of vessels built primarily in the US, as well as in France and Italy. In this grouping, six vessels are owned by Renato Curto (Cape Fleet Holdings), CEO and former majority shareholder of Tri Marine Group. Tri Marine is a global tuna trading company that has become incrementally more vertically integrated. In July 2019, Tri Marine was fully acquired by its long-time customer, Bolton Group, a branded manufacturer based in Italy which has owned a minority share in Tri Marine since 2013.¹²⁴ The vessels in the Cape Holdings fleet were not included in the transaction and will be privately retained by Renato Curto.¹²⁵ In addition to the Cape Holdings fleet, fourteen vessels are owned by independent vessel owners. All of these companies are based on the West Coast of the US (with the exception of one independent vessel with a company base in Florida). The Cape Fleet Holdings vessels and six of the independent vessels are registered in Pago Pago. The remaining independent vessels have registered ports in Hawaii (1) and various other sites in the mainland US.¹²⁶ Vessels in this 'old' portion of the fleet were built between 1971 and 1991, with an average age of 40 years old.

The 'new' fleet is comprised of vessels that were built new in Taiwan or existing vessels re-flagged around 2010 to access US Treaty licenses. There are 14 vessels in the 'new' fleet, owned by South Pacific Tuna Corporation (SPTC), which is affiliated with global trading company FCF, based in Taiwan. SPTC's company base is in San Diego, California, but the vessels are registered in Pago Pago and generally make a single compulsory call to that port each year for required inspections. These vessels operate under a transshipment model and their products are bound primarily for processing plants in Asia.¹²⁷ The vessels in this portion of the fleet were built between 2003 and 2008.¹²⁸ At the time of writing, SPTV announced the sale of eight US flagged vessels, citing uncompetitive conditions under the US flag and what it describes as a lack of support from the US Government.¹²⁹ If the sales go through, the US fleet will be reduced to approximately 23 vessels.

¹²⁴ IntraFish Media, 7 July 2019

¹²⁵ Industry Representative, pers. comm., July 2019

¹²⁶ WCPFC RFV, April 2019; International Fisheries Specialist, pers. comm., July 2019

¹²⁷ International Fisheries Specialist, pers. comm., July 2019

¹²⁸ WCPFC RFV, April 2019.

¹²⁹ Havice, Campling and McCoy 2019, May-June

Table 9 US Fleet Vessel Specifications

Feature	Range
Gross tonnage	1,097 – 2,437 gross tonnage (GT) ¹³⁰
Hold capacity	1,040 – 2,200 m ³ (23 vessels) 910 – 1,588 mt (10 vessels)
Freezing capacity	250-300 mt/day
Registered length	174.2-260.1 feet
Engine power	2,000-4,500 HP

Source: WCPFC RFV, April 2019

The American Tunaboat Association (ATA) represents all of the owners of the large US-flagged purse seine vessels in RFMO meetings and on domestic issues, including consultations with the US State Department on issues surrounding the US Treaty, testimony before relevant Congressional committees and with other government organizations, such as the National Atmospheric and Oceanic Administration (NOAA) involved with domestic regulations. The ATA has a broad representative role and is positioned to respond to the fleet's issues and political concerns as they arise. ATA also follows issues affecting the processing sector in American Samoa (e.g. the ongoing debate over minimum wages), since this is a major outlet for the Pago-based fleet's catch.¹³¹

7.2 WCPO Fishing Operations

Access Arrangements

For more than three decades, the US fleet's fishing access had been facilitated by the US Treaty and the arrangements are generally seen as successful and beneficial for all parties. For instance, in comparison with other access arrangements prior to the Vessel Day Scheme, the Treaty was among the most profitable access agreements for Pacific Island Parties (including the US State Department contribution to the deal) and US vessel owners were seen as responsible operators. However, bringing the US Treaty into line with VDS provisions has resulted in significant tensions among those involved and led to changes in the structure of access for the US fleet. In general, the US Treaty is now far less financially important to PNA countries specifically. Unsurprisingly, the benefit sharing arrangement through which non-PNA Parties receive a share of US Treaty value, remains of interest to those countries.

The terms of the current US Treaty specify access conditions for the period of 2017-2022. They are an outcome of a series of very volatile and tense negotiations between 2013 and 2016 that nearly saw the collapse of the Treaty. The resulting modified Treaty is structurally distinct from prior arrangements and has several key features.

- The US Government contribution has remained as USD 21 million/year. This aid vehicle is an important component of US diplomatic engagement in the region.

¹³⁰ For 28/33 vessels; the remaining vessels report in gross registered tonnes (GRT).

¹³¹ Industry representative, pers. comm., June 2019.

- The allocation and price of vessel days are the most significant changes to the Treaty. The pre-2013 Treaty agreements offered the US fleet unlimited fishing across the region. In the present arrangement, the US fleet has the option to purchase up to a set number of fishing days, at a set price. Further, rather than fishing days being utilized across the region, in the current Treaty, days are allocated to specific geographic 'pools' (Table 10).
- The total number of fishing days offered under the US Treaty has declined substantially since the interim agreements when total number of fishing days was set at 8,300 at its peak. By the end of the current Treaty in 2022, the total number of fishing days available for the US fleet to purchase will be 3,490. The US fleet is not obligated to purchase all available fishing days.
- US vessels are permitted to purchase additional days outside of the Treaty days offered by a Pacific Island Party or group of Pacific Island Parties, whether or not they have exhausted the official Treaty days. The price of any non-Treaty days that US vessels purchase is negotiated on a case by case basis and is not governed by the Treaty.

Table 10 US Treaty Fishing Day Allocation, 2017-2022

Pool	Number of Days Available
PNA EEZs, excluding Kiribati	3,200 declining to 2,240 in 2022
Kiribati EEZ	300 until 2020
Cook Islands	350 through 2022
Non-PNA 'Exploratory' (Fiji, Niue, Samoa, Tonga, Vanuatu)	600 through 2022

The US industry and Pacific Island Parties agreed to set the fishing day price for the first four years of the six-year arrangement. In the first two years (2017 & 2018), vessel day price was set at USD 12,500/day and increased to USD 13,500/day for years three and four (2019 & 2020). These figures do not account for the US State Department development assistance payment, which is a separate legal agreement. The price of fishing days will be renegotiated for years five and six of the Treaty (2021 & 2022).¹³² Like the price of all access arrangements under the VDS, these figures represent a significant increase in access prices paid by industry. Prior to the VDS, it is estimated that the US fleet was paying approximately USD 7,800 per fishing day *including* the contribution from the US State Department.¹³³ In addition to the substantially higher price of access, the US fleet is also now required to comply with all individual PIP's national laws, where in prior iterations, the US Treaty provided an umbrella legal and operational framework. Negotiations on pricing for 2021 and 2020 are scheduled for the second half of 2019, and these negotiations will also contribute to clarifying the future viability of the Treaty arrangement.

Operators within the US fleet have developed several responses to cope with changing access conditions under the Treaty.

First, vessels owners have diversified their approaches to fishing in PIC EEZs in response to the changing Treaty framework. Within the Treaty, the US has the option to purchase 'up-front' days from any of the four available 'pools'. 2017 was the first year in which the new framework was operational, and reportedly, the US purchased all of the available up-front days. In 2018 and 2019, however, the fleet did not purchase all up-front days, even when the total days available in the 'PNA minus Kiribati' pool declined according the schedule laid out in the Treaty.¹³⁴ The US fleet's decline in total catch in Kiribati

¹³² FFA pers. comm., April 2019

¹³³ Havice 2013

¹³⁴ International Fisheries Specialist, pers. comm., May 2019

in 2015 and 2016 – an historical stronghold for the fleet – following Kiribati’s 2015 decision to restrict its day offerings in the Second Interim Treaty is notable. In 2017, US fleet catch in Kiribati increased, presumably through bilateral access (see below and Table 11). Industry representatives report that the fleet has been interested in using the ‘exploratory’ pool days outside of the PNA countries and the days in the Cook Islands’ EEZ, particularly the ‘old fleet’ because of proximity to American Samoa.¹³⁵

Second, and related, outside of the Treaty, the fleet is engaging in bilateral access agreements. While the US Treaty days remained the primary source of access for the fleet up to the time of writing, for every three US Treaty Days, it is estimated that the fleet has purchased one bilateral day.¹³⁶ Bilaterals are reported with Kiribati, an important historical fishing ground for the fleet, now limited to only 300 days under the Treaty framework and with the Cook Islands. The ATA has also facilitated an access agreement between US vessel owners and the Cook Islands. The bilateral option provides the fleet with the ability to negotiate on the price and location of days. However, it also introduces new administrative burdens for vessel owners that previously had umbrella access under the Treaty. It is likely that these administrative processes present more challenges for the individual vessel operators in the older segment of the fleet and Cape Fleet Holdings vessels, than for the ‘new’ fleet. To date, with the exception of Cook Islands, the ATA has not played a central role in bilateral access agreements and it remains to be seen if this will become a task for the industry association into the future.

Third, in recent years, the US fleets’ focus on the high seas has grown, particularly in 2015 and 2016 when the US Treaty was especially volatile and the FFA briefly rescinded all US licenses when a portion of the fleet did not pay access fees. The US Government and fleet identify securing access to the high seas as a significant policy focus, one that will play out at the WCPFC (see below).¹³⁷ The US also utilizes fishing grounds in US EEZs from its Territories in the Pacific, including: Howland and Baker, Palmyra, Wake, Jarvis and American Samoa. Access to these locations has also been volatile in relation to US efforts to create large-scale marine protected areas (MPAs) (see below).

Fourth, the ‘old fleet’ has re-engaged more consistently in the Eastern Pacific Ocean. In the EPO, the Inter-American Tropic Tuna Commission (IATTC) allocates each flag state a total hold volume, an effort-based management tool aimed at controlling capacity. For the US, this was set at the well capacity of 32 vessels operational in the EPO in 2002 when the capacity resolution was adopted.¹³⁸ For many years, the US had not been using its full capacity allocation, but at the time of writing, it was fully utilized and 32 US vessels were registered in IATTC.¹³⁹ In addition, IATTC permits a ‘one-trip’ exemption in the IATTC fishing area east of 150° West for US vessels with a record of occasionally fishing in the EPO, provided that it is a single trip not exceeding 90 days in one calendar year, the vessels do not possess a Dolphin Mortality Limit pursuant to the Agreement on the International Dolphin Conservation Programme and the vessels carry an approved observer.¹⁴⁰ While it is unlikely that the fleet would shift fully to the Eastern Pacific Ocean because of the seasonality of fishing conditions there, it is a regular tool in several of the vessels’ operational strategy. According to one industry representative, the expectation is that catch is better in the Western Pacific, but following the introduction of the VDS, fishing in the Eastern Pacific costs less.¹⁴¹ To date, there has not been competition within the fleet for access to EPO capacity and with the shrinking size of the fleet, further competition is unlikely.¹⁴²

¹³⁵ Industry Representative, pers. comm., June 2019

¹³⁶ Government Official, pers. comm., May 2019

¹³⁷ Government official, pers. comm., May 2019

¹³⁸ IATTC 2002 C-02-03

¹³⁹ ICCAT Regional Vessel Register List, June 2019

¹⁴⁰ IATTC 2002 C-02-03

¹⁴¹ Industry Representative, pers. comm., May 2019

¹⁴² Industry Representative, pers. comm., June 2019

A final strategy for the US fleet under changing conditions is to leave the US flag: close to 25% of the fleet have or will have done so between 2014 and the time of writing (July 2019). Further, as noted, SPTC announced the sale of eight vessels at the time this report was being written. Assuming the sale is completed, the total size of the US fleet will be reduced to approximately 23 vessels. The access changes described in this section have coincided with a dynamic composition and size of the US fleet. Prior to the 2007 introduction of the VDS, the US fleet had declined from 40 vessels to around 12-14, largely the result of a global boom in fisheries production and related new competitive dynamics for the fleet that resulted in the inability of the US vessels to successfully compete in the new order. However, in 2007 as the VDS destabilized long-standing purse seine access relationships and threatened to increase access fees for all fleets, the US Treaty which was agreed upon for a period from 2003-2013, appeared to offer a refuge from uncertainty as its terms included unlimited fishing access in all Pacific Island Party EEZs for the pre-negotiated fishing license fees.

To take advantage of this opportunity, owners of approximately 16 vessels – primarily from the Taiwan fleet but also a couple from the Korean fleet – were added to the US flag in joint ventures with US citizens. This reinvestment, along with US flagged vessels that had left the WCPO and returned to the Treaty, revitalized the US fleet to 40 operational vessels.¹⁴³ By 2017, however, that number declined and 34 active vessels were listed on the WCPFC vessel registry, despite that 40 Treaty licenses were available. In the coming licensing period, a total of 31 US flagged vessels are expected¹⁴⁴ and SPTC has listed eight vessels for sale, reflecting a further decline. Of the vessels that left the US fleet prior to 2017, five were in the 1,000-1,500 GRT category and one was greater than 1,500 GRT.¹⁴⁵ Two of the vessels were from Tri Marine's Cape Holdings fleet and were sold to National Fisheries Developments Ltd. in Solomon Islands, a natural move as the vessels will serve Tri Marine's Soltuna processing plant and also meet the European Union's Rules of Origin for duty free access for loins.

When viewed together, this diversification of strategies reflects a growing uncertainty about the future of the US Treaty, discussed further below.

Vessel Operations

The 'old' fleet and 'new' fleet have distinct operational practices. The old fleet typically fishes further in the eastern portion of the WCPO to be closer to its central offloading site: Pago Pago, American Samoa. The new fleet, which is based on a transshipment model, fishes throughout the WCPFC area. Across the fleet, the most significant fishing grounds based on 2013-2017 averages are: Kiribati, Tuvalu, Nauru, FSM and Tokelau. Outside of the PNA, the US fleet fished mostly in the Cook Islands and Tokelau. Catch data also reveal the importance of the high seas for the US fleet. Under WCPFC CMM 2018-01, the US fleet has been allocated 1,270 high seas fishing days, the highest allocation under the measure. On average, between 2013-2017, 19% of the fleets' total catch was taken in the high seas.¹⁴⁶ From 2013-2014, the number of fishing days the fleet took in the WCPFC Convention Area increased by 8%, before declining significantly (by 33%) between 2015 and 2017.¹⁴⁷ The fleet's total catch volume has steadily declined alongside vessel numbers (Table 11).

¹⁴³ See Hamilton et. al. 2011

¹⁴⁴ Industry representative, pers. comm., May 2019

¹⁴⁵ SPC 2018

¹⁴⁶ SPC CED, October 2018

¹⁴⁷ SPC CED, October 2018

Table 11 US Purse Seine Fleet – Total Tuna Catch By Area (2013-2017)

Area	2013	2014	2015	2016	2017
FSM	26,861	5,666	14,533	22,706	25,074
Kiribati	72,311	158,552	9,497	23,837	48,049
Marshall Islands	7,444	16,860	12,991	14,434	3,487
Nauru	181,559	26,693	6,803	20,325	10,557
PNG	29,968	1,056	441	13,552	8,214
Solomon Islands	8,938	376	18,382	1,596	8,214
Tuvalu	11,738	22,769	45,200	31,545	8,285
Tokelau	9,794	19,333	39,786	3,939	11,392
Cook Islands	8,364	13,358	9,218	4,629	16,180
US	4,687	6,991	906	3,412	5,043
High Seas	33,988	40,870	77,094	56,512	18,451
Others	211	428	3,313	4,665	1,654
Total	254,348	312,953	238,164	201,152	165,134

Source: SPC CED, October 2018

The 'old' fleet offloads directly to StarKist's processing facility in Pago Pago. Industry representatives note that wait times for offloading in Pago Pago can be a constraint on profitability. Some vessels enter into contracts with StarKist; these contracts provide the opportunity to move to the front of the offloading line with they arrive in port.¹⁴⁸ The vessels in the 'new' fleet tranship their catch to processing plants in Thailand and the rest of Asia and occasionally, Central/Latin America. In 2017, approximately 60% of the fleet's total catch was transhipped. It is estimated that 102,055 mt was transhipped in 165 transhipments in PIC ports.¹⁴⁹

The US fleet regularly reports that the cost of operating under the US flag is relatively higher than under competitor flags. Reportedly, when vessel owners registered under the US flag, they faced higher than anticipated operating costs and needed to adjust to them. These costs include the need to comply with US Coast Guard requirements and to be regularly inspected for safe working conditions and operations. Industry representatives also note the very high costs of vessel insurance, reportedly between USD 300,000 – USD 400,000 per vessel per year or more for protection and indemnity, owing to the requirements of US laws that protect fishermen and offer certain remedies that not required under other flags.¹⁵⁰ While these costs are seen as a financial detriment, the high operating standards of the US fleet might enable the fleet to comply with unfolding requirements to verify social standards and worker conditions on board vessels (see Box 5 - Labour Conditions).

¹⁴⁸ Industry Representative, pers. comm., May 2019

¹⁴⁹ WCPFC 2019g

¹⁵⁰ Industry Representative, pers. comm., May 2019

Box 5 Addressing Labour Conditions in the Purse Seine Sector

Until 2014, labour standards in the global tuna industry were the focus solely of trade unions and the International Labour Organisation and rarely considered by industry and media. However, investigations by news outlets *The Guardian* in 2014 and the *Associated Press* in 2015 (the latter of which won a Pulitzer Prize) helped change that landscape, showing that fish were caught by what they called “slave” or slave-like labour and could be traced to principal market products. Subsequent attention has focussed on developing regulatory frameworks to address this problem. Attention initially focussed on the processing and longline fishing sectors, however, the number of initiatives related to labour conditions on board purse seine vessels are growing.

Several multilateral efforts are advancing, including:

United Nation Work in Fishing Convention (ILO 188): This convention came into force on 16 November 2017 and emphasises labour rights and protection of working conditions, including: occupational safety and health and medical care at sea and assurance of receiving care ashore; sufficient rest for crew health and safety; written work agreements; equivalent social security protection to other workers; and, decent living conditions on board. National legislation remains the key policy tool for developing and enforcing these ILO working standards (Article 6).

WCPFC: In 2018, an FFA member proposal for a resolution on labour standards was adopted by WCPFC15, the first tuna RFMO ever to adopt measures focused on working conditions (Resolution 2018-01). While non-binding, the Resolution sets a platform for minimum standards for crew to ensure fair working conditions on fishing vessels flagged to WCPFC CCMs and operating within the WCPFC Convention Area. It emphasises the role of states in developing national legislation around working conditions and ensuring that such regulations are enforced. Overall, the resolution echoes the priorities laid out in ILO 188.

FFA: In 2019, Pacific Island countries adopted new Minimum Terms and Conditions (MTCs) on labour conditions for crews working on both foreign and domestic-flagged fishing vessels licensed to fish in FFA members’ waters, effective 1 January 2020. These MTCs are legally binding and thus strengthen WCPFC’s non-binding resolution 2018-01. Vessels that fail to meet FFA’s crewing MTCs will not be deemed in ‘good standing’ on the FFA Vessel Register, and as such, cannot be licensed to fish in FFA member waters. The FFA crewing MTC is also underpinned by the ILO Work in Fishing Convention (No 188).

Outside of multilateral and national frameworks, several industry organizations and NGOs have also launched initiatives, including third-party audits of labour conditions. Many of these efforts emerge from or target downstream value chain actors, who in turn, engage with upstream suppliers – such as fishing firms – to trace, verify and/or improve labour conditions throughout the value chain.

Thai Union – the largest tuna processing firms in the world – launched **SeaChange** in 2015, which includes commitments to ‘safe and legal labour’, compliance with labour regulations, and Business Ethics and Labour Code of Conduct.

Princes Tuna Mauritius was the first global supplier of canned tuna to hold the **SA8000** certification for social accountability. While far from comprehensive, the SA8000 does measure labour rights, working conditions and practices including all of the ILO core conventions.

Marine Stewardship Council has brought labour into its certification process. Since 2014, the MSC has held a policy that companies successfully prosecuted for forced labour violations would be

ineligible for MSC certification. More recently, MSC introduced a requirement effective from 28 February 2019, that all fisheries participating in the MSC program must complete a declaration detailing measures they have in place to mitigate the presence of forced or child labour by 31 August 2019. MSC will also be assessing Chain of Custody certificate holders to determine the level of risk of labour violations across the value chain. Depending on the determined level of risk, companies are subject to audits by third party labour audit programmes.

The *Seafood Task Force* is an industry-led initiative borne from the 2014 ‘slavery scandal’. Its members include major US and EU retailers, Thai processors, governments, traders and NGOs whose central focus includes canned tuna. The group aims to address human rights and human trafficking concerns in the fishing industry by focusing on traceability and supply chain oversight. Members have agreed to a code of conduct for business operations that is based on the principles of ILO 188, and the group relies on an External Stakeholder Advisory Group for verification and validation. The Taskforce relies on the MSC and International Seafood Sustainability Foundation’s traceability practices for vessels fishing in the WCPFC and delivering products to Thailand. The Task Force has developed a Code of Conduct and auditable standards for tuna fishing vessels, which are currently being rolled out. Vessel self-assessments will begin in the second half of 2019 and third-party audits in 2020.

To date, many of these emergent efforts are voluntary and/or non-binding, with FFA’s legally binding MTCs an important exception that link labour assurances to fishing access. However, the multiplication of approaches in the selection presented here suggests that labour concerns will continue to gain attention and that fishing firms will be required to engage with them. As with the proliferation of ecolabels, fishing firms are likely to face the challenge of navigating a range of regulations and protocols, particularly at the outset as governments, industry, and markets experiment with how to approach the notoriously difficult challenges of improving and monitoring labour conditions on board vessels as they move through the sea.

Sources: FFA 2019; Havice & Campling 2018; Campling et. al. 2019, March-April; Seafood Task Force 2018,2019

7.3 Major Markets & Supply-Chain Linkages

The US fleet's primary product is canning-grade tuna. The 'old' fleet offloads directly to StarKist in Pago Pago and StarKist processes into canned and pouched product exclusively for the US market. StarKist (Korean parent company, Dongwon Industries) is the leading brand of tuna in the US market, accounting for 42.3% of category dollars and 36.9% of category volume (11,408,438 cases). Being the 'market leader' in the US, the firm sells high volumes of light meat and has capitalized on the higher margin pouch sector in what is otherwise a stubbornly low price point product in the US market.¹⁵¹ Notably, the US fleet is important to production of one specific product segment: it provides fish that meet rules of origin for US Government contracts for canned tuna that goes to, for instance, school lunch programs and military contracts.

Trading company Tri Marine (now owned by Bolton Group) also has former links to American Samoa. Cape Holdings, continue to supply StarKist along with the other individually owned vessels in the fleet. In 2014, Tri Marine also purchased the former Chicken of the Sea processing plant in Pago Pago (renamed Samoa Tuna Processors) with an aim to develop a high quality 'Made in America' tuna line for the US market. However, after a significant investment, the project failed and Tri Marine closed its processing activities and entered into a 10-year lease of its cold storage to StarKist.¹⁵² Samoa Tuna Processors was not purchased by Bolton in the recent acquisition of Tri Marine Group and is privately retained by Renato Curto.

As noted above, the new segment of the fleet has a strategic relationship with Taiwan-based trading company FCF, which coordinates transshipping of its products for processing in plants in Asia and Central/Latin America.

For vessels active in the EPO, there are a range of processing outlets available for their product, a result of a surge of investment in processing capacity in Central and South America in the early 2000s. Some vessels owners also have strategic relationships with processing facilities in the EPO, for instance, Tri Marine owns Seafman in Ecuador.¹⁵³

7.4 Recent Developments & Future Prospects

Drivers for Change

The future of the US Treaty is one of the major potential drivers for change with the fleet. A central issue will be if, as the US fleet and State Department and Pacific Island Parties negotiate the vessel day price for the final two years of the current Treaty, all determine that the Treaty still serves mutual purposes. The landscape may have begun to change more dramatically in the wake of the news that SPTC is selling more than half of its fleet.

For the US Government, the Treaty has long served a central foreign policy role for US relations in the region. However, in the Treaty, the US Government faces the difficult task of navigating at times conflicting interests of the US fleet, management practices at the WCPFC and the broader Treaty goal of developing and maintaining shared geopolitical relations with Pacific Island countries. Meanwhile, as the terms of the Treaty have changed, vessel owners are finding themselves facing the same price

¹⁵¹ Melbourne 2018

¹⁵² Havice, McCoy & Campling 2016, September-October; Campling, Havice & McCoy, 2018, May-June

¹⁵³ Hamilton et al. 2011

increases as other fleets, the economic constraints of the US flag (high operating costs relative to others), but without the benefit of eased transactions costs that the pre-VDS Treaty offered. As a result, the US fleet has had to cope with increased access costs and take on new management tasks, including negotiating bilateral deals that were unnecessary under the historic Treaty terms.

For Pacific Island countries, the revenue from the Treaty is far less important than it once was. This is particularly the case for the PNA countries who have successfully increased access fees in bilateral agreements, and as a result, are less interested in subsidizing the non-PNA group with the US Treaty. All PIPs however, recognize and are attentive to the historic relationship and to that fact that the US fleet has high operating and reporting standards.

At the time of writing, the future of the Treaty was uncertain, and this uncertainty was intensified by news once again of a decline in fleet size. It is clear that the revisions in the most current Treaty – increased flexibility, a more market-informed approach to buying days – temporarily stabilized the relationship that was very near to collapse. The future will become evident as negotiations on the price of vessel days for the final two Treaty years commence and as discussions of the difficult work of negotiating the future of the Treaty as a whole unfold. Several options are possible: the end of the Treaty, continuation in its current form, or further modifications to the structure that combines some form of Treaty with a wider range of possible access options.

Regulatory Issues

The US fleet is also actively following and concerned with several regulatory issues. A first issue that the fleet identifies is exemptions to the PNA three-month FAD closure outlined in the PNA 3IA. The US fleet reports being supportive of FAD bans for conservation improvements, but has expressed concern about the uneven playing field and economic disadvantage for the US fleet that the broad exemptions can engender.¹⁵⁴ The US fleet is aware of the delicate nature of navigating its request for an even playing field with WCPFC Article 30 provisions on the *Recognition of the special requirements of developing States*, but has noted, with concern, the recent growth in the size of the PIC-flagged fleet. In recent years, up to 49 vessels were exempted from CMM 2018-01 management measures (i.e. 3-month FAD closure, high seas effort limits, capacity limits), though it is notable that while exempted, flag/coastal states might not have taken up the opportunity. For instance, interviews suggested that Taiwan would not allow their beneficially-owned PIC-flagged vessels to utilize the exemption.¹⁵⁵

A second issue for the US fleet is the management of high sea fishing days through WCPFC CMM 2018-01, an important consideration for the fleet as it has faced increasing prices for in-zone fishing and shifted some effort to the high seas. WCPFC conservation measures limit fishing effort by purse seine vessel in certain parts of the Convention Area and have provisions for the US effort in both US EEZs and on the high seas. Since going into effect, the US high seas effort allocation has been reduced from over 2,000 fishing days (originally set at 2004 effort levels, see CMM 2008-01) to 1,270 high seas fishing days (CMM 2018-01). In recent years, the US has combined its in-zone US EEZ effort allocation of 558 days and 1,270 high seas days, implementing its total limit in a manner that they apply to a single area, without regard to the boundary between the US EEZ and the high seas (termed the 'Effort Limit Area for Purse Seine' (ELAPS)).¹⁵⁶ The intent of this move is to secure supply for the economically important processing activities in American Samoa, which as a small island developing territory, can argue for special provisions at the WCPFC under Article 30, although this consideration for American

¹⁵⁴ Government representative, pers. comm., May 2019

¹⁵⁵ Industry representatives, April 2019

¹⁵⁶ CMM 2018-01. See also, Havice, McCoy & Campling 2016, May-June.

Samoa is mediated by its political relationship with the United States. Access to high seas fishing days remains a high priority for the US fleet.

In 2014, the US fleet was concerned about the US Government's proposed expansion of the Remote Pacific Islands National Marine Monument that would close seven US Pacific Island territories and atolls to commercial tuna fishing. In the end, the Monument expansion and fishing closures applied to three areas – Jarvis Island, Wake Island and Johnson Atoll – instead of the seven territories and atolls originally proposed. Palmyra Atoll, Kingman Reef and Howland and Baker Islands remain open to commercial fishing.¹⁵⁷

Several non-state regulatory issues – including eco-labels, FAD management (e.g. shifts to non-entangling and biodegradable FADs) are now firmly on the radar. Tri Marine's Cape Holdings fleet holds an MSC certification for free-school fishing for its American Samoa based purse seiners targeting skipjack and yellowfin tuna. The SPTC vessels also hold a free-school MSC certification. An industry representative suggested that the market for shelf-stable tuna does not seem to have accepted a generalized premium for MSC certified product, but that certifications are becoming more of a norm in the sector and that demand for certification or assurances that raw material is MSC certified, in a Fisheries Improvement Program (FIP) and/or FAD-free is common. Demand is being driven by processors and brands, including public commitments by downstream actors such as Bolton Foods and Thai Union.¹⁵⁸

Members of the US fleet are taking note that social responsibility, particularly concerns over labour standards are gaining attention, though formal regulation is still in its infancy. Major retailer Costco has developed a labour conditions taskforce that the fleet has noted and the WCPFC and FFA member countries are addressing labour issues for the first time (see Box 5- Labour Conditions). This represents an important shift from the past when regional organizations suggested that labour concerns were the purview of the International Labour Organisation (ILO) rather than fisheries management bodies. As noted above, the high operating standards required in the US fleet could present a competitive advantage for the fleet if labour regulations develop more fully. They will perhaps be in a stronger position to comply more quickly than competitors and others will have to increase production costs to come in line, in effect creating a more level playing field for the high cost US vessels, if such conditions eventuate. In general, the US fleet notes the bureaucratic challenges of complying with an ever-growing array of regulatory frameworks from state, interstate, and non-state bodies.

¹⁵⁷ NOAA Fisheries 2015; Campling & Havice 2014, September-October

¹⁵⁸ Industry representative, pers. comm., May 2019

8. PHILIPPINES

8.1 Current Fleet Status

Brief History

Philippine tuna fisheries were amongst the first to develop on a large scale in the WCPO, starting in the 1970s with development of purse seine and ring net¹⁵⁹ fishing around anchored FADs (payaos). The fishery grew rapidly, initially within Philippines waters, then steadily expanded during the 1980s to Indonesia, PNG and other adjacent WCPO waters.¹⁶⁰

The beneficially-owned Philippines purse seine fleet now has three components, with 91 vessels in total registered in the WCPFC Convention Area:¹⁶¹

- a) Domestic PS vessels, mostly less than 500 GT in size, which fish mostly within the Philippines but are also permitted to fish in the high seas pocket north of Indonesia and PNG (HSP1).¹⁶² Approximately 55 domestic PS vessels caught 67,908 mt of the three main oceanic tuna species in 2017, with another 38,049 mt taken by ring nets. Of the PS catch, 20,554 mt (30%) was taken in HSP1, with another 4,960 mt by ring net in HSP1 (25,514 mt total caught in HSP1).
- b) Philippines flag PS vessels which fish in PNG waters under distant water access agreements (DW) or as locally- based foreign (LBF) vessels under charter arrangements with mostly Philippines-owned PNG companies. There were 37 vessels on the WCPFC RFV in April 2019, but some of these do not fish in PNG waters, so the actual number as per other registers (PNA VDS, FFA RVR) varies between 30-32. There is some inconsistency in these numbers which can also change from year to year. The provisional total catch in 2017 of these Philippines-flag vessels (PNG LBF¹⁶³ and Philippines-flag DW¹⁶⁴) in 2017 was 141,126 mt.¹⁶⁵
- c) PNG flag vessels beneficially-owned by Philippine companies but operating under charter to PNG companies – these seem to comprise 25 of the 30 current PNG flag vessels, with five owned by predominantly Taiwanese interests. The catch by PNG flag vessels was provisionally estimated at 131,467 mt in 2017; estimated catch by the 25 Philippines beneficially-owned PNG flag vessels could be in the order of 110,000 mt.

The total PS catch by all beneficially-owned Philippine PS vessels, including domestic, DW, LBF and PNG flag, may well be ~310,000 mt. The SPC Fisheries Yearbook gives congruent 2017 estimates, with a catch of 302,599 mt by the PNG fleet of 67 vessels, including LBF and PNG flag (including five Taiwan vessels), and 30,261 mt by twelve Philippines DW purse seiners, or ~310,000 mt of 'Philippine' vessels, excluding the catch of the five Taiwanese vessels. This makes the catch by the combined Philippines beneficially-owned PS fleet possibly the highest of all the WCPO commercial fleets.

¹⁵⁹ Ring nets are usually by operated by smaller vessels and are hauled at the vessel's stern using net wings, whereas purse seine nets are longer and deeper and are retrieved alongside the vessel.

¹⁶⁰ Lewis 2005; Thomas 1999

¹⁶¹ WCPFC RFV, April 2019

¹⁶² WCPFC CMM 2017-01. Paras 26 to 28 re: high seas purse seine effort control and Attachment 2 - Philippines measure; 36 fishing (catcher) vessels and 4,659 fishing days allowed.

¹⁶³ The catch by Philippines flag vessels fishing in PIC waters (34) was estimated at 66,694 mt, suggesting that the catch by PNG LBF vessels was provisionally 74,372 mt less catch taken by the DW vessels in the waters of other PICs. Catch outside PNG waters was estimated at around 800 mt in 2017 but was much higher in 2016 and 2018 at around 11,000 mt. P. Williams, SPC, pers. comm., June 2019.

¹⁶⁴ SPC CED gives an estimate of the Philippines flag PS fleet catch in 2017 of 99,693 mt. This includes the domestic and HSP1 catch, as well as the DW catch in mostly PNG (29,204 mt). The DW catch is declining as more vessels switch to LBF status.

¹⁶⁵ WCPFC 2019h

There will be no further consideration of the domestic purse seine and ring net fleets in this review, with a focus on Philippines flag vessels, DW and LBF, and the Philippines beneficially-owned PNG flag vessels.

Ownership and Management Structure

The 25 PNG flag Philippines vessels are understood to be owned by four Philippines companies - Frabelle (17), RD Fishing (2), Trans-Pacific Journey (TPJ) (3), and TSP Marine Industries (3).¹⁶⁶

The 32 Philippines flag vessels,¹⁶⁷ including LBF and DW (with 5 domestic vessels excluded), have a similar ownership pattern, with RD Group owning 12 of these vessels, TPJ 10, Frabelle 7 and TSP 3. Of these 32 Philippines flag vessels¹⁶⁸ on WCPFC's RFV, 60% are more than 30 years old and only 25% less than 10 years old. Half were constructed in Taiwan, a quarter in Japan, and the rest in USA and other countries. The average gross tonnage (GT) of the fleet is just over 1,000. The majority of vessels have had different flags and names in their history, many with second or third owners. On the other hand, the RD Group has built eight new vessels since 2010, all in Taiwan shipyards and all 1,100 GT class; some with dry locker capability, but not ULT/PS special.

Some companies have opted to retain Philippines flag and operate under charter arrangements, which means the tuna catch from these vessels qualifies as 'wholly obtained' under the EU-GSP+ scheme's Rules of Origin, enabling frozen cooked loins/canned tuna processed in Philippines from this catch to enter the EU market duty free (i.e. RD, TPJ). Others have re-flagged to PNG, at the encouragement of the PNG Government with favourable access conditions (i.e. Frabelle), or have vessels in their fleet operating under a combination of both approaches. The Frabelle fleet, currently at around 24 vessels, could possibly be one of the world's largest tuna purse seine fleets owned by a single company, at least in terms of vessel numbers.

With the expectation by the PNG Government from 2004 onwards that much of the catch from PNG waters would be processed locally onshore, processing plants were established under State Agreements which allocated a nominal number of vessel licences, conferring the conditional right to fish in PNG waters and supply onshore processors. Charter arrangements were then put in place to provide supply to the plants, with companies allowed up to 12 vessels under the State Agreements. In most cases, the actual processing production capacity was much less than the potential supply, with large volumes of catch still exported to the Philippines.

Onshore Investment

About half of the Philippine companies are based in General Santos (GenSan), hailed as the 'tuna capital' of the Philippines, with others in Navotas, Manila. Most have onshore facilities such as docks, slipways, vessel maintenance facilities and cold storage. RD also owns a large cannery in General Santos and a shareholding in another. All the fishing companies are key suppliers to six canneries in General Santos and two in Zamboanga which process some tuna, as well as small pelagics, notably sardines. The largest of these GenSan canneries is undergoing expansion to add 100 mt/day canning capacity and enhance efficiency,¹⁶⁹ fuelled largely by increased exports to the EU since the acquisition of GSP+ concessions (see below).

¹⁶⁶ Early 2019 estimates indicate some slight changes in chartering arrangements – total 26 vessels under charter - Frabelle (15), Majestic (3), RD (2), SSTC (6 - TSP (3) and TPJ (3)) – total 26; PNG Fishing Industry Association (FIA), pers. comm., February 2019.

¹⁶⁷ Early 2019 estimates are similar (34 total), with some shift between the distant water and locally-based foreign categories.

¹⁶⁸ Five of the original 37 seem to be Philippines domestic vessels, which brings the number (32) comparable to those on the PNA VDS (30) and the FFA RVR (32); PNG FIA lists 34 Philippines LBF vessels for 2019.

¹⁶⁹ Atuna, 3 July 2019

In addition to investment in the Philippines, all of the companies operating LBF, DW and PNG flag vessels in PNG have interests in processing plants in PNG – RD in RD Tuna Canning, Madang; Frabelle in Frabelle PNG (Lae) and equity in Majestic Canning (with Thai Union and Century Canning (Philippines)) in Malahang, Lae; and TPJ and TSP in the Namabawan cannery (Malahang, Lae). The PNG canneries have enjoyed a ‘global sourcing’ derogation from the standard EU rules of origin for processed fish since 2008, whereby fish processed in PNG from any flagged vessel qualifies for duty-free status. However, they have not made extensive use of the concession until recently (see Section 8.3), with most continuing to operate well below full capacity.

8.2 WCPO Fishing Operations

Catch

Philippine vessels have historically fished primarily on anchored FADs (payaos), with extensive arrays deployed throughout Philippines and later, PNG waters. This pattern of fishing has shifted over the past fifteen years to progressively fish more on unassociated schools, accompanied by technology upgrades and greater reliance, at least initially, on foreign fishing masters with extensive free-school fish experience. With the addition of new larger vessels to the fleet with greater range, mobility and storage capacity, the operational area of the Philippines fleet has also expanded. During the 2013-2017 period, the Philippines flag PS catch¹⁷⁰ (annual average catch 135,000 mt, but steadily declining in recent years) was taken mostly in PNG (48%), Philippines waters (31%) and high seas (9%) with other areas, including Kiribati and Nauru, accounting for the remainder.¹⁷¹

Similarly, PNG NFA data for 2017¹⁷² shows that of the provisional LBF PS catch of 142,126 mt, nearly 40% was taken outside PNG waters, whereas for the PNG flag PS vessels’ catch of 131,487 mt, the proportion taken outside PNG waters was even higher (63%). Overall, 50% of the PNG catch was taken outside the PNG EEZ, by vessels benefitting from FSMA access or fishing under bilateral access arrangements.

Access to PNG archipelagic waters is restricted to the PNG fleet (LBF and PNG flag) and is capped at 5,500 days under the National Tuna Management Plan. PNG’s VDS PAE is set at 12,678 days for 2019 and has been declining in recent years, as fishing effort in PNA waters has shifted eastwards under El Niño conditions.¹⁷³

The catch landed by the Philippines flag fleet typically has a higher proportion of yellowfin than in other fleets, averaging 31% over the period 2013-2017, with 66% skipjack and 3% bigeye.¹⁷⁴ This is attributed to the high proportion of the catch taken in archipelagic waters of both PNG and the Philippines (57% in 2017) and much of the catch taken on anchored FADs, especially in Philippine waters.

Although an increasing portion of the catch taken by LBF (and PNG flag) vessels is landed and processed in PNG plants, the PNG Government introduced a rebate scheme in 2018 with a payment of USD 400/mt to processors for fish demonstrably landed and processed in PNG plants. The volume still

¹⁷⁰ Including domestic, HSP and PIC catches

¹⁷¹ SPC CED, October 2018.

¹⁷² WCPFC 2019h

¹⁷³ PNA 2019c

¹⁷⁴ SPC CED, October 2018



One of the new generation Philippines locally-based foreign purse seine vessels - Dolores 872.

Source: WCPFC RFV, April 2019

remains less than 50% of the catch, with most plants operating below full capacity. In any case, rebate payments have ceased since late 2018, because of PNG Government financial problems and changes to the financial autonomy of PNG's National Fisheries Authority (NFA). The future of the rebate remains uncertain, with the new Government making a commitment to turn the situation around.¹⁷⁵

Unloading occurs in the three major processing locations in PNG (Lae, Madang and Wewak), whereas most transshipment, both for export and for transferral by domestic carriers to the three PNG unloading ports, occurs in Rabaul (104,000 mt in 2017), with lesser amounts in Madang, Wewak and Lae (78,000 mt total).¹⁷⁶

A mandatory requirement for placement of 10% PNG nationals as crew remains in place, with an average of 2-3 PNG crew per Philippines LBF/DW and PNG flag vessels.¹⁷⁷

Regulatory Environment

Philippines is a signatory to FAO's Port State Measures Agreement. A range of flag state measures are in place and apply to vessels fishing within and outside Philippines waters. These measures were strengthened in an effort to close out a 'yellow card' warning issued to the Philippines in 2014 under the EU-IUU Fishing Regulation. The Philippines were successful in having the yellow card lifted in 2015.

A National Tuna Council has been established which meets regularly to consider national policy issues in the tuna fishery. The Philippines Government, through the Bureau of Fisheries and Aquatic Resources (BFAR) has played an active role in national tuna resource management and securing the interests of Philippines overseas operations, as well as access arrangements for HSP1. A Tuna Fishery Management Plan has been in place since the mid-2000s and was recently revised and updated. Philippines has been a cooperating member of WCPFC since the Commission was first established.

¹⁷⁵ PNG FIA, pers. comm., February 2019

¹⁷⁶ SPC transshipment database, April 2019

¹⁷⁷ PNG FIA, pers. comm., February 2019

Access Arrangements

Philippines fisheries access centres largely on PNG waters. However, in recent years, access arrangements have been negotiated to provide Philippines vessels with the option to fish further afield – some vessels have FSMA licences enabling them to fish in all eight PNA EEZs; others have bilateral access under PNA's VDS scheme to fish in neighbouring EEZs including FSM and Nauru. One company also has shareholdings in several Korean joint venture vessels in Kiribati, and previously had a joint venture with a Japanese company for a single vessel which was eventually sold to the Philippines/PNG company and continues to fish in PNG.

Two Philippines-owned vessels which operated in Solomon Islands in the past have recently changed ownership and are flagged to Solomon Islands; they are scheduled to re-commence operations in Solomon Islands waters in the near future.¹⁷⁸

The primary tuna industry association for Philippine flag vessels is the Soksargen¹⁷⁹ Association of Fishing and Allied Industries Inc. (SAFAII), based in General Santos.

In PNG, the Fishing Industry Association (PNG FIA) works on behalf of both processors and fishing companies, including beneficially-owned Philippines entities which occupy a central role in the sector, and are vertically integrated in many cases.

8.3 Major Markets & Supply-Chain Linkages

Philippines processing plants have benefited from EU-GSP+ status since 2016, which provides duty free access to EU markets for frozen cooked loins and canned tuna produced from 'wholly originating' fish, whereas a 20.5% duty would otherwise apply. EU-GSP+ requires ratification of 27 international conventions relating to human rights, labour standards, good governance and the environment. Philippines compliance with human rights conventions has been called into question, including treatment of workers in the tuna industry¹⁸⁰ and President Duterte's hard line stance on drug traffickers which has resulted in extra-judicial killings and a proposal to reintroduce the death penalty. These actions could potentially compromise Philippines' EU-GSP+ status.

Exports of canned tuna products, mostly to EU countries, have more than doubled from 60,800 mt to almost 135,000 mt in 2018, with Germany and the UK the main EU markets. This production cannot be entirely supported by landings from Philippines domestic, DW or LBF vessels. It is supplemented with significant imports of frozen whole round tuna – nearly 140,000 mt in total in 2018 – from a range of countries, including PNG (nearly 60,000 mt, including 40,000 mt of yellowfin), China, Taiwan, Japan, Korea and various PICs. The amount of whole round fish (mostly purse seine-caught tuna) processed in Philippines is estimated to be approaching 300,000 mt. In addition to the EU, the USA, Japan and Canada are also notable export markets for canned tuna/cooked loins processed in the Philippines.¹⁸¹

In the past, Philippine companies have also maintained canneries in Bitung, Indonesia, supplied initially with fish from PNG or Philippine vessels fishing under access agreements. Production of these canneries has contracted in recent years, as a result of restrictive Indonesian Government policies on foreign-built

¹⁷⁸ Industry representative, pers. comm., May 2019

¹⁷⁹ Acronym for the provinces of South Cotabato, Sultan Kudarat and Sarangani in southern Mindanao, plus the General Santos municipality.

¹⁸⁰ Richardson et. al. 2017

¹⁸¹ ITC Trade Map 2019

vessels fishing in Indonesian waters, which has affected supply, and most are now in decline or have ceased operations entirely.

As mentioned, PNG processing plants benefit from a 'global sourcing' rules of origin derogation, enabling fish caught by any vessel regardless of flag/ownership to qualify for EU-duty access, provided it is processed in PNG. These plants are largely supplied by beneficially-owned Philippines vessels (DW, LBF and PNG flag). Only poor-quality data is available on PNG exports since 2014, however it is understood that exports of frozen cooked loins and canned tuna are increasing, primarily to Europe. The total value of canned products and cooked loins exported from PNG plants to the EU was USD 473 million in 2018,¹⁸² compared to USD 112 million in 2012.¹⁸³ Most of the loin exports originate from the Taiwan-owned SSTC plant which is now 100% cooked loin production.

There are complex linkages between fishing companies and processors, serving interests in PNG, Philippines and export markets which may not always be complementary. It is beyond the scope of this review to dissect these arrangements in detail.

8.4 Recent Developments & Future Prospects

Changes in operational aspects of the complex Philippines beneficially-owned fleet in the last decade have been marked – transitioning from fishing on AFADs to free-schools and drifting FADs, expanding the area of fishing beyond PNG's EEZ, re-flagging to PNG flag, investment in vessel JVs with non-PNG/Philippine flag – and show no sign of diminishing. It is not clear if there are plans to construct any new vessels after the recent surge or to continue to acquire older second-hand vessels.

The number of charter vessels associated with PNG canneries has declined and this seems unlikely to reverse, with production from the newer canneries essentially stagnant. Fleet management structures and vessel deployment systems, combined with changing government regulations, means that the operational scenario remains dynamic and uncertain. The future of PNG's rebate system, currently benefiting processors, but once mooted to be extended to vessel operators, remains uncertain, but may become clearer following the change of government in mid-2019.

Whilst GenSan cannery production appears to be booming, driven largely by EU-GSP+, the increased supply required seems to be coming from not only from PNG, but increasingly from a number of DWFNs and PIC fleets.¹⁸⁴ Given non-Philippines (or EU) flag vessels are not eligible for duty free status under GSP+, this indicates growth in other non-EU markets for Philippines canned tuna exports (e.g. Middle East, domestic consumption). On the other hand, recently constructed canneries in Lae (PNG), which are largely Philippine-owned, are struggling to attain full production capacity – high operational costs (utilities, freight) and labour issues remain serious constraints. The established canneries, notably SSTC and RD, are however, significantly increasing production for loins, and cans/loins, respectively. Whilst the Philippines DW fleet has not made a concerted as yet to move towards MSC certification, Philippines PNG vessel owners as a group are moving towards certification, independent of the existing PNA/Pacific MSC certification. The 'Western Pacific Sustainable Tuna Alliance' fleet supplying SSTC (Taiwanese/FCF) achieved MSC certification for free-school skipjack and yellowfin in 2018.

¹⁸² Atuna, 27 June 2019

¹⁸³ Atuna, 25 June 2019

¹⁸⁴ WCPFC WPEA - Philippines Annual Catch Estimates Workshop, May 2019

9. IMPLICATIONS FOR PACIFIC ISLAND COUNTRIES

This section offers two forms of analysis with the intention of drawing out implications for Pacific Island countries in their broad pursuits to increase socio-economic benefits from tuna fisheries, drive new investments in the regions and improve management of the fishery and consolidate control by coastal states. The first is a summary and analysis of the key trends and dynamics observed for each of the six fleets reviewed in the report (for an overview, see Table 12). The aim is to demonstrate the distinct and varied operating strategies and strengths and weakness of each fleet (and the variability within some of them) and to examine how these features relate to conditions in the WCPO. The second is an analysis of general findings and key dynamics and drivers in the purse seine sector as they relate to existing and potential opportunities for Pacific Island countries.

9.1 Fleet-Specific

Taiwan

The Taiwanese fleet and Taiwanese capital are major players in the WCPO. Since the Taiwan Government introduced a total vessel limit, Taiwan interests in the fishery have continued to expand the fleet size by seeking 'islandization' partnerships in PICs. They are likely to continue to do so and recent events reveal that companies are becoming more discriminating and searching for locations that maximize profitability, not least as VDS prices have increased. For example, in the last couple of years, a few Taiwanese companies searching for greater stability and better VDS prices have abandoned Papua New Guinea as a place to register vessels and opted for registration in FSM and Vanuatu, the latter of which is notably not a PNA country.

Some in the Taiwanese industry believe this flight from PNG registration will continue in the face of rising operational costs, as PNG requires that boats operating under PNG flag without a local partner must purchase bilateral days under the VDS. This observation suggests potential competition among PICs for firms that will undertake domestic registration. The terms of this registration will depend on a range of domestic features including investment climate and fishing conditions.

The Taiwanese fleet's reliance on transshipment provides some opportunities for expanded economic benefits in PICs. The recent approval of Tarawa as a transshipping port for Taiwan-flag seiners could see some transshipping business shift from Majuro in the future. Kiribati has plans to improve purse seine services with such attractants as a net repair yard, however the basic limitations of the port itself, as well as limited air and sea transport services, may continue to be a hindrance to any large-scale development.

The current political competition between Taiwan and China generally should not necessarily be seen to apply in any great measure to the tuna industry. Financial cooperation and cross-investment between Taiwan and China with its growing tuna fishery sector has occurred for some time and will continue. The early years of the Chinese tuna industry saw Taiwanese capital invested on the mainland; however, flows seem to be more two-way than in the past, owing to factors such as the vessel limits imposed on China's fleet and its desire to secure raw material for processing. One notable exception is that the Chinese Government has been seeking to encourage PICs to break diplomatic ties with Taiwan in favour of stronger economic relationships with China.

Some segments of the Taiwan fleet have sought commercial advantage by obtaining MSC certification.

Korea

The Korean distant water purse seine fleet has the highest catch rates of any distant water fleet. The modern, efficient and largely profitable fleet is dependent on the WCPO. It has advanced electronic reporting systems in place and an excellent record of sanitary and phytosanitary compliance.

The Korean industry remains focused on maintaining good working relationships and cooperation with PICs and has developed an access and investment strategy that involves joint ventures. Korean companies now have joint ventures in four Pacific Island countries and it is likely that companies will continue to use and expand the fleet with this option, on the condition that the strategy provides economically viable outcomes. The fleet tranships nearly all of its purse seine catch in PIC ports, which brings some economic benefits to PICs, as well as possibilities for developing future services.

While the fleet has engaged in joint venture operations, other onshore investment opportunities have been limited. The Korean fleet has explored processing investments in the Solomon Islands and in Papua New Guinea, however, such plans have not come to fruition. Potential investors, as well as Pacific Island countries, remain wary about the viability and potential outcomes of such proposed investments.

The Korean fleet expressed concern about further increases in VDS fishing day prices and that a potential multi-year VDS TAE could further increase prices. Industry participants also pointed to concern over what they described as a tension between scientific management of tuna species and the economic interests of PICs, emphasizing interest in seeing management governed by the former over the latter.

Japan

The Japanese fleet, early pioneers of industrial purse seine fishing in the WCPO, is no longer a dominant fleet, but has remained a stable presence. The fleet is comprised of 28 Japanese flagged vessels and five vessels operating in joint venture under the FSM flag; the majority of the vessels are older and smaller than competing fleets from China, Taiwan and Korea. The Japanese Government has strictly regulated the size of the vessels. However, this policy has been relaxed in recent years, allowing for larger vessels. New vessels will replace older vessels in keeping with the Japanese Government capacity management scheme.

The Japanese fleet historically was involved in onshore investments in processing, founding two important processing plants that are still operational today (though no longer with Japanese involvement): Soltuna in the Solomon Islands and PAFCO in Fiji. However, in the present, those in the Japanese fleet have expressed little interest in either onshore investments or in further joint-venture operations, despite the relative success of the existing FSM joint venture. The Japanese Government, however, remains an important geopolitical participant in the region and development assistance and political relations are expected to continue in the future through the PALM process, supporting OFCF activities, and ODA. Recently, the Japanese Government has offered new forms of support for observer training, maritime boundaries and training initiatives. These forms of support dovetail with PIC interests in supporting domestic economic gains from the tuna industry.

The Japanese fleet primarily returns to Japanese ports to offload, and as such, does not rely on PIC transshipment ports. Though the Japanese Government has relaxed requirements to offload in Japan, the fleet largely retains the practice. The exception is the vessels operating from Pohnpei, which have the advantage of being able to acquire vessel fishing days at a discount, but report the disadvantage of more difficult maintenance and repairs.



The Japanese fleet continues to supply the Japanese market, which includes a broader range of product types in comparison with other fleets. These include: *katsuobushi*, *sashimi* and canned tuna. All Japanese vessels now have varying levels of purse seine special capacity for storing a portion of catch for sale to higher value markets. The fleet is also relatively well insulated from the Bangkok price fluctuations in canning grade skipjack and yellowfin because of higher prices in Yaizu and considerably higher prices for the purse seine special portion of the catch. To date, the fleet has not engaged in MSC certification, but some tuna operations have engaged with Japan MEL, a nationally oriented eco-label.

China

Since the early 2000s, the Chinese fleet has grown considerably through a combination of new building and acquisition of used vessels. In recent years, the fleet has contracted slightly in anticipation of replacement vessels and the closure of one company's purse seine operations. Vessels are owned either wholly or substantially by large state-owned enterprises or by private sector companies. Vessels owned by Chinese SOEs and capital primarily fly the Chinese flag, but also have been flagged in PICs.

In recent years, China has been making a concerted effort to be seen as a law-abiding participant in the WCPO purse seine fishery. Harsh penalties have been instituted for infractions of China's domestic laws, WCPFC management measures and other requirements. This includes limits on total number of vessels and on high seas fishing days. Vessel limits have led one Chinese fishing firm to re-flag vessels to the Marshall Islands and to link that investment with a loining plant. This investment offers the vessels the benefits of expanded high seas fishing, FAD closure exemptions and eligibility for FSMA licenses. However, the loining plant operates far below capacity, a common problem across the region when onshore investments are linked to access conditions. Similarly, between 14-16 vessels have been chartered under the WCPFC Charter Scheme to fish in Kiribati waters, which enables those vessels to avoid the FAD closures in the Kiribati EEZ.

Subsidies have been important in the government's efforts to support the Chinese fleet, and recently, the Chinese Government has used the withdrawal of subsidies to crackdown on IUU fishing by its fleet. It is likely that subsidies will remain an important part of the fleet's operating equation, but data are not available. As long as China requires a certain percentage of catch returned to China for processing by vessels or companies receiving subsidies and fishery access in PICs is available to Chinese purse seiners through joint ventures, pseudo-joint ventures, chartering, and other mechanisms, it is unlikely that Chinese firms engaged in the WCPO purse seine fishery will make any further large investments in processing in Pacific Island countries. China appears able to liberally interpret or even ignore its domestic regulations on such matters as foreign flagging or crewing if those regulations are perceived as hindering the potential for fishery access in PICs.

The fleet generally tranships product using PIC ports and product is closely linked to China's tuna processing industry. The processing industry targets the (small) domestic and export markets and there is no report of purse seine special product from the fleet. The recent US-China trade war has had some ripple effects with the potential that China has diverted semi-processed product from the US to Thailand, contributing to the recent oversupply situation in Thailand.

The main VDS concerns of China's purse seine companies are assured access to days and an ability to plan ahead for their purchase. Although important, VDS price appears to be less of a concern than the other two.



USA

The US fleet has a long history in the WCPO, though the last decade has seen a far less stable fleet in terms of numbers and future in the region. Instability has revolved around the US Treaty, which initially provided a haven from increased costs associated with the introduction of the VDS, but as it has come into compliance with the VDS, has offered fewer advantages for those flying the US flag than in the past. Likewise, while the US Treaty historically provided PICs with economic benefits above those of other access arrangements due to the combination of licensing fees and the US State Department economic development package, this difference has eroded as vessel licence prices have increased across all fleets.

In the context of these changes, the US fleet has faced a significant decline in total vessel numbers, with vessel owners citing the high costs of doing business under the US flag, as well the increased costs of fishing days. As a result of increased costs under the Treaty, the fleet has not recently purchased all available Treaty days in favour of experimenting with bilateral access. This decision has emerged as the Treaty has transitioned from granting access to all FFA country waters to one that allocates fishing days with more geographic specificity. As the US and Pacific Island Parties to the Treaty enter negotiations on fishing day prices for the final two years of the agreement, the future of the Treaty is uncertain.

The US fleet is split into two distinct operating models, with one segment of the fleet serving StarKist's American Samoa processing plant (and for some, also EPO processors), and the other segment operating under a transshipment model. The decline in total vessel numbers has been evident in both fleet segments.

Broadly, the US fleet faces concerns over its economic competitiveness relative to other fleets. The fleet has been attentive to issues at the WCPFC, including securing its access to high seas fishing days (for which it has the highest number of all fleets) and ensuring supply for the processing plant in American Samoa. The fleet has expressed concern about the growing costs of access and the new logistical and transaction costs it faces in negotiating bilateral access. It has also expressed concern about an uneven playing field relative to vessels that have gained exemptions to the FAD bans by flagging or registering in PICs. Outside of state-based regulations, several vessels in the US fleet have secured MSC certifications and increasingly see these certifications as a regular component of the market.

Philippines

The Philippine tuna industry was among the first to develop on a large scale in the WCPO. Today, the beneficially-owned Philippines purse seine fleet of 91 vessels is collectively the largest in the WCPO in terms of vessel numbers, with a total annual catch of over 300,000 mt. The Philippines national tuna sector, notably the processing sector, seems to be thriving in the wake of EU-GSP+ acquisition – this appears likely to continue, albeit with finite market limits on further growth. The PNG-based capture sector – which contributes to fuelling the processing sector in the Philippines – continues to grow, mainly due to expansion of fishing operations to areas beyond PNG but is likely to begin to plateau.

Diverse Philippines tuna industry presence remains at the heart of the large PNG tuna sector, with around 60 locally-based foreign and PNG flag vessels, distant water purse seine vessels and ownership of four of the six operational canneries in the country. In general, the Philippines flagged fleet is comprised of older vessels which are relatively small in size in comparison with other fleets, making it a relatively less efficient fleet. All of the fishing companies are key suppliers to canneries in the Philippines. All of the companies operating locally based foreign, distant water and PNG-flagged vessels in PNG have interests in PNG processing plants. In exchange, many have access to FSMA fishing licenses. Most of the plants in the PNG processing sector continue to operate well below capacity, despite the global sourcing component of the EU Rules of Origin and given that affiliated vessels export high volumes of catch to

the Philippines. However, there is some indication that exports from PNG to the EU have grown in recent years. PNG faces the ongoing challenge of making the economic environment more enabling, including by taking better advantage of the EU global sourcing.

After several false starts and a crowded investment space, there seem little appetite to expand the Philippines involvement to other PICs, other than bilateral or multilateral fishing access. As an exception, one company still harbours plans to expand processing to FSM and Kiribati and renew plans to operate in Solomon Islands.

9.2 General

In addition to these fleet specific dynamics, when viewed together, they reveal several broader dynamics that are impactful industry-wide and have specific implications for Pacific Island countries. This report comes at a time in which fleet dynamics have largely settled out following the significant increase in access prices associated with the PNA Vessel Day Scheme, presenting an important opportunity to take stock of current trends. Several key points emerge in relation to PIC tuna-based economic development aspirations.

Issues surrounding **vessel day price and conditions** varied fleet by fleet. High cost operators expressed concern about the increasing price of fishing days. Some lower cost operators noted that fishing day prices have affected their bottom lines, but expressed more concern over consistent availability than price per se. There was also concern about continued inconsistency on the definition of a fishing versus a non-fishing day.

Increasing cooperation among PICs and the PNA, in particular, has generated impacts beyond the increases in access fees. First, it is evident that VDS is driving a continued need for improved **efficiency in vessel design and fishing**. This kind of capacity and effort creep is an expected outcome that PICs will continue to encounter as they work to collectively increase control of the fishery.

A second major dynamic is that recent years have also seen **modifications in fishing access relationships and dynamics**. The VDS and the FSMA are important examples of these, but additional innovations have emerged in turn. For instance, the US Treaty has created a wider range of geographically specific fishing day options and some vessels have begun to participate in new sub-regional pooling arrangements with PNA members and Tokelau. As the price of fishing access under the VDS continues to increase there are further opportunities for such innovations. Notably, fleets are also beginning to think ahead to the spatial changes to fish stock distribution expected to emerge as the effects of climate change continue to develop, which also might forge new access relationships relating to an increase of fish biomass in the eastern high seas areas.

A third major dynamic that has emerged is **growth in PIC-flagged and domestically registered vessels**. This change has been driven by the potential opportunities for beneficial access relationships generally, and more specifically, reduced prices for fishing access compared to the VDS and other flexibilities such as exemptions from FAD bans, and as an enabling agent for the construction of new vessels for foreign states that otherwise have high seas effort limits and capacity limits on fleet size. Access relationships are influenced by considerations such as the prices and terms of access, as well as fish abundance and market access concerns.

REFERENCES

- Alibaba 2019. Website: <https://www.alibaba.com/showroom/katsuobushi.html>
- Allain, V. 2017. *The impacts of climate change on tuna in the Western and Central Pacific Ocean*, Presentation to Pacific Tuna Forum 2017, Port Moresby, PNG. 12 Sept 2017.
- Allen, R., Joseph, J. and Squires, D. 2010. *Conservation and management of transnational tuna fisheries*. pp 295-296. Blackwell Publishing.
- Atuna 2010. 'New tuna cannery for Century Pacific in 2019', 3 July 2019.
- Atuna 2019. 'PNG losing out because of climate change', 27 June 2019.
- Atuna 2019. 'PNG tuna exports to the EU steadily growing', 25 June 2019.
- Atuna 2019. 'Palau allows Japanese seiners to fish 20% of their EEZ, 21 June 2019.
- Becker, E. 2019. *June 2019 Enso Blog Update: Concentrate and Ask Again*, NOAA, 13 June 2019.
- Business Wire 2019. 'South Pacific Tuna Corporation slashes fleet by more than half, 2 July 2019.
- Campling, L. Havice, E. and McCoy, M. 2019. 'New Marine Stewardship Council Chain of Custody measures to combat labour abuse', *FFA Trade and Industry News*, 12(2): March-April.
- Campling, L., Havice, E. and McCoy, M. 2018. 'Starkist secures raw material and cold storage', *FFA Trade and Industry News*, 11(3): May-June.
- Campling, L. and Havice, E. 2014. 'Obama compromises on US Pacific Marine National Monuments', *FFA Trade and Industry News*, 7(5): September-October.
- Clark, S. 2019. *Purse Seine Fishing Activity in PNA Waters*, WCPFC-SC15-2019/ST-IP-04, 15th Regular Session of the Scientific Committee, Federated States of Micronesia, 12-20 August 2019.
- Davies, T., Mees, C., and Milner-Gulland, E. 2014. The past, present and future use of drifting fish aggregating devices (FADs) in the Indian Ocean, *Marine Policy*, Volume 45, March 2014, pp. 163-170.
- Doulman, D. 1986. *Fishing for Tuna: The Operations of Distant Water Fleets in the Pacific Islands Region*, East West Centre, Hawaii, USA.
- Dueri, S., Bopp, L. and Maury, O. 2014. Projecting the impacts of climate change on skipjack tuna abundance and spatial distribution. *Global Change Biology* 20 (3):742-753.
- Escalle, L., Brouwer, S., Pilling, G. and PNAO 2018. *Estimation of the number of FADs active and FAD deployments per vessel in the WCPO*, FADMO-IWG3-WP-05, Third Meeting of the WCPFC FAD Management Options Inter-Sessional Working Group, 3 October 2018, Marshall Islands.
- FAO 2018. *Globefish Highlights – A Quarterly Update on World Seafood Markets*, April 2019.
- FFA – Trade and Industry News Price Database, July 2019.
- FFA 2019. *Information Note on the Agreed Minimum Terms and Conditions in Relation to Crewing Employment Conditions*, June 2019.
- FFA 2019b. 'FFA & Japan agree new support to Pacific fisheries', Media Release, 18 April 2019.
- FIS 2019. 'Dongwon launches new tuna fishing vessel 'Jubilee'', 16 July 2019.
- Friend of the Sea 2019. 'Purse seiners vessels of major South Korean company Silla Co. Ltd found compliant with Friend of the Sea's sustainability criteria, following third party certification audit', Media Release, 19 May 2019.
- Gillett, R. 2007. *A Short History of Industrial Fishing in the Pacific Islands*, FAO, Thailand.

Gillett, R. 2003. *Domestic tuna development in the Pacific Islands: the current situation and considerations for future development assistance*. FFA Report 03/01. Pacific Islands Forum Fisheries Agency, Honiara, Solomon Islands.

Gillett, R., and Lewis, A. 2003. *A survey of purse seine fishing capacity in the Western and Central Pacific Ocean, 1998-2003*. National Marine Fisheries Service, Honolulu, Hawaii

Gillett, R., McCoy, M. and Itano, D. 2002. *Status of the US Western Pacific Tuna Purse Seine Fleet and Factors Affecting Its Future*, JIMAR Contribution 02-01, Pelagic Fisheries Research Programme, Joint Institute for Marine and Atmospheric Research, University of Hawaii, Honolulu.

Godfrey, M. 2019. 'Zoneco, CNFC see stocks rise on government port investment announcement', *Seafood Source*, 8 July 2019.

Godfrey, M. 2018. 'China rushing to build global fishing bases before capping its fleet size', *Seafood Source*, 17 January 2018.

Graduate School USA 2018. Republic of the Marshall Islands - Fiscal Year 2017 Statistical Appendices, August 2018. Available at www.econmap.org.

Greenpeace 2013. *South Korean Distant Water Fisheries Illegal, Unreported, Unregulated – and tarnished by human rights abuses*, April 2013.

Hamilton, A., Lewis, A., McCoy, M., Havice, E. and Campling, L. 2011. *Market and Industry Dynamics in the Global Tuna Supply Chain*, FFA, June 2011.

Harkell, L. 2019. 'CNFC inks deal for Chinese fishing firm', *Undercurrent News*, 7 June 2019.

Harkell, L. 2019. 'China's largest seafood companies lose ground on peers', *Undercurrent News*, 30 April 2019.

Harkell, L. 2019. 'Despite US tariffs, China's tuna exports surpass 100,000t', *Undercurrent News*, 26 March 2019.

Harkell, L. 2017. 'Chinese tuna fishing companies still yet to crack domestic market with canned products', *Undercurrent News*, 16 November 2017.

Havice, E. 2013. Rights-based management in the Western and Central Pacific Ocean tuna fishery: Economic and environmental change under the Vessel Day Scheme. *Marine Policy*, 42 (November):259-267.

Havice, E. and Campling, L. 2018. *Corporate Dynamics in the Shelf-Stable Tuna Industry*, Honiara: Pacific Islands Forum Fisheries Agency, August.

Havice, E., Campling, L. and McCoy, M. 2019. 'Eight US purse seine vessels to be sold, US Treaty fate uncertain', *FFA Trade and Industry News*, 12 (3): May-June.

Havice, E., Campling, L. and McCoy, M. 2019. 'Despite criticisms, MSC continues to gain traction in tuna fisheries', *FFA Trade and Industry News*, 12(1): January-February.

Havice, E., Campling, L. and McCoy, M. 2018. 'MSC retracts "mixed fishery" standards change', *FFA Trade and Industry News*, 11 (4): July-Aug.

Havice, E., Campling, L., and McCoy, M. 2017. 'Taiwan shipyard financial woes spill over the fishing vessels', *FFA Trade and Industry News*, 10 (6): November-December 2017.

Havice, E. Campling, L. and McCoy, M. 2017. 'Subsidies reported to continue fuelling profitability for China's largest tuna fishing companies', *FFA Trade and Industry News*, 10 (1): January-February 2017.

Havice, E., Campling, L. and McCoy, M. 2017. 'China continues subsidies to two large state-owned enterprises active in the WCPO', *FFA Trade and Industry News*, 10 (4): July-August 2017.

Havice, E., McCoy, M. and Campling, L., 2016. 'Tri Marine closes American Samoa plan; concern over overcapacity growing', *FFA Trade and Industry News*, 9(5): September-October.

Havice, E. McCoy, M. and Campling, L. 2016. 'US combines in-zone and high seas fishing effort in interim rule', *FFA Trade and Industry News*, 9(3): May June.

IntraFish Media, 2019. 'Bolton Group acquires Tri Marine: Long-time partner takes control of tuna giant', 7 July 2019.

International Trade Centre, 2019. Trade Map. Available at: <https://www.trademap.org/index.aspx>

Kiribati Fish Limited 2019, Company Website: <http://kiribatifishltd.com>, accessed April 2019.

Kiyofuji, H., Aoki, Y., Kinoshita, J. and Okamoto, S. 2019. Northward migration dynamics of skipjack tuna (*Katsuwonus pelamis*) associated with the lower thermal limit in the western Pacific Ocean. *Progress in Oceanography* 175: 55-67.

KOFA, 2019. A study on the WCPO Purse Seine Fishery, Notes prepared for a meeting with the consultant, KOFA Conference Room, Seoul, 26 April 2019.

Lewis, A. 2004. Review of tuna fisheries and the tuna fishery statistical system in the Philippines. WCPFC-SC1-ST/IP-6, OFP, SPC, Noumea, New Caledonia.

Lloyds List, 2018. Top 10 Flag States 2018, 10 December 2018. Available at: <https://lloydslist.maritimeintelligence.informa.com/LL1125024/Top-10-flag-states-2018>

McKechnie, S. Pilling, G. & Hampton, J. 2017. *Stock Assessment of Bigeye Tuna in the Western and Central Pacific Ocean*, WCPFC-SC13-2017/SA-WP-05, 13th Regular Session of the Scientific Committee, Rarotonga, Cook Islands, 9-17 August 2017.

Melbourne, D. 2018. 'US Market Overview', Presentation at 15th Infotech World Tuna Trade Conference, 28-30 May, 2018, Bangkok.

Ministry of Justice 2019. Regulations for the issuance of building permit and fishing licenses of fishing vessels, *Laws and Regulations Database of the Republic of China*. Available at: <https://law.moj.gov.tw/Eng/>

Ministry of Foreign Affairs of Japan, 2019. Pacific Islands Leaders Meeting (PALM). MOFA Website: <https://www.mofa.go.jp/region/asia-paci/palm/index.html>

Marine Stewardship Council 2019. Track a Fishery Database, MSC website: <http://www.msc.org>

National Research Institute of Far Seas Fisheries 2019, Data provided during interviews, April 2019.

NOAA Fisheries, 2015. Compliance Guide: Fishing in the Marianas Trench, Pacific Remote Islands, and Rose Atoll Marine National Monuments, Revised April 2015.

Pilling, G. 2018. Presentation – Stock Status Summary, 14th Regular Session of the Technical and Compliance Committee, Marshall Islands, September 2018.

PITIA 2019. 'PNA working group aims to complete FAD Tracking and Registration Measure', 11 February 2019.

Plastic Pipe, 2019. '2012: China shipbuilding industry breaks the tide', 3 March 2019.

PNA 2008. *A Third Arrangement Implementing the Nauru Agreement Setting Fourth Additional Terms and Conditions of Access to the Fisheries Zones of the Parties*, amended 1 May 2019.

PNA 2019a. *A Fourth Arrangement Implementing the Nauru Agreement Setting Fourth Additional Terms and Conditions of Access to the Fisheries Zones of the Parties Relating to FAD Tracking and FAD Buoy Registration*.

PNA 2019b. *PNAMIN14 WP.8: Update on FAD Management*, Parties to the Nauru Agreement 14th Annual Ministerial Meeting, 29-30 May 2019, Palau.

PNA 2019c. *WP.2a: PSVDS Administrator's Annual Report for Management Year 2018*, 24th Annual Meeting of the Parties to the Palau Arrangement, 14-15 March 2019, Koror, Palau.

Richardson, B., Harrison, J., and Campling, C. 2017, 'Labour rights in Export Processing Zones with a focus on GSP+ beneficiary countries', Brussels: European Parliament's Sub-Committee on Human Rights.

Rueters 2019. Company Profile - Shandong Zhonglu Oceanic Fisheries Co. Ltd. Available at: <https://www.reuters.com/finance/stocks/company-profile/200992.SZ>

Scott, G. and Lopez, J. 2014. *The Use of FADS in Tuna Fisheries*, European Parliament, European Union.

Seafood Task Force 2019. Supplier Letter – Seafood Task Force Supply Chain Oversight Programme for Tuna Fishing Vessel, 1 February 2019.

Seafood Task Force 2018. *Progress Report 2018: Not letting perfection get in the way of progress*. December.

Seaman, T., 2019. 'FCF says tuna volumes dropping with its increased sustainability focus', *Undercurrent News*, 8 July 2019.

Shing Jing 2017. 'Bright takes over fisheries in reform of Shanghai SOEs', *China Daily*, 20 May 2017.

Skirtun, M. and Reid, C. 2018. Analyses and Projections of Economic Conditions in WCPO Fisheries, WCPFC-SC14-2018-ST-WP-04 Rev. 1, 14th Regular Session of the Scientific Committee, Busan, Korea, 8-16 August 2018.

South Pacific Community 2019. *SPC Policy Brief #32: Implications of climate-driven redistribution of tuna for Pacific Island economies*, Noumea, New Caledonia.

South Pacific Community 2018. Transshipment database.

South Pacific Community, 2018. *WCPFC Tuna Fisheries Yearbook 2017*, Oceanic Fisheries Program, Noumea, New Caledonia.

Taipei Times 2018. 'Five indicted over Ching Fu scandal', 13 February 2018.

Thomas, F.C. 1999. *The Commercial Fishery Sector of the Philippines – A Centennial Chronicle 1989-1998*. 170 pp.

Undercurrent News, 2019. 'China's largest tuna company orders new \$24m tuna purse seiner', 14 May 2019.

Undercurrent News, 2019. 'Controversial Echebaster skipjack tuna fishery attains MSC certification', 9 November 2018.

Vincent, M., Pilling, G., and Hampton, J. 2019. Stock Assessment on Skipjack Tuna in the Western and Central Pacific, SA-WP-05, 15th Regular Session of the Scientific Committee, Federated States of Micronesia, 12-20 August 2019.

WCPFC 2019a. Record of Fishing Vessels, <https://www.wcpfc.int/record-fishing-vessel-database>, accessed April 2019.

WCPFC 2019b. Annual Report to the Commission (Part 1) - Kiribati 2018. WCPFC-SC14-AR/CCM-11, Pohnpei, FSM, 12-20 August 2019

WCPFC 2019c. Annual Report to the Commission (Part 1) - Japan 2018. WCPFC-SC14-AR/CCM-, Pohnpei, FSM, 12-20 August 2019

WCPFC 2019d. Annual Report to the Commission (Part 1) - Korea 2018. WCPFC-SC14-AR/CCM-12. Pohnpei, FSM, 12-20 August 2019

WCPFC 2019e. Annual Report to the Commission (Part 1) - Chinese Taipei 2018. WCPFC-SC14-AR/CCM-23. Pohnpei, FSM, 12-20 August 2019

WCPFC 2019f. Annual Report to the Commission (Part 1) – Marshall Islands 2018. WCPFC-SC14-AR/CCM-13. Pohnpei, FSM, 12-20 August 2019

WCPFC 2019g. Annual Report to the Commission (Part 1) – USA 2018. WCPFC-SC14-AR/CCM-27. Pohnpei, FSM, 12-20 August 2019

WCPFC 2019h. Annual Report to the Commission (Part 1) – PNG 2018. WCPFC-SC14-AR/CCM-19. Pohnpei, FSM, 12-20 August 2019

WCPFC 2018a. Annual Report to the Commission (Part 1) - Papua New Guinea 2017. WCPFC-SC14-AR/CCM-19, Busan, Republic of Korea, 8-16 August 2018.

WCPFC 2018b. Annual Report to the Commission (Part 1) - Philippines 2017. WCPFC-SC14-AR/CCM-20, Busan, Republic of Korea, 8-16 August 2018.

WCPFC 2018c. Annual Report to the Commission (Part 1) – Korea 2017, WCPFC-SC14-AR/CCM-12, Busan, Republic of Korea, 8-16 August 2018.

WCPFC 2018d. Summary of notifications to WCPFC of charter, lease or other mechanisms. WCPFC 15- 2018-IP11. Fifteenth Regular Session, Honolulu, Hawaii, 10-14 December 2018.

WCPFC, Conservation and Management Measure for Bigeye, Yellowfin and Skipjack in the Western and Central Pacific Ocean, CMM 2017-01, CMM 2018-01.

WCPFC, Conservation and Management Measure on Marine Pollution, CMM 2017-04

WCPFC, Conservation and Management Measure on Transshipment, CMM 2009-06

WCPFC, Conservation and Management Measure on Charter Notifications, CMM 2016-05

WCPFC, Conservation and Management Measure on Sea Turtles, CMM 2008-05

WCPFC, Conservation and Management Measure on Sharks, CMM 2010-07

WCPFC, Conservation and Management Measure on Cetaceans, CMM 2011-03

WCPFC, Conservation and Management Measure on Oceanic White Tip Sharks, CMM 2011-04

WCPFC, Conservation and Management Measure on Whale Sharks, CMM 2012-04

WCPFC, Conservation and Management Measure on Silky Sharks, CMM 2013-08

Williams, P. and Reid, C. 2019. Overview of Tuna Fisheries in the Western and Central Pacific Ocean, Including Economic Conditions – 2018, WCPFC-SC15-2019/GN WP-1, Scientific Committee Fifteenth Regular Session, Federated States of Micronesia, 12-20 August 2019.

Williams, P. & Reid, C. 2018. Overview of Tuna Fisheries in the Western and Central Pacific Ocean, including Economic Conditions – 2017, WCPFC-SC14-2018/GN-WP-01 Rev. 1, 14th Regular Session of Scientific Committee, 8-16 August 2018, Busan, Korea.

Yaizu Fisheries Cooperative 2018. Annual Report (translated).

Zhejiang Ocean Family Company 2019. Company Website: www.zheyu.cn/en/about.asp?classid=17&ClassNameEn=Company+Profile; accessed April 2019.

APPENDIX 1 List of Persons Consulted

Name	Organisation	Position
Amanda Hamilton	Tri Marine International, Singapore	Senior Manager – Fisheries Policy & Regulation
Marco D’Agostini	Tri Marine International, Bellevue, WA, USA	Assistant Chief Operating Officer
Taro Kawamoto	Pacific Islands Forum Fisheries Agency	Tuna Industry Advisor
China		
Densen Woo	Shanghai Kaichuang Marine International Co Ltd.	Assistant President
Daniel Chou	Shanghai Kaichuang Marine International Co Ltd.	Vice-Manager of Ship Affairs, Purse Seine Dept.
Zeng Yue Xiang	Zhejiang Ocean Family Co. Ltd.	President
Wang Xiao Qing	Zhejiang Ocean Family Co. Ltd.	Chief Fishing Engineer
Chen Xuejian	China Overseas Fisheries Association	Deputy Secretary-General
Xiao Menjiie	China Overseas Fisheries Association	Director, High Seas Fisheries Dept.
Li Yan	China Overseas Fisheries Association	Deputy Director, High Seas Fisheries Dept.
Sun Chong	China Overseas Fisheries Association	Deputy Director, High Seas Fisheries Dept.
Wang Xu Yang	Zhong Yu Global Fisheries Co Ltd.	Director of High Seas Fisheries Dept.
Taiwan		
Wen-Ying Wang	Taiwan Fisheries Agency	Section Chief, International Fisheries Affairs Section, Deep Sea Fisheries Division,
Hsiang-Yi Yu	Taiwan Fisheries Agency	International Fisheries Affairs Section, Deep Sea Fisheries Division,
Peter Sheu	Taiwan Tuna Purse Seiner Boat-Owners and Exporters Association	General Secretary
Memphis Han	Jong Shyn Shipbuilding Co. Ltd.	
Mullin C.H. Chuang	Fong Kuo Fishery Co. Ltd.	General Manager
Jesse Huang	Fair Well Fishery Co. Ltd.	General Manager
Jennifer Lai	Fair Well Fishery Co. Ltd.	Deputy General Manager
Max Chou	FCF Fishery Co. Ltd.	Executive Vice-President
Eddie Chiang	FCF Fishery Co. Ltd.	Specialized Assistant
Sam Chang	FCF Fishery Co. Ltd.	Section Manager
Jubby Sun	FCF Fishery Co. Ltd.	Specialized Assistant
Harry Chen	FCF Fishery Co. Ltd.	Assistant Manager
Chia Pao Li	RD Fishing Group	Consultant, Bilateral and Fishing Operations
USA		
US PS industry representatives	Various	Various



Korea		
Hyun-ai Shin	Korea Overseas Fisheries Association	Deputy General Manager
Ho-Jeong Jin	Korea Overseas Fisheries Association	Deputy General Manager - International Affairs Department
Bong-Jun Choi	Korea Overseas Fisheries Association	International Affairs Department
Sang-Jin Back	Korea Overseas Fisheries Association	International Affairs Department
KS Lee	Silla Co. Ltd.	Executive Director
Sancho Kim	Silla Co. Ltd.	Purse Seine Team Manager
Min Seop Kim (Oscar)	Silla Co. Ltd.	Purse Seine Team
Gun-Hoon Kwak (Kofi)	Silla Co. Ltd.	Purse Seine Team
Jay (Jae Hwa) Lee	Dongwon Industries Co. Ltd.	Assistant Manager - Maritime Fisheries Team
Deuk-hwa Kong	Dongwon Industries Co. Ltd.	Assistant Manager - Marine and Fisheries Team
Ducklim Kim (Liam),	Sajo Industries Co. Ltd.	Assistant Manager, Fishery 2 Team
SG Kim	Silla Group	Former Chief Officer, Purse Seine Team
Japan		
Susumu Oikawa	Taiyo A & F Co. Ltd.	Managing Director/Chief - Fisheries Division
Meiko Kawahara	Taiyo A & F Co. Ltd.	Manager - Corporate Planning
Hidetoshi Ito	Taiyo A & F Co. Ltd.	General Manager - Purse Seine Fishing
Akira Hashigushi	Taiyo A & F Co. Ltd.	Deputy General Manager - Tuna Trade Section
Akira Nakamae	Japan Far Seas Purse Seine Fishing Association (KAIMAKI)	President
Kazuhiko Nagao	Japan Far Seas Purse Seine Fishing Association (KAIMAKI)	Adviser to the President
Shingo Ota	Fishery Agency of Japan (SUISAN-CHO)	Director General - International Fisheries
Takashi Koya	Fishery Agency of Japan (SUISAN-CHO)	Director General - Resource Management Division
Wataru Inoue	Fishery Agency of Japan (SUISAN-CHO)	Assistant Director - International Affairs Division
Ryo Omori	Fishery Agency of Japan (SUISAN-CHO)	Assistant Director - International Affairs Division
Akira Bamba	Fishery Agency of Japan (SUISAN-CHO)	International Affairs Division
Shimba Fukuda	Overseas Fisheries Cooperation Foundation (OFCF)	Managing Director - Financial Cooperation Dept



Koichi Morita	Overseas Fisheries Cooperation Foundation (OFCF)	Director - Loan Division
Naoki Nishimura	Overseas Fisheries Cooperation Foundation (OFCF)	International Exchange Promotion Division
Masahiro Toyooka	Overseas Fisheries Cooperation Foundation (OFCF)	Loan Division
Akihiko Yatsuzuka	Overseas Fisheries Cooperation Foundation (OFCF)	Advisor
Kengo Suzuki	Miho Shipyard Co. Ltd.	President
Shigeru Kuwabara	Miho Shipyard Co. Ltd.	Managing Director - General Affairs Department
Hirosho Minami	National Research Institute of Far Seas Fisheries	Director - Tuna and Skipjack Resources Department
Hidetada Kiyofuji	National Research Institute of Far Seas Fisheries	Head – Skipjack and Albacore group
Ziro Suzuki	National Research Institute of Far Seas Fisheries	Advisor
Hiroshi Katayama	Yaizu Fisheries Cooperative Association	Deputy General Manager
Mr. Katsutoshi	Yaizu Fisheries Cooperative Association	Ogihara Manager
Tsuneo Masuda	Yaizu Fisheries Cooperative Association	Vice President
Shigeru Kinoshita	Japan Marine Service Co. Ltd	Director
Phylister Ebitoa	Japan Marine Service Co. Ltd	Recruit Division
Hiroataka Hagiyama	Ichimaru Co. Ltd.	Senior Managing Director
Haruo Unno	Ichimaru Co. Ltd.	Director - Fisheries Department
Akira Terao	Kanetora Co. Ltd.	Managing Director
Hitohide Terao	Kanetora Co. Ltd.	Manager
Taichiro Kondo	Fukuichi Fisheries Co. Ltd.	Manager – Purse Seine Fishery
Hiroyuki Aoki	Kyokuyo Suisan Co. Ltd.	President
Tetsuya Hashimoto	Kyokuyo Suisan Co. Ltd.	Manager – Purse Seine Section
Akihiro Kawaguchi	Kyokuyo Suisan Co. Ltd.	Director - Fisheries Department



APPENDIX 2 History of the WCPO Purse Seine Fishery

Event	Year	Event
	1954	Van Camp establishes cannery in Pago Pago, American Samoa
StarKist establishes cannery in Pago Pago, American Samoa	1963	
	1970-1972	Japan conducts experimental PS fishing trials in Palau and PNG
Japan deploys commercial PS fleet in Pacific Islands; vessels fishing in PNG, FSM, SI.	1972	Solomon Islands first cannery 'Solomon Taiyo' and small arabushi plant established in Tulagi by Japanese company, Taiyo Gyogyo (name change to Maruha Corporation in 1993) in joint venture partnership with Solomon Islands Government (initially supplied by pole-and-line fleet).
Exploratory US PS voyages into US Trust Territories (Palau, RMI, Guam, FSM, Northern Marianas) funded under US-Pacific Tuna Development Fund (PTDF)	1976	
	1977-1984	All PICs and territories declare EEZs.
Pacific Islands Forum Fisheries Agency (FFA) established in Honiara, Solomon Islands	1979	
Japan operating 12 purse seine vessels in the WCPO fishing predominantly on logs and other floating objects; Japanese vessel replacement policy to swap 5 P&L vessel licences for 1 PS vessel licence.	1979-1980	Philippines canning industry established (processing facilities initially Manila, Zamboanga and General Santos); Philippines PS fleet expands to start fishing in PNG, Indonesia and high seas to supply canneries.
First ATA bilateral agreement established for US PS with FSM, RMI, Palau in 1982-1984, followed by one with FSM, Palau, and Kiribati in 1984-1985.; served as a pre-cursor to the US Tuna Treaty in 1986	Early 1980s	First Solomon Islands flag purse seiner starts fishing; owned by Taiyo Gyogyo to supply Solomon Taiyo
Korean canning industry established to supply domestic market.		Taiwan builds its first tropical PS, a group PS model with Japanese technical assistance. Later developed single purse seiners, also on the Japanese model.
US dolphin free campaign results in US PS fleet shifting to WCPO to become the first major DWFN competitor to Japan; US PS fish typically transhipped in Guam and Tinian (Nth. Marianas) for canneries in Am. Samoa and Puerto Rico.		Thai canning industry starts to develop; capacity grows exponentially over next 30 years to become the world's largest tuna canner (over 3,000 mt/day); around 30 packers; dominated by Thai Union (1,000mt/day) & Sea Value (800 mt/day).
Japan canning sector contracts significantly due to competition from Thailand		



Event	Year	Event
Korea starts PS fishing with 2 vessels	1982	Philippines starts PS fishing with 1 vessel
The Nauru Agreement is established between Solomon Islands, Tuvalu, Kiribati, Marshall Islands, Papua New Guinea, Nauru, Federated States of Micronesia and Palau to formalize cooperation in managing tuna stocks within their national waters.		PNA 1 st Implementing Arrangement (1IA) is established (vessel licencing; catch & effort reporting; authorized personnel (observers); vessel identification)
Taiwan starts PS fishing with 3 vessels	1983	NZ starts PS fishing with 7 vessels
US PS fleet peaks at 62 vessels	1983	
	1984	Mexico establishes PS access agreement with FSM
11 mainland US and 1 Hawaiian canneries close due to high labour costs, high US dollar, increased imports, strict environmental regulations in US mainland; 8 remain (5 - Puerto Rico; 1 - mainland; 2 - American Samoa)	Mid 1980s	
Mexico PS vessels exit the WCPO fishery	1986	USSR establishes PS access agreement with Kiribati for 8 vessels
		US Treaty established with Pacific Island Parties (PIPs) providing multilateral access to PIPs waters for up to 50 US PS vessels.
Indonesia canning sector develops (East Java, Bitung, Bali, Sorong, Biak)	1980s -1990s	
Solomon Taiyo cannery relocates from Tulagi to Noro	1990	Korea PS fleet peaks at 39 vessels
		PNA 2 nd Implementing Arrangement established for foreign vessels (ban on high seas transshipment; daily catch & effort reporting; observer placements; VMS)
Tuna trading companies start becoming more involved in purse seine sector (prior to this, canneries were buying direct from fishing companies, with buyer representatives based in main ports)	Early 1990s	
FSM starts PS fishing with 6 vessels	1991	
PNA 2IA high seas transshipment ban comes into effect	1992	Taiwan-flag fleet peaks at 45 vessels
USSR-flag fleet peaks at 8 vessels	1993	
Kiribati starts PS fishing with 1 vessel (Japanese beneficially owned)	1994	USSR PS fleet exits WCPO fishery
PNG start PS fishing with 3 vessels		Vanuatu starts PS with 1 vessel
PNA establishes the Federated States of Micronesia Arrangement (FSMA), providing concessional multilateral access to PNA parties' waters for vessels contributing significantly to a PNA country's economic involvement in fishing	1995	PNA establishes The Palau Arrangement – a multilateral treaty to manage purse seine fishing within PNA waters; foreign vessel numbers limited to 205.



Event	Year	Event
RD Tuna Cannery (Philippines) established in Madang, PNG.	1997	
	1998	EU (Spain) starts PS fishing with 5 vessels
PM&O loining plant established in Majuro, Marshall Islands to supply StarKist in Am. Samoa	1999	
Marshall Islands start PS fishing with 5 vessels (Taiwan, China beneficially owned)	2000	Ecuador starts PS fishing with 7 vessels
EU (Spain) fleet peaks at 12 vessels		Japanese-flag distant water fleet peaks at 37 vessels
		Maruha Corporation withdraws from Solomon Islands due to ethnic tension; gifts Solomon Taiyo to Solomon Islands Government; renamed Soltai Fishing & Processing Ltd.
El Salvador starts PS fishing with 3 vessels	2001	China starts PS fishing with 1 vessel
Vietnam's tuna processing sector develops (in parallel with a large aquaculture sector)	Early 2000's	
China processing sector develops (mostly loins)	2000's	US fleet deeply affected by international competition/declining fish prices; fleet contracts to 11 vessels.
NZ fleet peaks at 11 vessels	2002	
	2003	South Seas Tuna Corporation (SSTC) loining plant established in Wewak, PNG (Taiwanese)
Western and Central Pacific Fisheries Commission (WCPFC) established	2004	
	2005	PM&O processing plant in Majuro closes
Frabelle cannery established in Lae, PNG (Philippines)	2006	Former PM&O processing plant in Majuro is purchased by Shanghai Deep Sea Fisheries (Chinese); renamed Pan Pacific Foods (PPF).
US fleet bolstered by new entrants (US-flagged, Taiwanese majority beneficially owned vessels); 'old fleet' unloads to Pago Pago canneries; 'new fleet' tranships to Thai/Latin American canneries.	2007	PNA Purse Seine Vessel Day Scheme comes into effect under the Palau Arrangement, replacing the 205 limit on foreign vessels with a limit on total on fishing effort in PNA EEZs.
Vanuatu PS fleet peaks at 10 vessels	2007	
Defunct PM&O loining plant in Majuro taken over by Shanghai Fisheries and re-named Pan Pacific Foods.	2008	PNA 3 rd Implementing Arrangement established (ban on PS fishing in high seas pockets 1 & 2; 3 month FAD closure; full tuna catch retention)
Chicken of the Sea/Thai Union opens loin-only canned tuna plant in Lyons, Georgia; closes Am. Samoa plant.	2009	

Event	Year	Event
Bumble Bee opens loin-only canned tuna plant in Santa Fe Springs, California (LL albacore/PS skipjack)	2010	PNA Office established in Majuro, Marshall Island to provide Secretariat services and coordinate PNA initiatives
Tri Marine purchases 51% shareholding in Soltai Fishing & Processing; name changes to Soltuna Ltd.		Ecuador PS fleet peaks at 14 vessels
PNA obtains Marine Stewardship Council (MSC) certification for free-school skipjack/ yellowfin in PNA EEZs	2012	
	2013	Majestic Seafood cannery opens in Lae, PNG (Thailand – Thai Union; Philippines – Century Canning, Frabelle Fishing).
Philippines-flag distant water fleet peaks at 27 vessels	2014	WCPFC establishes hard limits for PS fishing effort on the high seas for DWFN fleets (CMM 2013-01)
Nambawan Seafoods Tuna loining/canning plant opens in Lae, Madang (Taiwan – FCF; Philippines – Transpacific Journey Fishing Corporation, TSP Mariner Industries)	2015	China-flag fleet peaks at 15 vessels
	2017	WPCFC adopts a limit of 350 drifting FADs with activated instrumented buoys per vessel (CMM 2017-01)
WCPFC adopts binding design and construction specifications for non-entangling FADs (CMM 2018-01)	2018	WCPO large-scale PS fleet by flag: China – 15 Ecuador – 4 El Salvador – 2 EU (Spain) – 2 FSM – 22 Japan – 28 Kiribati – 10 Korea – 27 Marshall Islands – 8 Nauru – 2 New Zealand – 1 PNG – 30 Philippines – 34 Solomon Islands – 10 Taiwan – 27 Tuvalu – 1 USA – 33 Vanuatu – 2

Sources: Douman 1986, Gillett 2007, Gillett, McCoy & Itano 2002, SPC 2018, WCPFC Annual Country Reports – 2018, authors' own knowledge

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